REVISION NUMBER	DATE OF REVISION	AFFECTED PAGES	REMARKS/PURPOSE
	09/02	APP-A	Investigator-in-Charge Checklist
	09/02	APP-B	Cockpit Voice Recorder Handbook
	09/02	APP-C	Stakedown Duties of Field Investigators
	09/02	APP-D	On-Scene Organizational Chart
	09/02	APP-E	IIC's Opening Statement at Organizational Meeting
	09/02	APP-F	Guidance for Accredited Representatives, Advisors, Party Coordinators, and Other Participants in the Investigation of Aircraft Accident Reports by the Safety Board
	09/02	APP-G	On-Site Safety
	09/02	APP-H	Group Chairmen Checklists
	09/02	APP-I	Sample Group Chairman Progress Meeting Brief
	09/02	APP-J	Materials Laboratory Examinations
	09/02	APP-K	Group Chairman Factual/Analysis Report Outlines
	09/02	APP-L	Hearing Officer's Checklist for Preparing a Public Hearing
	09/02	APP-M	Exhibit Cover Sheet and Identification Numbers
	09/02	APP-N	Prehearing Conference Proceedings
	09/02	APP-O	Public Hearing Proceedings
	09/02	APP-P	IIC's Opening Statement to Board Meeting
	09/02	APP-Q	Petition for Reconsideration Procedures
	09/02	APP-R	Policy on Freedom of Information Act
	09/02	APP-S	Excerpt From ICAO's *Manual Of Aircraft Accident Investigation*
	09/02	APP-T	Occupational Safety and Health Information
	09/02	APP-U	Foreign Travel Information
	09/02	APP-V	Office of Transportation Disaster Assistance Task List

APPENDIX A
INVESTIGATOR-IN-CHARGE CHECKLIST

Introduction

This advisory checklist is designed to lead an Investigator-in-Charge through most of the administrative steps and many of the operational steps required for a major aircraft accident investigation. It also provides continuity and standardization among IICs as the IIC staff changes over the years. It is arranged for large, major hull loss/numerous casualty type accidents. Items not necessary for such an accident may be ignored.

The checklist should be used in conjunction with the standardized memorandums, letters, etc., contained on this CD-ROM. Document titles are in italics following the checklist items. Pertinent Board Orders are also on this CD-ROM and should be referred to periodically during the investigation and report preparation process.

Suggestions for changes to this document should be brought to the attention of the Chief, AS-10. This CD-ROM will be reissued periodically, as such changes warrant.

While on Call

- Required Administrative Equipment

  - Charged cell phone with spare set of charged batteries
  - Pager with new battery
  - Laptop computer with appropriate peripheral equipment and software to communicate with NTSB HQ
  - At least 50 business cards
  - Small supply of NTSB lapel pins and/or NTSB embroidered patches
  - Current official passport and NTSB credentials, and personal passport
  - Single notebook to record all notes on an accident from initial notification to close of Board Meeting. Glue business card in notebook to avoid loss.
    - Wreckage release forms
    - This CD-ROM

- Required paper copies of:

  - This checklist
  - IIC organizational meeting speech (*On scene Opening Speech IIC.doc)*
  - Party participation form *(Party Participation Form.doc)*
  - Risk management matrix *(On Scene Risk Management Matrix.doc)*
  - Party participant matrix *(On Scene Party Participant Matrix.doc)*
  - ICAO Annex 13
  - 6120.1 form
  - SF44 form

- Required Personal Equipment

  - Clothing appropriate for the season and NTSB hat, NTSB reflective vest, and jacket or coat with NTSB seal
  - Small backpack to contain personal survival items and material obtained on scene in remote locations
  - Personal survival kit (first aid supplies, pocket knife, nonprescription and prescription medicine supply for three weeks, etc.)
  - Gym bag with two days of clean clothes and toilet articles (stored in office)

Upon Initial Notification

- Obtain:

  - Call list, including numbers for AS-1/2, the Managing Director, the Chairman, the Offices of Government Affairs (GA) and Public Affairs (PA), the Office of Transportation Disaster Assistance (TDA), Board regional offices, the FAA and other parties.

- General information on accident (time, location, casualties, aircraft information, etc.)
- Temperature and other weather conditions at accident site
- Site terrain information
- Aid senior staff in determination of NTSB team members, including Board Member, PA, and TDA representatives (investigators, Board Member, and PA and TDA have priority on the FAA airplane; others go commercial)
- Confirm availability of initial supply (approx. 20) of biohazard kits.
- Confirm air transportation arrangements (number of seats available on FAA airplane and show time at Hangar 6, or commercial flight information).
- Confirm ground transportation arrangements (rental cars or 4X4s, as appropriate).
- Confirm forward location accommodations and command post setup (use established hotel chain, if possible).
- Obtain on scene contact phone numbers (local authority, regional NTSB investigator cell phone number, etc.).
- Obtain directions to site from expected destination airport.
- Have Communications Center contact probable parties and notify them of command post location and organizational meeting time.

Prelaunch/Launch

- Perform head count at airport or Hangar 6.
- Confirm fitness for duty of all investigators and ensure that they have proper clothing for accident site.
- Start the risk analysis matrix.
- If not already accomplished, establish time for organizational meeting and have Communications Center spread the word to parties.
- Deliver briefing on accident circumstances and general safety briefing to investigators and staff.
- Contact regional investigator on scene for briefing on situation and give him your ETA and organizational meeting time.
- Ask the FAA for air traffic control information.

On FAA or Commercial Aircraft

- Via onboard telephone, ensure that regional investigator on scene is aware of team's ETA.
- Establish initial game plan (i.e., division of available rental cars, airworthiness investigators, IIC, and Board Member to actual site, everybody else to hotel command post).
- If not already accomplished, decide on time and place for organizational meeting and relay to NTSB Communications Center and regional investigator on scene.

- Review IIC organizational meeting speech *(On Scene Opening Speech IIC.doc)* and edit for the situation at hand.
- Be prepared for (compose brief notes) possible immediate press conference upon arrival.

On Scene Investigation

- <u>Upon arrival at airport or on scene incident command post</u>

  - Obtain briefing from local authorities/on scene commander and regional investigator on scene.
  - Give press conference, if required.
  - Check on status of recorders.

- <u>Observe wreckage and accomplish the following</u>

  - Determine general scope of work ahead.
  - Confirm initial site security arrangements.
  - Determine site safety hazards.
  - Order the collection of perishable evidence (paperwork, ice shapes, etc.).

- <u>Organizational meeting and press conference</u>

  - Confirm that representatives from major parties are present.
  - Invite reporters and attorneys representing possible claimants out of the room.
  - Distribute attendance roster.
  - Introduce NTSB investigators and staff.
  - Have all attendees identify themselves and their affiliations.
  - Offer local authorities an opportunity to brief group on status of accident.
  - With local authorities, establish security access system for accident scene.
  - Deliver IIC opening speech *(On scene Opening Speech IIC.doc)*.
  - Designate parties to the investigation and determine party coordinators (be selective…extra "courtesy" parties will later become an administrative burden).
  - Distribute party participation form *(Party Participation Form.doc)* for party coordinator signature.
  - Select qualified party participants for investigative groups (record participant's names on party participant matrix…*On scene Party Participant Matrix.doc)*
  - Collect business cards.
  - Determine which investigative groups will depart for other locations (ARTCC, operator headquarters, etc.) and establish time and procedures for daily contact.

- Establish duty hour plan (i.e., duty day begins at 0730, progress meeting at 1800 the first day, 1700 after 2 days, 1600 thereafter). Inform group that only participants can attend progress meetings. The duty day should generally end at the end of the progress meeting. No overtime will be approved thereafter.
- Designate time for next progress meeting and adjourn meeting.
- With PA representative, prepare Board Member for press conference.
- Attend press conference.

- <u>Initial Administrative Actions</u>

  - Determine phone numbers for command post and other possible locations where IIC can be routinely found (police van, on scene commander's van, etc.) and relay this information to AS and the Communication Center.
  - Determine need for administrative assistance and obtain same from AS or local temporary hiring agency.
  - Arrange for security guard for command post, if required.
  - Perform first call-in to AS senior staff if during duty hours (include information for ADMS preliminary report) and proposed time for next call-in
  - If required, brief administrative assistant on duties upon arrival.
  - Send administrative assistant on shopping trip for basic administrative supplies.
  - Meet with hotel services representative and confirm meeting groom rate and other rental costs associated with command post. (Do not agree to pay for any food services in command post, including coffee urns).
  - Determine need for administrative machines (copiers, phone lines, PCs, printers fax machines) and rent same from local businesses or hotel.
  - Set up "mailboxes" (shallow cardboard boxes) to contain distributed paperwork for each party.
  - Print and distribute to party coordinators copies of the party information pamphlet *(Party Information Pamphlet.doc)*, the latest attendance roster, and the filled-in party participant matrix.
  - Establish "message board" area in command post for incoming phone messages to participants.

- <u>Daily activities</u>

  - About 0700 meet with group chairmen to discuss potential investigation or interpersonal problems.
  - About 0745 meet with party coordinators to discuss potential investigation or interpersonal problems.
  - Visit site several times each day, if feasible, to check on security, manpower, and environmental problems and to ensure site safety.
  - If time is available, type up short progress report and e-mail to AS.

- Review note sand perform daily call-in to AS.
- Prepare notes for progress meeting concerning administrative items, times of later meetings, and the like. Then, hold daily progress meeting.

- <u>Daily progress meeting/press conference</u>

  - Invite nonparticipants and attorneys representing possible claimants out of room.
  - Distribute attendance roster.
  - Introduce new arrivals.
  - Make administrative announcements.
  - Ask each group chairman for 5 to 10 minute progress report to include the current day's activities, tomorrow's activities, significant problems that arose, and help needed from other investigative groups.
  - Reemphasize information security issue.
  - Reemphasize site safety issue.
  - Determine time for next progress meeting, group chairmen meeting, and party coordinators meeting.
  - Adjourn meeting and prepare Board Member for press conference.

- <u>Predeparture Administrative Actions</u>

  - Thoughtfully review and sign off individual group chairman notes, then release group chairmen for return trip.
  - If entering into a long-term arrangement for wreckage storage, notify AS for instructions to enter into a contract.
  - Pay outstanding hotel meeting room bills
  - If appropriate, return wreckage to owner after he signs the NTSB Wreckage Release form *(Wreckage Release.doc)*.

Immediately Upon Return to Washington, DC

- Submit travel voucher electronically and turn in overtime form *(Overtime Request.xls)*.
- Ensure that ADMS and Keys are updated.
- Enter investigation into NTSB Works and ensure that group chairmen division chiefs do the same.
- Write and distribute progress report if interval between last written progress report and return from scene is longer than 7 days.
- Update Board Member on scene in person on latest investigation activities
- In Microsoft Outlook, create Personal Distribution List for this investigation containing all group chairmen, individual specialist, appropriate division chiefs, and AS-2 e-mail addresses. This e-mail list is for mass distribution of updates, meeting information, etc., to NTSB personnel.

- In Microsoft Outlook, create a Personal Distribution List for this investigation with all party coordinators' e-mail addresses. This e-mail list is for mass distribution of updates, meeting information, etc., to party personnel.
- Create Party & Staff Participant List and distribute to all, including AS-10 administrative assistant (*Party & Staff Participant List.doc)*.
- Establish a single master electronic folder on the AS-10 common drive to contain documents and e-mails associated with the accident. It must be available to supervisors and titles so other investigators and supervisors can find it and retrieve documents from it.
- Compose common summary opening paragraph for future factual reports and distribute to group chairmen.
- Send a copy of the fax and phone numbers of the party coordinators to RE-51.

Work Planning Meeting(s) and Debrief for Launch

- Reserve meeting room.
- If you need audio/visual services or the new Board Room, use the request form on the NTSB intranet under "Projects."
- Determine outstanding issues.
- Select proposed due dates for factual and analytical reports.
- Determine meeting date to coincide with availability of key personnel.
- Write and distribute work planning meeting announcement memo and meeting agenda for distribution at meeting *(Work Planning Meeting Agenda.doc)*.
- Following the meeting, write and distribute a memo repeating decisions made during meeting (due dates, discarded issues, new issues, etc.).

Later Post-On Scene Investigation

- Begin preparing IIC portion of Board Meeting Powerpoint presentation.
- Query parties via e-mail on their views on need for a public hearing and retain their responses.
- With responses in mind, write memo recommending or not recommending a public hearing *(Hearing Memo No Hearing.doc* or *Hearing Memo Yes Hearing.doc)*.

Preparation of Factual Reports/Exhibits

- Periodically query group chairmen on their progress and expectations making the declared due dates for factual and analytical reports.
- If a factual or analytical report due date has passed, reestablish a realistic due date and notify AS-10 and the investigators' division chiefs of the new date.

- Should a second due date be missed, reestablish a new due date and notify AS-10, the appropriate division chief, AS-2, and AS-1 of the difficulty.
- Create a docket for the accident in the Docket Management System (DMS), and instruct group chairmen to upload their reports and addendums in .PDF format.
- Instruct group chairmen to upload a short .PDF description of non-scannable items associated with factual reports to DMS (video or audio tapes, etc.). Then leave the original with RE-51.

Opening of Public Docket

- Prepare a docket opening warning memo (Open Docket.doc) and begin to circulate it about 2 weeks before your intended docket opening date.
- When the majority of factual reports are uploaded (if the reports include a CVR transcript) alert Public Affairs, the Office of Transportation Disaster Assistance, and Public Inquiries that AS-10 is ready for the docket opening.
- Send electronic warning memo to parties to the investigation that the docket will probably be opened on the agreed-upon date before that date.
- Review the docket in DMS. Mark all releasable docket items for release, and set the docket opening date.
- After the initial opening of the docket review DMS periodically and release reports and addendums added by group chairmen.
- Retain original factual and analytical reports for 1 year following the Board Meeting on the accident.

Depositions

- Determine deposition location, time, and date.
- Reserve deposition location.
- Obtain hotel accommodations for NTSB participants.
- Obtain letter from Chairman authorizing IIC to administer oaths.
- Arrange for court reporter through Office of Administrative Law Judges.
- Select witnesses to be deposed.
- Ensure that group chairmen brief witnesses about areas of questioning and deposition procedures.

Public Hearing

- If the public hearing will not be conducted in our Board Room, reserve a remote venue and accommodations for NTSB participants immediately.
- Announce location, date, and time of hearing to parties and the public.
- Announce location, date, and time of the prehearing conference to the parties.
- Set a deadline for the factuals and exhibits to be at least 2 weeks before the prehearing conference.

- Refer to the Hearing Officer's Checklist for preparing for a public hearing (see Appendix L).

Technical Review

- Decide upon review format…remote first draft review by parties or formal technical review meeting at NTSB.
- Reserve meeting room.
- Invite parties to review material *(Technical Review Invitation.doc)*.
- Before meeting, refamiliarize yourself with reports.
- At the meeting, offer up each factual report or study for factual criticism, and carefully note agreed upon changes, deletions, or additions.
- Announce need for and due date of party submissions.
- After the meeting, write memo to parties and group chairmen listing agreed upon changes, deletions, or additions, to factual reports.

Party Submissions

- Periodically query parties on the status of their submissions.
- Deliver copies of party submissions to Board Members and appropriate group chairmen, AS-70 staff, and senior staff, as they are received from parties.
- Place party submissions into public docket upon receipt.

Report Planning Meeting

- Reserve meeting room.
- Distribute meeting announcement and meeting agenda.
- Update NTSB Works.

Preparation of Analytical Reports

- Periodically query group chairmen on progress of analytical reports and report extreme late reports to appropriate managers.
- Update NTSB Works.

Initial Draft

- Review and return to report writer in a timely manner.
- Work with report writer to resolve conflicts and fill holes in initial draft.

Director's Draft

Director's Review Meeting

- As soon as meeting time, date, and place are decided upon by MD, e-mail this information to group chairmen and senior staff.
- Before the meeting, determine dissenting opinions from or between group chairmen and discuss differences of opinions with group chairmen and senior staff (consensus is the goal but not a requirement).

Notation Draft

- Ensure that Board Members have copies of all party submissions prior to delivery of the notation draft to them.
- Ask each Board Member if they would like to discuss aspects of the notation draft with staff. Set up appointments, if required.

Board Meeting

- Board Meeting Preparation

  - Reserve Board Room for three practice sessions on the Tuesday, Thursday, and Monday prior to the Board Meeting.
  - Once announcement of Board Meeting is placed in Congressional Record, send an announcement of date and time to party coordinators.
  - Have group chairmen presenters read the informal pamphlet "How to Survive a Board Meeting".
  - Hold meeting with key group chairmen to coordinate Powerpoint presentations.
  - Consolidate IIC and group chairmen Powerpoint presentations into one presentation with common colors, fonts, etc.

- Following the Board Meeting

  - Place original factual and analytical reports in a sealed, clearly marked cardboard box and store in the basement for a period of 1 year after the Board Meeting.

Document Preservation and Archiving

- FOIA Notification and Subsequent Actions

  - When a FOIA notification is received, cease destroying paperwork, photographs, video tapes, audio tapes, electronic files and electronic correspondence (Do not attempt to determine if what you have is subject to the FOIA or not).
  - Send electronic memo to group chairmen, technicians, Board Members, and other appropriate staff to do the same.

- If NTSB FOIA personnel request your material, make copies of items you are still using or may use in the future to complete the investigation, then…
- Deliver all investigation material to NTSB FOIA personnel with the exception of the copies you made in the previous step. Be advised that it will be difficult to retrieve items once they are given up. Make copies of what you need!
- Make copies of material received by you subsequent to the first delivery to NTSB FOIA personnel, for your use during the rest of the investigation. Deliver originals to FOIA personnel immediately thereafter.

Foreign Accidents

- Initial Notification

  - Attempt to establish contact with the foreign accident investigation authority and determine the level of participation as an Accredited Representative or Technical Advisor.
  - Notify the Managing Director and obtain approval to travel (see Appendix U).
  - Request country clearance from the State Department (see Appendix U).
  - Determine whether assistance will be needed from the U.S. embassy in the host country and obtain a point of contact from the State Department (do not contact the embassy directly without first contacting the State Department).
  - If visas are required, visit the State Department's web site (http://www.travel.state.gov/foreignentryreqs.html) to determine foreign entry visa requirements. Prepare a letter on official Safety Board letterhead to accompany the visa application (see Appendix U).

- Prelaunch/Launch

  - Review ICAO Annex 13.
  - Visit the State Department's web site (http://www.travel.state.gov/travel_warnings.html) to become familiar with local customs, political climate, crime, recommended inoculations, etc.
  - Establish contact with the aircraft and/or engine manufacturer (as applicable) and coordinate travel plans.
  - Make arrangements with the foreign investigation authority **or** the U.S. embassy to join the investigation.

- On Scene Investigation Participation

  - Seek out the investigation authority.
  - As time permits, contact the U.S. embassy and maintain contact with embassy representatives during your stay.

- Communicate regularly with HQ via telephone or e-mail (depending on differences in time zones).
- If the host country requests a report of the team's work, prepare factual documentation **only**. If conclusions or requested, seek the advice of technical advisors on the team and Safety Board management before advising foreign authorities.

- Predeparture

  - Offer an out-briefing of key embassy officials to cover the general nature of the investigation. **Refrain from speculation.**

- Upon Return to Washington, DC

  - Prepare trip report.
  - Forward trip report and other related documents to the appropriate supervisor. Retain a copy for the division case file.

- Report Preparation/Review

  - Upon receipt of the host country's request for consultation on the draft report, review and prepare an appropriate response to it. Coordinate reviews with Office Directors and other staff. Employ an editorial style when providing comments; **do not** usurp the Board's authority by using language such as "the Board believes/is concerned," etc.
  - After the final report has been published, enter the report into the public docket and forward the findings of the investigation to U.S. Government agencies and corporations (as appropriate).

- FOIA Notification

  - Do not turn over any information relating to the Board's participation in a foreign aircraft accident investigation until the host country has issued the final report or until 2 years have passed since the accident's occurrence, whichever occurs first. You may disclose information earlier if the host country has authorized such release.

Underwater Wreckage Recovery

- If the accident aircraft had a CVR and/or FDR installed, make sure that a search for the underwater locator beacon is initiated immediately.
- Request that AS management contact Department of Defense/Supervisor of Salvage personnel to determine their level of participation in search and recovery planning. (Consider foreign authority responsibilities if the wreckage is in international waters.)
- Depending on the circumstances of the accident, obtain witness statements, weather data, radar tracking data, and trajectory analyses to aid in locating the wreckage.
- Once a search and recovery plan is approved, using U.S. Government resources prepare a letter from the Safety Board Chairman to the Chief of Naval Operations to initiate funding.
- Before recovery is attempted, ensure that personnel have been thoroughly briefed on the recommended locations for attaching cables, straps, hooks, etc. Be sure to consult specialists from the operator or the airframe/engine manufacturer.
- Immediately treat recovered wreckage with appropriate solvents to prevent rapid corrosion.

APPENDIX B
COCKPIT VOICE RECORDER HANDBOOK

Foreword

This handbook provides general information to assist the investigator-in-charge, group chairmen, and other Safety Board staff who may encounter a cockpit voice recorder during the course of an aviation accident investigation. It is intended to provide guidance on the procedures, laws and standard practice surrounding the cockpit voice recorder and its audio data within an investigation.

The Vehicle Recorder Division will be responsible for keeping this handbook updated. The handbook's printing date will be indicated in the upper left corner of each page. While the intent of the handbook is to provide guidance for handling a cockpit voice recorder and its data, the handbook may not cover all situations, and any questions or concerns may be directed to the Chief of the Vehicle Recorder Division for immediate assistance.

This handbook is intended to provide information and guidance to NTSB employees who are involved in the cockpit voice recorder portion of an aviation accident investigation. This handbook is not regulatory in nature and does not create any rights in any of the parties to an NTSB investigation or any other person. Deviation from the guidance offered in this handbook will at times be necessary to meet the specific needs of an investigation.

1. Director Authority

1.1. Permission must be obtained from the Directors of the Offices of Research and Engineering and Aviation Safety regarding any exceptions to the cockpit voice recorder (CVR) standard practices or procedures. It is the discretion of the Directors of the Offices of Research and Engineering and Aviation Safety to grant approval for the exceptions.

1.2. It is also the discretion of the Directors of the Offices of Research and Engineering and Aviation Safety to adjust a standard practice or procedure, if necessary for a unique circumstance.

2. Applicable Recorded Audio Data

2.1. The laws and policies that govern the procedures regarding CVRs and CVR recordings are generally applicable to any and all audio that is recorded on board an aircraft. Any audio recording that is recovered from an aircraft following an accident or incident is given the same protection and security of a CVR or CVR recording.

2.2. Safety Board on-scene staff shall secure any device that records audio, found within the cockpit or cabin, carried by a passenger, or installed in the aircraft. Devices that record audio include, but are not limited to: camcorders, video recorders/cameras, digital cameras, handheld tape recorders, personal digital audio recorders, and flight test equipment. Furthermore, any magnetic tape or digital memory chips found in the wreckage could contain recorded audio and shall be secured by Safety Board staff.

2.3. Audio from alternate audio devices shall not be read out or played on scene and the equipment or recording medium shall be secured by the Safety Board to prevent read-out or damage.

2.4. In the event that audio from an alternate audio device is recovered, the investigator-in-charge (IIC) shall immediately contact the Director of the Office of Aviation Safety and the Chief of the Vehicle Recorder Division for guidance.

3. CVR Recording Disclosure and Access

3.1. CVR recordings and transcripts contain highly sensitive material, and premature or unauthorized release of information by Safety Board employees is grounds for

disciplinary action. All Safety Board staff and Members who obtain information concerning the contents of a CVR recording or written transcript, regardless of reason or source, are bound by Federal CVR nondisclosure laws (refer to *From 49 U.S.C. §1114–Disclosure, availability, and use of information*).

3.2. The CVR specialist, the Directors of the Offices of Research and Engineering and Aviation Safety, and the IIC are the only staff automatically authorized to listen to a CVR recording.

3.3. The CVR specialist assigned to the accident ordinarily has complete access to the CVR recording, data and information at all times. Other Safety Board CVR specialists may be called upon to assist with a CVR recording, when necessary.

3.4. Any other Safety Board staff is required to consult with the IIC and seek approval from the Directors of the Offices of Research and Engineering and Aviation Safety prior to reviewing a CVR recording or written transcript.

3.5. All individuals who listen to a CVR recording are required to sign and log their CVR review or audition into the CVR Audition Log. This is required for each session.

3.6. The CVR recording (original or copy) shall not be brought to any other facility for investigative work without the specific approval from the Directors of the Offices of Research and Engineering and Aviation Safety.

3.7. The CVR specialist shall keep the IIC apprised of information and activities concerning the CVR or CVR recording.

4. CVR Recorder Recovery: From On Scene to the Audio Laboratory

4.1. Upon notification of an accident or incident in which a CVR is installed on the aircraft, the IIC shall attempt to ensure that the CVR circuit breaker is pulled as soon as possible.

4.2. The IIC then considers whether the CVR might contain information relevant to the investigation, taking into consideration that the CVR can be 30 minutes or 2 hours in duration. It is possible for the events from an accident or incident to be overwritten when power is applied to the aircraft for an extended time following an event (through its own power or external power). However, some aircraft have an automatic shutoff logic that removes power to the CVR (even if the aircraft remains powered), and possibly allow for the capture of the events. With a CVR part number, the Vehicle Recorder division may assist in determining the type of CVR installed.

4.3. The CVR shall not be read out or played on scene.

4.4. The CVR unit shall not be opened and the recording medium shall not be removed (i.e., the tape or memory module) until it reaches the audio laboratory at Safety Board headquarters in Washington, D.C.

4.5. If the CVR is recovered in water, it shall immediately be packed in water (fresh, if possible) and not be allowed to dry out. Packaging may be accomplished by sealing the recorder (in water) inside a plastic beverage container with silicon adhesive or a similar sealant.

4.6. The CVR must be shipped to Safety Board headquarters in a manner that protects it from damage (i.e., inside a cardboard or wooden box, wrapped in either foam or bubble-wrap or in a container filled with foam peanuts).

4.7. The IIC shall contact the Chief of the Vehicle Recorder Division to coordinate the shipment of the CVR to headquarters.

4.8. The Chief of the Vehicle Recorder Division assigns the CVR to a CVR specialist.

4.9. The CVR may be sent to Washington on board a commercial airplane. This usually needs to be coordinated with the captain of the flight. The IIC must also arrange for headquarter staff to meet the arriving flight. If necessary, the CVR shall be packaged appropriately.

4.10. Preliminary recorder and accident information shall be sent/emailed to the Chief of the Vehicle Recorder Division. The CVR specialist shall also be included in the notification.

5. CVR Arrival at the Safety Board Audio Laboratory

5.1. The CVR specialist is responsible for handling and securing the CVR, the original recording medium, and any audio copies.

5.2. If the recorder is damaged, the CVR specialist extracts the recording medium with the use of cutting tools or other special equipment. This is not ordinarily a group activity.

5.3. The CVR specialist checks the recording to determine that useable audio information has been recorded (CVRs may be erased or malfunction and contain no useable audio).

5.4. Useable audio is defined as any audio that is recorded by the CVR and includes, but is not limited to: the accident events, overwritten post accident discussions, and aircraft noises.

5.5. The CVR specialist notifies the Directors of the Offices of Research and Engineering and Aviation Safety of the condition of the audio in the recording.

5.6. The CVR specialist downloads the original tape or memory from the CVR. The recording is digitally copied in its entirety without alterations or filters. This task is ordinarily accomplished during the initial audition, if practicable.

5.7. All non-foreign CVR recordings are digitally archived regardless of whether the recording contains useable audio.

5.8. Although most subsequent audio work is accomplished using the digital copy of the original recording, the original recording may be used.

6. CVR Initial Audition

6.1. If the recording contains useable audio, the initial audition is conducted by the Directors of the Offices of Research and Engineering and Aviation Safety (or their designees).

6.2. The original recording is typically used for the initial audition. A digital copy is made as soon as possible – during the initial audition, if practicable.

6.3. Any critical information that might assist in the field phase of the investigation is relayed to the IIC and other appropriate on-scene staff, by either (or both) Directors of Aviation Safety and/or Research and Engineering (or their designees).

6.4. The discussion shall be held over a secure landline telephone – not a portable mobile phone – and not routed through any conferencing facility.

6.5. The CVR recording shall never be played over the telephone.

6.6. If the recording contains audio information pertinent to the investigation, the IIC and the Directors of the Offices of Research and Engineering and Aviation Safety (or their designees) determine whether it is appropriate to convene a CVR group.

6.7. If a CVR group is to be convened, the IIC and the Directors of the Offices of Research and Engineering and Aviation Safety (or their designees) determine which parts of the transcript shall be transcribed (if the entire recording is not going to be transcribed). In general, the entire recording is transcribed in the event of a major investigation.

7. Planning the CVR Group Meeting

7.1. Not all CVRs that are sent to Safety Board headquarters result in a CVR group convening. The Directors of the Offices of Research and Engineering and Aviation Safety, in consultation with the IIC, determine if a group is necessary.

7.2. The CVR specialist is the group chairman for the CVR portion of the investigation and shall be included in any correspondence and discussions that pertain to all group chairmen participating in the investigation.

7.3. The IIC must coordinate with the CVR group chairman to select a tentative date for a CVR group meeting at Safety Board headquarters. The group meeting does not necessarily occur immediately after the CVR is sent to headquarters.

7.4. The IIC shall notify the party coordinators that a CVR group is convening.

7.5. The IIC must ensure that only parties appropriate to the CVR group are invited: FAA (must be invited), and typically, the manufacturer, pilot union, and owner/operator. Flight crew cannot participate as group members. The Director of the Office of Aviation Safety or the Director of the Office of Research and Engineering must approve the party representatives that the IIC recommends.

7.6. Party representatives that can provide a technical contribution may be assigned to the CVR group. The CVR group shall include at least one pilot typed or current in the accident aircraft model. Typically other individuals seated on the CVR group include those familiar with the crew's voices, and those familiar with company procedures. The party coordinator is not automatically qualified to be a CVR group member.

7.7. Ordinarily, only one representative per party is seated on the CVR group. Additional party representatives may be seated, at the discretion of the Directors of the Offices of Research and Engineering and Aviation Safety, in consultation with the IIC and the CVR group chairman.

7.8. Transcribing a 30-minute recording may be accomplished in one day, but typically continues late into a second day or more. The IIC finalizes a meeting time and date with the group members and reconfirms with the CVR group chairman.

7.9. The IIC shall advise the party representatives attending the CVR group meeting that once the CVR group meeting has started the group members are not allowed to leave the group until the transcript of recorded events has been completed and the CVR group chairman authorizes the group to be dismissed.

7.10. The IIC must forward the names of the CVR group members to the CVR group chairman prior to the CVR group meeting day. Only authorized individuals are permitted to participate in the group. Authorized individuals are those individuals recommended by the IIC and approved by the Director of the Office of Aviation Safety or the Director of the Office of Research and Engineering.

7.11. For a regional investigation, if the FAA's regional FSDO representative is unavailable for the CVR group meeting, the IIC shall contact the FAA's Accident Investigation Division (AAI-100 in Washington D.C.) as soon as possible. An AAI-100 investigator is assigned to represent the FAA or the FAA may choose to decline participation. The CVR group chairman shall contact the AAI-100 division before the day of the group meeting to ensure that the AAI-100 division has been notified of the CVR group activities.

7.12. The IIC shall advise CVR group members to go to the 6th floor reception area at the 490 L'Enfant Plaza office elevators and ask the receptionist to contact the CVR group chairman.

7.13. The IIC is welcome to attend the CVR group meeting, but his or her presence is not required.

8. The CVR Group Meeting

8.1. The CVR group chairman's primary role is to provide technical expertise in handling the audio recording and audio equipment. During a group meeting, the CVR group chairman is responsible for facilitating and focusing the group members in extracting factual audio data. The group chairman must exercise extreme caution in offering opinions or speculation so as not to bias the group members and compromise the group meeting.

8.2. At the designated meeting time, the CVR group members are met at the reception desk and escorted into the CVR listening room by the CVR group chairman.

8.3. The CVR group chairman explains the CVR disclosure laws and policies. In particular, CVR group members are prohibited from releasing CVR information to the public. However, the Safety Board may decide to publicly release information regarding CVR activity.

8.4. CVR disclosure policy does not prohibit a party from implementing safety-of-flight related adjustments within their organization, as a result of their participation in a CVR group. However, the Safety Board requires notification of the subject matter prior to any disclosure of CVR information to the group member's organization. It is the CVR

group member's responsibility to notify the CVR group chairman prior to disclosure. The CVR group chairman shall ensure that the IIC and the Directors of the Offices of Research and Engineering and Aviation Safety are apprised of the situation. Disclosure of information to a group member's respective organization shall include only information that is directly related to safety—at no time shall remarks, comments, or conversations be disclosed to any person, party, or organization.

8.5. The group members must sign the CVR Audition Log, *CVR Non-Disclosure Agreement*, and *Statement of Party Representatives to NTSB Investigation* (see attached). The FAA does not sign the party representative form.

8.6. Quotes and statements from the CVR recording are prohibited from being discussed with anyone—except the CVR group members during the CVR group meeting .

8.7. Group members on a break shall not discuss the CVR or its contents while away from the audio laboratory.

8.8. At the beginning of the CVR group meeting, before starting the transcription process, the CVR group chairman plays the recording in its entirety without stopping.

8.9. The CVR group is a tool to help in the investigation. Only the facts (i.e., words and sounds) are to be ascertained by the group—no analysis or interpretation shall be introduced into the transcript.

8.10. Any notes taken during the meeting are collected by the CVR group chairman at the end of the group meeting and destroyed. No notes shall be taken out of the CVR listening room.

8.11. During group activities, group members are prohibited from bringing electronic devices into the CVR Audio Laboratory unless explicitly authorized by the Director of the Office of Research and Engineering (through the CVR group chairman).

8.12. The CVR group chairman, in coordination with the Directors of the Offices of Research and Engineering and Aviation Safety, has the right to excuse any member who is disruptive to the process or is in violation of the CVR nondisclosure policies and laws.

8.13. The CVR group chairman shall keep the IIC and the Directors of the Offices of Research and Engineering and Aviation Safety apprised of the CVR group activities.

8.14. The CVR group may reconvene at a later date at the request of the CVR group chairman. The decision to reconvene the group must be authorized by the IIC, and the Directors of the Offices of Research and Engineering and Aviation Safety.

8.15. If the CVR group reconvenes, all members must be invited to return, but may decline the invitation. Except in extenuating circumstances, substitutes are not allowed during a reconvening of a CVR group. Approval for a substitute must be obtained in advance from the Directors of the Offices of Research and Engineering and Aviation Safety, via the CVR group chairman.

8.16. The individual group members may only listen to the CVR recording in a group setting.

8.17. Once a CVR group meeting has started, the group members are not allowed to leave the group until the transcript of recorded events has been completed and the CVR group chairman authorizes the group to be dismissed.

9. CVR Transcription

9.1. The CVR group commences transcription at either the beginning of the recording or at the point decided upon by the Directors of the Offices of Research and Engineering and Aviation Safety in consultation with the IIC.

9.2. The transcript produced by a CVR group is a factual record of audio events. In discerning an audio event, if a disagreement arises among the group members, the differing observations may be documented in the transcript. Inclusion of differing observations within the final transcript is the discretion of the Directors of the Offices of Research and Engineering and Aviation Safety.

9.3. Non-verbal audio and other CVR noise events that are distinctly identifiable are noted as “sound similar to…” within the transcript. Typical noise events identified in a transcript include: engine sounds, crew seat movement, windshield wiper motors, and aircraft aural warnings. Latched/detent handle movement, such as flaps, slats and gear handles, are sometimes generically identified as a “sound similar to latched/detent handle movement.” Care shall be exercised when associating generic noises, such as clicks, clacks, and thumps, with a specific action or event. In general, any noise, or series of noises, associated with a specific event or action must be distinctive and readily identifiable by itself out of context from the CVR recording.

9.4. It is possible for an audio event to be recorded on several channels by several microphone sources. The sound source identified in the transcript is the source with the clearest audio.

9.5. All conversation recorded (within the portions of the recording specified by the Directors and the IIC prior to the group meeting) is transcribed for the draft sent to the Directors of the Offices of Research and Engineering and Aviation Safety. The CVR group does not decide the relevance of crew conversation—the Directors of the Offices

of Research and Engineering and Aviation Safety evaluate the transcript for any non-pertinent conversation.

9.6. A coversheet is attached to the preliminary transcript (see attached: *Coversheet for CVR Factual Report/Transcript and Review Log* or *Release of CVR Factual Report with Transcript to Regional Director*).

9.7. The transcript is punctuated and formatted to standard Safety Board transcript style.

9.8. Safety Board staff must obtain approval from the Directors of the Offices of Research and Engineering and Aviation Safety prior to reviewing a written transcript of a CVR recording.

9.9. Aside from minor editorial corrections by the CVR specialist, any significant changes to the transcript require group consultation and consensus via telephone or through reconvening the CVR group at Safety Board headquarters.

9.10. The transcript may be correlated from the relative time of the recording to local/UTC time of the accident or any other appropriate correlation data point as determined by the CVR specialist. If applicable, the timing and correlation is coordinated with the FDR and Vehicle Performance group chairmen.

9.11. Timing and correlation is not a group activity.

9.12. If ATC, FDR or radar data are unavailable or do not provide an appropriate correlation point, the IIC shall supply the CVR specialist with a time that may be correlated to a CVR event, such as accident time.

10. The CVR Factual Report

10.1. If a CVR group is determined to be unnecessary, the CVR specialist writes a factual report stating that a group was not convened. Additional information may be included in the factual report such as a summary of the recording contents or timing of select audio events.

10.2. The CVR factual report typically contains information about the CVR type, operation, damage, recording extraction methods, audio quality, and a summary of transcribed audio events.

10.3. If a CVR group convenes to prepare a transcript, the transcript is attached to the CVR factual report.

10.4. The Directors of the Offices of Research and Engineering and Aviation Safety review the factual report and/or transcript. Any non-pertinent or expletive remarks or conversations may be edited or deleted from the transcript as deemed necessary by the Directors of the Offices of Research and Engineering and Aviation Safety, before public release.

10.5. All notes, preliminary transcript drafts, and copies are destroyed when the content of the CVR transcript has been finalized, unless there is a pending FOIA request, in which all notes and paperwork are retained, as required.

11. Safety Board Staff CVR Review and Official Use of CVR Data

11.1. All Safety Board staff and Members who obtain information concerning the contents of a CVR recording or written transcript, regardless of reason or source, are bound by Federal CVR nondisclosure laws.

11.2. The Directors of the Offices of Research and Engineering and Aviation Safety coordinate requests from Board Members to review a CVR recording or, prior to public release, a CVR transcript.

11.3. All Safety Board staff are required to have approval from the IIC, and the Directors of the Offices of Research and Engineering and Aviation Safety prior to reviewing a CVR recording, transcript, or notes.

11.4. All Board Members and staff are required to sign the CVR Audition Log before each audition.

11.5. Approval to listen to the recording during subsequent review sessions is covered by the initial approval.

11.6. The IIC and other authorized staff may review the transcript, but at no time may any of the information from the CVR recording, notes, or written transcript be shared or distributed (verbally or in writing) to the party members or unauthorized staff until the public release of the CVR factual report with transcript.

11.7. Notes may not be taken from the CVR listening room without authorization from the Directors of the Offices of Research and Engineering and Aviation Safety. Notes may be secured by the CVR specialist or destroyed.

11.8. To the extent possible, the transcript shall not leave the CVR listening room prior to public release, except in the following instances:

11.8.1. With approval from Directors of the Offices of Research and Engineering and Aviation Safety, and in consultation with the IIC and CVR group chairman, authorized staff may recreate portions of the CVR recording or transcript, in their report, as necessary for the investigation.

11.8.2. Staff must obtain explicit approval from the Directors of the Offices of Research and Engineering and Aviation Safety to take CVR notes or portions of the transcript outside of the CVR listening room. At all times, the authorized staff must ensure the security of CVR-related portions of their reports and CVR notes. When finished with any CVR notes, the notes shall be returned to the CVR group chairman for storage or destruction.

11.8.3. No unauthorized copies of the CVR factual report or CVR transcript shall be made. An authorized copy may be given to Safety Board staff on a case-by-case basis with explicit written approval from the Directors of the Offices of Research and Engineering and Aviation Safety. The CVR group chairman shall clearly mark the authorized copy to indicate that it is a draft copy or a copy of the final pre-released report. The transcript must be marked "DUPLICATE" or "COPY," indicating that it is not the original. A coversheet shall be attached to the report or transcript (see attached: *Coversheet for CVR Factual Report/Transcript and Review Log*) and the authorized staff shall sign the coversheet's review log. The coversheet must also clearly indicate that the copy must be returned to the CVR group chairman. The name of the Safety Board staff that has been authorized to use the copy must also be clearly stated on the coversheet. The copy must be returned to the CVR group chairman for destruction.

11.9. CVR–related sections of other group chairmen reports may not be distributed to any party coordinators, group members, unauthorized staff, or the general public prior to the public release of the CVR factual report with transcript.

12. Public Release of the CVR Factual Report and Transcript

12.1. After the report review process, the CVR specialist maintains the security of the factual report and transcript. The release of the factual report with transcript into the public docket is coordinated through the CVR group chairman, the Chief of the Vehicle Recorder Division and either a) the IIC for a major investigation, or b) the Regional Office Director with the IIC for a regional investigation. A placeholder will be placed in the Docket Management System (DMS) until immediately prior to the docket's release to the public. (see *Docket Management System CVR Report Placeholder*).

12.2. For the case of a CVR factual report without an attached transcript, the factual report may be released to the IIC after the report review process.

12.3. Per 49 U.S.C. §1114(c), a factual report with a transcript is released to the public only when the docket is opened to the public (see *From 49 U.S.C. §1114–Disclosure, availability, and use of* **information**). Upon the opening of the docket, the CVR factual report with transcript may be made available through electronic means, including via the Safety Board's website: http://www.ntsb.gov.

12.3.1. In the event that a public hearing is held, the CVR factual report with the attached transcript shall be released into the public docket at the time of the public hearing. The general public, including parties to the investigation, may not receive the CVR transcript prior to the time of the public hearing.

12.3.2. In the event that a public hearing is not held, the report is released into the public docket only when the majority of the factual reports are placed into the docket. The general public, including parties to the investigation, may not receive the CVR transcript prior to the time the transcript is placed into the public docket.

12.4. The CVR factual report with transcript may be sent to the party coordinators at the time of public release.

13. Regional Investigations: Receipt of Factual Report with a Transcript—Prior to Public Release

13.1. For a regional investigation, after the report review process, the CVR specialist may release the factual report with transcript to the IIC, through the Regional Office Director. This is accomplished by mailing the transcript, in a sealed envelope, directly to the Regional Office Director at the regional office. A coversheet shall be attached to the factual report and transcript (see attached: *Release of CVR Factual Report with Transcript to Regional Director*).

13.2. It is the Regional Office Director's responsibility to ensure that appropriate physical security is afforded the written transcript (i.e., stored in a locked file cabinet).

13.3. The IIC may check out the transcript from the Regional Office Director and to refer to this secured transcript in the preparation of the IIC's factual report, but at no time may any of the information contained in the written transcript be shared or distributed to the party members until public release.

13.4. Other Safety Board staff must obtain authorization from the Directors of the Offices of Research and Engineering and Aviation Safety prior to reviewing a written transcript of a CVR recording.

13.5. Authorized individuals who check out the transcript from the Regional Director are required to sign the cover sheet attached to the factual/transcript. At all times, the authorized staff must ensure the security of the CVR transcript, CVR-related portions of their reports, and CVR notes.

13.6. No unauthorized copies of the transcript shall be made.

14. Flight Crew and Other CVR Review

14.1. The IIC is responsible for notifying the surviving flight crew of the opportunity to listen to the recording and review the CVR transcript. The crew review is a courtesy extended to the crew, not a requirement.

14.2. A CVR specialist supervises the crew's review of the CVR recording and transcript.

14.3. The crew is not allowed to participate as a member of the CVR group activities.

14.4. After the crew's review, additions or changes shall not be made to the CVR transcript—changes or comments from the crew are noted in the CVR factual report.

14.5. A CVR group member may be permitted to accompany a crewmember during the CVR review, if requested by the crewmember.

14.6. No copy of the transcript or notes shall leave the CVR listening room.

14.7. Any notes taken during the CVR review are collected by the CVR specialist and destroyed.

14.8. All individuals who review a CVR recording are required to sign the CVR Audition Log.

14.9. At the crewmember's discretion, each crewmember may listen separately or together.

14.10. All other non-Safety Board individuals provided the opportunity to listen to a CVR recording must obtain explicit approval from the Directors of the Offices of Research and Engineering and Aviation Safety.

14.11. Any individual who reviews a CVR recording is bound by Federal CVR nondisclosure laws.

15. Release of the Recorder and Audio Recording

15.1. The IIC shall supply the CVR specialist with the recorder's return organization and address. Ordinarily with minor accidents and incidents, the owner/operator at the time of the accident or incident is the rightful return organization. However, there are instances when the rightful return organization is less apparent, such as when the insurance company has control of the wreckage, or there are fractional owners, or if the aircraft is leased. If there is uncertainty regarding the proper return organization, the IIC and CVR specialist shall contact the General Counsel, who can resolve any issues regarding who shall receive the CVR and original CVR recording.

15.2. Because of the sensitivity of CVR recordings, it is possible that the return organization for the CVR unit (the recorder box) is not the same organization that shall receive the original CVR recording medium.

15.3. For tape-based CVRs, the CVR unit—minus the recording original tape—may be returned to the owner (or authorized recipient) as soon as the CVR specialist determines that there are no issues related to its operation. The original tape recording is returned to the authorized recipient only after the investigation is complete and the transcript has been released to the public.

15.4. Typically with a solid-state recorder and recording, the actual recorder and its memory cannot be easily separated. Therefore, the entire CVR is considered "The Original Recording" and appropriate security measures and protection must be observed.

15.5. For solid-state recorders, the CVR, with its solid-state memory, shall not be released until the investigation is completed or otherwise authorized by the Directors of the Offices of Research and Engineering and Aviation Safety on a case-by-case basis.

15.6. Prior to returning an original CVR recording medium, the CVR specialist must obtain specific permission from the Directors of the Offices of Research and Engineering and Aviation Safety. The CVR specialist shall notify the IIC of its return.

15.7. Copies of the CVR recording shall not be released to the owner, or any other party without the approval of the Directors of the Offices of Research and Engineering and Aviation Safety.

16. Military Investigations or Other Federal Agencies

16.1. On occasion the Safety Board is asked to assist with the recovery and read-out of a CVR involved in a military/Federal accident investigation. The specific tasks requested

by the DOD or Federal agency and the extent of participation by the Safety Board audio laboratory is determined by the Directors of the Offices of Research and Engineering and Aviation Safety. The requirements of the CVR specialist may include: downloading the CVR, producing audio copies of the recording, preparing a transcript, or running a CVR group.

16.2. Generally, a brief report of CVR-related procedures performed may be required by the investigating organization.

16.3. Normally, the original and copies of the recording and reports are returned to the investigating agency. The Safety Board shall not retain any copies.

17. NTSB Investigation with Foreign Representatives

17.1. When the Safety Board conducts an investigation that involves a foreign operator/manufacturer, Safety Board CVR procedures and policies apply, in consultation with the foreign government's Accredited Representative. Coordination between the governments is managed by the IIC with the Directors of the Offices of Research and Engineering and Aviation Safety, and the foreign government's Accredited Representative.

17.2. If the recording contains useable audio, the initial audition is conducted by the Directors of the Offices of Research and Engineering and Aviation Safety (or their designees). The foreign government's Accredited Representative and their designees may be provided the opportunity to review the recording prior to the CVR group meeting.

17.3. Participants from the foreign government and their technical advisors shall be clearly identified to the CVR specialist to avoid unauthorized access to the recording or written transcript.

17.4. The Safety Board and the French Bureau Enquetes-Accidents have a Memorandum of Agreement that defines the cooperation between the two countries (see attached: *NTSB and BEA Memorandum of Agreement*).

18. Foreign Investigations with NTSB Participation or Assistance

18.1. Under ICAO Annex 13, when the Safety Board is asked to participate or assist in an investigation that occurs outside of the United States, the Safety Board audio laboratory may be used for the CVR portion of the investigation.

18.2. If the Safety Board assists a foreign government in their accident investigation and the services of a CVR specialist are required, the Safety Board's Accredited Representative shall coordinate the requested services through the Directors of the Offices of Research and Engineering and Aviation Safety. Assistance in the CVR portion of a foreign investigation may include: downloading the CVR, producing audio copies of the recording, preparing a transcript, or running a CVR group.

18.3. Any subsequent sound spectrum analysis of the CVR recording shall be arranged through the Safety Board's Accredited Representative in consultation with the Director of Research and Engineering. Sound spectrum work may require additional Safety Board staff and resources, and it shall not be assumed that the work is automatically included as part of the CVR activities.

18.4. The point of contact for the foreign investigation (the IIC or the designee) is introduced to the CVR specialist. It shall be made clear to all participants involved with the CVR activities that the CVR specialist shall only be coordinating with the foreign government through the individual designated as the point of contact.

18.5. Participants from the foreign government and their technical advisors shall clearly be identified to the CVR specialist to avoid unauthorized access to the recording or written transcript.

18.6. The CVR specialist shall keep the Safety Board's Accredited Representative and the foreign government's IIC or designee apprised of any CVR activities or actions.

18.7. When assisting in a foreign government's investigation, the CVR specialist may suggest to the investigating government's IIC or designee the CVR policies and procedures that are used by the Safety Board. However, if the foreign government wishes to use its own policies or procedures, the CVR specialist shall try to comply. In the absence of specific guidance from the investigating government, pertinent Safety Board CVR standard practices and procedures apply.

18.8. Any issues or conflicts concerning procedures shall immediately be brought to the attention of the Directors of the Offices of Research and Engineering and Aviation Safety, in consultation with the Safety Board's Accredited Representative, for immediate resolution.

18.9. Generally, the investigating government may require a brief report of procedures performed, along with a written transcript of the CVR recording, if applicable.

18.10. At the request of the foreign government's IIC or designee, audio copies and written transcripts and reports shall be distributed, in consultation with the Safety Board's Accredited Representative and the Directors of the Offices of Research and Engineering and Aviation Safety.

18.11. The original recording and recorder shall be returned to the foreign government's IIC or designee. The Safety Board shall not retain copies of the CVR recording.

18.12. During a foreign investigation, the foreign officials are guests of the Safety Board and shall be welcomed accordingly. During the CVR activities, coordination of daily events, such as meeting time, lunch and other breaks, are the responsibility of the CVR specialist. To facilitate our accommodating their needs, other concerns regarding faxes, telephones, hotels, transportation, travel arrangements, and investigation activities not related to the CVR shall be coordinated through and brought to the attention of the Accredited Representative or the Office of Aviation Safety delegate. Additional Safety Board staff may be needed to assist with these other concerns. During the initial meeting after the arrival of the foreign officials, the role of the CVR specialist shall be relayed to the group participants in order to avoid unnecessary delays in completing the CVR activities.

18.13. The Safety Board and the French Bureau Enquetes-Accidents have a Memorandum of Agreement that defines the cooperation between the two countries (see attached: *NTSB and BEA Memorandum of Agreement*).

18.14. Investigations with Safety Board participation or assistance are protected from FOIA requests for 2 years.

ATTACHMENT A Statement of Party Representatives to NTSB Investigation

STATEMENT OF PARTY REPRESENTATIVES
TO NTSB INVESTIGATION

Aircraft Identification:
Accident Number _____
Registration Number _____
Make and Model _____
Location _____
Date _____

The undersigned hereby acknowledge that they are participating in the above-referenced aircraft accident field investigation (including any component tests and teardowns or simulator testing) on behalf of the party indicated adjacent to their name, for the purpose of providing technical assistance to the National Transportation Safety Board.

The undersigned further acknowledge that they have read the attached copy of 49 CFR Part 831 and have familiarized themselves with 49 CFR §831.11, which governs participation in NTSB investigations and agree to abide by provisions of this regulation.

It is understood that a party representative to an investigation may not be a person who also represents claimants or insurers. The placement of a signature hereon constitutes a representation that participation in this investigation is not on behalf of either claimants or insurers and that, while any information obtained may ultimately be used in litigation, participation is not for the purposes of preparing for litigation.

By placing their signatures hereon all participants agree that they will neither assert nor permit to be asserted on their behalf, any privilege in litigation, with respect to information or documents obtained during the course of and as a result of participation in the NTSB investigation as described above.

It is understood, however, that this form is not intended to prevent the undersigned from participating in litigation arising out of the accident referred to above or to require disclosure of the undersigned's communications with counsel.

SIGNATURE	**NAME (Printed)**	**PARTY**	**DATE**

Party Statement (cont.)

SIGNATURE	NAME (Printed)	PARTY	DATE

ATTACHMENT B CVR Non-Disclosure Agreement

CVR NONDISCLOSURE AGREEMENT

ACCIDENT ID:_____

Each of the undersigned acknowledges that he/she has read National Transportation Safety Board (NTSB) regulations 831.11(b) and 831.13(b), which are printed on the reverse side of this document, and agrees to comply with those rules.

Each undersigned further agrees not to disclose or cause to be disclosed any information from the cockpit voice recorder (CVR) recording or any transcript thereof except as expressly authorized by the NTSB. Approval from the NTSB Investigator-In-Charge must be obtained before disclosure of any information. Disclosure of information to his/her respective organization shall include only that information which is directly related to safety and at no time shall non-pertinent remarks, comments, or conversations be disclosed to any person, party, or organization.

By placing his/her signature hereon, the undersigned acknowledges that the unauthorized release of CVR information shall be grounds for immediate dismissal from the investigation, and may result in further legal sanction.

I HAVE READ AND UNDERSTAND THE ABOVE CONDITIONS.

SIGNATURE	NAME (PRINTED)	PARTY	DATE

831.11 Parties to the investigation.

(a) All Investigations, regardless of mode.

(1) The investigator-in-charge designates parties to participate in the investigation. Parties shall be limited to those persons, government agencies, companies, and associations whose employees, functions, activities, or products were involved in the accident or incident and who can provide suitable qualified technical personnel actively to assist in the investigation. Other than the FAA in aviation cases, no other entity is afforded the right to participate in Board investigations.

(2) Participants in the investigation (i.e., party representatives, party coordinators, and/or the larger party organization) shall be responsive to the direction of Board representatives and may lose party status if they do not comply with their assigned duties and activity proscriptions or instructions, or if they conduct themselves in a manner prejudicial to the investigation.

(3) No party to the investigation shall be represented in any aspect of the NTSB investigation by any person who also represents claimants or insurers. No party representative may occupy a legal position (see **845.13** of this chapter). Failure to comply with these provisions may result in sanctions, including loss of status as a party.

(4) Title 49, United States Code **1132** provides for the appropriate participation of the FAA in Board investigations, and **1131(a)(2)** provides for such participation by other departments, agencies, or instrumentalities. The FAA and those other entities that meet the requirements of paragraph (a)(1) of this section will be parties to the investigation with the same rights and privileges and subject to the same limitations as other parties, provided however that representatives of the FAA need not sign the *"Statement of Party Representatives to NTSB Investigation"* (see paragraph (b) of this section).

(b) Aviation investigations. In addition to compliance with the provision of paragraph (a) of this section, and to assist in ensuring complete understanding of the requirements and limitations of party status, all party representatives in aviation investigations shall sign *"Statement of Party Representatives to NTSB Investigation"* immediately upon attaining party representative status. Failure timely to sign the statement may result in sanctions, including loss of status as a party.

831.13 Flow and dissemination of accident or incident information.

(a) Release of information during the field investigation, particularly at the accident scene, shall be limited to factual developments, and shall be made only through the Board Member present at the accident scene, the representative of the Board's Office of Public Affairs, or the investigator-in-charge.

(b) All information concerning the accident or incident obtained by any person or organization participating in the investigation shall be passed to the IIC through appropriate channels before being provided to any individual outside the investigation. Parties to the investigation may relay to their respective organizations information necessary for purposes of prevention or remedial action. However, no information concerning the accident or incident may be released to any person not a party representative to the investigation (including non-party representative employees of the party organization) before initial release by the Safety Board without prior consultation and approval of the IIC.

ATTACHMENT C Coversheet for CVR Factual Report/Transcript and Review Log

CVR Factual and Transcript

DO NOT LEAVE UNATTENDED

RETURN TO: CVR Group Chairman: _____OFFICE: _____ PH: x _____

NTSB Accident Number: _____ IIC: _____

CVR DRAFT REPORT/TRANSCRIPT REVIEW TRACKING: ____ Hours to Complete

DRAFT							FINAL				
Routing Symbol	Author						Routing Symbol	RE40	RE1	AS1	RE40
Date	10/16/2002						Date				
Initials							Initials				

CVR TRANSCRIPT REVIEW LOG

Prior to public release of this CVR report/transcript, the following procedures are applicable:

- **THIS DOCUMENT IS FOR OFFICIAL USE ONLY. DUPLICATION IS PROHIBITED.**
- ACCESS TO THIS TRANSCRIPT SHALL BE AUTHORIZED ONLY BY AS-1 AND RE-1.
- THIS DOCUMENT IS NOT TO BE LEFT UNSECURED OR UNATTENDED.
- THE CVR GROUP CHAIRMAN IS RESPONSIBLE FOR KEEPING THIS TRANSCRIPT SECURE. THE INVESTIGATOR-IN-CHARGE OR OTHER NTSB STAFF AUTHORIZED BY AS-1 AND RE-1 MAY TEMPORARILY "CHECK OUT" THIS DOCUMENT FROM THE CVR GROUP CHAIRMAN AFTER SIGNING THE REVIEW LOG.
- A TRANSCRIPT REVIEW LOG SHALL BE MAINTAINED TO DEFINE WHO HAS HAD ACCESS TO THIS TRANSCRIPT.
- THIS DOCUMENT AND ITS CONTENTS ARE NOT TO BE SHARED WITH ANY UNAUTHORIZED INDIVIDUALS, INCLUDING UNATHORIZED SAFETY BOARD STAFF.

Print Name	Signature	Date/Time OUT	Date/Time IN

ATTACHMENT D Release of CVR Factual Report with Transcript to Regional Director

National Transportation Safety Board

Memorandum

Date: _____

To: _____
Regional Director

From: _____
CVR Group Chairman

Subject: Regional Investigation–CVR Factual Report/Transcript Release

NTSB Number: _____

IIC: _____

Prior to public release of this CVR report/transcript, the following procedures are applicable:

THIS DOCUMENT IS FOR OFFICIAL USE ONLY. DUPLICATION IS PROHIBITED.

ACCESS TO THIS TRANSCRIPT SHALL BE AUTHORIZED ONLY BY AS-1 AND RE-1 (OR AS-2M OR RE-2, IF NECESSARY).

THIS DOCUMENT IS NOT TO BE LEFT UNSECURED AND UNATTENDED.

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ATTACHMENT E Federal CVR Legislation and Regulations

Federal CVR Legislation and Regulations

The following codes are referenced in this section: 49 U.S.C. §1114, 49 CFR 831.11, 49 CFR 831.13, 14 CFR 23.1457, 14 CFR 25.1457, 14 CFR 27.1457, 14 CFR 29.1457, 14 CFR 121.359, 14 CFR 135.151, 14 CFR 91.609, and 49 U.S.C.§ 1154. **Please check the appropriate sections and codes to obtain current regulations**[1].

From 49 U.S.C. §1114–Disclosure, availability, and use of information

(c) COCKPIT RECORDINGS AND TRANSCRIPTS.--(1) The Board may not disclose publicly any part of a cockpit voice or video recorder recording or transcript of oral communications by and between flight crew members and ground stations related to an accident or incident investigated by the Board. However, the Board shall make public any part of a transcript or any written depiction of visual information the Board decides is relevant to the accident or incident --

(A) if the Board holds a public hearing on the accident or incident, at the time of the hearing; or

(B) if the Board does not hold a public hearing, at the time a majority of the other factual reports on the accident or incident are placed in the public docket.

(2) This subsection does not prevent the Board from referring at any time to cockpit voice or video recorder information in making safety recommendations.

(d) SURFACE VEHICLE RECORDINGS AND TRANSCRIPTS.-

(1) CONFIDENTIALITY OF RECORDINGS.-The Board may not disclose publicly any part of a surface vehicle voice or video recorder recording or transcript of oral communications by or among drivers, train employees, or other operating employees responsible for the movement and direction of the vehicle or vessel, or between such operating employees and company communication centers, related to an accident investigated by the Board. However, the Board shall make public any part of a transcript or any written depiction of visual information that the Board decides is relevant to the accident-

(A) if the Board holds a public hearing on the accident, at the time of the hearing; or

(B) if the Board does not hold a public hearing, at the time a majority of the other factual reports on the accident are placed in the public docket.

(2) REFERENCES TO INFORMATION IN MAKING SAFETY RECOMMENDATIONS.- This subsection does not prevent the Board from referring at any time to voice or video recorder information in making safety recommendations.

From 49 CFR 831.11–Parties to the investigation

(a) All Investigations, regardless of mode. (1) The investigator-in-charge designates parties to participate in the investigation. Parties shall be limited to those persons, government agencies,

[1] Section is current, as of November 2001. Internet website addresses of complete and current regulations: *Code of Federal Regulations*: http://www.access.gpo.gov/nara/cfr/index.html
United States Code: http://uscode.house.gov/uscode.htm

companies, and associations whose employees, functions, activities, or products were involved in the accident or incident and who can provide suitable qualified technical personnel actively to assist in the investigation. Other than the FAA in aviation cases, no other entity is afforded the right to participate in Board investigations.

(2) Participants in the investigation (i.e., party representatives, party coordinators, and/or the larger party organization) shall be responsive to the direction of Board representatives and may lose party status if they do not comply with their assigned duties and activity proscriptions or instructions, or if they conduct themselves in a manner prejudicial to the investigation.

(b) Aviation investigations. In addition to compliance with the provisions of paragraph (a) of this section, and to assist in ensuring complete understanding of the requirements and limitations of party status, all party representatives in aviation investigations shall sign ``Statement of Party Representatives to NTSB Investigation" immediately upon attaining party representative status. Failure timely to sign that statement may result in sanctions, including loss of status as a party.

From 49 CFR 831.13–Flow and dissemination of accident or incident information

(b) All information concerning the accident or incident obtained by any person or organization participating in the investigation shall be passed to the IIC through appropriate channels before being provided to any individual outside the investigation. Parties to the investigation may relay to their respective organizations information necessary for purposes of prevention or remedial action. However, no information concerning the accident or incident may be released to any person not a party representative to the investigation (including non-party representative employees of the party organization) before initial release by the Safety Board without prior consultation and approval of the IIC.

From 14 CFR 23.1457–Airworthiness Standards: Normal, Utility, Acrobatic, and Commuter Category Airplanes – Cockpit Voice Recorders

(a) Each cockpit voice recorder required by the operating rules of this chapter must be approved and must be installed so that it will record the following:

(1) Voice communications transmitted from or received in the airplane by radio.

(2) Voice communications of flight crewmembers on the flight deck.

(3) Voice communications of flight crewmembers on the flight deck, using the airplane's interphone system.

(4) Voice or audio signals identifying navigation or approach aids introduced into a headset or speaker.

(5) Voice communications of flight crewmembers using the passenger loudspeaker system, if there is such a system and if the fourth channel is available in accordance with the requirements of paragraph (c)(4)(ii) of this section.

(b) The recording requirements of paragraph (a)(2) of this section must be met by installing a cockpit-mounted area microphone, located in the best position for recording voice communications originating at the first and second pilot stations and voice communications of other

crewmembers on the flight deck when directed to those stations. The microphone must be so located and, if necessary, the preamplifiers and filters of the recorder must be so adjusted or supplemented, so that the intelligibility of the recorded communications is as high as practicable when recorded under flight cockpit noise conditions and played back. Repeated aural or visual playback of the record may be used in evaluating intelligibility.

(c) Each cockpit voice recorder must be installed so that the part of the communication or audio signals specified in paragraph (a) of this section obtained from each of the following sources is recorded on a separate channel:

(1) For the first channel, from each boom, mask, or handheld microphone, headset, or speaker used at the first pilot station.

(2) For the second channel from each boom, mask, or handheld microph one, headset, or speaker used at the second pilot station.

(3) For the third channel--from the cockpit-mounted area microphone.

(4) For the fourth channel from:

(i) Each boom, mask, or handheld microphone, headset, or speaker used at the station for the third and fourth crewmembers.

(ii) If the stations specified in paragraph (c)(4)(i) of this section are not required or if the signal at such a station is picked up by another channel, each microphone on the flight deck that is used with the passenger loudspeaker system, if its signals are not picked up by another channel.

(5) And that as far as is practicable all sounds received by the microphone listed in paragraphs (c)(1), (2), and (4) of this section must be recorded without interruption irrespective of the position of the interphone-transmitter key switch. The design shall ensure that sidetone for the flight crew is produced only when the interphone, public address system, or radio transmitters are in use.

(d) Each cockpit voice r ecorder must be installed so that:

(1) It receives its electric power from the bus that provides the maximum reliability for operation of the cockpit voice recorder without jeopardizing service to essential or emergency loads.

(2) There is an autom atic means to simultaneously stop the recorder and prevent each erasure feature from functioning, within 10 minutes after crash impact; and

(3) There is an aural or visual means for preflight checking of the recorder for proper operation.

(e) The r ecord container must be located and mounted to minimize the probability of rupture of the container as a result of crash impact and consequent heat damage to the record from fire. In meeting this requirement, the record container must be as far aft as practicable, but may not be where aft mounted engines may crush the container during impact. However, it need not be outside of the pressurized compartment.

(f) If the cockpit voice recorder has a bulk erasure device, the installation must be designed to minimize the probability of inadvertent operation and actuation of the device during crash impact.

(g) Each recorder container must:

(1) Be either bright orange or bright yellow;

(2) Have reflective tape affixed to its external surface to faci litate its location under water; and

(3) Have an underwater locating device, when required by the operating rules of this chapter, on or adjacent to the container which is secured in such manner that they are not likely to be separated during crash impact.

[Amdt. 23-35, 53 FR 26142, July 11, 1988]

From 14 CFR 25.1457–Airworthiness Standards: Transport Category Airplanes–Cockpit Voice Recorders

(a) Each cockpit voice recorder required by the operating rules of this chapter must be approved and must be installed so that it will record the following:

(1) Voice communications transmitted from or received in the airplane by radio.

(2) Voice communications of flight crewmembers on the flight deck.

(3) Voice communications of flight crewmembers on the flight deck, using the airplane's interphone system.

(4) Voice or audio signals identifying navigation or approach aids introduced into a headset or speaker.

(5) Voice communications of flight crewmembers using the passenger loudspeaker system, if there is such a system and if the fourth channel is available in accordance with the requirements of paragraph (c)(4)(ii) of this section.

(b) The recording requirements of paragraph (a)(2) of this section must be met by installing a cockpit-mounted area microphone, located in the best position for recording voice communications originating at the first and second pilot stations and voice communications of other crewmembers on the flight deck when directed to those stations. The microphone must be so located and, if necessary, the preamplifiers and filters of the recorder must be so adjusted or supplemented, that the intelligibility of the recorded communications is as high as practicable when recorded under flight cockpit noise conditions and played back. Repeated aural or visual playback of the record may be used in evaluating intelligibility.

(c) Each cockpit voice recorder must be installed so that the part of the communication or audio signals specified in paragraph (a) of this section obtained from each of the following sources is recorded on a separate channel:

(1) For the first channel, from each boom, mask, or hand -held microphone, headset, or speaker used at the first pilot station.

(2) For the second channel from each boom, mask, or hand-held microphone, headset, or speaker used at the second pilot station.

(3) For the third channel--from the cockpit-mounted area microphone.

(4) For the fourth channel, from--

(i) Each boom, mask, or hand -held microphone, headset, or speaker used at the station for the third and fourth crew members; or

(ii) If the stations specified in paragraph (c)(4)(i) of this section are not required or if the signal at such a station is picked up by another channel, each microphone on the flight deck that is used with the passenger loudspeaker system, if its signals are not picked up by another channel.

(5) As far as is practicable all sounds received by the microphone listed in paragraphs (c)(1), (2), and (4) of this section must be recorded without interruption irrespective of the position of the interphone-transmitter key switch. The design shall ensure that sidetone for the flight crew is produced only when the interphone, public address system, or radio transmitters are in use.

(d) Each cockpit voice recorder must be installed so that --

(1) It receives its electric power from the bus that provides the maximum reliability for operation of the cockpit voice recorder without jeopardizing service to essential or emergency loads;

(2) There is an automatic means to simultaneously stop the recorder and prevent each erasure feature from functioning, within 10 minutes after crash impact; and

(3) There is an aural or visual means for preflight checking of the recorder for pr oper operation.

(e) The record container must be located and mounted to minimize the probability of rupture of the container as a result of crash impact and consequent heat damage to the record from fire. In meeting this requirement, the record container must be as far aft as practicable, but may not be where aft mounted engines may crush the container during impact. However, it need not be outside of the pressurized compartment.

(f) If the cockpit voice recorder has a bulk erasure device, the ins tallation must be designed to minimize the probability of inadvertent operation and actuation of the device during crash impact.

(g) Each recorder container must--

(1) Be either bright orange or bright yellow;

(2) Have reflective tape affixed to its external surface to facilitate its location under water; and

(3) Have an underwater locating device, when required by the operating rules of this chapter, on or adjacent to the container which is secured in such manner that they are not likely to be separated during crash impact.

[Doc. No. 5066, 29 FR 18291, Dec. 24, 1964, as amended by Amdt. 25-2, 30 FR 3932, Mar. 26, 1965; Amdt. 25-16, 32 FR 13914, Oct. 6, 1967; Amdt. 25-41, 42 FR 36971, July 18, 1977; Amdt. 25-65, 53 FR 26143, July 11, 1988]

From 14 CFR 27.1457–Airworthiness Standards: Normal Category Rotorcraft–Cockpit Voice Recorders

(a) Each cockpit voice recorder required by the operating rules of this chapter must be approved, and must be installed so that it will record the following:

(1) Voice communications transmitted from or received in the rotorcraft by radio.

(2) Voice communications of flight crewmembers on the flight deck.

(3) Voice communications of flight crewmembers on the flight deck, using the rotorcraft's interphone system.

(4) Voice or audio signals identifying navigation or approach aids introduced into a headset or speaker.

(5) Voice communications of flight crewmembers using the passenger loudspeaker system, if there is such a system, and if the fourth channel is available in accordance with the requirements of paragraph (c)(4)(ii) of this section.

(b) The recording requirements of paragraph (a)(2) of this section may be met:

(1) By installing a cockpit-mounted area microphone located in the best position for recording voice communications originating at the first and second pilot stations and voice communications of other crewmembers on the flight deck when directed to those stations; or

(2) By installing a continually energized or voice-actuated lip microphone at the first and second pilot stations. The microphone specified in this paragraph must be so located and, if necessary, the preamplifiers and filters of the recorder must be adjusted or supplemented so that the recorded communications are intelligible when recorded under flight cockpit noise conditions and

played back. The level of intelligibility must be approved by the Administrator. Repeated aural or visual playback of the record may be used in evaluating intelligibility.

(c) Each cockpit voice recorder must be installed so that the part of the communication or audio signals specified in paragraph (a) of this section obtained from each of the following sources is recorded on a separate channel:

(1) For the first channel, from each microphone, headset, or speaker used at the first pilot station.

(2) For the second channel, from each microphone, headset, or speaker used at the second pilot station.

(3) For the third channel, from the cockpit-mounted area microphone, or the continually energized or voice-actuated lip microphone at the first and second pilot stations.

(4) For the fourth channel, from:

(i) Each microphone, headset, or speaker used at the stations for the third and fourth crewmembers; or

(ii) If the stations specified in paragraph (c)(4)(i) of this section are not required or if the signal at such a station is picked up by another channel, each microphone on the flight deck that is used with the passenger loudspeaker system if its signals are not picked up by another channel.

(iii) Each microphone on the flight deck that is used with the rotorcraft's loudspeaker system if its signals are not picked up by another channel.

(d) Each cockpit voice recorder must be installed so t hat:

(1) It receives its electric power from the bus that provides the maximum reliability for operation of the cockpit voice recorder without jeopardizing service to essential or emergency loads;

(2) There is an automatic means to simultaneously stop the recorder and prevent each erasure feature from functioning, within 10 minutes after crash impact; and

(3) There is an aural or visual means for preflight checking of the recorder for proper operation.

(e) The record container must be locate d and mounted to minimize the probability of rupture of the container as a result of crash impact and consequent heat damage to the record from fire.

(f) If the cockpit voice recorder has a bulk erasure device, the installation must be designed to minimize the probability of inadvertent operation and actuation of the device during crash impact.

(g) Each recorder container must be either bright orange or bright yellow.

[Amdt. 27-22, 53 FR 26144, July 11, 1988]

From 14 CFR 29.1457–Airworthiness Standards: Transport Category Rotorcraft–Cockpit Voice Recorders

(a) Each cockpit voice recorder required by the operating rules of this chapter must be approved, and must be installed so that it will record the following:

(1) Voice communications transmitted from or received in the rotorcraft by radio.

(2) Voice communications of flight crewmembers on the flight deck.

(3) Voice communications of flight crewmembers on the flight deck, using the rotorcraft's interphone system.

(4) Voice or audio signals identifying navigation or approach aids introduced into a headset or speaker.

(5) Voice communications of flight crewmembers using the passenger loudspeaker system, if there is such a system, and if the fourth channel is available in accordance with the requirements of paragraph (c)(4)(ii) of this section.

(b) The recording requirements of paragraph (a)(2) of this section may be met--

(1) By installing a cockpit-mounted area microphone, located in the best position for recording voice communications originating at the first and second pilot stations and voice communications of other crewmembers on the flight deck when directed to those stations; or

(2) By installing a continually energized or voice-actuated lip microphone at the first and second pilot stations. The microphone specified in this paragraph must be so located and, if necessary, the preamplifiers and filters of the recorder must be so adjusted or supplemented, that the recorded communications are intelligible when recorded under flight cockpit noise conditions and played back. The level of intelligibility must be approved by the Administrator. Repeated aural or visual playback of the record may be used in evaluating intelligibility.

(c) Each cockpit voice recorder must be installed so that the part of the communication or audio signals specified in paragraph (a) of this section obtained from each of the following sources is recorded on a separate channel:

(1) For the first channel, from each microphone, headset, or speaker used at the first pilot station.

(2) For the second channel, from each microphone, headset, or speaker used at the second pilot station.

(3) For the third channel, from the cockpit-mounted area microphone, or the continually energized or voice-actuated lip microphones at the first and second pilot stations.

(4) For the fourth channel, from--

(i) Each microphone, headset, or speaker used at the stations for the third and fourth crewmembers; or

(ii) If the stations specified in paragraph (c)(4)(i) of this section are not required or if the signal at such a station is picked up by another channel, each microphone on the flight deck that is used with the passenger loudspeaker system if its signals are not picked up by another channel.

(iii) Each microphone on the flight deck that is used with the rotorcraft's loudspeaker system if its signals are not picked up by another channel.

(d) Each cockpit voice recorder must be installed so that --

(1) It receives its electric power from the bus that provides the maximum reliability for operation of the cockpit voice recorder without jeopardizing service to essential or emergency loads;

(2) There is an automatic means to simultaneously stop the recorder and prevent each erasure feature from functioning, within 10 minutes after crash impact; and

(3) There is an aural or visual means for preflight checking of the recorder for proper operation.

(e) The record container must be located and mounted to minimize the probability of rupture of the container as a result of crash impact and consequent heat damage to the record from fire.

(f) If the cockpit voice recorder has a bulk erasure device, the installation must be designed to minimize the probability of inadvertent operation and actuation of the device during crash impact.

(g) Each recorder container must be either bright orange or bright yellow.

[Amdt. 29-6, 35 FR 7293, May 9, 1970]

From 14 CFR 121.359–Operating Requirements: Domestic, Flag, and Supplemental Operations–Cockpit Voice Recorders

(a) No certificate holder may operate a large turbine engine powered airplane or a large pressurized airplane with four reciprocating engines unless an approved cockpit voice recorder is installed in that airplane and is operated continuously from the start of the use of the checklist (before starting engines for the purpose of flight), to completion of the final checklist at the termination of the flight.

(b) [Reserved]

(c) The cockpit voice recorder required by paragraph (a) of this section must meet the following application standards:

(1) The requirements of part 25 of this chapter in affect on August 31, 1977.

(2) After September 1, 1980, each recorder container must--

(i) Be either bright orange or bright yellow;

(ii) Have reflective tape affixed to the external surface to facilitate its location under water; and

(iii) Have an approved underwater locating device on or adjacent to the container which is secured in such a manner that they are not likely to be separated during crash impact, unless the cockpit voice recorder, and the flight recorder required by Sec. 121.343, are installed adjacent to each other in such a manner that they are not likely to be separated during crash impact.

(d) No person may operate a multiengine, turbine-powered airplane having a passenger seat configuration of 10-19 seats unless it is equipped with an approved cockpit voice recorder that:

(1) Is installed in compliance with Sec. 23.1457(a) (1) and (2), (b), (c), (d), (e), (f), and (g); Sec. 25.1457(a) (1) and (2), (b), (c), (d), (e), (f), and (g) of this chapter, as applicable; and

(2) Is operated continuously from the use of the checklist before the flight to completion of the final checklist at the end of the flight.

(e) No person may operate a multiengine, turbine-powered airplane having a passenger seat configuration of 20 to 30 seats unless it is equipped with an approved cockpit voice recorder that--

(1) Is installed in compliance with Sec. 23.1457 or Sec. 25.1457 of this chapter, as applicable; and

(2) Is operated continuously from the use of the checklist before the flight to completion of the final checklist at the end of the flight.

(f) In complying with this section, an approved cockpit voice recorder having an erasure feature may be used, so that at any time during the operation of the recorder, information recorded more than 30 minutes earlier may be erased or otherwise obliterated.

(g) For those aircraft equipped to record the uninterrupted audio signals received by a boom or a mask microphone, the flight crewmembers are required to use the boom microphone below 18,000 feet mean sea level. No person may operate a large turbine engine powered airplane or a large pressurized airplane with four reciprocating engines manufactured after October 11, 1991, or on which a cockpit voice recorder has been installed after October 11, 1991, unless it is equipped

to record the uninterrupted audio signal received by a boom or mask microphone in accordance with Sec. 25.1457(c)(5) of this chapter.

(h) In the event of an accident or occurrence requiring immediate notification of the National Transportation Safety Board under part 830 of its regulations, which results in the termination of the flight, the certificate holder shall keep the recorded information for at least 60 days or, if requested by the Administrator or the Board, for a longer period. Information obtained from the record is used to assist in determining the cause of accidents or occurrences in connection with investigations under part 830. The Administrator does not use the record in any civil penalty or certificate action.

[Doc. No. 6258, 29 FR 19205, Dec. 31, 1964, as amended by Amdt. 121-20, 31 FR 8912, June 28, 1966; Amdt. 121-23, 31 FR 15192, Dec. 3, 1966; Amdt. 121-32, 32 FR 13914, Oct. 6, 1967; Amdt. 121-130, 41 FR 47229, Oct. 28, 1976; Amdt. 121-135, 42 FR 36973, July 18, 1977; Amdt. 121-143, 43 FR 22642, May 25, 1978; Amdt. 121-197, 53 FR 26147, July 11, 1988; Amdt. 121-251, 60 FR 65933, Dec. 20, 1995]

From 14 CFR 135.151–Operating Requirements: Commuter and On Demand Operations and Rules Governing Persons On Board Such Aircraft–Cockpit Voice Recorder

(a) No person may operate a multiengine, turbine-powered airplane or rotorcraft having a passenger seating configuration of six or more and for which two pilots are required by certification or operating rules unless it is equipped with an approved cockpit voice recorder that:

(1) Is installed in compliance with Sec. 23.1457(a) (1) and (2), (b), (c), (d), (e), (f), and (g); Sec. 25.1457(a) (1) and (2), (b), (c), (d), (e), (f), and (g); Sec. 27.1457(a) (1) and (2), (b), (c), (d), (e), (f), and (g); or Sec. 29.1457(a) (1) and (2), (b), (c), (d), (e), (f), and (g) of this chapter, as applicable; and

(2) Is operated continuously from the use of the check list before the flight to completion of the final check list at the end of the flight.

(b) No person may operate a multiengine, turbine-powered airplane or rotorcraft having a passenger seating configuration of 20 or more seats unless it is equipped with an approved cockpit voice recorder that--

(1) Is installed in compliance with Sec. 23.1457, Sec. 25.1457, Sec. 27.1457 or Sec. 29.1457 of this chapter, as applicable; and

(2) Is operated continuously from the use of the check list before the flight to completion of the final check list at the end of the flight.

(c) In the event of an accident, or occurrence requiring immediate notification of the National Transportation Safety Board which results in termination of the flight, the certificate holder shall keep the recorded information for at least 60 days or, if requested by the Administrator or the Board, for a longer period. Information obtained from the record may be used to assist in determining the cause of accidents or occurrences in connection with investigations. The Administrator does not use the record in any civil penalty or certificate action.

(d) For those aircraft equipped to record the uninterrupted audio signals received by a boom or a mask microphone the flight crewmembers are required to use the boom microphone below 18,000 feet mean sea level. No person may operate a large turbine engine powered airplane

manufactured after October 11, 1991, or on which a cockpit voice recorder has been installed after October 11, 1991, unless it is equipped to record the uninterrupted audio signal received by a boom or mask microphone in accordance with Sec. 25.1457(c)(5) of this chapter.

(e) In complying with this section, an approved cockpit voice recorder having an erasure feature may be used, so that during the

operation of the recorder, information:

(1) Recorded in accordance with paragraph (a) of this section and recorded more than 15 minutes earlier; or

(2) Recorded in accordance with paragraph (b) of this section and recorded more than 30 minutes earlier; may be erased or otherwise obliterated.

[Doc. No. 16097, 43 FR 46783, Oct. 10, 1978, as amended by Amdt. 135-23, 52 FR 9637, Mar. 25, 1987; Amdt. 135-26, 53 FR 26151, July 11, 1988; Amdt. 135-60, 61 FR 2616, Jan. 26, 1996]

From 14 CFR 91.609–General Operating and Flight Rules–Flight Recorders and Cockpit Voice Recorders

(a) No holder of an air carrier operating certificate or an operating certificate may conduct any operation under this part with an aircraft listed in the holder's operations specifications or current list of aircraft used in air transportation unless that aircraft complies with any applicable flight recorder and cockpit voice recorder requirements of the part under which its certificate is issued except that the operator may--

(1) Ferry an aircraft with an inoperative flight recorder or cockpit voice recorder from a place where repair or replacement cannot be made to a place where they can be made;

(2) Continue a flight as originally planned, if the flight recorder or cockpit voice recorder becomes inoperative after the aircraft has taken off;

(3) Conduct an airworthiness flight test during which the flight recorder or cockpit voice recorder is turned off to test it or to test any communications or electrical equipment installed in the aircraft; or

(4) Ferry a newly acquired aircraft from the place where possession of it is taken to a place where the flight recorder or cockpit voice recorder is to be installed.

(b) Notwithstanding paragraphs (c) and (e) of this section, an operator other than the holder of an air carrier or a commercial operator certificate may--

(1) Ferry an aircraft with an inoperative flight recorder or cockpit voice recorder from a place where repair or replacement cannot be made to a place where they can be made;

(2) Continue a flight as originally planned if the flight recorder or cockpit voice recorder becomes inoperative after the aircraft has taken off;

(3) Conduct an airworthiness flight test during which the flight recorder or cockpit voice recorder is turned off to test it or to test any communications or electrical equipment installed in the aircraft;

(4) Ferry a newly acquired aircraft from a place where possession of it was taken to a place where the flight recorder or cockpit voice recorder is to be installed; or

(5) Operate an aircraft:

(i) For not more than 15 days while the flight recorder and/or cockpit voice recorder is inoperative and/or removed for repair provided that the aircraft maintenance records contain an entry that indicates the date of failure, and a placard is located in view of the pilot to show that the flight recorder or cockpit voice recorder is inoperative.

(ii) For not more than an additional 15 days, provided that the requirements in paragraph (b)(5)(i) are met and that a certificated pilot, or a certificated person authorized to return an aircraft to service under Sec. 43.7 of this chapter, certifies in the aircraft maintenance records that additional time is required to complete repairs or obtain a replacement unit.

(c) No person may operate a U.S. civil registered, multiengine, turbine-powered airplane or rotorcraft having a passenger seating configuration, excluding any pilot seats of 10 or more that has been manufactured after October 11, 1991, unless it is equipped with one or more approved flight recorders that utilize a digital method of recording and storing data and a method of readily retrieving that data from the storage medium, that are capable of recording the data specified in appendix E to this part, for an airplane, or appendix F to this part, for a rotorcraft, of this part within the range, accuracy, and recording interval specified, and that are capable of retaining no less than 8 hours of aircraft operation.

(d) Whenever a flight recorder, required by this section, is installed, it must b e operated continuously from the instant the airplane begins the takeoff roll or the rotorcraft begins lift-off until the airplane has completed the landing roll or the rotorcraft has landed at its destination.

(e) Unless otherwise authorized by the Administrator, after October 11, 1991, no person may operate a U.S. civil registered multiengine, turbine-powered airplane or rotorcraft having a passenger seating configuration of six passengers or more and for which two pilots are required by type certification or operating rule unless it is equipped

with an approved cockpit voice recorder that:

(1) Is installed in compliance with Sec. 23.1457(a) (1) and (2), (b), (c), (d), (e), (f), and (g); Sec. 25.1457(a) (1) and (2), (b), (c), (d), (e), (f), and (g); Sec. 27.1457(a) (1) and (2), (b), (c), (d), (e), (f), and (g); or Sec. 29.1457(a) (1) and (2), (b), (c), (d), (e), (f), and (g) of this chapter, as applicable; and

(2) Is operated continuously from the use of the checklist before the flight to completion of the final checklist at the end of the flight.

(f) In complying with this section, an approved cockpit voice recorder having an erasure feature may be used, so that at any time during the operation of the recorder, information recorded more than 15 minutes earlier may be erased or otherwise obliterated.

(g) In the event of an accident or occurrence requiring immediate notification to the National Transportation Safety Board under part 830 of its regulations that results in the termination of the flight, any operator who has installed approved flight recorders and approved cockpit voice recorders shall keep the recorded information for at least 60 days or, if requested by the Administrator or the Board, for a longer period. Information obtained from the record is used to assist in determining the cause of accidents or occurrences in connection with the investigation under part 830. The Administrator does not use the cockpit voice recorder record in any civil penalty or certificate action.

[Doc. No. 18334, 54 FR 34318, Aug. 18, 1989, as amended by Amdt. 91-226, 56 FR 51621, Oct. 11, 1991; Amdt. 91-228, 57 FR 19353, May 5, 1992]

From 49 U.S.C. §1154–Discovery and use of cockpit and surface vehicle recordings and transcripts

(a) TRANSCRIPTS AND RECORDINGS.--(1) Except as provided by this subsection, a party in a judicial proceeding may not use discovery to obtain--

(A) any part of a cockpit or surface vehicle recorder transcript that the National Transportation Safety Board has not made available to the public under section 1114(c) or 1114(d) of this title; and

(B) a cockpit or surface vehicle recorder recording.

(2)(A) Except as provided in paragraph (4)(A) of this subsection, a court may allow discovery by a party of a cockpit or surface vehicle recorder transcript if, after an in camera review of the transcript, the court decides that--

(i) the part of the transcript made available to the public under section 1114(c) or 1114(d) of this title does not provide the party with sufficient information for the party to receive a fair trial; and

(ii) discovery of additional parts of the transcript is necessary to provide the party with sufficient information for the party to receive a fair trial.

(B) A court may allow discovery, or require production for an in camera review, of a cockpit or surface vehicle recorder transcript that the Board has not made available under section 1114(c) or 1114(d) of this title only if the cockpit or surface vehicle recorder recording is not available.

(3) Except as provided in paragraph (4)(A) of this subsection, a court may allow discovery by a party of a cockpit or surface vehicle recorder recording if, after an in camera review of the recording, the court decides that--

(A) the parts of the transcript made available to the public under section 1114(c) or 1114(d) of this title and to the party through discovery under paragraph (2) of this subsection do not provide the party with sufficient information for the party to receive a fair trial; and

(B) discovery of the cockpit or surface vehicle recorder recording is necessary to provide the party with sufficient information for the party to receive a fair trial.

(4)(A) When a court allows discovery in a judicial proceeding of a part of a cockpit or surface vehicle recorder transcript not made available to the public under section 1114(c) or 1114(d) of this title or a cockpit or surface vehicle recorder recording, the court shall issue a protective order--

(i) to limit the use of the part of the transcript or the recording to the judicial proceeding; and

(ii) to prohibit dissemination of the part of the transcript or the recording to any person that does not need access to the part of the transcript or the recording for the proceeding.

(B) A court may allow a part of a cockpit or surface vehicle recorder transcript not made available to the public under section 1114(c) or 1114(d) of this title or a cockpit or surface vehicle recorder recording to be admitted into evidence in a judicial proceeding, only if the court places the part of the transcript or the recording under seal to prevent the use of the part of the transcript or the recording for purposes other than for the proceeding.

(5) This subsection does not prevent the Board from referring at any time to cockpit or surface vehicle recorder information in making safety recommendations.

(6) In this subsection:

(A) RECORDER.-The term "recorder" means a voice or video recorder.

(B) TRANSCRIPT.-The term "transcript" includes any written depiction of visual information obtained from a video recorder.

ATTACHMENT F NTSB and BEA Memorandum of Agreement

Guidelines for the Conduct of International Aviation Accident Investigations Between the National Transportation Safety Board and the Bureau Enquetes-Accidents

1. Purpose

On March 20, 1985, the Bureau Enquetes-Accident (BEA) and the National Transportation Safety Board (NTSB) signed a Memorandum of Agreement (MOA) to ensure that the investigating agencies coordinate their efforts closely during aircraft accident investigations that involve aircraft equipped with CFM 56 engines, which are jointly manufactured by SNECMA in France and General Electric Aircraft Engines in the United States.

France and the United States are today the major States of design and manufacture for the world's aircraft. As such, they are obligated to either conduct or participate in numerous investigations throughout the world in accordance with Annex 13 to the Convention on International Civil Aviation. In addition, France and the United States are often asked to provide technical assistance, particularly in the readout and analysis of flight recorders, even for investigations that do not meet the specific conditions of Annex 13. Further, in accordance with their international responsibilities, France and the United States must oversee operations and continuing airworthiness of aircraft, as stated in Annexes 6 and 8. This situation has led the NTSB and BEA to recognize the necessity of replacing the previous MOA with these broader guidelines that would extend to accidents and incidents involving aircraft of a maximum mass of more than 2250kg.

Article 26 of the Convention on International Civil Aviation, and Annex 13 to the latter, contain language pointing out the importance for the safety of world air transport that investigations be carried out with the greatest diligence and with the full cooperation of the concerned States.

The purpose of these guidelines is to reinforce the cooperation between the BEA and the NTSB to ensure maximum efficiency for the safety of world civil aviation. The guidelines are also intended to improve communication and exchanges of information between the two agencies.

2. Application of Annex 13

The text of Annex 13 referred to in this document is that of the eighth edition dated July 1994. France and the United States apply the standards and recommended practices contained in Annex 13 within the limits of the specific differences noted.

Insofar as the guidelines serve to reinforce joint work between the two investigating agencies, it is the spirit of Annex 13 that is to be applied. In particular, each

agency intends to make its best efforts to overcome potential difficulties arising due to differences in languages, national cultures or geographic locations.

3. Definitions

For application of these guidelines, the definitions of the following words and phrases are to be those specified in or understood from Annex 13:

Accident
Incident
Serious incident
State of Occurrence
State of Design
State of Manufacture
State of Registration
State of the Operator
Investigator-in-charge
Accredited Representative
Adviser
Draft final report
Differences

For the purpose of these guidelines, “agencies” are defined as the BEA and the NTSB.

Along with the accredited representative, there may be a deputy accredited representative, who should be accorded the same rights, in accordance with Annex 13.

4. Purpose of Technical Investigations

The purpose of accident and incident investigations is to determine the facts, conditions and circumstances, to analyze and determine the probable causes of such accidents or incidents, to make recommendations to avoid their recurrence, and to safeguard human lives. It is not to impute fault or establish responsibility in terms of any person or agency or to exonerate any person or agency. Any safety recommendations produced by BEA/NTSB as a result of accident and incident investigations are intended as a means to improve safety and preclude recurrence.

5. Notification of Accidents and Incidents

When an agency becomes aware of an accident or incident that involves the direct interests of the other State, it is to inform the other agency by the most rapid means possible and provide the other agency with all available information consistent with Annex 13 and the laws of the notifying State. Both sides intend to follow the guidance contained in Annex 13 regarding serious incidents.

6. Procedures Relating to Investigations of Occurrences Wherein One State is the State of Manufacture, Design, Registration, or of the Operator, and the Other is the State of Occurrence

6.1 Participation in the Investigation

During investigations conducted by agencies of either State, domestic participants are to participate in the investigation in accordance with the organizational structure prescribed by the investigating agency.

During investigations conducted by agencies of either State, international participants are to participate in the investigation as advisers to the accredited representative of their State in accordance with the organizational structure prescribed in Annex 13.

Normal communication is to be conducted through accredited representative channels. The two agencies are to inform each other of any possible direct communications with a participant or an organization of the other State.

For public hearings and submissions, the organizational structure may be altered to provide participants with the ability to best represent themselves.

6.2 Access to Data From an Investigation

The States affected by the investigation, such as the State of Manufacture or the State of the Operator, have international duties, in accordance primarily with Annexes 6, 8, and 13. In order to fulfill these duties, they need to have access to the information. Therefore, the State responsible for conducting the investigation is to provide the accredited representative from the other State access to all available material, as cited in paragraph 5.25 of Annex 13. The accredited representative is to receive the material as soon as practicable. See paragraph 6.6 hereafter regarding proprietary or commercially sensitive information.

Such data is to include, but is not to be limited to:

- An electronic copy of the raw, unmanipulated data obtained from the flight data recorder(s)(FDR), including data from all previous flights.

- Computer printouts, data files and plots of the data, once the accuracy of the data files has been established and agreed to by all participants.

- Data obtained from Quick Access Recorders should be handled in the same manner as FDR data, if it is determined that these data are relevant to the investigation. (For example, if they provide more data than the FDR recording).

- A copy of the air traffic control voice recording and transcript of radio communications, and any other available recordings.

- Radar data obtained from civilian sources in prescribed format and authorized, available military sources.

- Plots of the time correlation between radar, FDR, air traffic control recordings, cockpit voice recorder (CVR) data, and other relevant information. These plots are to be produced in a way that does not disclose protected data from the CVR or image recorders.

To ensure confidentiality of the sensitive information contained in CVRs and image recorders, initial readout, examination and analysis of the data derived from these recorders are to be performed only in the laboratory selected by the State conducting the investigation, participants should be limited strictly to:

- the investigator in charge and/or personnel from his agency that he will designate, as well as technically qualified advisers that he will designate, based on the procedures of his agency,
- the accredited representative or his designee,
- technically qualified advisers designated by the accredited representative.

The distribution of transcripts or reports derived from analyses of CVRs and image recorders is to be prohibited until they have been released by the agency conducting the investigation. However, both agencies will proceed in a fully coordinated manner to provide timely and full access to the CVR recording and transcripts to the accredited representative or his designee and to selected advisers in the laboratory of the agency conducting the investigation. Notes are not to be removed from the laboratory.

6.3. Analysis, Conclusions, and Development of Safety Recommendations

6.3.1 Participation in the Analysis, Conclusions, and Development of Safety Recommendations

The two agencies intend to apply the provisions of paragraph 5.25 of Annex 13, particularly paragraphs g) and i), which state that participation shall confer entitlement to:

(g) participation in off-scene investigation activities such as component examinations, technical briefings, tests, and simulation;

(i) make submissions in respect of the various elements of the investigation.

Analysis, and determination of probable causes are the full responsibility of the investigating agency. However, it is strongly recommended that the other participants in the investigation provide their contribution on the study of the factual data and be associated with the deliberations related to the analysis, findings, causes and safety recommendations. This can best be achieved by regular contacts and discussions between the investigator in charge and accredited representatives and by written submissions during the investigation process.

6.3.2 Drafting and Distribution of Safety Recommendations

Safety recommendations should be discussed throughout the investigation. Advisers should be part of this process. When the agency conducting the investigation plans to issue safety recommendations before the completion of the draft Final Report, that agency is to make every effort to share the content of the safety recommendations with the accredited representative of the other agency (and other agencies, if appropriate) as soon as practical. The accredited representative is to have the opportunity to comment on those recommendations and provide those comments to the investigating agency within a reasonable period of time based on the degree of urgency of the proposed recommendations. The length of the comment period is to be determined by the investigating agency. If the accredited representative or his designee is present, he will be associated with the drafting process.

6.3.3 Distribution of Safety Recommendations

Safety Recommendations are to be sent to the other agency, along with copies to both aviation authorities, the U. S. Federal Aviation Administration and France's Direction Generale de l'Aviation Civile (FAA and DGAC).

6.4. Exchanges of Correspondence

In the event that formal correspondence is necessary, each agency may choose the most appropriate method to transmit correspondence and documents consistent with prompt receipt. In order to facilitate record keeping and to avoid the loss of correspondence, the recipient will acknowledge receipt of the correspondence.

6.5 Consultation

Regarding consultations on the draft Final Report outlined in Annex 13, each agency should seek State comments from the other agency. In addition, the agency conducting the investigation may give participants an opportunity to review the draft Final Report and to provide observations through the accredited representative of their State.

6.6 Confidentiality

The agency that receives materials from the other agency should handle the materials according to their confidentiality or proprietary status, within the bounds of the respective laws of the two States. Drafts, internal, or working documents that have been transmitted, except when explicitly indicated to the contrary, are to be considered as proprietary/confidential documents and treated as such.

6.7 Informing the News Media

The agency conducting the investigation is to be the sole organization that releases information about the investigation to the news media. After an accident or incident, the news media and relatives of the victims will be contacting their respective agencies. Therefore, the press officers of both agencies are to establish working procedures to ensure that information can be mutually developed and coordinated as much as possible. Also, whenever possible, such information is to be transmitted by the investigating agency to the other agency before it is made public. If there are differences of opinion, efforts are to be made to resolve them before the information is released.

7. Procedures Relating to Investigations of Occurrences Involving Aircraft Equipped with CFM56 Engines

The following provisions are to be applied to the investigations of occurrences involving CFM56 engines, which are jointly manufactured by France and the United States.

1. In the case of an investigation directed by either agency, the other agency is to be notified of the event that prompted the investigation, and may elect to designate an accredited representative and advisers to participate in the investigation in accordance with the provisions of Annex 13. If the other agency elects not to appoint an accredited representative, the other agency is to be provided timely updates on the progress of the investigation, safety issues developed, and conclusions that arise.

2. In the event that an accident or incident occurs in the territory of a third State and the United States or France is the State of Design or Manufacture of the aircraft, the other agency, which is not the State of Manufacture, the State of Registration or State of the Operator, is to provide notification of its plans for participation in the investigation. The other agency may then elect to designate an accredited representative and appoint advisers to the concerned agency. If the other agency elects not to take such action, it should be provided timely updates on the progress of the investigation, safety issues that are developed, and conclusions that arise.

3. In the event that there is an occurrence in the territory of a third State, for which neither of the two agencies is the State of Design or Manufacture of the aircraft, the two agencies together are to approach the State of occurrence to determine the most appropriate procedures for representation and participation in the investigation.

8. Cooperation Between the Two Agencies

8.1 Assistance in the Supervision of Examination of a Component Part

The agency that conducts the investigation may request that the other agency assist in supervising the examination, testing, or disassembling component parts that have been removed to the location of a manufacturer or other facility of the other State. The other agency is to provide such assistance to the extent possible. In all cases, the agency that conducts the investigation is to provide updates as soon as practicable to the other agency of all investigation activities being carried out in the territory of that State and is to invite the other agency to participate.

8.2 Training of Personnel

To the extent possible, the two agencies are to facilitate exchanges of personnel for training and development, including observer status at major investigation accident sites and subsequent off-scene investigative activities.

8.3 Exchange of Information

Either agency may request information on the progress of investigations by the other agency. The other agency is to do everything possible to provide the information. This information is then to be treated with the same rules of confidentiality as those to which the providing agency is itself bound, in accordance with the laws of the respective States.

8.4 Conduct of the Agency Invited to Assist a State of Occurrence

When one of the two agencies is requested by the State of occurrence to provide technical assistance for an investigation in which the other agency is participating, or should be participating, under the provisions of Annex 13, the response to the request should be coordinated with the other agency. The two agencies should work together to ensure that the investigation is conducted in accordance with the spirit and procedures of Annex 13. Specifically, all the data necessary to fulfill the responsibilities prescribed by Annexes 6 and 8, including FDR and CVR information and copies of the recordings, should be made available to the involved State as soon as practicable. Both agencies are to update and refine data as it becomes available and are to coordinate to ensure that the best data set is available as the investigation progresses.

8.5 Future Coordination and Planning

The agencies' representatives should meet at least annually and alternately at the facilities of the respective agencies to discuss current investigations and any other relevant issues.

9. Victims and Relatives

Both agencies are to work in a fully coordinated manner to better meet the expectations of the victims and their families to the extent provided for under the laws of each State.

10. Duration

To the extent consistent with their international obligations, participating agencies may cease following the procedures set forth in this document at any time, except that they should continue to follow such procedures for purposes of any investigations in progress at that time. Regarding investigations in progress, confidentiality of information previously provided under these guidelines should continue consistent with domestic law.

To take into account any changes to international or national rules or policies, these guidelines are to be reviewed periodically by both agencies.

Signed at _Washington D.C. _on November 16, 2000 _in duplicate in the English and French languages.

_/s/ Paul Arslanian_____	____/s/ Jim Hall_____
Director	Chairman
Bureau Enquetes-Accidents	National Transportation Safety Board

ATTACHMENT G Docket Management System CVR Report Placeholder

APPENDIX C
STAKEDOWN DUTIES OF FIELD INVESTIGATORS

The following information discusses the initial response of Regional staff to a major accident before the Go Team's arrival. There are two distinct areas of responsibility, those who go to the scene and those who stay at the office or residence for phone coordination with all involved parties. Both are equally important and must function as a coordinated team.

ON-SCENE

Immediate response is necessary. All Regional and Field Office Air Safety Investigators (ASI) should have at the office a Bloodborne Pathogen protection kit, jump suit, suitable foot wear, and a packed bag of necessities for an overnight stay. The first person to arrive on-scene should bring a cell phone and, if possible, a video camera. The purpose of the video is twofold: 1) documentation of wreckage in the early stages of response and 2) training.

1. Upon arrival, contact the on-scene commander (or Incident Commander) introduce yourself as the NTSB representative pending arrival of the Go Team. Explain that the team is en route and state their ETA. Explain that recovery of the "black boxes" is key to the investigation and brief his team on what to look for and where they are typically located. Whoever initially establishes contact with the on-scene commander/Incident Commander should remain the primary representative. If a change is appropriate, ensure that the on-scene commander/Incident Commander is advised. Maintain contact with the command post and the NTSB Communications Center.

2. Immediately after assessing the scene, call the designated contact back at the Field Office. Ask him/her to attempt to establish a conference call with Washington.

3. Attempt to make no media comments. If media pressure cannot be avoided mention only that the team is en route, their ETA, and the names of the assigned Board Member, public affairs officer, and IIC.

4. Work with local officials to document any wreckage manipulation for removal of bodies or rescue of survivors. Ensure that body removal is properly documented and photographed. This should be done as a team effort by local officials and the medical examiner. You are not expected to participate in the removal of bodies.

5. Do not initiate your own investigation. Do not contract for any services unless specifically requested or approved by the IIC.

6. Thoroughly photograph the scene with still and video cameras. Often your pictures will be the only ones of the scene prior to body removal and the associated disturbance of wreckage. Make copies available to the IIC as soon as possible, preferably before the Organizational Meeting. Retain your negatives, unless they are specifically requested by the IIC.

7. Communicate frequently with those remaining at the office. This is especially true if you are out of beeper range. The two groups must work together to keep headquarters aware of what is going on at the scene.

8. Put high priority on recovery of the CVR and FDR. Coordinate with those back at the office and headquarters to get the recorders to the lab as soon as possible.

9. In the event of surviving crewmembers, make yourself aware of their location and pass that information to the IIC.

10. Coordinate with the Incident Command Safety Officer for appropriate safety concerns and procedures. Be prepared to conduct a safety briefing for the IIC and team.

11. Ensure that the designated media area is not too close to wreckage. If on an airport that has a public relations department, coordinate with them.

12. Attempt to meet the Go Team and debrief the Board Member and IIC on known facts, problems, and actions taken thus far. Introduce them to the Incident Commander and any other pertinent individuals at the scene. A smooth transition of command from the local NTSB to the Go Team is imperative. There should be no doubt in the Incident Commander's mind who is representing and leading the Safety Board at any given time.

13. Make sure that someone from NTSB is at the scene until relieved by the Go Team. If this becomes an extended period of time or conditions are intolerable, arrange shifts to share this responsibility. Do not work under extreme conditions too long.

14. The Field Office representative who responded on-scene should attend the Organizational Meeting and be prepared to brief the team.

15. Do not commit to being a Group Chairman without coordination with your Regional Director

FIELD OFFICE

1. If after-hours, decide if duties can be performed at home or if they require use of the office. This will be based on the complexity of the accident, time of day, and number of people available. The regional director/field chief, or whoever is acting, will normally be the designated Field Office contact. If necessary, duties can be performed from either the regional office or the satellite office for any location in the region

2. Document all phone calls in detail.

3. Coordinate with AS-1, AS-10, and AS-20 continually. One of these offices will become your primary point of contact at headquarters. The Safety Board's Communications

Center at Headquarters will make arrangements for hotels, rental cars, command post, computer equipment and telephones.

4. Rental car arrangements may be delegated to you. If so, make sure no one from headquarters duplicates your efforts. If in doubt, ask AS-10.

5. Coordination with local authorities and headquarters regarding activities on scene could be the designated Field Office contact's responsibility for up to four hours. Make yourself available. This may dictate opening the office in order to have access to several phone lines. In such cases, it will probably be a two-person job for the first hour of so.

6. For after-hours accidents, whoever takes the first call will be the primary point of contact until relieved by the Field Office chief. Depending on the situation, this could be a few minutes or the duration of the initial response. Once you realize that you are taking notification on a potential Go Team accident, establish a conference call with the Field Office chief through the Safety Board's Communications Center (202-314-6290). Notification of headquarters will then begin with that conference call.

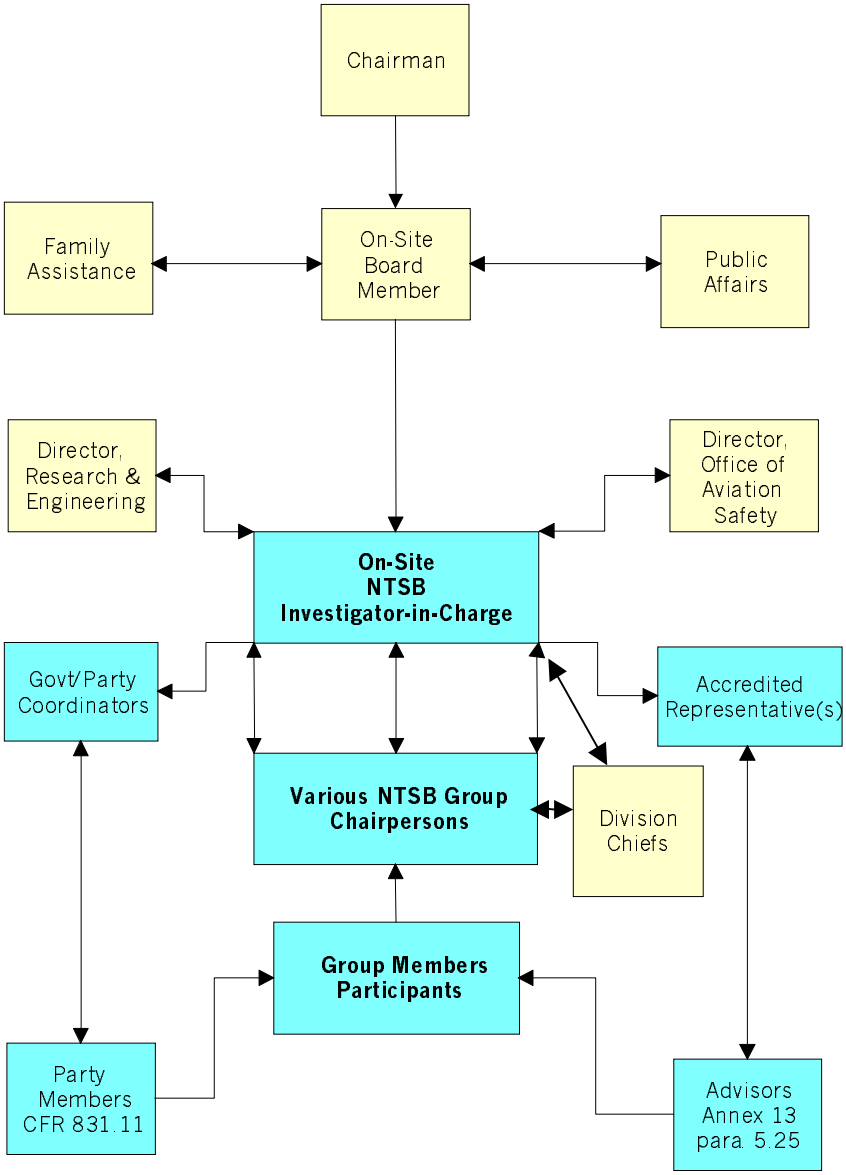
ATC TOXICOLOGY TESTS

Either those remaining at the office or those reporting on-scene may be called upon by the IIC or headquarters to assist in coordinating toxicology tests for ATC personnel. This responsibility could include taking custody of samples.

APPENDIX D

INVESTIGATION ORGANIZATION CHART, ON-SCENE ROSTER AND PARTY FORM

INVESTIGATION ORGANIZATION CHART



ON-SCENE ROSTER

IIC _____ ACCREDITED REPRESENTATIVE_____ ACCIDENT#_____

Party:							
Coordinator:							
Operations							
Human Perf.							
Structures							
Systems							
Powerplants							
Maintenance Rec.							
ATC							
Weather							
Aircraft Perf.							
FDR							
CVR							
Witnesses							
Survival Factors							
Airports							
Other							

OTHER PERSONNEL

BOARD MEMBER	SPECIAL ASSISTANT	PUBLIC AFFAIRS	TRANSPORTATION DISASTER ASSISTANCE
GOVERNMENT LIAISON	LOGISTICS ASSISTANT	OBSERVER	OBSERVER

STATEMENT OF PARTY REPRESENTATIVES TO NTSB INVESTIGATION

Aircraft Identification

Registration Number _____
Make and Model _____
Location _____
Date _____

The undersigned hereby acknowledge that they are participating in the above-referenced aircraft accident or incident investigation (including any component tests and teardowns or simulator testing) on behalf of the party indicated adjacent to their name, for the purpose of providing technical assistance to the National Transportation Safety Board.

The undersigned further acknowledge that they have read the attached copy of 49 C.F.R. Part 831 and have familiarized themselves with 49 C.F.R. § 831.11, which governs participation in NTSB investigations and agree to abide by the provisions of that regulation.

It is understood that a party representative to an investigation may not occupy a legal position or be a person who also represents claimants or insurers. The placement of a signature hereon constitutes a representation that participation in this investigation is not on behalf of either claimants or insurers and that, while any information obtained may ultimately be used in litigation, participation is not for the purposes of preparing for litigation.

By placing their signatures hereon, all participants agree that they will neither assert, nor permit to be asserted on their behalf, any privilege in litigation, with respect to information or documents obtained during the course of and as a result of participation in the NTSB investigation as described above. It is understood, however, that this form is not intended to prevent the undersigned from participating in litigation arising out of the accident referred to above or to require disclosure of the undersigned's communications with counsel.

SIGNATURE	NAME (Print)	PARTY	DATE

SIGNATURE	NAME (Print)	PARTY	DATE

APPENDIX E

IIC's OPENING STATEMENT AT ORGANIZATIONAL MEETING

We are here to investigate the accident involving [airline, flight #, aircraft type] that crashed at [location], on [date]. I have distributed information that addresses several pertinent Safety Board procedures regarding the conduct of aircraft accident investigations. Please read this and make sure that you understand all of the information given. Everyone participating in this investigation must adhere to these rules throughout the conduct of this investigation. Please keep in mind, though, that these rules are not intended to be all-encompassing. If you have any questions concerning procedures during the investigation or believe that you will be unable to follow a procedure, please see me.

I would now like to discuss participation by parties to this investigation.

National Transportation Safety Board rules limit party status in aircraft accident investigations to those organizations or agencies "whose employees, functions, activities, or products were involved in the accident or incident and who can provide suitable qualified technical personnel to actively assist in the field investigation." We allow participation by parties in our investigations for two reasons. First, parties, can assist the Safety Board by offering technical expertise that it may lack. Consequently, all persons participating in this investigation must be in a position to contribute knowledge or skills that could be relevant to the investigation. As a result, you may be asked to describe the qualifications of the individuals you nominate to participate in this investigation.

Second, and more important, party participation enables a company or organization to have immediate access to facts concerning the accident should it need to quickly initiate preventive or corrective action. If a problem is discovered, safety concerns require that it be immediately remedied, often by the company.

A party coordinator will supervise the members of each party involved in this investigation. This individual should also possess sufficient authority within his or her organization to be empowered to make decisions on behalf of the organization during this on-scene phase. In addition, there is no such thing as an assistant or co-coordinator. A single individual speaks for a party. The party coordinator will be the NTSB's direct and official point-of-contact for your organization and, therefore, should be able to maintain contact with me at all times while we are here. Sometimes decisions will have to be made very rapidly and we cannot waste time trying to track each other down. Consequently, I request that any coordinator who is not present at the command post be available for contact by cell phone, by pager, or by other means.

Each evening we will convene a progress meeting to learn the facts that have been gathered during the course of the day and to plan strategies for the next day. I would like the party coordinators to represent the parties at these meetings.

The Safety Board will disseminate to the public all information regarding the accident, either through our Board Member, public affairs officer, or myself. We will hold regular briefings to the press. Please refrain from discussing the accident or our investigation of it in public, or giving information about either to the press. Any violation of this restriction will be considered a serious infraction of Board rules. This does not mean you may not have any contact with the press. You can discuss certain facts. A good rule of thumb is if you had the information before the accident, you can discuss it after.

I hope I do not need to remind you that an airplane accident site can be a very dangerous environment. It may contain damaged but fully inflated tires or pressurized oxygen bottles, precariously balanced pieces of large heavy aircraft structure, razor-sharp torn sheet metal, scattered hazardous cargo, and the like. There may also be decaying organic material that can expose personnel to viruses such as hepatitis or AIDS. Please wear appropriate protective garb when working near the accident site, including rubber gloves with heavy leather gloves over them, strong boots, eye goggles, and the like. Lastly, from a psychological standpoint, please beware of the potential effects that a tragedy such as this accident can have on you. Working around scenes of death is not easy. The NTSB people in this room are accustomed to working in an environment like this. Most of you probably are not.

Are there any questions?

At this time, I would like to explain the NTSB group system of investigation.

Participants from the parties will be assigned to working groups led by NTSB specialists, called Group Chairmen, for the duration of the on-scene investigation. As a rule, we do not permit anyone who is unwilling or unable to remain with their assigned groups for the approximate ____ days of this on-scene phase to participate in the investigation.

The working groups are going to be as small as possible while maintaining the ability to accomplish their assigned tasks. Decisions as to who will be on the working groups will be made by the NTSB Group Chairmen. See me if you have questions about the Group Chairmen's decisions.

As applicable, each participant in the investigation will be given an identification badge allowing entry to the site and the command post. Please wear these at all times when working on the investigation during this on-site phase.

I know I have thrown a lot of information at you in just a few minutes. Please feel free now, or any time from now on, to ask questions. We will now identify party coordinators and assign individuals to working groups.

APPENDIX F

GUIDANCE FOR ACCREDITED REPRESENTATIVES, ADVISORS, PARTY COORDINATORS AND OTHER PARTICIPANTS IN THE SAFETY BOARD'S INVESTIGATION OF AIRCRAFT ACCIDENTS

At the organizational meeting of an accident or incident investigation, the investigator-in-charge (IIC) will provide guidance for accredited representatives, advisors and party coordinators about their participation in the Safety Board's investigative process. This document contains detailed guidance material and applicable Safety Board administrative procedures concerning the role of a foreign state representative, an adviser to a foreign state representative, or a party to the investigation. Please keep in mind that these guidelines are not intended to be all-encompassing. Answers to questions not provided by these guidelines should be obtained from the IIC.

1 . Role of Parties to the Investigation

The primary purpose of inviting organizations to participate in an accident investigation is to assist the Board in developing a complete and accurate factual record of the accident. It also helps responsible safety officials to have immediate access to facts regarding the accident/incident that may facilitate prompt preventive and/or corrective action. Participation as a party, however, is a privilege—not a right—and conveys no right to information or participation. You will participate initially in the field (on-scene) phase of the investigation as a Party Coordinator or as a representative of a party to the investigation. Later, your organization may be designated as a party to any public hearing on the accident the Board may hold, provided it meets the Board's requirements. Participation in the investigation does not automatically guarantee party status at a Safety Board public hearing. Conversely, participation in the investigation is not a prerequisite to participation in a public hearing.

All persons participating in the Safety Board's investigation must have qualifications that relate to specific factual information or skills that would not otherwise be available to the Board. Also, no participating organization will be permitted representation by a person who has interests beyond the safety objective of the investigation. The Board's rules specifically prohibit any party from being represented by a person who represents claimants or insurers. No persons occupying legal positions may participate as parties. Participants in the investigation shall be responsive to the direction of Safety Board personnel and may be expelled from the investigation if they do not perform their assigned duties or if they conduct themselves in a manner prejudicial to the investigation. If you are a party coordinator for your organization, you will also be required to sign a statement to ensure your complete understanding of 49 *Code of Federal Regulations* (CFR) Part 831.11 related to parties to the field investigation. At all phases of the investigation, party coordinators are responsible for the behavior of their employees or representatives.

2. The Role of the Federal Aviation Administration (FAA) in the Investigation

The Safety Board is charged by the U.S. Congress according to 49 U.S. Code (USC) Section 1131 with the responsibility of investigating civil aircraft accidents, reporting and

analyzing the facts, conditions, and circumstances relating to each accident, and determining the probable cause(s) thereof. To preclude any misunderstanding concerning the responsibilities of the Safety Board and the FAA, refer to 49 USC Section 1131, as amended, which sets forth the Safety Board's responsibilities for the investigation of aircraft accidents and its duties.

Title 49 USC Section 1132(c) states, "The Board shall provide for the participation of the Secretary of Transportation in the investigation of an aircraft accident under this chapter when participation is necessary to carry out the duties and powers of the Secretary. However, the Secretary may not participate in establishing probable cause." The FAA, on behalf of the DOT, is the only U.S. organization entitled by law to participate as a party; no other domestic organization is automatically entitled to participate in a Safety Board investigation.

In the past, some individuals have been reluctant to give evidence to Safety Board investigators because of the participation of FAA employees who may also be responsible for enforcement of Federal Aviation Regulations (FARs). To prevent such reluctance, Safety Board policy permits a person being interviewed to request exclusion of FAA employees from interviews. However, if FAA personnel are excluded from a Safety Board interview, the FAA may want to interview the person involved in the accident following the Safety Board interview. Also, the substance of a Safety Board interview will be made available to all participants, including the FAA.

3. The Role of Foreign States Participating in Safety Board Investigations

Annex 13 to the Convention on International Civil Aviation (ICAO) provides for the participation of states of design, manufacture, operation, or registration. Through various ICAO Annexes, member states of ICAO have international obligations to ensure the continuing airworthiness, safe operation, and oversight of aircraft manufactured, operated, or registered in their respective states, just as the FAA has similar responsibilities for U.S.-manufactured and operated aircraft.

In the event of an accident or serious incident, an accredited representative is designated by a state to participate in an investigation. Advisor(s) are appointed by a state for the purpose of assisting its accredited representative in an investigation. Based on the investigative procedures in Annex 13, advisors will remain under the supervision of and the accredited representative will be responsible for the appointed advisers. All advisers (including commercial company technical representatives and government aviation authority representatives) assisting in the investigation will remain under the supervision of the participating state accredited representative throughout the on-scene and technical phases of the investigation.

In order to conform to international standards and recommended practices, as well as to provide the IIC with the relevant information and necessary support, accredited representatives and their advisors from foreign states participate in the complete investigative process, which includes entitlement to the following:

- Visiting the scene,
- Examining the wreckage,
- Obtaining witness information and suggest areas of questioning,
- Full access to all relevant data as soon as possible,
- Receiving copies of all pertinent documents,
- Participating in readouts of recorded media,
- Participating in off-scene investigative activities,
- Participating in investigative progress meetings, and
- Making submissions with respect to the elements of the investigation.

The accredited representative will be invited and encouraged to attend all organization, progress, and planning meetings and to communicate freely with the IIC.

In order to promote international coordination and consultation, the accredited representative may wish to appoint an additional government investigator to act on his or her behalf either at the site or at the Safety Board's engineering laboratories. The Safety Board will recognize an "accredited representative assistant" and afford such a designee all the recognized rights of participation.

Although Safety Board rules provide that deliberations related to analysis, findings, probable cause(s) and recommendations remain internal products, accredited representatives are provided 60 days to review and comment on draft reports. Additional participation is also encouraged through the timely use of written submissions. The IIC will maintain follow-on communications and should endeavor to provide the accredited representative with an overview of the analysis in sufficient detail to allow preparation of his or her submissions.

The Safety Board will also invite all states that participated in the investigation to submit significant and substantiated comments for consideration in preparing the draft Final Report.

4. Public Hearing

The accredited representatives and parties will be notified if circumstances dictate that a public hearing will be held in conjunction with this accident. Public hearings are conducted in accordance with 49 CFR Part 845. After the hearing, a transcript of it will be prepared for inclusion in the public docket of facts relating to the occurrence.

5. Recovery and Security of Wreckage

In most cases, the Safety Board requires only the recovery of certain portions of the aircraft wreckage and protection of the accident site from interference by unauthorized persons. The Safety Board cannot assume responsibility for the recovery of deceased accident victims, crowd control, the recovery and removal of wreckage that may constitute a public danger or nuisance, or for normal police, fire, and rescue services. If special and unusual circumstances arise in this area, consultations with appropriate local government officials will take place. Following completion of the on-site investigation of the aircraft, the site and aircraft wreckage that is no longer needed will be released. Any further provision for securing the site or aircraft parts is not the responsibility of the Safety Board.

6. Handling of Accident Information

The flow and dissemination of information during the course of a Safety Board investigation shall follow a distinct pattern, which is that no individual or group will withhold information; failure to follow this policy is grounds for dismissal from the investigation.

Factual information obtained by group members assigned to the team will be brought promptly to the attention of the respective Safety Board group chairmen. The group chairmen will pass all information that is gathered by various groups during the investigation to the IIC.

Group members may provide factual information to their respective party coordinators after such information has been given to their group chairman. All the factual information and developments in the investigation that are known to the IIC will be passed on to each of the party coordinators.

The IIC will share and discuss all information and developments with the accredited representative(s). Subsequently, the accredited representative(s) are expected to share all relevant factual information with their advisers. Such exchanges of information among the technical members of the accredited representative adviser team and feedback to the IIC will contribute to the scope and depth of the investigation. Accredited representatives are guided by the Participation and Obligations paragraphs of Annex 13, chapter 5 regarding state communications.

Party coordinators or advisers to accredited representatives may relay information to their respective organizations provided that the information is factual and is presented in the proper perspective. This information should be transmitted on a “need to know” basis for purposes of accident prevention, remedial action, or similar reasons and is not for public release. Party coordinators or advisers to accredited representatives should keep the IIC apprised of how their organizations plan to use the information. Common sense and good judgment must prevail to avoid potential action on preliminary information that proves to be untrue.

7. Dissemination of Information to the Public (On-Scene)

Contacts with news media regarding the facts and circumstances of the accident will be made only by the on-scene Member of the Safety Board or the Public Affairs representative of the Safety Board. If neither a Board Member nor a representative of the Office of Public Affairs is available, such contacts will only be made by the IIC. Contact with the news media by party coordinators, Safety Board group chairmen, accredited representatives or their advisors and group members is not authorized and will be grounds for removing those individuals or organizations from the investigation. Whenever possible, accredited representatives and party coordinators will be afforded the opportunity to preview factual information before it is released to the news media.

Following progress meetings and at other, unscheduled times when significant information is uncovered, the Board Member, Public Affairs officer, or IIC will brief the press on the facts collected by the team. In some instances, one or more parties to the investigation will be adversely affected by the release of factual information. This situation is unavoidable and is sometimes resented by the affected party. However, if an accredited representative, adviser, or party coordinator questions the factual nature of information shared at the progress meeting, such concerns should be raised promptly before a news media briefing. Unilateral press briefings or formal "clarifications" by any participants to an investigation are prohibited.

The Safety Board's independence and objectivity make it the appropriate organization to publicly announce the facts. Safety Board rules and procedures regarding the release of information gathered during an investigation were designed to prevent parties with vested interests from "leaking" or releasing information that would reflect adversely on other parties. If the Safety Board does not release the facts, parties that have something to gain might make unauthorized releases. Questions regarding these regulations and policies should be resolved in discussions with the IIC, Public Affairs officer, or Board Member to prevent unnecessary resentment between investigation team members.

These provisions do not exclude the right of the manufacturer or the authority in charge of the aircraft's airworthiness to release, after discussions and coordination with the IIC, accident briefs informing third-party States or aircraft operators of previously released factual information and provisional safety measures that will be taken.

Party coordinators are authorized to allow their public affairs representatives to release general background information about their organization to the news media during the on-scene phase of the investigation. International participants are encouraged to follow similar guidelines. General information, such as the number of employees in a company, the numbers and types of aircraft in a fleet, is releasable. A good rule of thumb is any information that could have been released before the accident is acceptable. When doubt exists about the release of information, contact the IIC or the Safety Board's Public Affairs representative.

In summary, the Safety Board's guiding policy regarding the release of information is as follows:

> The Safety Board is a public agency engaged in the public's business and supported by public funds. The work it does in the business of aviation safety is open for public review, and the Act under which it operates makes this mandatory. The Safety Board believes that briefing the news media during the on-site investigation of an aircraft accident should be a normal part of that investigation.

Copies of 49 CFR Part 801, the Safety Board's Procedural Regulations regarding public disclosure of aircraft accident information, are available from the IIC for guidance.

8. Assignment and Duties of Group Members

The IIC, accredited representative(s) (when present), party coordinators, and group chairmen will assign and organize the various investigating groups. Selected group members should have expertise in their proposed areas of investigation and must be prepared to remain with the investigation until it is completed or until group members are released by the group chairman and the IIC. The on-scene phase of an investigation may require the undivided attention of participants for as long as 2 weeks. In extraordinary circumstances, the respective group chairman, party coordinator, or accredited representative must promptly bring to the IIC's attention any necessity for removing a person from an investigative group. Party coordinators, group members, accredited representatives and other advisers can expect to be involved in the investigation for as long as 12 months and possibly several years.

a. Group Working Procedures

Group members are expected to participate in the investigation to the extent requested by the group chairmen. Consensus should be sought regarding working procedures, and daily synthesis of the group's work on site should involve all group members. Progress meeting briefings should contain major facts, observations and future activities. The IIC and the accredited representatives should have timely access to information derived from the cockpit voice recorder/flight data recorders (CVR/FDR), which is appropriate to guide the on-scene investigative efforts. A person serving as a Safety Board headquarters coordinator of critical information from the laboratory to the on-scene command post should ensure timely communication of critical information to the on-scene team.

b. Group Notes

Group notes are a compilation of findings discovered by the group during the on-scene phase of the investigation. Under the direction of the Safety Board group chairman, one set of group notes will be developed for each group at the accident scene. Depending upon the group, the notes could contain interview summaries, wreckage diagrams, cockpit documentation lists, damaged component descriptions, photographs, and video/audio tapes. Group notes are very important because they are the foundation for the group chairman's factual report. They are also

important because witness memories can change with time. In addition, the wreckage could be altered or evidence could be destroyed shortly after the on-scene phase of the investigation is completed. Therefore, group notes are the only official representation of conditions immediately after the accident.

Each group member will participate in a complete review of the group notes for technical accuracy and adequacy of the investigation's scope and to provide feedback to improve the factual report. Before group members are released from the scene, they must sign group notes signifying that they have reviewed them and that any existing discrepancies reflected in the notes have either been corrected or annotated as dissenting opinions. Each group member will be provided a copy of such group notes prior to being released from the working groups. Accredited representatives and party coordinators will receive a copy of the notes from every working group.

Following the on-scene phase of the investigation, copies of group chairmen's final factual reports will be provided to the participating group members. Group members will normally be provided an opportunity to comment on the reports before they are finalized. It should be understood, however, that the final factual report is the group chairman's responsibility and that the entire group's concurrence is not required. Dissenting opinions should be provided to the group chairman.

9. Observers

The Safety Board IIC may invite designated members of aeronautical organizations, military personnel, safety organizations, certification authorities, or other representatives of foreign governments as observers to the investigation. The sole purpose of the observer status is for training and familiarization with the investigative process. Observers should not have any self-interest in the investigation, and they will only be permitted access to portions of the investigation deemed necessary by the IIC. Observer status must be coordinated and approved in advance. Approved personnel will be under the direct control of the IIC and will be given factual information on a "need-to-know" basis. The restrictions concerning dissemination of accident information apply to all observers. Persons not qualified in these categories shall not be granted observer status during the on-scene phase of the investigation.

10. Safety Precautions During the Accident Investigation

Aircraft wreckage sites can be hazardous for many reasons other than adverse terrain and climate conditions. Personnel involved in the recovery, examination, and documentation of wreckage may be exposed to considerable physical hazards, such as hazardous cargo, flammable and toxic fluids, sharp or heavy objects, and disease. A Safety Board group chairman (normally the structures group chairman) will be assigned as the accident site commander. This individual is responsible for wreckage security and site safety. The Safety Board urges everyone to exercise good judgment, utilize necessary protective devices and clothing, and use extreme caution when working in and around wreckage. It is important not to exceed physical limitations.

Before anyone is allowed on the site, the Safety Board, in conjunction with the aircraft operator and appropriate officials, will determine if hazardous materials were carried as cargo on the aircraft. In the event hazardous materials are identified on the flight manifest, decisions must be made regarding the type of material and the actions necessary to either remove the material or reduce the risk of contamination or injury. Once such a determination has been made, work at the site will be permitted.

The wreckage of an airplane involved in an accident may contain bloodborne pathogens. Bloodborne pathogens are microorganisms in human blood that can cause disease in humans. They could include but are not limited to hepatitis B virus (HBV) and human immunodeficiency virus (HIV), which causes AIDS. These viruses do not die immediately upon contact with oxygen or when they are dry. In fact, current studies show that certain climatic conditions may prolong the infectious potential of HIV. The Safety Board urges anyone who works in a wreckage site to use extreme caution concerning bloodborne viruses. At a minimum, heavy leather work gloves over nonpermeable rubber gloves should be worn when contact is made with the wreckage. Under certain conditions, such as enclosed spaces in the wreckage where investigators might contact blood or human remains, particulate masks or full face masks should be worn over the nose and mouth, protective goggles should protect the eyes, and disposable overalls and footwear should be worn.

The Safety Board will not assume responsibility for any personal injuries incurred during an investigation by any representative of an organization participating in the investigation as a party member, adviser, or authorized observer. The Safety Board cannot provide protection and equipment to team members other than Safety Board staff. All participants are urged to use extreme care and to provide for their own needs on the site. Safety concerns should be promptly expressed to the respective group chairman or the IIC.

11. Signing of Attendance Roster

Attendance rosters will be circulated during the organizational meeting and at nightly progress meetings held as part of the investigation. Please ensure that you have signed the roster before the end of the meeting. Include both local and office phone and fax numbers on the roster. **Your signature on the attendance roster at the organizational meeting will signify that you understand and agree to adhere to the guidelines set forth in this information sheet**. Failure to do so could lead to dismissal from the team. Copies of the attendance rosters will be distributed to all accredited representatives or party coordinators.

12. Problem Resolution Within the Chain-of-Command

Problem resolution among team members should be conducted in accordance with a clear "chain-of-command." Any problems arising between group chairmen and group members that cannot be resolved to a full mutual agreement should be raised to the next level of authority. The group chairmen should advise the IIC of the problem and the group members should advise their coordinators or accredited representatives of the problem so that it can be resolved at their level. If a full mutual agreement cannot be reached, the IIC will consult his or her supervisor

immediately and will include the coordinator or accredited representative in such consultation. If full mutual agreement cannot be reached at that level, the problem should then be raised to the Director of the Office of Aviation Safety. If resolution is not reached at this level, the problem may be elevated to the Safety Board's Managing Director and the Chairman. Failure to follow this chain of command can lead to unnecessary misunderstanding and poor communications within the investigation team.

13. Follow-on Activity Concerning an Investigation

Following the approximate 1- to 2-week on-scene phase of an investigation, the IIC will establish a tentative schedule of follow-on events. Items on this schedule include:

a. Work Planning Meeting

This is an internal meeting of the Safety Board group chairmen and senior staff, chaired by the IIC. During the work planning meeting, the staff decides what remains to be done concerning component teardowns, follow-on interviews with witnesses or survivors, and the like. The report writing schedule is discussed during this meeting.

In the event of an investigation involving international participants, the work planning meeting should be preceded by a dialog between the IIC and the accredited representative to coordinate needs regarding future tasks and tasking sites. Following the work planning meeting, the accredited representative will be fully informed of the results and of any need to organize further reviews or testing

b. Factual Report Due Date

Decided upon during the work planning meeting, this is the date the IIC expects the group chairmen to have their final factual reports completed. Accredited representatives and non-Safety Board investigative group members will be provided an opportunity to review and comment on the draft factual reports before this date.

c. Factual Reports Mailed to Parties

The IIC will approve and mail copies of all the finalized factual reports directly to states and parties, with some exceptions. If a public hearing is to be held, the CVR transcript or other reports that use direct quotes from the CVR recording will not be included in these mailings. By law, these can only be released on the day of the public hearing. Other procedures concerning CVR-related reports will apply if no public hearing is held. Also, on occasion, some complex reports cannot be completed by the time this mass mailing occurs. In these cases, parties will receive the additional reports in time to use them for the public hearing. The reports received before the hearing are sometimes referred to as hearing exhibits and will be the final, IIC-approved versions. All preliminary or draft versions in an organization's possession should be discarded or clearly marked as drafts to avoid future confusion. The factual reports and

amendments that may be produced later and the transcript from the public hearing should be the only basis for a party's submissions to the Safety Board (see item i).

d. Prehearing Conference

Accredited representatives and parties to the Safety Board's public hearing will attend a prehearing conference held either in Washington, D.C. or at the site of the public hearing about 1 or 2 weeks before the first day of the public hearing. At this meeting, ground rules for conduct and questioning during the hearing will be outlined. Also, the areas of questioning and the witnesses to be questioned will be discussed. This will be the last opportunity for attendees to request that certain areas be explored, certain witnesses be questioned, and new exhibits be included in the record during the hearing.

e. Public Hearing

A Safety Board public hearing is another step in the Safety Board's fact-gathering process. It is usually held at the Safety Board's conference center in Washington, D.C., but may also be held in the city where an accident occurred. It is a proceeding in which witnesses are questioned under oath by the Safety Board group chairmen (called the Technical Panel) and a Board of Inquiry chaired by a Board Member and senior staff. Accredited representatives are regarded as members of the technical panel and should be seated accordingly. To enable foreign advisers to provide evidence and express specific views, states that appoint advisers to an accredited representative during the on-scene investigation are encouraged to participate as parties to the Public Hearing and to furnish the Safety Board with submissions for findings, recommendations and probable causes (see paragraph 12 h).

The Safety Board hearing officer, who is usually the IIC of the investigation, controls administrative matters. Participants in a public hearing will receive further information from the hearing officer after the decision to hold a hearing is made. Close coordination is required to ensure agreement on witnesses and areas of questioning.

Each party will have independent seating and their spokesperson will be afforded an opportunity to question the witnesses after their initial questioning by the Safety Board technical staff. These witnesses might include FAA policy makers, surviving crewmembers or passengers, air traffic controllers, fire and rescue personnel, international oversight officials, and manufacturer's design engineers. The Safety Board Member is the presiding officer and provides the overall direction of the hearing.

On the morning of the first day of the public hearing, all the factual reports generated to that date, including the CVR transcript and reports using direct quotes from the CVR recording, are entered into the public docket for the accident. The public docket is the formal collection of documents relating to the investigation and is open to public review. The CVR information is also released to the party spokesmen at that time. Generally, no witnesses related to CVR information are questioned on this first day so that the parties will have time to include CVR information in their questions of the witnesses. Sometimes, witnesses dealing with issues not

pertinent to CVR information (rescue personnel, for example) are heard on the first day. During this session, the presiding officer reads into the record an opening statement concerning hearing protocol, and the IIC provides a statement concerning facts gathered to date.

Because this will be the first opportunity for the news media to have access to the substantial written factual information concerning the accident, parties should be prepared for press inquiries. The CVR transcript often becomes the focus of their interest and crew comments in that transcript are often taken out of context. The Safety Board is prepared to field all press questions, but the constraints on news media contact that the Board enforced on-scene no longer apply. In other words, because the factual reports have been released, the Safety Board would not object to the disclosure of accurate factual information if a party wants to talk to the press.

The remainder of the 3 or 4 days of the hearing are used to question witnesses. Depending on the complexity of their testimony, four to seven witnesses are usually questioned each day. Testimony and statements during the hearing are transcribed by a court reporter, and transcripts can be obtained from the court reporter about 1 month after the hearing.

f. Report Planning Meeting

This is an internal meeting to discuss and modify the report outline and resolve issues identified during the work planning meeting.

g. Due Date of Analytical Reports

This is the date on which the group chairmen have agreed to furnish the IIC with their analyses of the facts in their areas of expertise. Accredited representatives, advisers, and parties are given the opportunity to provide input to the Safety Board's analysis through their submissions. However, the Safety Board analytical reports are internal products for Safety Board use and will not be released to the parties or to the public. As with the factual reports, the report writer will consolidate the analytical reports into the final version of the investigation’s accident report.

h. Submissions for Findings, Recommendations, and Probable Causes

Participants in the investigation are encouraged to submit to the Safety Board their written interpretations of the findings and conclusions to be drawn from the evidence produced during the course of the investigation (see 49 CFR 831.14 or 845.27 or ICAO Annex 13, paragraph 5.25). The Safety Board believes that after the completion of the investigative activities relating to the accident and before the determination of the probable causes, it is the responsibility of participants in the investigation to make their submissions available to the Safety Board. If a party chooses to give the Safety Board a submission, they shall also provide copies to the other parties to the investigation. Accredited Representative submissions will be received by the IIC and distributed as appropriate to the situation. All submissions will become part of the public record of the investigation.

If a public hearing has been conducted, the Presiding Officer will normally require that submissions (proposed findings) be given to the IIC within 30 days after the technical review. These party submissions are extremely important because they are the only way that parties can officially inform the IIC, senior Safety Board staff, and the Board Members of their beliefs and opinions concerning the accident issues.

There is no set format for submissions. Some parties simply write a letter e xpressing their views. Others follow the Safety Board report format. The choice is up to the party, and the decision to submit something is voluntary. Please contact the IIC if you have any questions concerning the party submission process.

i. Technical Review

Organizations that have participated in the investigation may be invited to a technical review meeting in Washington, D.C. Safety Board personnel who attend this meeting are the IIC, the group chairmen, and midlevel Safety Board supervisors. Accredited Representatives, advisers, party coordinators and appropriate group members are encouraged to attend. Each factual report written by the group chairmen will be offered for final technical review. The goal is to ensure that each factual report is accurate and complete. Grammatical editing or the tone or style of the reports is not the focus of this meeting.

For smaller, uncomplicated investigations, a technical review may be held by telephone conference call.

j. Drafting the final report

The report writer writes the draft final report, with regular contacts, consultations, and discussions with the IIC, group chairmen, and any accredited representatives. This process typically involves three draft stages: 1) Initial drafts; 2) Directors' draft; and 3) Notation draft.

The initial draft of the entire report is provided to the group chairmen and midlevel Safety Board supervisors for their review and comments.

After comments and corrections from parties' submissions and those who reviewed the Initial draft have been incorporated, the document becomes the Directors' draft. This internal draft is then given to the Directors of the Office of Aviation Safety, Office of Safety Recommendations and Accomplishments, Office of Research and Engineering, General Counsel, and the Safety Board Managing Director for their comments.

In the case of international investigations, the Directors' draft should be considered the "draft Final Report" described in ICAO Annex 13, paragraph 6.9. State comments from the accredited representative(s) are solicited. Annex 13 permits a maximum of 60 days for State comments. The IIC will encourage timely submissions of comments in order to maintain a reasonable final report publication schedule. The accredited representative will consider this draft final report as an "Official Use Only" document and should not distribute it to anyone outside of

the investigation. Advisor comments may be solicited at the discretion of the Accredited Representative Comments are not solicited from "all interested persons" as is the practice in some States but only from the accredited representative(s).

After the accident report has been revised to address issues that may have been identified during the Directors' Review, the Directors' draft becomes the Notation draft. This version of the report is presented to the five Safety Board Members for review in preparation for the Board Meeting.

In the case of international investigations, the accredited representative should be informed of any substantive changes to the report as they appear in the Notation draft. Again, the accredited representative should not distribute the document to anyone outside of the investigation. The IIC will be prepared to present any comments received at the Board Meeting.

k. Board Meeting

After the Board Members have reviewed the report, a public Board Meeting will be held in Washington, D.C., during which Safety Board staff (the IIC, the group chairmen, and others) will present information and answer Board Members' questions about the report. Participants in the investigation are welcome to observe this meeting; however, all dialogue is between the Safety Board staff and the Board Members.

At this meeting, the Board may adopt the report in its entirety, adopt the report with changes that are discussed during the meeting, or require further investigation or rewriting before approving the report. After considering the accident report, the Members will discuss and vote on the findings, recommendations, and probable cause(s) of the accident. News media representatives will be present at this meeting and usually conduct interviews after the meeting.

As soon as possible after the meeting, usually within 1 hour, the Board's Office of Public Affairs releases the conclusions, probable cause, and recommendations. Parties can expect to be questioned on this material by the press that day.

Once changes decided upon during the Board Meeting are included in the report, a camera-ready copy is sent to the printer and may be posted on the Safety Board's Web site, <http://www.ntsb.gov>. Bound copies become available about 3 weeks later. Publication of the report is normally the final step in the Safety Board investigative process.

l. Request for Reconsideration of Probable Cause

Although the publishing of a final report is the final step in the investigative process, Safety Board investigations are never formally closed. At any time after the Board meeting, participants in investigations can petition the Board to reconsider and modify the findings and probable cause(s) of accidents for two reasons:

1. The party shows that the Board's findings are erroneous and that the Board made a mistake in its analysis during the original assessment of probable cause(s).

2. The party discovers new evidence that would require modification of the original findings and probable causes.

APPENDIX G

ON-SITE SAFETY

The information in this appendix includes discussions on safety precautions that should be taken prior to leaving for an investigation, standard safety precautions that should be taken during the investigation, and specific hazards and situations that may be encountered and precautions that should be taken at an aviation accident site.

1. PRECAUTIONS BEFORE AN ACCIDENT

The first step in ensuring the safety of yourself and your group members begins at the office prior to any accident. Prepare a Risk Assessment Work Sheet (available from Safety & Occupational Health and Inventory Services) prior to departure, determine the level of risk, and brief all appropriate personnel, even if a phone briefing is done. Proper planning requires that investigators be aware of the potential hazards at an accident site and take precautions in preparation for responding to an accident.

1.1 Safety Equipment

Most experienced investigators recommend maintaining two bags: a large one that contains just about everything you could ever need and a smaller bag or backpack for essential items in case you have to hike some distance to the wreckage site. Regardless of what items investigators take to the site, the bag should always include safety equipment. The following list of safety and protective equipment is based on suggestions from experienced field and headquarters investigators.

- Summer and winter weight uniforms (BDU)
- Winter weight jacket with hood
- Rain suit
- Work boots with steel toes and shanks
- Boots suitable for mountainous terrain
- Head cover (baseball cap, winter hat, or protective helmet)
- Sunglasses
- Personal Protective Equipment (PPE)
- Tyvek coveralls
- Goggles
- Leather gloves
- Latex examination gloves
- Boot Covers
- Particulate mask
- Explosion proof flashlight
- Compass
- Canteen/water bottle/camel pack
- Multipurpose hand tool (Leatherman, Gerber, Buck tool)
- Thermal blanket or sleeping bag

- Knives
- Miscellaneous items:
    - backpack
    - watch
    - chapstick, sun block, insect repellent (stick better than spray), extra glasses
    - personal first aid kit
    - food and water
    - water purification tablets
    - snake bite kit
    - If, you take medication, have a 7 to 14 day's supply available.

Some of these items have been included in the survival and first aid kits that have been provided to and maintained in (two each) each Regional and Field office and AS-10, AS-40, and AS-60. (A list of items in these kits is contained in Attachment 1 to this appendix.) These compact kits are intended to be used for remote and/or hostile accident sites. Items in each kit should be inventoried and resupplied after each use. In addition, dated items (i.e., over-the-counter medication) must be replenished periodically.

Questions concerning safety-related issues or equipment should be directed to the Safety Board's Occupational Safety and Health Coordinator (MD-11) at headquarters.

1.2 Health Precautions

Health precautions are further discussed in terms of 1) Physical Conditioning and 2) Inoculations.

1.2.1 Physical Conditioning

It may be difficult to stay in shape for the rigors of field work. The sudden transition from a sedentary office routine to the strenuous, outdoor activity of an investigation can be hazardous. Although yearly physical exams are important, "passing" the exam does not guarantee your ability to adjust to the increased physical requirements of an investigation.

You can minimize the effects of such a switch by performing regular, moderate to vigorous exercise. Regular mild exercise is useful in warding off weight gain and enhancing muscle tone. Activities such as bowling and golf are beneficial to one's overall health but are not sufficiently strenuous or engaged in often enough to provide adequate physical conditioning. More beneficial are regular, mild calisthenics, and activities such as tennis, cycling, or short periods of jogging. Walking can provide good conditioning benefits, but must be done for longer periods to achieve conditioning results comparable to the more vigorous activities. (Exercise must typically be sustained for about 15-20 minutes, three times a week, before one's aerobic performance is enhanced.) Physical conditioning requires long term commitment and regular participation.

1.2.2 Inoculations

The following is a list of recommended inoculations:

•	Hepatitis B	3 shot series
•	Yellow Fever	Good for 10 yrs.
•	Meningitis	Good for 3 yrs.
•	Typhoid	1 initially and a booster 1 month later
•	Polio Booster	Take within 2 weeks before trip
•	Diphtheria/Tetanus	Good for 10 years If injured, get tetanus booster
	Gamma Globulin	3 - 5 days before trip (for travel to extremely unsanitary location)

Inoculations are available at the U.S. Public Health Service, commercial immunization labs and clinics, military bases, and agency clinics, although many of this last group do not have some vaccines.

If going overseas, check with the State Department to find out if any health warnings have been issued for areas to which you will be traveling and for which shots are required or recommended. Another excellent source for such information is the Centers for Disease Control. By accessing its web site (www.cdc.gov) or calling its offices (888) 232-3228, investigators can receive updated, 24-hours-a-day health advice on a number of illnesses and diseases.

2. STANDARD PRECAUTIONS ON SITE

While engaged in the investigation, NTSB investigators have a responsibility to inform and educate the other investigators on the known and potential hazards at an accident site. In addition to the somewhat obvious hazards of an accident site, investigators should understand the importance of energy conservation and communications and be aware of the psychological factors that affect participants during an investigation

2.1 Energy Conservation

The investigation will be completed more quickly and efficiently when the IIC and the group chairmen take steps to conserve the energies of the participants. As soon as the investigation is under control, try to adhere as much as possible to a regular workday. This not only allows for controlled expenditure and restoration of energy, it provides the opportunity to consolidate, document, and prioritize each day's work and to coordinate activities for the next day.

Try to stay with a normal eating and sleeping routine. Eat a nourishing breakfast and carry snacks and fruit with you. Eat when you have the opportunity. Limit the use of alcohol. Don't try to do too much at one time. Remember to prioritize your tasks, stick to your plan, and delegate duties to others.

Once you have completed the on-scene investigation, do not forget safety in your hurry to go home. Do not drive or fly jumpseat if you are tired. Either stay an extra day or purchase a ticket.

If you have a choice of drinking and eating, socializing, or sleeping after finishing a day's work at the accident site, choose sleep. Your body needs to recharge itself.

2.2 Communications

Once at the accident scene, investigators must resist the urge to immediately set off without discussing and providing some means of communication. Radios or cellular phones may be necessary. In hostile environments, a buddy system should always be used to ensure that no investigators become isolated.

When cellular phones are used, be aware that conversions might be overheard if not used on a secure line. Be aware that sensitive information that is conveyed over the phone may be intercepted by others not intended to receive the information.

2.3 Psychological Factors

An accident can have a disruptive effect on all investigators, regardless of experience level, but more likely might affect those who have never been exposed to the confusion and emotions caused by an aviation disaster. As an investigator, you may at times work with Safety Board staff or party representatives who have never seen an accident or who have personal involvement with the victims. One common defense against the traumatic experience is the irresistible urge to take action, even when human lives are no longer at stake. This need for activity may seek expression without regard for endurance, personal safety, or the safety of others, and without apparent rationale. Although their actions may not be rational, their motivation is noble. For this reason, use great discretion when attempting to guide the activities of such a person into proper channels. Calm, competent behavior and firm, understanding leadership by NTSB investigators can prevent frantic or ill-advised action.

Participants in an investigation might not realize how physically, mentally, and emotionally draining an investigation can be. Some may not be able to cope with it. Be alert for warning signs such as alcohol or smoking in excess, lack of sleep, loss of appetite, absences for long periods of time for no apparent reason, obsessive behavior, forgetfulness, crying, and other signs of sensory overload. You may need to remove the person from the investigation, either directly or through the party coordinator. Make it clear that there is no stigma associated with the removal, that it is in the best interests of the individual as well as the investigation. NTSB investigators should also be honest with themselves when evaluating how they might have been affected by an accident investigation.

The Safety Board's Employee Assistance Program offers Safety Board employees and their families counseling and assistance as a result of work-related stress. It is very important to seek assistance as soon as possible. Feelings, such as those described in the preceding paragraph, are normal reactions to terrible situations. You can help yourself, your family and Safety Board team

members by seeking assistance and encouraging others to do so as well. The EAP telephone number is provided on the go-team sheet each week.

3. HAZARDS AT THE ACCIDENT SITE

As an investigator becomes more familiar with the hazards found at an accident site, it is easy to overlook the lack of experience on the part of those who may assist in the investigation. The IIC or a designated NTSB safety officer should always conduct a formal risk assessment and brief non-NTSB personnel on all known and potential hazards and established safety practices that should be followed. Request the support of the Incident Commander Safety Officer as necessary. In the event that hazardous materials may be involved, local officials or HAZMAT specialists should brief the entire investigative team.

Always evaluate the situation. What are the real and potential hazards? What expert assistance is needed to minimize risks or neutralize hazards? Remember that your job is to investigate the accident, not to fight fires or to remove hazardous materials. Let the experts in those areas do that.

This section addresses three types of hazards that an investigator might be exposed to at an accident site:

1. Wreckage hazards
2. Communicable diseases
3. Hazardous materials

3.1 Wreckage Hazards

Most wreckage hazards are "mechanical" in nature. They can injure through lacerations, crushing, fire, explosion, and asphyxiation. Other wreckage hazards include those posed by composites and fiberglass.

3.1.1 Mechanical Hazards

When you enter, handle, move, or disassemble wreckage, there is always a hazard from sharp edges. Always wear gloves when working around the wreckage. When checking for splintering or frayed cables, use gloves and a rag or cotton balls instead of your bare hand.

Wreckage removal is inherently dangerous. Cables and chains can break and parts can shift. When moving wreckage, always use professionals and keep your team completely away until the wreckage has been properly secured. Do not allow anyone to work under partially suspended wreckage. Heavy lifting equipment should be operated and managed by qualified operators under the overall guidance of NTSB personnel. Only the IIC or his/her representative, the wreckage removal team, and fire fighters should be near the wreckage during removal. Stay upwind during the moving of wreckage to limit your exposure to soot, dust, and other airborne materials.

Some specific wreckage hazards include flares, pressure bottles, tires, and accumulators. These items should be rendered safe and removed from the site, since they can explode when handled

or can become projectiles around the site. Pressure containers include such things as propane bottles, oxygen bottles, evacuation slide inflation bottles, fire extinguishes, LOX bottles, and protective breathing equipment. Also, solid state chemical oxygen generators can reach temperatures of 700° F when they are activated.

Other hazards include the following:

Tire rims -- May be damaged during a hard landing. The tires may explode anytime. Always approach tires from the front or rear, never from the sides. Deflate tires as soon as possible.

Propellers -- Some have spring-loaded hubs. If the hub is cracked, it can violently pop off. Do not attempt to probe inside a propeller assembly. Rely on the expertise of the propeller manufacturer to oversee such inspection, at a properly equipped facility.

Batteries -- Remove batteries from the wreckage; don't merely disconnect them. Sparks from a battery can ignite spilled fuel and other flammable materials. Use caution -- disconnecting and removing batteries can cause sparks.

Confined spaces -- Soot and insulation material are hazardous if you are working inside a confined space such as a cabin or a cargo bin, especially after a fire. Use respiratory and eye protection.

Flammable liquids and gases -- Can ignite or be hazardous if skin contact is made or if vapors are inhaled. Have the airplane defueled before going near it and record the amount of fuel that is removed. Instruct personnel that smoking will not be permitted at the accident site.

Firearms/Ammunition -- Firearms and ammunition could be onboard some aircraft. Have experts remove these from the site.

Military aircraft -- Some military aircraft contain exotic or heavy metals, hydrazine, etc., which may be hazardous when burned. Military aircraft may have ejection seats, armaments, pyrotechnics and munitions. Have experts de-arm and remove these from the site.

Depleted Uranium -- This material may be used as counter-balance weights in larger aircraft. Can be hazardous if outer protective coating is breached.

Ballistic Recovery Systems – Some aircraft and many ultra light aircraft are equipped with ballistic recovery systems. The explosive charge, which propels the parachute, can be hazardous and should treated as unexploded ordinance.

3.1.2 Composites and Fiberglass

Composite materials and fiberglass are a nuisance at an accident and can be hazardous to your eyes, skin, and respiratory system, especially if the wreckage has been damaged by fire. Composite materials, which typically consist of carbon/graphite or boron/tungsten, are found in many parts of an aircraft including structural skin, control surfaces, access panels, cabin materials, cabin seats, and rotor and propeller blades. Small micron-sized filaments from composites are similar to other objects in the air we breathe. Most are expelled in sputum. Fiberglass is found in soundproofing blankets, home insulation, cockpit and cabin panels, access panels, cargo bin liners, and other aircraft furnishings. Although studies indicate that composite fibers pose no more danger than fiberglass particles, they can cause short-term skin, eye, and respiratory irritation.

When dealing with composites or fiberglass in the wreckage, the following safety precautions apply.

- Stay upwind when handling the materials.
- Disposable coveralls may be needed. Wash clothes separately that may have become contaminated.
- Beware of splinters from fractured fiberglass panels and composites.
- Wet the materials if they have been damaged by fire. (Spray it down on site and again in the hangar or lab if necessary. A 50/50 solution of acrylic floor wax and water works well, and is available at most Naval Air Station ARFF facilities.)

3.2 Communicable Diseases

Several communicable diseases that present a particular hazard for investigators include meningitis, hepatitis, and the Human Immunodeficiency Virus (HIV). Meningitis, which can be caused by a virus or a bacterium, is an infection and inflammation of the membranes covering the brain and spinal cord. Symptoms include high fever, headaches, stiff neck, nausea, confusion, and light sensitivity. Early diagnosis for the type of meningitis (i.e., viral or bacterial) is essential. Viral meningitis, which can be contracted through fecal-oral and oral-oral routes from such things as drinking, eating, and handling infected items, is generally more common but less serious and cannot be helped by antibiotic treatment. Bacterial meningitis, which can spread from person to person through exchange of respiratory and throat secretions (i.e., through coughing, sneezing, kissing), is quite severe and can result in permanent brain damage or death. Prompt medical attention and antibiotics can cure the disease.

There are several forms of hepatitis. Due to the current lack of information about every type of hepatitis, only hepatitis A, B, and C viruses are discussed here. The hepatitis A virus is

transmitted through the fecal-oral route, which means that the disease can be contracted if anything contaminated with the virus is placed in the mouth. Gamma globulin, if given within two weeks of exposure, can prevent infection.

The hepatitis B virus is a bloodborne pathogen. It is found in body fluids and tissue and can enter your system through an opening in the skin. The virus is not transmitted by stool contamination of food or beverages. The virus is not fragile and is harder to destroy than HIV. It is more readily transmittable than HIV and requires a smaller amount to infect you.

There are two types of hepatitis B -- acute and chronic. In an acute infection, your body develops antibodies that overcome the virus. These antibodies remain in your system for the rest of your life and protect you from future infection. Symptoms of an acute infection appear in nine to sixteen weeks. The symptoms include tiredness, loss of appetite, taste changes, and yellow eyes and skin. In a chronic infection, your body does not develop antibodies. You may become a chronic carrier for the rest of your life. Often there are no symptoms. Your body adapts to the infection. Over time, a chronic hepatitis B infection can cause liver damage. Yearly exams help to determine if you have become infected.

Three types of inoculations are available to fight hepatitis B. Each has a slightly different use. General Gamma Globulin is a booster that is used to fight an existing infection. Hepatitis B Immune Globulin (HBIG) is used when there has been an exposure to contaminated blood, such as from a needle prick or by a surgeon cutting himself. HBIG prevents, or at least lessens the seriousness of, an infection. The third type of inoculation, Hepatitis Immunization, is designed to protect you from infection before any exposure occurs. It consists of a series of three injections. The immunization is safe and very effective. Some Health Maintenance Organizations (HMO's) provide hepatitis immunization.

Like hepatitis B, the hepatitis C virus is also a bloodborne pathogen and may result from exposure to blood or body fluids than contain the infection. There is currently no known treatment for the hepatitis C virus.

The HIV virus is also a bloodborne pathogen. Risk of contracting the disease from blood, body fluids, and tissue of infected persons is very low -- but precautions are always necessary. A cut on your skin can allow the pathogen to enter your system. Persons with HIV are also likely to have hepatitis B and other communicable diseases.

The HIV virus is relatively fragile and susceptible to disinfectants, drying, and heat. For example, household bleach in a 1:10 solution with water will destroy the virus in about one minute, as will 70 percent alcohol. (NEVER MIX BLEACH WITH ALCOHOL OR WITH AMMONIA. THE MIXTURE RELEASES TOXIC VAPORS.) The virus can also be destroyed by use of an autoclave, fire, gamma rays, and x-rays.

Note for Materials Lab personnel: Use the same precautions in the lab as on scene. Even if blood and tissue have been removed from an article, there is no guarantee that it is free of infection.

Although HIV and Hepatitis B may be the most notorious communicable diseases that you will face as an investigator, they are not the only ones. The guidelines below will help you protect yourself from communicable diseases in general during an accident investigation.

- Be careful searching luggage, the accident scene, or debris since used hypodermic needles may be present but hidden.
- Allow wounds to bleed freely, then clean with alcohol. Carry packaged alcohol swabs in your Go Bag.
- If administering CPR, use a device with a one-way valve and a shield that covers the victim's face.
- Wear surgical or rubber gloves under your leather lined gloves.
- Be careful when searching through blood-soaked clothing.
- Don't reuse or rinse surgical gloves. Discard them after use. You can decontaminate household or heavy-duty rubber gloves, but you should discard them if torn, discolored, or cracked.
- Don't handle your personal items such as pens, pencils, wallet, etc., with soiled gloves.
- Always wear new, clean gloves when using your camera, notebook, or other investigative equipment.
- Once the gloves have become contaminated, don't touch your equipment until you have removed the gloves, washed your hands, and put on new gloves.
- Wash your hands thoroughly even if you have worn gloves. Liquid soap in dispensers is preferable to bar soap for communal use at an accident scene.
- Disinfect shoes and boots with household bleach solution. Decontaminate cameras, tools, etc., with alcohol or bleach solution.
- When large amounts of blood are present, use disposable, waterproof coveralls. Change them frequently.
- Before sending aircraft parts to the lab that you believe may be contaminated with tissue, blood, or other body fluids, decontaminate them using bleach, alcohol, x-rays, or gamma rays.
- Do not remove needed evidence during cleaning. Completely air dry the part before shipment, wrap it in plastic, and note how the item has been disinfected.
- Do not participate in body removal or attend autopsies unless it is necessary for your investigation. If you observe an autopsy, wear protective clothing (e.g., mask, fully disposable coveralls, booties, gloves, and eye protection.

3.3 Hazardous Materials

Safety regulations limit the type and quantities of hazardous materials that may be legally transported aboard aircraft. The captain of an aircraft must be informed, in writing, of any hazardous materials cargo loaded aboard the aircraft and air carriers should have a record. However, undeclared

hazardous materials may be hidden in general freight or passenger luggage and the possibility should always be considered in accident investigations. Exposure to hazardous materials can result in corrosive damage to body tissues, thermal injury, asphyxiation, radiation, disease, absorption of poisons or toxins by inhalation or through the skin, or mechanical injury (from explosive fragments or the failure of stressed containers).

When hazardous materials are suspected or reported to be onboard the aircraft, the IIC should take immediate steps to identify any safety hazards posed by a release of the materials before investigators enter the site. The following persons or organizations should be able to provide information on the physical, chemical, and hazardous properties of the materials:

- local emergency response personnel
- shipper or manufacturer of the materials
- CHEMTREC (Chemical Transportation Emergency Center) at 1-800-424-9300, or 703-527-3887, 24 hours a day
- Department of Energy (radioactive materials)
- State Health Department

NTSB personnel should not direct emergency response activities; this is the responsibility of the emergency response personnel. Check the credentials of anyone offering information about the hazardous properties of dangerous goods involved in an accident. The accident site should be entered only after the IIC, based on guidance from HAZMAT specialists, is satisfied that hazardous materials do not pose a risk to personal safety. The need for preserving evidence should be explained to personnel directing any HAZMAT clean-up.

Information on hazardous materials can be found in 49 CFR Part 172 and in the ICAO manual, "Technical Instructions for the Safe Transport of Dangerous Goods by Air" (Document 9284-AN/905). Additional guidance is provided in the ICAO manual, "Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods" (Document 9481-AN/928). Generally, hazardous materials are described by the following classifications:

Explosives
Flammable gas
Non-flammable compressed gas
Poisonous gas
Flammable and combustible liquid
Flammable solid
Spontaneously combustible material
Dangerous-when-wet material
Oxidizer
Organic peroxide
Poisonous materials (liquid or solid)
Infectious substance (etiologic agent)
Radioactive material
Corrosive material (liquid or solid)

Any accident involving agricultural operations has the potential for exposing investigators to hazardous materials in the form of pesticides or insecticides. FAA Advisory Circular AC 137-1 is a good source of information on these and other hazardous products used in agriculture. It describes precautions for pilots and ground workers. Determine the name of the product carried on the aircraft and alert CAMI (Civil Aerospace Medical Institute) to test for it in the toxicological analysis on the pilot.

The following evidence should be documented when hazardous materials are found to be transported onboard an aircraft involved in an accident:

Shipping documents
Name, hazard classification, and quantity of material
Location stored on aircraft
Chemical, physical, and hazardous properties of material
Shipping container type, markings, labels, and areas of mechanical failure or damage
Damage directly related to the release of the hazardous material (look for evidence that might indicate the pre-impact release of hazardous materials)
Notification to Captain
Relevant crew or witness observations.

For the safety of everyone involved, the following guidance is provided for dealing with hazardous materials.

1. Prior to your departure for the accident scene, have the operator determine whether the aircraft carried any hazardous materials and, if so, what type (chemical, biological, radioactive, explosive, corrosive, etc.). Request that the operator FAX shipping forms to your attention to the on-scene command post. Ask the operator to identify information about the materials such as that listed above.

2. When you arrive at the command post, confirm information about the materials with the aircraft operator. If any new information is received, contact the Hazardous Materials Division for guidance and, if needed, assistance. Pass along any new information to local officials and HAZMAT specialists on the scene. Determine the current status of the materials and when the accident site will be safe to enter. The operator and local officials may be able to help you determine whether the materials were properly packaged, labeled, and in the proper cargo compartment.

When the transportation of hazardous materials onboard an aircraft is believed to be causal or contributory to an accident, the Hazardous Materials Division of NTSB should be contacted immediately. The Division can then assign a group chairman to the investigation.

3. Prior to entering the accident site, have local officials brief investigators who will be on-scene on the type and status of hazardous materials onboard the aircraft. Everyone should be informed that undeclared, improperly labeled, or improperly packaged materials might remain undetected in the wreckage and at the accident site. If such materials are found during the investigation, order investigators away from the site immediately and contact local officials. Do not return to the site until local officials declare it is safe. Ask local officials to photograph and document the packaging and labeling of these additional or unexpected materials before removing them from the site for disposal.

4. Personal hygiene precautions for a hazardous materials incident include the following: stay upwind when the materials are removed; wear protective clothing/equipment; don't transfer contaminants to the car, hotel, etc. (discard or disinfect clothing and equipment), or leave at; and have water and soap at the site. Showering at the site may even be n ecessary.

4. SPECIAL PRECAUTIONS

In addition to the standard safety precautions that should be taken before and during any accident investigation, certain accidents will require special safety precautions because of such things as location, extreme weather, indigenous plants/animals/insects, or specific operations necessary to support the investigation. The following may present specific hazards to investigators:

- Environmental/natural hazards
- Helicopter operations
- Water operations
- Urban areas and airports.

4.1 Environmental/Natural Hazards

Environmental and natural hazards include those posed by such things as extreme weather; mountainous terrain; deserts, jungles, and swamps; and poisonous plants, dangerous animals, and insects. When working in hostile environments such as these, always use a buddy system and carry a survival/medical kit.

4.1.1 Extreme Weather

Investigators may be faced with extremes of heat and cold depending on the terrain and the time of year. Investigators expecting to spend a few hours at a remote site could find themselves spending the night if their transportation is unable to return for them. Check current and forecast local conditions before departing.

In cold weather, the following procedures should be used:

- Be aware of the dangers of frostbite, hypothermia, and white out (disorientation that can occur during a snowstorm or otherwise uniformly bright and white surroundings).
- Protect against the danger of wind chill by wearing layered clothing that will absorb perspiration.
- Bring sunglasses and sunblock -- even in the winter a sun burn/wind burn is possible.
- Protect yourself from becoming dehydrated (even in cold weather).

In hot weather, the following procedures should be used:

- Provide for personal drinking water needs.
- Don't wait to get thirsty; by the time you feel thirsty you are already dehydrated.
- Drink at least 1 quart of water or fruit juice per hour in extreme situations of high humidity and exertion.
- Know the symptoms of heat stress and heat exhaustion. Pace yourself to compensate for heat and humidity. Wear a wide brim hat and loose fitting clothing. Sunblock may be required.

4.1.2 Mountainous Terrain

Local rescue teams are good sources of information about working in mountainous terrain. Pace your activities and conserve energy. Be aware of the danger of altitude sickness and alert to its symptoms in yourself and others. Altitude sickness is characterized by dizziness, headache, loss of appetite, difficulty sleeping, aches and pains, pale complexion, and loss of energy. Acute cases can last several months. If you suspect altitude sickness, have the person sit or lie down. In severe cases, the individual will have to immediately descend to improve his/her condition. You may have to have him/her removed from the scene. If the individual feels better and remains on scene, assign a buddy to keep an eye on the person.

The following safety precautions are recommended for working in mountainous terrain and high elevations:

- Limit exertion above 8,000 feet.
- Keep your hands free for steep climbing.
- Rest frequently.
- Have oxygen on hand for high-altitude climbing.
- Drink plenty of water or fruit juice -- dehydration can happen quickly.
- Protect your skin from the sun with sunblock, sunglasses, and hat. You can sunburn quickly, especially at higher elevations.
- Seek advice from local mountain-climbing experts; preferably, they should accompany you. Don't involve yourself in body removal unless necessary.

4.1.3 Deserts, Jungles, and Swamps

Accident sites located in these environments require certain safety precautions.

Deserts

- Wear a wide brim hat, loose fitting clothing, sunglasses, sunblocking lotions, and goggles, if necessary.
- Drink plenty of water. You may need to carry several (6 to 8) quarts of water per person per day.
- Limit activity during the heat of the day.
- Arrange for shelters from the sun, preferably open-sided with some protection from blowing sand.
- Let professionals do the driving. Navigating sand dunes and unmarked roads, even in a four wheel drive vehicle, can be hazardous.
- Have appropriate clothes and shelter for temperature decrease at night.

Jungles

- Ensure that adequate communications with others are maintained.
- Put rubber bands or string around the bottom of your trouser legs and over the tops of your boots to protect against leeches, insects, etc.
- Limit activity to compensate for the heat and humidity. Carry only those items that are absolutely necessary.
- Drink plenty of water. You may need to carry several (6 to 8) quarts of water per person per day.
- Wear appropriate footwear (fast-drying canvas jungle boots with lug soles are good).

Swamps

- Take care to prevent swamp water from contacting open cuts and sores. Swamp water can be highly contaminated.
- Watch for tree roots and deep holes when walking in water.
- Use a tall walking stick to find level footing and water depth. Keep your hands free except for the walking stick.
- Chest waders may be necessary, even though they are hot and awkward to use. Never jump into water higher than your waders.

- Swamp boats may by the only means of transportation. Wear a life jacket and ear plugs. Don't travel or work at night unless absolutely necessary.
- Beware of mud ponds with a few inches of water on the surface; they can be very deceptive.
- Keep your sleeves rolled down and shirt collars buttoned. You may need a wide brimmed hat with mosquito netting. Prepare for dealing with insects, leeches, and snakes. Also beware of alligators and crocodiles.

4.1.4 Poisonous Plants, Dangerous Animals, and Insects

The level of danger from plants, animals, and insects depends on several factors--terrain, weather, elevation, time of year, etc. Listen to local officials. They can advise you on what to expect and on particular preventive actions that you should take.

Poisonous plants vary with location. Learn to identify poison ivy, poison oak, and poison sumac. In the winter, poisonous plants may lose their leaves, but remain dangerous and even harder to spot. Stay away from smoke that may contain residue of poisonous plants.

Dangerous animals might include anything from poisonous snakes to rabid raccoon to bears. Poisonous snakes can be found in all states. Listen to precautions from local authorities. Learn to recognize poisonous snakes. A snake bite kit should be part of your Go Bag. Even relatively domesticated animals can present certain hazards. Horses can bite and buck. Animals may even be part of the cargo of the aircraft involved in the accident.

Know what allergies you have to trees, grasses, plants, and insects. Carry appropriate medication with you. It may be difficult or impossible to obtain at or near an accident site. An "Epi-Pen" containing epinephrine or ephedrine is available by prescription and can counteract some allergic reactions.

Fire ants, wasps, bees, and spiders can all cause painful bites and, in some people, allergic reactions. With the exception of mosquitoes and certain ticks, insects are more of a nuisance than a danger. Repellents such as "Deep Woods Off" are useful items in your Go Bag. Some people swear by Avon's "Skin So Soft" as an effective repellent against chiggers, ticks, and mosquitoes (although scientific studies have not proved or disproved this). A commercially available product called "Permanone Tick Repellent" has been shown to be very effective. A 6 oz. spraycan can protect two sets of clothing for two weeks, including two washings. Eating garlic may also repel mosquitoes (from odors emitted through the skin). Mosquitoes and ticks present special problems because both can carry infectious diseases.

Mosquitoes

Mosquitoes have been the mode of transmission for malaria and yellow fever. U.S. Army sources have recommended "Deep Woods Off" as an effective, commercially available mosquito

repellent. Any product that contains "DEET" in a 25 to 30 percent solution should be effective. Two cautionary notes: first, concentrations of "DEET" higher than 30 percent can irritate skin; second, mosquito repellents of this type contain a solvent that may melt or scar plastics found on cameras, watches, small tools, etc.

Ticks

In the United States, the highest concentrations of ticks are along the East Coast and in southeastern, south central, north central, and Midwestern states. The lowest concentrations are in the extreme West and in the Plains states. Ticks can carry Lyme disease and Rocky Mountain spotted fever. Lyme disease is a bacterial infection caused by the bites of certain, very small, infected ticks. The two most likely carriers of Lyme disease are the deer tick in northeast and north central states and the western black-legged tick in western states. The deer tick is usually a suburban creature. It likes transition zones -- the edges of roads fields and forests. It is not frequently found in deep forests or in open fields. Although the deer ticks that carry the disease are slowly expanding into new areas, there are three areas where the risk of getting the disease is greatest:

- East-coastal states of Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Maryland, Virginia, and Delaware;
- north central states of Wisconsin, Minnesota, and Michigan; and
- northern California.

Lyme disease and the ticks that carry it are rare or non-existent in the Rocky Mountain states, Hawaii, and Alaska.

Deer ticks can be smaller than the head of a pin, and are therefore difficult to find. Finding the tick is important since the longer the tick stays attached, the more likely the disease will develop and the more serious it can be. Some research indicates that chances of contracting the disease increase greatly if the tick stays attached for more than 24 hours.

The first sign of Lyme disease is usually a large, red skin rash, which may be accompanied by "flu-like" fever, headache, fatigue, and vague aches and pains in muscles and joints. Most persons treated with the appropriate antibiotics at this stage will have a quick and complete recovery. The characteristic rash expands outward from the site of the bite beginning 3 to 30 or more days after the bite. The rash will be flat and circular and usually reach a size of at least 2 inches in diameter. As the rash expands, the central portion partially clears, while the outer edges redden, which gives the rash a "bull's-eye" appearance. The rash may appear in multiple places on the body and then fade away before any other symptoms appear. Patients who don't receive early treatment for Lyme disease can develop further problems involving the heart, joints, or nervous system as the disease progresses. Lyme disease responds well to oral antibiotic treatment, but is often mistaken for other illnesses due to the delayed onset of symptoms and the ambiguity of the symptoms when they do appear. A vaccine for Lyme disease is available but requires three shots over a 1-year period and is about 80 percent effective.

Rocky Mountain spotted fever affects about 800 people in the U.S. each year. The disease usually occurs in the East from New York to Florida, and from Alabama to Texas in the South. It is most commonly seen from April through September but can occur anytime during the year when it is warm. Signs of the disease usually begin 3 to 12 days after a tick bite. The most common symptoms are fever, headache, rash, and nausea or vomiting. Left untreated, the disease can cause death.

If you get a fever, headaches, body aches, rash, or nausea soon after a possible tick bite or exposure, see your doctor immediately. Since there is presently no vaccine available for Lyme disease and Rocky Mountain spotted fever, however, prevention is important. The following advice is offered when working in areas that may be infested with ticks:

- Wear long pants and sleeves. Tuck pants legs into long socks or seal pants legs with duct tape or rubber bands.
- Spray a permethrin-type tick repellent on clothes, if available.
- Use a repellent containing the compound DEET on skin areas that are exposed except for the face area. Follow label directions carefully.
- Check your entire body carefully for ticks twice a day, including inspection of the neck and scalp. If you are alone, the use of a fine-tooth comb will help locate adult ticks in your hair.
- Remove attached ticks from your skin immediately with tweezers by grasping the tick's head parts as close to your skin as possible and applying slow steady traction. Do <u>not</u> attempt to get ticks out of your skin by burning them or coating them with anything such as nail polish remover or petroleum jelly.

4.2 Helicopter Operations

Helicopter operations are generally associated with rugged terrain and remote areas. The most common situations for using helicopters include:

- traveling to and from the site
- searching for and removing wreckage and/or bodies
- flying the flight path of the accident aircraft
- aerial photography.

Each of these situations is potentially dangerous. All persons associated with helicopter operations should be briefed by the IIC or a group chairman daily on the proper working procedures and the inherent hazards. The hazard briefing should particularly address, but not be limited to, main and tail rotor hazards, FOD, and rotor wash. Earplugs should be recommended, as should protection for eyes (from downwash) and head (from debris). Individuals should also be directed to only approach the helicopter from the designated direction and, if at all possible, to avoid walking under a hovering helicopter. It is the IIC's responsibility to make sure that the helicopter operator briefs all persons on the operation of exits in normal and emergency situations, use of headsets and restraint systems, and, if involved in over-water operations, describes all additional precautions that must be

exercised (including the use of flotation gear). Use caution when operating in hostile environments or over water--especially in single-engine helicopters. Many helicopter pilots are anxious to assist the NTSB and may overlook some safety aspects of the mission.

The IIC, in coordination with the helicopter operator, should maintain strict control over the use of the helicopter. Both must be aware of the effects of ambient temperature, wind, and altitude on helicopter operational capabilities. When circumstances permit, helicopter operations should be controlled from a centrally located base, which will serve as an operational headquarters and communications center for the IIC or his designee and the helicopter operations manager. One of the key tasks of the operations center should be to maintain a log of the persons and equipment carried on each helicopter trip. Limit helicopter transportation to those individuals who are absolutely necessary to conduct the investigation.

Communication between the helicopter and the base, the base and the wreckage site, and the wreckage site and the helicopter will be necessary. Operations at the accident site should be under the control of a qualified loadmaster. The loadmaster would maintain radio contact with base operations as well as with all incoming aircraft. Only qualified persons should be allowed to rig and attach loads to helicopters.

The landing site should be established so that disablement of one helicopter will not prevent the landing of a relief aircraft. In addition, fire extinguishes should be available at the landing site. Investigators should take the necessary survival precautions in the event that weather or mechanical problems prevent their timely return to the main base.

4.3 Water Operations

The actual operation of water recovery equipment and the supervision of respective personnel should be left to the equipment operator. Only properly trained and fully qualified personnel will be assigned special missions such as underwater recovery and photography.

Salvage barges can be dangerous places. The hazards, to name a few, include large machinery, hoists, cables, nets, and rigging equipment. If necessary, advise on how to attach cables, hooks, etc. to the wreckage and ensure that the wreckage is not unnecessarily damaged during the recovery. Factory representatives should be able to provide guidance on lift points.

Some precautions include the following:

- Know the locations of exits, life rafts, and life preservers (if not already required to wear them).
- Require, if possible, all persons involved in the recovery to wear life preservers whether or not they can swim.
- Insist on a safety briefing for everyone from the vessel captain on evacuation stations, safety precautions, and other critical information.
- Stay clear of sling loads. Take photos from a distance. (A telephoto lens is handy in this situation.)

- Even if the wreckage is secured on the deck, it can shift due to motion of the vessel.

4.4 Urban and Airport Accident Sites

Maintain tight security at urban and airport accident sites. Keep the fire department on hand during the investigation and during the wreckage removal. As with any wreckage removal, keep people away and do not permit anyone under sling loads.

The hazards of urban crash sites include downed power lines; leaking natural gas, propane, heating oil or other flammable liquids or gases; and buildings that have become structurally unsound from fire or impact damage. (The latter source could also present a problem since some older buildings might still contain asbestos.) Before entering a building involved in an aviation accident, get a building inspector to approve entry. Minimize the number of individuals who must enter. Wear a hard hat; eye and respiratory protection may also be necessary.

Accident sites on airport premises will require escorts who are familiar with the taxiways, ramps, and runways. Caution people to stay inside the boundary of the site and maintain distance from runways or taxiways. Arrange for food, water, portable toilets, and other necessities at the site so members of the team won't need to return to the terminal.

ATTACHMENT 1

Survival Kit

Combination match holder, compass, and whistle
2 disposable ponchos
Emergency thermal sleeping bag
Canteen, 1-quart size
Collapsible drinking cup
Stainless steel pocket knife (Swiss Army type)
Silva compass
25-ft. 300-lb-test braided paraline
2 yellow light sticks, 12 hours duration each
2 boxes waterproof matches
1 insect repellent
Halazone (water purification), 50 tablets
First aid kit
Snake bite kit
Multipurpose tool (Leatherman/Gerber/Buck tool)

First Aid Kit

Antiseptic wipes (70% alcohol), 20 packs
Wash and Dry wipes, 20 packs
Eyedrops, 1 oz. bottle
Dramamine (for motion sickness)
Tylenol, purse pack of 16 tablets
Kleenex, purse pack
Hydrocortisone cream (1%)
Mycitracin cream (antibiotic cream)
Imodium AD (antidiarrheal), 6 caplets
Chlor-Allergy (antihistamine), 20 capsules
Allergy Formula, 20 capsules
Chapstick
Afterbite stick (treats insect bites)
Silica gel (protects kit from moisture), 1 pack
Tweezers
Magnifying glass
Benadryl, 20 tablets
Antacid
Scissors
Moist burn pads, 5

ATTACHMENT 2

Accident Investigation Risk Management Worksheet

ACCIDENT TYPE_____ DATE_____ PLACE_____ IIC_____

This worksheet is designed to be filled out by the IIC, or their representative, PRIOR to the accident investigation launch, daily during accident investigations in the field, and for any event not planned for in the daily risk management process. The purpose of the sheet is to aid the IIC in determining the types of risks associated with the launch, during the mission, and during the recovery of all team members to the home station. The front will be used as the hazard assessment, and the rear is for the control plan. Once controls are in place, reduce the risk to the next lowest value. This document may be faxed for signatures and approval.

	Low Risk				**High Risk**		**TOTAL**	
Team duty hours (hours awake)	Normal duty 8 hours	1	Extended duty 12 hours	3	Critical duty 18 hours (no duty past 18 hours)	6	Before	after
Team Experience (assess the team as a whole)	Well trained	1	Partially trained	3	Limited trained	5	Before	After
Safety Equipment (if respirator used add 1 point**)**	All proper Equipment issued	1	Limited amounts Of Equipment	3	Insufficient for all team member	6	Before	After
Environment (add 2 points for foreign location)	Flat Terrain, remote location	2	Mountain terrain Remote location	4	Desert Terrain Remote location	5	Before	After
Work Load Requirement	Low stress work load, no protective gear needed	1	Long walk or ride to site, partial BBP needed	3	Full BBP suit required	5	Before	After
Fitness Requirement	Job entails similar duties to office work	1	Job entails moderate physical effort Or alt. Mode of transport & carrying loads	3	Job entails heavy work load or complex physical work	5	Before	After

	Low Risk				High Risk		TOTAL	
Weather (add 3 for night)	Standard day, daytime hours 32⌋ to 85⌋	1	Less than 32⌋, greater than 85⌋	3	Less than 0⌋, greater than 98⌋	6	Before	After
Travel Disruption (add 1 point for travel at night)	If travel exceeds 6 hours	1	If travel exceeds 8 hours	2	If travel exceeds 12 hours	3		
							Before	After

1-12 points, low risk 1st Supervisor approves	12 to 24points, medium risk Senior Supervisor (or IIC) approves	More than 24, or any high risk Office Director Approves

Individual Go/No Go (each person gives their own status on ability to do mission)
Has each person; been briefed, understand the risks, and feel ready to handle the mission?

Signature of appropriate supervisor: _____
Date_____

RISK MANAGEMENT PLAN

B. When completed, reduce risk area to next lower risk value from previous page.

C. Fatigue Management Plan (duty hours/travel time)

Indicate your plan to control work hours and compensate for travel time exposure.

Note* the crossing of time lines and date lines increases the fatigue levels, and should be addressed as a fatigue issue

D. TRAINING/EXPERIENCE COMPENSATION

Indicate your plan to use your most highly trained individuals to oversee or assist with less trained people.

E. Safety Equipment Use

Indicate your plan to assure that all required safety equipment is available and used properly.

F. Environment/Weather Control Plan

Indicate your plan to compensate for environmental effects

G. Physical Exertion Plan

Indicate your controls to mitigate the potential for injuries due to physical activity.

APPENDIX H

GROUP CHAIRMEN CHECKLISTS

AIR TRAFFIC CONTROL

This section addresses the acquisition and use of air traffic control information by field investigators and specialist air traffic control investigators, including:

- ATC system basics
- Various types and sources of ATC records available to investigators
- Circumstances that indicate a need for specialist help
- Outline of a more detailed ATC investigation

AIR TRAFFIC CONTROL FACILITIES

Automated Flight Service Stations (AFSS): Air traffic facilities that provide pilot briefings, en route communications and VFR search and rescue services, assist lost aircraft and aircraft in emergency situations, relay ATC clearances, originate Notices to Airmen, broadcast aviation weather and NAS information, receive and process VFR and IFR flight plans, and monitor navigational aids. In addition, at selected locations, FSSs provide En route Flight Advisory Service (Flight Watch), take weather observations, issue airport advisories, and advise U.S. Customs and the Immigration and Naturalization Service of transborder flights.

FSSs record all operational telephone calls, radio traffic, and weather briefings, and can also provide an "event reconstruction" printout documenting references used by a briefer during a pilot contact.

Usefulness to accident investigators: May be able to document weather briefings, clearances relayed to pilots from ATC facilities, existing weather conditions, pilot reports, weather advisories in effect such as SIGMETs and NOTAMs, and provide flight plan data filed by pilots. FSS facilities may also be the focal point for FAA search and rescue support for overdue VFR flights, and can provide information associated with initial notification/search activities.

Air Traffic Control Towers (ATCT): A terminal facility that provides ATC services to aircraft operating in the vicinity of an airport or on the surface movement area. (The "movement area" is the ground equivalent of controlled airspace: it is the part of the airport that ATC controls, generally including the runways and most or all of the taxiways, but excluding ramp areas.) Towers authorize aircraft to land or takeoff at the airport or to pass through the airport traffic area regardless of flight plan or weather conditions (IFR or VFR). A tower may also provide approach control services (radar or nonradar), and issue IFR clearances to departing aircraft on behalf of the parent IFR control facility. Tower controllers are also responsible for notifying airport rescue and firefighting services when a potential or actual emergency exists. Towers are only required to meet specific separation standards between aircraft operating on or over runways. Other airborne operations and non-runway movement areas do not have specified minimum distances between aircraft.

Towers may be equipped with digital bright radar indicator terminal equipment (D-BRITE), which provides radar information using data from the parent approach control facility.

This is normally used for identifying and sequencing aircraft only and is not used for separation. If D-BRITE is present, the facility may also be able to receive aural and visual Minimum Safe Altitude Warning (MSAW) alerts from the parent radar facility for relay to aircraft under tower control.

Most low-activity towers have been transferred from FAA operation to private contractors working either for the FAA or for state and local authorities. Contract towers operate under the same ATC procedures as FAA facilities and are subject to periodic quality assurance checks by FAA evaluators.

Usefulness to accident investigators: Tower controllers are knowledgeable about airport surface operations, and may be good eyewitnesses to incidents and accidents that occur within sight of the tower. Towers maintain arrival and departure records in the form of flight strips and notepads, and record all radio and most telephone communications. Towers may also record other information such as airport equipment status and lighting settings, weather reports, windshear alerts, and runway contamination reports. Radar data used by towers is normally remote from a separate radar facility, and any desired recordings must be obtained from there.

Radar Approach Control Facility: A civil or military terminal ATC facility that applies radar and nonradar approach control procedures to aircraft arriving, departing, or transiting airspace delegated to the facility by its parent ARTCC. Provides ATC services to aircraft operating in the vicinity of one or more civil and/or military airports in a terminal area. All radio and operational telephone traffic is normally recorded. With minor exceptions, military and civil approach control facilities use identical procedures.

These facilities currently have a variety of radar data processing systems, with different radar recording capabilities. FAA systems all include minimum safe altitude warning (MSAW) and conflict alert (CA) software to warn controllers of possibly unsafe situations. Activation of either MSAW or CA is logged automatically; these activation records should be requested if MSAW or CA is relevant to the incident being investigated.

FAA terminal radar facilities have one of the following versions of the Automated Radar Tracking System (ARTS):

ARTS IIE: Found at small to medium-sized facilities, usually where the tower and TRACON operations are combined. Records all primary (if available from digitized radar sources) and secondary radar data, with detailed text files of all radar messages available on request. Plotting capability may be available on request.

ARTS IIIA: About 60 installations, at larger facilities where traffic demand and workload exceeds that found at ARTS II facilities. Records all primary (if available from digitized radar sources) and secondary radar data, with detailed textual printout available on request. There may be no readily available radar plotting capability available at these facilities although some local automation specialists may provide a graphic track depiction if asked to do so.

ARTS IIIE: Currently the largest and most capable terminal radar processing system, found at locations such as Denver, Southern California TRACON, New York, and Atlanta. These facilities typically have multiple radar sites covering large geographical areas with high-density traffic. All radar data is recorded, and some areas have multi-site coverage depending on geographic limitations.

Military aviation bases also provide approach control services using Department of Defense civilian and military controllers. Equipment capabilities vary from rudimentary to very sophisticated, such as the multi-tracking radar and range monitoring system installed at Edwards AFB, California. Access to DOD data can be arranged either directly with the base air traffic control officer or with the assistance of military liaison officers assigned to each FAA regional office.

Air Route Traffic Control Center (ARTCC): A facility that provides ATC separation services to aircraft operating on IFR flight plans within controlled airspace. ARTCCs are predominantly responsible for en route aircraft but provide approach control services to airports that do not fall under the jurisdiction of an approach facility. When equipment capabilities and controller workload permit, certain advisory/assistance services may be provided to VFR aircraft. ARTCCs are the "parent" facility for all lower-level ATC facilities such as towers and approach controls within their boundaries. ARTCCs use long-range radar systems (200 to 250 miles, depending on altitude) to track flights and are typically divided into 30 to 40 airspace sectors defined by geographic and vertical boundaries. All radar data and radio transmissions are recorded. Radar data can be printed using the National Track Analysis Program (NTAP), presenting both plotted and tabular information on one or more flights, and other radar archiving capabilities exist as well. ARTCCs also have primary responsibility for initiating search and rescue actions on IFR flights and VFR flights that were receiving services from the facility. ARTCCs also provide radar data support to the Civil Air Patrol and others involved in looking for downed aircraft,

Except in the case of a known accident or incident, FAA facilities retain most data for only 15 days. Do not delay in making information requests as needed to support an investigation – holding off may result in permanent loss of useful data.

RADAR DATA EXTRACTIONS

When requesting radar data from ATC facilities it is often critical to explain exactly what you are looking for. ATC cannot individually extract data on airplanes they have not radar identified (i.e. 1200 code), even though information may be recorded. Unless you are sure the facility will know exactly how to locate the data on the airplane you are interested in, you should specify as much as possible, such as the geographic area you are concerned with, and the time period.

An ARTCC NTAP "input card" looks like this:

```
CODE ADD 1200 7700 7600 7500
POINT 5R2   0746.1250,0472.7500   30 23 25N 088 45 10W
PLOT 060000 090000 0690 0501      160 0300 ALL LST3
```

The "CODE ADD" line is just what it looks like, Beacon Codes. If it is blank it will give you all codes.

"POINT" specifies one or more user selected locations. "5R2" is an airport that was used for this NTAP, the digits next to it are internal coordinates you don't use for anything, then the lat/long of the airport. It's often used for the center point of the NTAP, but wasn't in this one. There can be many points specified if you need them (you usually won't)

If "LOCATE" is on this line the NTAP will auto-center to pick up the code specified in the CODE ADD line. This is good if you know the code, and you don't care about the scale on the plot. This is not good for 1200 codes or multiple codes.

"PLOT" has a lot of info. The first two number groups are the time, in UTC. (hhmmss)

The next number group is the center of the plot. These are internal x/y coordinates, but they can be lat/longs or a point defined in the POINT line.

The "160" is called the radius, although it's not round. This is saying to make a square, 160 miles on a side, centered on the x/y coordinates.

"0300" specifies how much time per page to plot. If you aren't going to use the paper plot, this number doesn't matter. If you are, try to keep it to no more than a couple minutes so the targets don't all glob together. 0300 equals 300 seconds—5 minutes.

"ALL" is an "option". The most common options are:

LDB – limited data blocks
BCN – beacon targets
PRI – primary targets
FDB – full data blocks
WHI/WLO – weather (high and lo inten sities)
ALL – all of the above
SEL – just the info associated with the code(s) in the code line

ALL centered on a specified location makes sure you're covered, but the FDBs are not usually useful, and aren't actually radar targets. But they can be handy if you need to identify who other airplanes were. LDB/BCN/PRI are normally used together.

LST3 (or LST5) makes a list of the targets with a lat/long conversion—very handy:

```
PLOT          TIME        X         Y
SYM CODE ALT HHMM SS    COORD.    COORD.  LATITUDE  LONGITUDE
A   0176 030 0605 12  661.0000  543.8125  31 36 03N 090 22 37W
```

The headers explain it, x/y cords are meaningless outside the ATC computer.

Remember, NTAPs are subject to all the limitations of the mosaic radar system. There are other programs and maintenance type recordings beyond the scope of this manual. If you need to go much deeper than an NTAP, please call AS-30 for assistance.

Approach Control CDR extractions are somewhat different. Sometimes RE-60 will ask you to get the whole CDR TSO (or Optical disk). These are not very easy to work with, but we can specify our own extractions from it. For most purposes a CDR extraction is sufficient and much faster. CDR extractions are based on the radar site used at the facility. Some facilities do have more than one site, so the extractions will have multiple "centers".

There are a couple of styles of CDR editors depending on the ARTS version, but the one below is typical:

```
ODS CDR EDITOR LISTING A3.06 .

                DATA SELECTED
TG TD

                        FILTERS
TIME:  11/16/01 07:00:00 - 11/16/01 09:00:00.     CONTROLLER:
             ALTITUDE: 170                                  ACID:    N89645
SUBSYSTEM: 0    BEACON: 1234      RANGE: 10 - 55      AZIMUTH: 345 - 70
          ETG:  N       INTERFACILITY:       NON_CONFLICT:  N       ASSOCIATED: Y
UNASSOCIATED: Y


PC ARTSIIIA CDR Editor
```

The filters in **bold** are the ones you mostly care about. (There's more that don't show in the sample).

The "TG TD" are data classes. TG means "target" It's the radar targets, beacon, primary or reinforced (i.e. both a primary and a beacon are received from the airplane).

TD is Track Data, it's like the full data blocks in NTAPs, handy for knowing what the controller was looking at, but not really a target. (ARTS 2E and 3E have "TA/TU" which is the same thing)

RB, BT, RT all together mean the same thing as TG – Reinforced Beacon, Beacon Target, and Radar Target. If you get a TG and TD you're pretty much covered. There are lots of other data classes, but these are the most common. ARTS does not record weather.

Time is self-explanatory, it's required.

Altitude is self explanatory, if it's blank you'll get all altitudes.

ACID is aircraft ID, associated with TD or TA/TU, it will limit the extraction to just that ID, if the system had a track on it. Not required or desirable.

Subsystem specifies which radar site to use. Blank gives you all of them.

Beacon is transponder code, limits to just that code. Blank gives you all of them.

Range is from the radar site, and azimuth specifies a "wedge" based on the radar site. Of course, you have to know where the radar site is relative to your area of interest. Blank gives you the whole circle, up to about 60 nm.

If you tell the facility to follow the instructions for a RAPTOR extraction, you'll get a CDR with TG and TD, no filters on altitude, code, range, azimuth, ACID or subsystem. All you need is time. The files can be pretty big, though. If you're absolutely sure you don't need primary, you can have them do it with just RB, BT and keep the file size down. Similar to the NTAPs, you may have to do a little prep work to get a useful CDR extraction if the facility is not involved with the airplane.

Targets are specified:

```
TIME            RANGE    ACP    DEG      QUA STR    BEACON     ALT
07:49:32.039    15.80    438     38       7   S     7107-3     43-3  RB
```

ACP= Azimuth Change pulses. 4096 per 360 degrees.
Range/Deg is from the radar site.
Qua/Str are internal parameters.
Beacon is transponder, the -3 means it's from a mode 3 transponder.
Alt is altitude in hundreds of feet. TG's are uncorrected for non-standard atmospheric pressure.
RB tells you this is a Reinforced Beacon.

Tracking Data is a lot more complex, but the headers in the file explain the basics.

Accident Packages

When accidents occur, FAA air traffic facilities may prepare one of two types of accident report packages: formal and informal. Guidance on preparation and content of these packages is contained in FAA Order 8020.11. Check the latest revision of that order if you have any questions on this process.

A. Formal Accident Package

A formal accident package is prepared any time that ATC facilities may have been involved in an accident, regardless of whether ATC actions are suspected to be causal or contributory. Formal packages are always prepared for air carrier, air taxi and commuter accidents, and for IFR or SVFR accidents with fatalities or serious injuries. For all other accidents, the determination of whether a formal accident file/package is necessary or required shall be based on the "level of ATC service" (if any) that was being provided to the aircraft. (See 8020.11 for determination of "level of service".) The FAA Regional Offices, HQ, or the FAA Coordinator ***may*** require the facility to prepare a formal package.

The formal accident report package will contain the following:

Part I:

1. FAA Form 8020-6, Report of Aircraft Accident
2. Flight Path Chart, Approach Plate, and/or diagrams
3. Certified Indexes
4. Normal Service Statements
5. FAA Form 7230-4, Daily Record of Facility Operation
6. Personnel Logs
7. Form 7230-10, Position Log, or Automated Equivalent
8. Facility Layout Chart
9. Airport Diagram
10. Flight progress strips
11. Transcription of Voice Recordings
12. Form 8020-3, Facility Accident Notification Record
13. Personnel Statements
14. Weather Products
15. Non-published applicable NOTAMs
16. FAA Form 7233-2, Preflight Briefing Log
17. FAA Form 7233-1, Flight Plan, or automated equivalent
18. Other

Part II: Incident Forms

1. FAA Form 8020-21, Preliminary Near Midair Collision Report
2. FAA Form 8020-17, Preliminary Pilot Deviation Report
3. FAA Form 8020-19, Reclassification of Aviation Incident Report
4. FAA Form 8020-11, Incident Report
5. FAA Form 8020-24, Preliminary Vehicle or Pedestrian Deviation Report

Part III: Air Traffic Notification and Reporting Process

1. Accident Notification and Reporting Process for Air Traffic
2. Air Traffic Incident Notification and Reporting Process for Air Traffic

B. Informal Accident File

If it is determined that it is not necessary to prepare a formal accident file/package, the regional AT division ***may*** request the facility(ies) to prepare an informal accident file.

The informal accident file shall be retained by the facility and include the original of:

1. FAA Form 8020-3, Facility Accident Notification Record
2. Form 8020-9, Aircraft Accident/Incident Preliminary Notice
3. Forms 8020-6 and 8020-6-1, Report of Aircraft Accident
4. Form 8020-11, Incident Report, (if appropriate)
5. FAA Form 8020-24, Preliminary Vehicle or Pedestrian Deviation Report
6. Each personnel statement
7. A certified cassette re-recording and a certified re-recording (marked "Original" to replace the original)
8. Other pertinent items

In a case where no ATC service was being provided to the aircraft but ATC subsequently became aware of the accident (via notification by police or similar organizations), no formal or informal file/package is required, and all forms and documentation associated with the notification process shall be retained as specified in the latest edition of FAA Order 1350.15.

An investigator who needs the contents of an accident package to continue an investigation should realize that the air traffic facility preparing the package has up to 60 days to complete and forward it to the FAA coordinator. However, when time is critical to the investigation and the investigator needs part of the information within a few days or even a few hours of the accident, the ATC investigator should ask the FAA coordinator to contact the Regional Air Traffic Division (if not already at the facility) and request "working" copies of the needed documents. It may also be possible to arrange a direct review of ATC tapes and records at the involved facilities shortly after the accident if necessary, although copies may not be immediately available. The accident package may not be provided to you automatically, so submit a request for it along with any other information you need early in the investigation.

Important Actions to Take with Every ATC-Involved Accident

Even when the cause of an accident is not ATC-related, there may still be ATC issues involved that warrant attention. The ATC specialists in AS-30 are willing to handle virtually all air traffic aspects of an accident investigation, but the first step is to identify the cases that need special attention. We can be much more effective if brought in soon after the accident or incident. This can be accomplished in two ways: a request from field investigators for an evaluation of the

circumstances by an ATC investigator, or personal evaluation of the accident scenario by the field investigator based on personal flight experience. If you have the slightest feeling that ATC may have any culpability or may not have responded effectively to a pilot's need for assistance, it may be easiest and most effective to refer the case to AS-30. Generally, the response will be to obtain enough information from the FAA and others to determine whether further investigation is warranted. The types of issues we have found to present a high probability of needing specialist attention are:

- Midair collisions where one or both aircraft is receiving ATC service of any type
- Accidents where ground equipment (navaids, radios, etc.) may have failed
- ARTCC controllers providing approach control services
- Wake turbulence encounters
- Emergency declared
- Special use airspace intrusions
- Tower controller application of radar services
- Contract tower involvement
- Traffic pattern sequencing/collisions and airport surface collisions
- Flight service stations – incorrect clearance relay, NOTAM omissions, or loss of flight plan data
- Approach issues: obstruction clearance, CFIT on IFR approach
- VFR aircraft in IMC with ATC involvement

Do not be reluctant to ask for an evaluation! We would much rather tell you that everything looks okay early than try to catch up with a bad situation later.

DETAILED ATC INVESTIGATIONS

Should the situation appear to warrant specific attention to ATC issues or performance, AS-30 will normally assign an investigator to identify and provide whatever assistance is needed by the field investigator. This section addresses the basic steps involved in a specialist ATC investigation.

Setting Up the Investigation

Once the decision has been made to proceed with an in-depth examination of ATC issues, coordination is required with Air Traffic Investigations (AAT-20) at FAA headquarters. They will arrange interviews at the facility and make any other FAA contacts required to accommodate the needs of the investigation. AAT-20 will also normally send an FAA investigator to the facility to serve as data collection liaison and brief the involved employees before their Safety Board interviews. The FAA's Office of Accident Investigation (AAI-100) may also send someone to participate as the FAA's party representative/group member. It is a good idea to obtain as much information as possible (briefing from AAT/AAI, tape review, radar replay, etc) before leaving Washington in order to have a basis for identifying possible parties and ensuring that all necessary resources are available to you at the facility.

Selecting Group Members – party member selection is a joint decision between the ATC investigator and the IIC

1. Persons with ATC experience, preferably in the same facility or at least the same type of facility
2. Facility Quality Assurance or Training specialist (no management)

B. Conducting the Investigation

1. Receive an initial briefing from ATC facility staff/manager. Try to control the size of the crowd, limiting attendees to those necessary to assist in the investigation. The briefing is for you and those you choose to assist you; feel free to account for all those present and ask that unnecessary persons leave.
2. Listen to the original ATC recording (may be tape or digital off a hard disk drive.)
    a. Facilities generally record the line to/from the control position headset jack. If there are any questions about what actually got transmitted or received from the radio system, it may be necessary to consult with the airway facilities technicians to discover whether other recording points exist and were being recorded at the time of the accident or incident. You may find that comparing the two recordings shows discrepancies, although this is unusual.
    b. Watch the time clock to ensure there are no breaks.
    c. Read the draft transcript along with the recording to ensure you have an accurate working copy.

d. If the time is off more than 1 or 2 seconds, point it out to the facility person responsible for creating the recording. If the times are not corrected in the certified transcript, make a footnote in your report that this is what you found.
e. Previously furnished cassette working copies are good to take with you, but you should listen to the original ATC tape. Certified re-recordings will be stereo, with time on one channel and voice on the other, whereas working copies normally include only the voice channel.

3. Additional data should be obtained via written request to the FAA air traffic coordinator. Retain a signed and dated copy for yourself. For major incidents with many items requested, try to maintain a consolidated list with the status of each item; it is easier on you and the coordinator to manage one request list instead of several partial lists.

Items to Request

18.15. Certified voice recording (in stereo) time channel re-recorded at 5db or less. List each position you are requesting a recording for, typically 5 minutes before initial contact to 5 minutes after the last contact with the subject aircraft. Include the Automatic Terminal Information Service (ATIS), as necessary. Most facilities record incoming and outgoing telephone conversations; request these recordings if pertinent calls were made or received.

18.16. Certified transcripts. A partial transcript is normally sufficient for frequencies the aircraft was working with before the accident or incident. A full transcript should be requested for the frequency the aircraft was on at the time of the accident/incident.[2]

18.17. A copy of controller statements for any person who had direct responsibility for controlling or communicating with the flight or preparing or handling data related to the flight; witnessed any portion of the flight operation; was involved in emergency action as a result of the accident; or provided a weather briefing to the flight crew within 24 hours of the accident. Obtain a statement from the supervisor on duty at the time of the accident/incident.

18.18. Copies of all notes, flight progress strips, pads, forms, and memoranda used by the controller at the time of the accident/incident, as well as copies of pertinent chapters of facility orders and position binders.

[2] A partial transcript contains only the communications between ATC and the accident or incident aircraft and any pertinent interphone conversations. A full transcript contains all communications on the recording.

18.19. If OJT was being conducted, a copy of the facility training order and verification that the instructor is properly certified, and a copy of the training evaluation for the session that included the incident/accident

18.20. Diagram of facility layout

18.21. Applicable letters of agreement between the air traffic facility and other facilities or operators

18.22. Pilot bulletins

18.23. A copy of the authorized and on-duty staffing on the day and the shift at the time of the accident/incident.

18.24. Logs, Reports, Forms – as applicable:

a. FAA Form 7230-10, Position Log for all involved positions of operation
b. FAA Form 7230-4, Personnel Log and Daily Record of Facility Operation
c. FAA Form 8020-6 and 8020-6-1, Report of Accident and Continuation Sheet
d. FAA Form 8020-9, Aircraft Accident/Incident Preliminary Notice
e. FAA Form 8020-3, Facility Accident Notification Record
f. Traffic Management Logs
g. FAA Form 8020-21, Preliminary Near Midair Collision Report
h. FAA Form 8020-17, Preliminary Pilot Deviation Report
i. FAA Form 8020-11, Incident Report
j. FAA Form 7233-1, Copy of Flight Plan Record
k. FAA Form 7233-2, Copy of Preflight Briefing Log
l. FAA Form 7233-5, In-Flight Contact Record

12. Recorded radar data (NTAP, CDR, F20, RS3, COMDIG as appropriate)

13. LLWAS, RVR, TDWR (LLWAS kept 15 days, digital RVR 15 days, TDWR)

14. Copy of all NOTAMs pertaining to airport operational and equipment status on the day of the accident/incident.

15. Copy of all SIGMETs, AIRMETs, CWA, Meteorological Impact Statements, terminal forecasts, and current weather observations for the time and day of the accident/incident.

16. Facility equipment status documentation

a. FAA Form 6030.1, Facility Maintenance Log
b. Previous flight checks of NAVAIDs, as appropriate
c. Postaccident flight check reports

17. Copy of instrument approach procedure, including the chart on file at the air traffic facility if an instrument approach procedure is involved.

18. Facility evaluations and facility replies

19. Unsatisfactory Condition Reports related to procedures or equipment pertinent to the incident.

20. Any other pertinent documentation that may come to your attention as a result of your investigation.

21. Review controllers training records for the following information:

a. Date entered the current facility
b. Date became fully certified
c. If in training, the positions the individual is certified on
d. The number of hours the individual has accumulated on the position involved
e. Date certified on the position involved
f. Any applicable training briefing items and the date received
g. Any history of operational errors. Any in past 2 ½ years should be shown in training records, and the full facility investigative package can be requested if needed. Date entered on duty FAA
h.
i. Technical training discussion records – supervisory evaluations of controller performance

Conducting interviews

a. Introduce yourself and the other members of the group, if any.
b. Explain how the interview will be conducted. Normally, tape recorders are not allowed in the interview.
c. Interviewee has the right to one representative of his/her choice. Their role is not to either tell the interviewee what to answer or tell you what you can't ask.
d. You are in charge of the interview. Ensure that questions are fair and are not phrased in a leading manner. (i.e., "would you agree that….")
e. Although NTSB operates on a party system, the only requirement is that the NTSB and interviewee attend the interview. Group members can be given your notes in lieu of actual attendance if you believe that having others present during the interview will reduce the interviewees willingness to talk. Interviewees may also request that one or more members of the group be excused, but you should advise the interviewee that the interview notes will still be available to all group members.

22. Observe conditions in the facility

a. Determine the location and accessibility of maps, charts, approach plates, ready reference files
b. Noise levels
c. Lighting
d. Locations of alarms, bells, doors, various sectors, traffic management staff, supervisory positions.

Sample Interview Questions

1. Air traffic control history. Did they attend the FAA academy? When? Did they graduate? Where were they first assigned? Did they successfully complete training? Where did they transfer? Did they complete training there?
2. Do they have military ATC experience? How long? Where? What type of facilities?
3. Any pilot experience? What ratings do they have? How many hours? Do they fly in the area of the accident/incident? Are they current?
4. What are their operating initials?
5. Date of their last medical certification. (Get a copy from the facility) Any waivers or restrictions? What are they? (If they must wear glasses or contacts, were they wearing them at the time of the incident/accident?)
6. Describe their general health.
7. Who is their immediate supervisor? How long?
8. How much overtime in the last round of shifts?
9. What assigned shift was the individual working? What did they actually work? What were the previous shifts? Which day of the work week?
10. What were they doing before taking the position involved?
11. Did they receive a complete relief briefing? Did they use a position relief checklist? Was the briefing recorded? (Briefing should be on the position tape.) What information did they receive during the briefing?
12. Ask the interviewee to provide a narrative description of his/her involvement in the incident, starting from when he/she first became aware of the aircraft involved.
13. If appropriate, elicit controller assessment of workload, staffing levels, traffic complexity, supervisory performance, response to requests for help, condition of equipment, settings of equipment, effectiveness of ATC procedures used, and any distractions in the control room at the time of the incident. Watch out for "agendas"—controllers often use interviews as an opportunity to complain about issues of concern to them although the issues' relevance to the accident is dubious.
14. Ask if interviewee has any questions or is aware of any areas not adequately covered in the interview.

Time Sources

ARTCC: GPS clock – very accurate.

ARTS: Time may be set to either an external reference such as a GPS clock, or manually via keyboard entry. Manual updates are verified three times a day. Once set, the ARTS system records time to the nearest $1/100^{th}$ of a second.

Voice: Most digital recorders use a GPS time source, which is extremely accurate. Analog systems use a digital time signal that is recorded on a specific (assigned and numerically designated) recorded channel. Either airways facility or ATC personnel check timing at least twice per day.

Other Replay and Analysis Capabilities

Terminal radar data can be replayed on either internal ARTS replay software, or on RAPTOR software developed by the FAA. In either case, it will usually be necessary to manually synchronize the replay with the voice recording. ARTCC facilities can produce SATORI replays that include both radar display and voice files. RE-60 can also assist in plotting data and performance analysis if necessary. AS-30 ATC personnel can produce track plots if needed for a quick look at what the aircraft was doing during a period of interest, but cannot perform performance analysis.

The USAF 84th Radar Evaluation Squadron can also provide recorded radar data to supplement that available from the FAA. The Air Force retains their data for 120 days, and can often assist us if the FAA cannot provide information for a particular date or time. The data files can be obtained via remote FTP from the 84th RADES file server at Hill AFB, Utah.

C. Completing the Field Phase

Coordinate with the IIC to ensure that you both understand what the ATC investigation is to accomplish. Once the field phase is complete, produce your field notes in conjunction with the group. Validate the notes with the group members and obtain their concurrence that the contents represent the group's work at the site. Supply each member with a copy of the notes and ensure that the IIC, if present at the site, accepts that your work is complete by initialing off on the note package.

D. Completing the Investigation

When assisting on field investigations, the ATC group chairman normally produces a factual report and an analysis report. The factual report will be reviewed by AS-30 management and then presented to the group for their written concurrence. Management will again review and approve the report. Once the factual report has been approved, it will be incorporated into the Board's DMS and forwarded to the IIC for inclusion in his report package on the accident. The analysis report is reviewed by AS-30 management but is not distributed to the group at any time. Once management has approved the analysis report, it is also sent to the IIC and included in DMS. Consult with the IIC to ensure that there are no open FOIA requests for information you hold. If there are, comply with the Board's policy regarding disposition of your files. Any questions on this should be referred to the General Counsel's office for advice.

Major investigations follow the same process for development of factual and analysis reports, but may include a public hearing and much more extensive interaction with other group members and AS-70 during the report development process. These issues are addressed in depth in other sections of this manual.

HUMAN PERFORMANCE GROUP

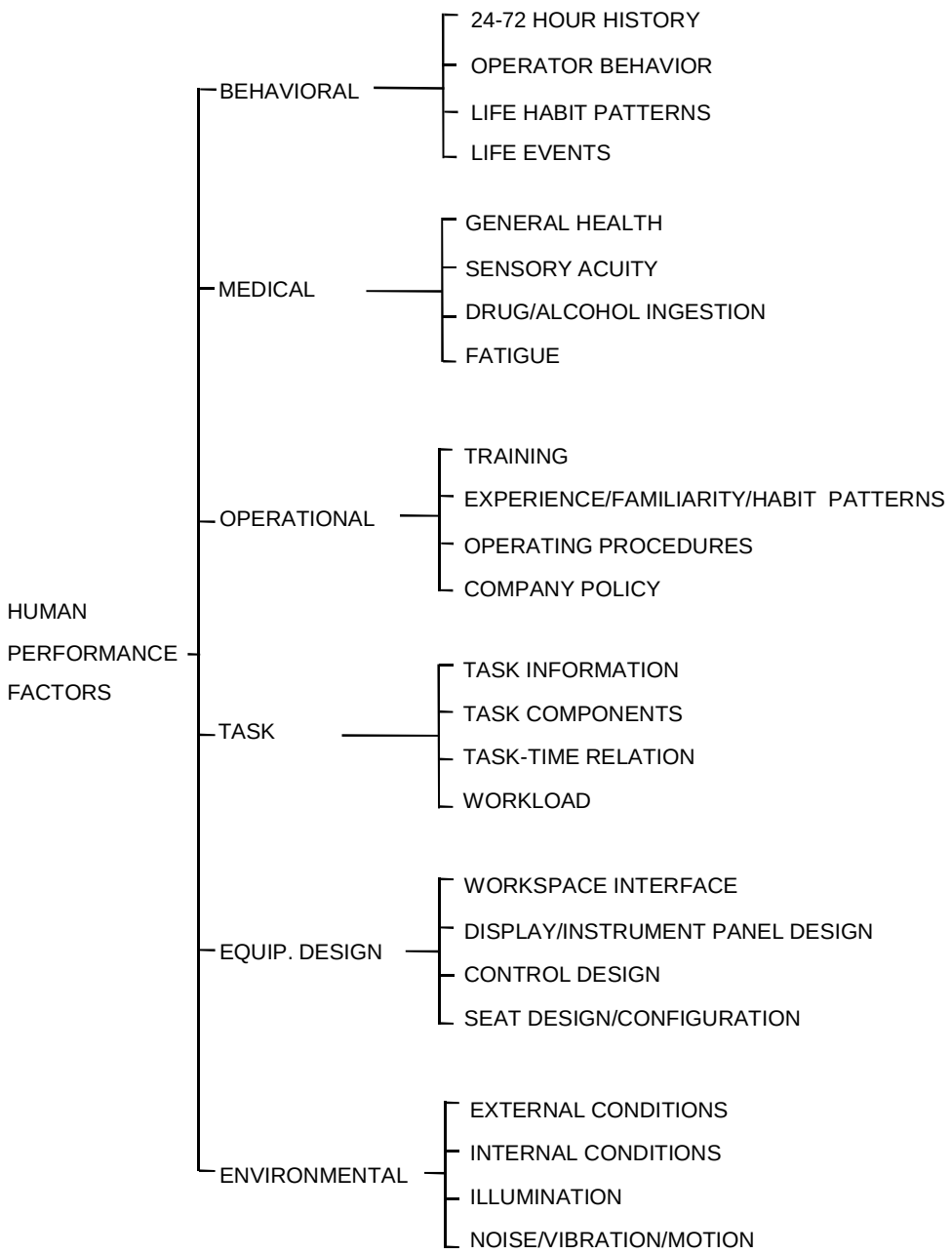
Human Performance

A human performance investigator will typically launch on a major investigation as part of the initial team at the accident site. The human performance investigator is attached as a specialist to another group—especially the Operations Group and/or the Air Traffic Control Group—until such time as a formal Human Performance Group is formed. Even after a Human Performance Group is formed, there may be important interviews (such as interviews of surviving crew members) for which the Human Performance investigator alone joins another group in order to minimize the number of persons present in the room.

Human performance attention can be addressed toward any individual involved in the accident, but will usually examine cockpit crew members, air traffic controllers, or maintenance personnel. Human performance attention may also be directed at larger system issues, such as those concerning company policy, training, and design.

Activities/Procedures of the Human Performance Investigator

Human performance investigation centers on the six areas charted in the following figure. In some cases, the work of the human performance specialist may parallel that of an operations or air traffic control specialist, except the human performance specialist examines certain evidence in greater depth. In other cases, such as medical and equipment design issues, the human performance specialist may be the lead collector of evidence for an investigation.



As a member of the team at a major aviation accident, the human performance investigator has specific areas of responsibility during the on-site investigation and in the weeks to follow. Like other investigators, the human performance investigator focuses at first on the collection of "perishable" information, which would include arrangements for toxicological testing and collection of information and witness statements regarding the 72-hour history. As the investigation proceeds, the human performance investigator can focus more on the "less perishable" information, which would include general background statements and information from public records. Specific areas of human performance involvement would include the following:

(1) Arrangements for analysis of the toxicological samples. Most toxicology specimens—including urine and blood—should be drawn as soon as practical after the accident to provide suitable samples for toxicological testing. These samples are typically drawn by hospital personnel (for living subjects) or pathologist (for deceased subjects) before the investigator arrives on-site. It is the responsibility of the human performance investigator to oversee that samples are collected and tested properly. When first notified of the accident, and before leaving for the accident site, the investigator should ensure that timely requests are made through the proper authorities for toxicological samples from all relevant air traffic and surviving aircrew personnel. After arriving on-site, the human performance investigator interacts with the proper medical and laboratory authorities to track and assist with proper protection and testing of the samples. Activities include locating and documenting the available samples, assisting as needed in arranging for laboratory testing, assisting as need in preserving a proper chain-of-custody, giving input to the laboratories on desired tests, and obtaining and interpreting the toxicology results. It is the responsibility of the human performance investigator to oversee the toxicology testing effort to insure that this very perishable information is collected in timely fashion and without error.

(2) Requesting air traffic voice tapes. All FAA air traffic control facilities in the United States (and most private air traffic facilities) record air-to-ground communications on large audio tapes on a continuous basis. Upon request, the FAA normally provides to the investigation a copy on an audio cassette tape of the communications directly involved in the accident. In some cases, a human performance investigator may also be interested in recordings of the pilot's earlier flight legs to examine the pilot's earlier performance or to have a sample of the pilot's speech under routine conditions. Such material can normally be obtained from the FAA only if the request is made within 15 days after the accident. It is a responsibility of the human performance investigator, in coordination with the ATC investigator (if assigned), to request appropriate voice tapes from the FAA representative in as timely a manner as possible.

(3) Obtaining information for the 72-hour history. A critical part of the human performance investigation is tracing the activities prior to the accident of the pilots, controllers, or other individuals of importance to the investigation. The purpose of this history is to determine such information as sleeping and eating history, purpose and preparation for the accident trip, unusual activities or events, mood, crew interaction, and other information that could prove critical to understanding the accident. The time period of 72 hours is typical, but other time periods are examined at the discretion of the investigator.

Information related to the 72-hour history is considered "perishable" because memory tends to become less accurate and less detailed over time (and because some witnesses become difficult to locate with the passage of time). Those witnesses who are of prime interest would include: the last person to talk with the individual; anyone with professional contact during the 72-hour period; anyone with whom the individual lived; anyone with whom the individual was having a romantic relationship; immediate family;

and anyone in the general public who came in contact with the individual, including taxi drivers, hotel staff, and neighbors. These individuals are so central to the 72-hour history that it is usually worth interviewing them even if they feel their exposure was modest and they indicate that everything seemed routine. Simply knowing that everything seemed routine can be of significant value to the investigation.

(4) Examining all material from the wreckage related to human performance. The human performance investigator should examine and document all material found in the wreckage with relevance to human performance, including paperwork, personal effects, and any medications (counting the number of pills in the container in the case of medication).

(5) Obtaining general background information on the individual. When human performance failures occur in an accident, it is often possible to find problems in the individual's background that foretell the problems of the accident. A careful human performance investigation would develop information related to issues such as previous accidents and professional difficulties, approach to flying, personality characteristics, and major life events including medical, financial, and emotional changes in the recent past.

A principal source of background information is interviews with persons familiar with the individual. These interviews may take place during the on-site investigation or during the weeks following. Background information is considered "perishable", but less so than information related to the 72-hour history (which is often obtained from the same individuals). Those witnesses who are of prime interest would include: close family members, supervisors, professional colleagues with whom the individual worked, personal physicians, previous employers, and close friends. When individuals are deceased, the family members are normally not interviewed until after the funeral, although this can vary at the discretion of the interviewer. Some background interviews can be completed by telephone at the discretion of the investigator.

(6) Background records. A human performance investigation should include a review of background records including records of previous accidents/incidents, airman records, and personnel, training, and medical records. These help to establish previous job history, discipline record, training strengths and weaknesses, and medical issues. The investigation may also include checks of the National Crime Information Center (NCIC) records maintained by the FBI and National Driver Register records. In the case of medical records and NCIC records, there may be confidential material that is not appropriate for public reports but is valuable at suggesting areas for further investigation.

(7) Corporate culture. In some accident and incidents, the stage is set for accidents by corporate events far removed in time and place from the accident. Companies vary in the degree that they emphasize safety in their operations, and individuals involved in

accidents may be affected by the actions and decisions of even well-intentioned company officers and managers.

To investigate corporate culture issues, an investigator should talk to individuals knowledgeable about the company (including local NTSB and FAA employees and others who may have first-hand knowledge). The investigator should interview other employees, supervisors, and managers, up to the Chief Executive Officer, as appropriate. Focus on company history and policy in areas such as pay, morale, flight and duty time schedules, workload, sick leave, size of workforce, turnover rate of workers and managers, training, equipment, maintenance, promotion progress, financial condition of the company, and safety office/programs.

Examine the adequacy of operating procedures, as well as the extent to which these procedures are adhered to. Does the company say one thing and do something else? By talking to people, observing employees in action, and examining records, obtain a view of the employee's commitment to performing a job well, and the company's commitment to assuring that employees perform all tasks at the highest level of safety possible. One of the most important "trouble signs" to alert an investigator that corporate culture issues may be involved is probably: multiple mistakes by different employees in different circumstances.

Checklists of Human Performance Questions

A short checklist of common human performance questions is supplied at the end of this section for use by investigators when interviewing individual witnesses. Additional questions are often suggested by the details of the specific accident and may include training and management issues. By listening closely to witness descriptions, and by asking simple questions to reach a "common sense" understanding of the accident, the investigator can often generate additional areas for greater human performance understanding.

Human performance interviews normally begin with very general questions that allow witnesses to describe what they know at length, without influence from the interviewer. As the interview progresses, more pointed questions are normally asked to focus the witness on topics that were not fully addressed.

Following this standard human performance checklist is a special checklist for interviews on corporate culture issues, to provide guidance in this new and often subtle area of investigation.

HUMAN PERFORMANCE STANDARD CHECKLIST

A. Activities in last 72 hours

1. When was the last time you (the pilot, the controller, etc.) worked before the accident?

2. When did you work during the previous 3 days? What were your other activities during this period?

3. When did you go to sleep the previous night (or previous 3 nights)? When did you wake up? Did you feel well rested?

4. What is your normal work schedule? When are days off? When was your last vacation?

5. Describe your activities on the day of the accident up to the accident. When/what did you eat? Any rest breaks?

6. Was this an unusual schedule?

B. Accident History

1. Have you been involved in any previous accidents? Have you been disciplined for your performance? Have you received commendations for your performance?

C. Life Changes

1. In the past year:

   a. Have you had major changes in your health (good or bad)?

   b. Have there been major changes in your financial situation (good or bad)?

   c. Have there been major changes in your personal life (e.g., separation, divorce, birth, death, changes in the health of immediate family/close friends)?

D. Medical/Drugs

1. How is your health?

2. What is the name/address of your personal doctor?

3. How is your vision? Do you wear corrective lenses? Name of eye doctor? Prescription?

4. How is your hearing? Do you wear a hearing aid? Name of doctor?

5. Do you take prescription medicine? What? How often? When was the last time you took it before the accident?

6. Do you drink alcohol? When/what was your last drink before the accident?

7. Do you smoke tobacco? Last use before the accident?

8. Do you use illicit drugs?

9. In the 72 hours before the accident, did you take any drugs, prescription or non-prescription that might have affected your performance?

E. Workload

1. How was workload on the day of the accident?

2. How was workload affected by the weather?

F. Environmental

1. Any problems with the aircraft?

2. Any problem with noise, vibration, temperature?

3. Any problems with visibility (instruments, signals, etc.)?

G. Mood

1. What was the mood of the other crewmembers before the accident? During the accident? After the accident?

2. Had the crewmembers flown together before?

3. Did the crewmembers get along personally? Did they see each other socially?

4. What did they talk about?

5. How did the pilots get along with passengers/flight attendants?

H. Background

1. What was the pilot like personally?

2. Was he married? Any children? What were his living arrangements?

3. What level of education did he complete?

4. How did the pilot get interested in aviation? Where did the pilot get training? What were previous jobs?

5. What did the pilot like about flying? About this job? About the aircraft?

6. How familiar was the pilot with the accident route? With the accident airport?

7. What was the deadline for completing the trip?

8. What were the pilot's greatest strengths as a pilot? Were there areas in which the pilot could have improved?

9. Did anyone ever complain about flying with this pilot?

10. Did the pilot ever complain about the company or equipment?

11. Did the pilot experience any emergency/incident/problem during a previous flight? What happened?

12. Did the pilot receive training in cockpit resource management?

CORPORATE CULTURE CHECKLIST

Compared to industry standards, how is:

pay
morale
flight and duty time schedules
overtime
sick leave
employee assistance program
size of workforce/workload to perform required tasks
turnover rate of workers
turnover rate of managers
reasons for turnover
quality of new hires
training
equipment
maintenance
promotion opportunities
financial condition of the company
relationship between company and company labor unions
number of disciplinary actions/number of grievances

In the past several years, has the company undergone a significant expansion or reduction of its operations?

How much overtime is there? Mandatory or voluntary? Is the employee paid extra for overtime work?

What pre-employment background screening is done for new hire candidates?

What complaints do you hear from employees? What complaints do you hear from managers?

How would you describe labor-management relations? What is the relationship with the union's Safety Committee?

Has the company entered bankruptcy protection? Has it entered a recent merger? What happened?

Has this company experienced previous accidents or incidents? Violations? Commendations? What was the company response in terms of changes in policy/procedure/personnel following any accident/incident?

What are the chief pilot's greatest strengths (as a manager)? Vice-President of Operations/Maintenance? Chief Executive Officer (CEO)?

Has the chief pilot, Vice-President of Operations/Maintenance, or CEO been involved in previous accidents or violations either personally or through a previous company at which he/she served as a manager? (This information is best obtained from the FAA.)

What contact is there between the CEO and other employees, including the line employees?

Do you have a corporate safety office? What are its activities? Does it report to the CEO? Executive Vice President of Operations? Vice President of Flight? Does it meet with the Board of Directors? How often?

How does the company communicate safety information to its employees (e.g., newsletters, videos)?

Is there a way for employees to bring up safety-related issues without fear of retribution (e.g., safety hotline)?

If there is no safety office, to whom do employees report safety recommendations/problems? What recent safety-related issues have employees raised, and what was done in response?

Is there incident reporting and incident investigation? How and to whom are incidents reported? Give a recent example of changes resulting from internal investigation of an incident.

How does the company learn of and share industry safety-related information? Does the company participate in industry safety meetings and organizations, such as Flight Safety Foundation, IATA, and ATA?

How does the company examine trends (good and bad) in operations and maintenance?

Does the company keep a safety database or employ risk assessment? Does it employ safety audits? Internal or external?

Does the company provide training in crew resource management (CRM)? What does it consist of? How many hours are devoted to it?

How are relations with the Federal Aviation Administration (FAA)? What are areas of differences?

How often do you see inspectors from the FAA?

MAINTENANCE GROUP

The maintenance records group is responsible for reviewing all maintenance records to ascertain the service and maintenance history of an aircraft involved in an incident or accident. The data will address the approved maintenance program, indicators of the adequacy of inspection, airworthiness directives, and service bulletin compliance that might be related to the occurrence, time, and cycles on the aircraft engines and applicable components, and time or cycles since overhaul or major inspections of the airframe or critical system components. This group's function will require coordination with the operator and is frequently performed at the maintenance headquarters of the operator. The investigation may extend into design, certification, manufacturing, and/or maintenance management. The areas could include standards and procedures, quality assurance, equipment and facilities, and maintenance personnel selection and training issues.

The collected data from all these areas of interest will be studied to determine the effectiveness of the maintenance system and its potential relevance to the issues associated with the accident. The investigator must consider operator differences and the regulations that govern them. Large air carriers are regulated by 14 CFR Part 121, which is rigid and thorough. Commuter air carriers, on-demand air taxi, and general aviation operators are less rigorously regulated by Parts 135 and 91. It is therefore important to review the approved maintenance program with respect to the applicable operating specifications and rules.

The significance of improper or inadequate maintenance, servicing, or inspection of an aircraft becomes most evident after a thorough review of the relevant records. These data may indicate a need to explore further any records relative to the aircraft type under investigation. The adequacy of a maintenance program should never be assumed based upon the size or apparent sophistication of its operation or records system. The Maintenance Records group chairman will alert the investigative team to any system or component that becomes suspect through the records review. In this manner, the Maintenance Records Group will reduce the potential for overlooking possible system or "hardware"-related accident causes. In general aviation accidents in which extensive modifications to the aircraft have been accomplished, the investigative process is expanded. This expansion will include modification and engineering data relative to supplemental type certificates (STC) and major repairs and modifications (Form 337).

During the investigative process, the maintenance group should focus on the following specific objectives:

1. Collecting a sufficient amount of general maintenance history information to serve as a reference database for all members of the investigative team

2. Researching and evaluating the maintenance aspects of specific issues presented to the maintenance group by other group chairmen or the IIC

3. Proactively analyzing previous maintenance activities and trends associated with the accident aircraft in an attempt to uncover issues that may not be discernible to other groups because of the destruction of systems and structures evidence

4. Reviewing the operator's, repair station's, and contract maintenance provider's programs, policies, procedures, and work environment to determine whether any of these may have contributed to the accident sequence

5. Evaluating the FAA oversight of the subject operator to determine whether the oversight program may have contributed to the accident sequence

Group Composition

In a team-investigated accident or incident, an airworthiness specialist will be assigned as Maintenance Records group chairman to manage a group that includes representatives from certain parties to the investigation. During the initial organization meeting, parties assigned to the maintenance group should be able to address the numerous powerplant, structures, systems, and operations questions that will arise during the group's extensive investigation. At a minimum, the group should consist of the group chairman, an FAA participant, and a representative from the airframe and powerplant manufacturer. In addition, it will normally be helpful to include a cockpit flight crewmember who is employed by the involved operator and who is rated in the accident aircraft type.

The group chairman should also consider including an individual from the operator's maintenance quality assurance department or maintenance engineering department. This individual should have the ability to assist in deciphering aircraft maintenance log writeups and have a good overall understanding of the operator's maintenance program. The group chairman should also request that the operator or subject repair station place the director of maintenance records on standby to respond to the numerous requests for data retrieval and tracking system clarification that will be made.

Notification

Because the maintenance group will need to quickly gather information about issues that may provide direction for the IIC and other groups, the group chairman should launch to the location of the initial organizational meeting as part of the major investigation go team. Immediately after notification and before launching, the group chairman should ensure that either he or the IIC notify the aircraft owner/operator about impounding all maintenance and service records pertaining to the accident aircraft. The owner will be responsible for the records' safekeeping until the group chairman or the chairman's representative arrives to take possession. These records may extend back to the date of the aircraft's manufacture. In some situations, the group chairman may want to request that a local FAA office take possession of the last 90 days' worth of records until the group arrives.

During the initial contact with the owner/operator, it should be stressed that any and all records pertaining to the accident aircraft must be retained for Safety Board review, photographing, or copying. This is important to emphasize because many Part 121 operators use a complex system of computerized record-keeping in addition to their FAA-required/approved program. Although the data from these additional programs is not normally reviewed in the process of ongoing FAA oversight, 49 CFR Part 831 requires that the operator make this additional data available to the Safety Board. It

will not be necessary for the Board to retain original documents as long as suitable copies of necessary records are obtained for the public docket of the accident.

Convening the Group

After the preliminary steps have been taken to impound the records and establish the group membership, the group chairman should proceed to the maintenance facility or other location of the impounded records. The investigator will usually find the operator and his employees ready to cooperate in any way. At this point, the group chairman should suggest that one of the company's technical personnel be placed on standby to assist in deciphering any unclear or confusing writeups in the maintenance log. Additionally, the group chairman should take the following steps to enhance the group's effectiveness:

1. Arrange for a secure conference-type room to be set aside for the exclusive use of the group for at least 1 week. If possible, this room should be located in the building that houses the operator's maintenance administration offices. If the operator cannot provide a room, a local FAA office will usually provide the needed facility. Whatever room is used, it should be able to be locked so that the records can be secured in this room during nonwork hours.

2. Attempt to acquire a dedicated phone line for the group's use. If possible, the line should be routed to the group's work room if not already located there.

3. Ensure that a computer is available to the group for the processing of field notes on a daily basis (bring a laptop if possible). Because the maintenance group will deal with a very large volume of data daily, it is recommended that field notes be composed on an ongoing basis. Arrange for any secretarial or reproduction assistance as early as possible.

4. Have a complete set of up-to-date operational and maintenance handbooks regarding the subject aircraft.

5. If the group is meeting at a remote location, it will also be helpful to arrange for contact with the IIC immediately after each morning's group chairman's coordination meeting. This will provide the maintenance group the opportunity to be informed about any new issues or special areas of concern that were brought up in that meeting.

6. Brief any members who were not present at the IIC's initial organizational meeting about party participation in the investigation. Remind all group members that their participation is required for the duration of the investigation; also remind them about the restrictions on dissemination of information by any organization other than the Safety Board.

7. If you are working in a secure area that requires visitors to be escorted (e.g., a maintenance hangar), attempt to acquire temporary operator identification badges. This will allow group members to enter and move about the facility without being restricted or challenged.

8. Acquire or bring with you an accordion file with at least 30 partitions to facilitate the storage and easy retrieval of the massive amounts of data that will be collected.

9. Before reviewing any records, be sure to provide each group member an index sheet delineating the Air Transport Association (ATA) chapter codes. Almost every piece of data reviewed will reference these codes.
10. Divide working group by assigning each person certain relevant ATA codes.

11. Coordinate with the IIC to decide the extent and priorities of the records review. Decide on documents to be copied or data to be extracted for the report.

12. Advise all group members of the time and location of all daily maintenance group progress meetings. Hold progress meetings or discussions periodically to make the group aware of the entire effort. Full agreement might not be possible but awareness of the pertinent facts by group members is necessary.

Program Briefing

Before reviewing documentation that relates specifically to maintenance performed on the accident aircraft or the operator's maintenance systems, it is essential that the group chairman brief the group about the maintenance program and activities they are about to review. As soon as possible after convening the group, the group chairman should advise the operator that the group will need to be briefed on the operator's overall maintenance program. Provide the operator with a list of documents that should be made available during the briefing and allow the operator about 2 hours to prepare the briefing and gather the documentation.

Documents to be provided at the briefing include the following (if applicable):

1. Parts "D" and "E" of the Operating Specifications

    a. General aircraft maintenance requirements
    b. Short-term escalation authorization
    c. Leased aircraft maintenance program (U.S.)
    d. Leased aircraft maintenance program (foreign)
    e. Parts-borrowing authorization/program
    f. ETOPS maintenance program authorization
    g. Maintenance inspection time limitations
    h. Minimum equipment list (MEL) and configuration deviation list (CDL) authorization/program
    i. Weight and balance control procedures

2. The operator's General Maintenance Manual

3. A diagram (with names) showing the structure of the maintenance management system. This diagram should delineate management positions down to the level of shop supervisor for each shop (e.g., avionics, engines, etc.)

4. A list of all maintenance and non-maintenance bases (to include the maintenance level classification of each base)

5. A list of all contract maintenance providers (to include maintenance level authorizations and the primary point of contact at each station)

6. A copy of the components repetitive inspection list for the accident aircraft model. Expect a list of 100+ component inspections listed by ATA code.

7. A copy of the conditional inspections list for the model aircraft involved in the accident. These inspections are only performed when the aircraft has experienced some uncommon condition (e.g., severe turbulence, hard landing, flap overspeed, etc.)

8. A copy of the general airframe and engine manuals

9. A copy of the aircraft's flight crew operations manual

10. A list of all of the operator's aircraft by make, model, and tail number

When these documents are provided, the operator should brief the group on the following maintenance program topics:

1. Program type. Type of maintenance program authorized and under what FAR Part it is performed.

2. Scheduled and phase inspection program. Include type of checks, time intervals, locations where checks are performed, description of splitting checks into subphases or intervals, and a list of those checks performed by contract maintenance providers.

3. Contract maintenance program. Include scope and limitations of the program, method of coordination for on-call maintenance, operator oversight/guidance, records movement and tracking of work performed.

4. Deferred maintenance policy. Include tracking process, crew notification, and deadline extension.

5. MEL and CDL policy. Include tracking process, crew notification, and deferral extension.

6. Airworthiness directive (AD) compliance program. Include tracking system, repetitive inspection compliance methods, procedure for converting applicable portions of ADs to engineering orders (EO) or engineering authorizations (EA).

7. Maintenance record-keeping system. Include type of FAA-approved system, description of supplemental systems, method of data collection/entry, tracked items/events, data retrieval/printout capabilities.

Immediate action items

While the operator is preparing the briefing and collecting the requested documents, the following actions should be taken:

1. Perform a cursory review of the accident aircraft's maintenance log entries and maintenance history printout for the last 30 days. This review should focus on maintenance discrepancies that appear to relate to systems that are tentatively suspect based on the limited accident sequence information already available.

2. Determine if either the operator or a contract maintenance provider performed maintenance actions on the accident aircraft in the last few days. If they have, now is the time to determine if drug testing of the individuals who performed the work will be requested.

3. Have the operator complete the Aircraft and Engine History Data Sheet.

In-depth review of items specific to the accident aircraft

Review the following items for the accident aircraft:

1. Aircraft maintenance logs for the last 90 days. Make sure to record the station identifier, mechanic's identification number, and ATA chapter code for any suspicious writeup or corrective action.

2. Aircraft maintenance history data printout for the last 120 days. The operator should be able to print out this history by an ATA code and for any time period that you feel is important.

3. All non-routine work cards for the last periodic check and for the last "D" or "C" level Heavy Check. For a transport-category aircraft, there will probably be hundreds of cards from a "C" or "D" check.

4. All overhaul records for the aircraft's engines, propellers, and primary system components.

5. Routine work cards. If there is a suspect system or component, the routine work cards signed off during the last applicable inspection should be requested. Each action box on the relevant card should be reviewed for inspection findings and corrective actions taken.

6. Conditional inspection history for life of aircraft. Because these inspections are only performed if the aircraft has experienced a special or unusual condition, it is important to search the work cards for evidence of damage and repairs.

7. Contract maintenance before final flight. Talk directly to the contract shop supervisor to determine if maintenance was performed. The operator may not yet be aware of all contract maintenance actions taken before the aircraft's last flight.

8. Aircraft damage report. This might be the only place that will say if the aircraft was damaged while out of service (e.g., service truck colliding with engine pylon while aircraft is parked at gate overnight).

9. List of major repairs and alterations. In one case in which the aircraft experienced an inflight loss of control, reviewing this list helped to determine that the accident aircraft was the only one in the operator's entire fleet with the newest thrust reverser modification.

10. A list of all STC work that has been accomplished on the accident aircraft.

11. Engine condition monitoring data for the last 30 days. There may be a formal or informal program or just untracked data recorded on the daily aircraft maintenance log. If you are provided raw data only, ask the operator if it can display the data in a graphic format. Provide this data to the Powerplants Group.

12. Engine change log. This log will show you which aircraft within the operator's fleet the engines on the accident aircraft have been on in the past. If there is a suspect engine, you can review its maintenance history (by engine ATA code) for the period it was on the previous aircraft.

13. Engine and airframe vibration monitoring data. Collect and provide to Powerplants and Structures groups.

14. List of MEL/CDL items currently being carried on the accident aircraft. Determine from the master MEL the category (A, B, C, or D) of any carried items, and whether any B or C category items are on an extension.

15. List of all ADs for the accident aircraft. Confirm compliance date and methods. If there is a suspected problem with a component or system that has any ADs written against it, review a copy of the EO or EA that was written by the operator to carry out the applicable portions of the AD.

16. Service difficulty reports (SDR) or maintenance defect reports (MRD) for any suspect component. Data may be obtained through the local FSDO or by calling (405) 954-6509. Be very specific and narrow the request as much as possible (there may be thousands of MRDs for a specific model of aircraft.)

17. List of service bulletins/letters, by title, that apply to the accident aircraft and its components.

18. Operator's list of cancellations/diversions/deviations for the accident aircraft (and all others of the same model) for the last 6 months. If possible, have data listed separately for each maintenance base.

19. Weight and balance sheet. If weight or cg might an issue, check the compliance date, location, and method used for the last weight and balance check. If electronic scales were used, check the method and date of calibration and certification.

20. Import and return-to-service documentation. If the accident aircraft or its engines were imported from a foreign country in the recent past, review all import process documentation and the actions taken qualifying the aircraft to be returned to service. You may have to contact and possibly interview the involved designated airworthiness representative (DAR) who handled this process. You may also need to contact the FAA office that provided oversight of the DAR.

In-depth review of operator's programs, policies, and work conditions

In addition to the group's review of the accident aircraft's maintenance history, the following programs, policies, and conditions should be considered for review:

1. Maintenance training program. Look at the in-house training program for engine, airframe and systems, to include curriculum, instructor qualification/training, participation percentage, recurrent training, training on special systems, and record-keeping. Determine percentage of participation in manufacturer's resident training courses. Interview workers to get their opinion of initial and recurrent training. Also look at the in-house training of maintenance inspectors.

2. Environmental conditions/human factors. Evaluate the work conditions for line and hangar maintenance personnel (day and night shifts). Take a look at lighting, temperature, ventilation, dryness, noise, hazards (e.g., weak or unstable work scaffolds), size and roominess of work area, hazardous waste collection and disposal. Review assigned shift consistency, amount of overtime, and rest break adequacy. Interview workers to get their opinion about relationships with supervisors, management, parent company, and unions. Get the workers' opinions on the clarity of manuals, work cards, and oral instructions. Coordinate with AS-50 for support and guidance in this effort.

3. Shift-change program. Determine how workers on the oncoming shift know where the previous shift left off in the performance of any uncompleted maintenance tasks. Ensure the program is really being used and that it identifies any components or hardware disconnected or removed simply to gain access to the component being worked on.

4. Reliability program. How does the operator identify and track repeat writeups, line and hangar maintenance rejects (completed maintenance tasks that were determined to be unacceptably performed at inspection sign-off), and part infant mortality (i.e., parts determined to be unairworthy when received new from the manufacturer). Get a copy of the operator's FAA-approved program.

5. Tool control program. Determine how personal and company-owned tools are accounted for after each shift change. Determine how a tool is tracked when temporarily at another base. Review procedures followed when a tool appears to be missing. Find out what type of inspection the operator performs to make sure personal tool boxes do not contain loose, excess, or unapproved hardware.

6. Supplemental Structural Inspection Program (SSIP). Review the operator's corrosion prevention control program. Make sure the required reports are being sent to the Aircraft Certification Office (ACO) and manufacturer for findings of level 2 and 3 corrosion. Review the aging aircraft inspection status sheet for the fleet.

7. Repetitive inspection program. Acquire a copy of the component repetitive inspection list for the model of aircraft involved in the accident. Review the program to ensure that all components for the accident aircraft are being inspected at required intervals.

8. Parts receiving program. If a specific off-the-shelf part is suspect, review the program by which the operator receives, inspects, and incorporates parts into its system. Review the documentation to make sure that the suspect part was "approved" and "airworthy" when installed on the aircraft.

9. Functional check flight (FCF) program. Determine what type of maintenance actions require an FCF. Review the operator's program for FCF pilot qualification, maintenance technician participation and qualification, flowchart/checklist usage, and documentation of data and final airworthiness determinations.

10. Foreign object damage (FOD) program. Review program for hangar and line maintenance. Determine if the program is actually being used.

Review of FAA surveillance for Program Tracking and Reporting System (PTRS) oversight (operator or Part 145 repair station)

1. Look at the work program of the principal maintenance inspector (PMI). Document the extent of the PMIs responsibilities, percentage of time spent with this operator, percentage of time spent in each major area, and any assistance provided by other inspectors (to

included geographic inspectors). Evaluate the qualifications and experience of the PMI and any assigned assistant PMIs. Included in this review the subject individuals' pre-FAA maintenance experience.

2. Review the reports from the PTRS to document the PMIs required inspections, inspection status, inspection information/comments, and any trend data for this operator. Review any action letters between the PMI and the operator.

3. For an operator, review reports from the last National/Regional Aviation Safety Inspection Program (NASIP or RASIP). Review any recent Department of Defense inspection reports generated as part of the Civil Air Reserve Fleet (CRAF) program.

4. Interview line-maintenance workers, hanger-maintenance workers, and local FAA inspectors not associated with the involved operator to get insight into the PMI's working relationship with the operator's supervisory maintenance personnel.

Review of FAA surveillance for Air Transport Oversight System (ATOS) carrier

1. Document by name and position the makeup of the FAA ATOS maintenance certificate management team for the subject carrier. Include in this list all geographic inspectors assigned to provide oversight of this operator. Determine the extent of the PTRS responsibilities assigned to these geographic inspectors by their respective FSDOs.

2. Review the most recent Safety Attribute Inspection and Element Performance Inspection. You may want to look at the related System Safety Analysis Tool and Air Carrier Assessment Tool.

3. Interview the data evaluation program manager and the analyst to determine if there are current negative trends that have not yet shown up in ATOS reporting and evaluation program reports.

4. If this carrier has been in operation for 5 years or fewer, interview the associated representatives from the Certification, Standardization, and Evaluation Team to determine if there are oversight issues that have been identified but not yet adequately addressed by the Certificate Management Office (CMO).

The maintenance group report should cover at a minimum:

- Type of maintenance program
- List of documents reviewed
- Historical data on aircraft and engines
- Serial numbers
    a. Times
    b. Times since last major inspections
    c. Times since last line checks

d. Selected maintenance actions and/or discrepancies which may be relevant to findings or issues developed by other groups.

13. If the field notes are compiled at a site remote from the IIC and command post, the draft report should be faxed to the IIC for his concurrence before the maintenance records group or key records are released.

OPERATIONS GROUP

During the initial organizational meeting, the operations group chairmen should instruct the participants to pick up any papers, documents, or manuals from the accident site and forward them to the operations group, which will review this material for its relevance to the investigation. This group's chairman should also coordinate with the appropriate group (usually, the structures group) in documenting the identification, location, and weight of the cargo and passenger baggage on board the aircraft. To the extent possible, the material should be returned to its pre-accident condition before weighing.

The operations group chairman should also coordinate with the appropriate group (usually, the systems group) in documenting the cockpit environment and should confirm that the cockpit area will not be moved or violated pending its full documentation. If the cockpit area is being documented, the assistance of those who are qualified and proficient in the design and operation of the aircraft (e.g., representatives from the airline, the aircraft manufacturer, and the FAA) should be enlisted . In documenting the cockpit, the group should:

1. Take copious notes of the observations and have the participants sign the notes in agreement

2. Take photographs, if possible

3. Obtain the aircraft flight manual for reference

4. Obtain and document the contents of the flight crew's flight cases and personal/overnight luggage. Have a representative of the airline, union (if applicable), and the FAA present during this activity.

5. Retrieve any and all copies form police/port authority/FBI interviews that may have been conducted prior to NTSB involvement.

History of Flight

The following information should be collected to document the history of the flight:

1. Name(s), address, and telephone number of owner and operator of the aircraft

2. Type of aircraft

3. Registration number and serial number

4. Flight number(s)

5. Type of operation (i.e., 14 CFR Part 121, 125, 129, or 135)

6. Date, time, and location of accident site (latitude, longitude, and elevation). Distance from departure or destination

7. Last point of departure. Obtain block in/out and takeoff time.

8. Intermediate stops. Obtain block in/out and takeoff time.

9. Point of intended landing

10. Diversionary landing site, if applicable

11. Dispatch release. Review the original and obtain a certified copy.

12. Weather information provided to the crew. Review the original and obtain a certified copy. Request a statement of the weather briefing that was given, if applicable.

13. Flight plan filed with the FAA. Review original and obtain a certified copy.

14. Clearance received. Obtain certified transcript. Listen to original recording if no ATC group assigned.

15. Route and altitude actually flown and normally flown/assigned. Crew familiarity with each route.

16. En route company and ATC radio contacts (facility and frequency). Obtain certified transcripts and recordings.

17. Flight plan log. Review the original, if available, and obtain a certified copy.

18. Aircraft maintenance log. Review the original and obtain certified copies, as required, of writeups entered during the previous 72-hour period, checking for conditions that could affect the performance of the aircraft and/or the ability of the flight crew to perform their duties. Maintenance records groups will view more extensively.

Weight and Balance

The operations group should complete the following items to verify the aircraft's weight and balance:

1. Weight and Balance Form. Review the original document and obtain a certified copy. Perform manual weight and balance and compare with automated results. Validate the authorization for actual vs. standard weights. Weigh the cargo and passenger baggage, if applicable.

(3) Cargo manifest. Review for type, labeling, placement, and means of securing cargo, especially hazardous cargo, as applicable to the situation. Review original documents and obtain certified copies.

(4) Passenger manifest.

(5) Fuel and oil record. Review original documents, if available, and obtain a certified copy. Compare data with quantities verified or stated to be on board the aircraft. Check with airport authorities for previous problems with fuel and/or the fueling facility. Verify the security of fuel samples for future analysis. (See Airport section).

(6) Method of mean aerodynamic chord (MAC) or center of gravity (cg) computation. Verify by manual and automated method, if applicable.

(7) Weight and balance manual used by airline. Compare with manufacturer and FAA approved data.

(8) Aircraft limitations. Compare airline, manufacturer, and FAA approved data.

Aircraft Performance

Per evidence and company standard operating procedures (SOP), the operations group should determine the following:

1. For Takeoff and Landing

    a. Flap and trim settings
    b. Reference V speeds. (atmospheric adjustments)
    c. Takeoff and go-around engine pressure ration (EPR)

2. En route

    a. Engine power schedules for climb, cruise, and descent
    b. Airspeed (indicated) schedules for climb, cruise, and descent

Air Carrier Information

The operations group should collect the following information regarding the air carrier:

1. Size and scope of operation

    a. Number of personnel, aircraft and size of route structure
    b. Standardization of aircraft fleet

2. Copy of operations certification

3. Copy of operations specifications. Waivers and amendments to the operations specifications.

4. Operations manual. Compare with operating procedures of the airline with the procedures recommended by the manufacturer and the FAA.

5. Aircraft flight manual. Compare the checklist in the company flight manual with the checklist actually used by the flight crew and the one published by the manufacturer.

6. En route, Standard Terminal Area Arrival Route (STAR), Standard Instrument Departure (SID), terminal, and approach charts used by flight crew. Determine if each crewmember was provided with his/her own.

7. Training program. Obtain training program and syllabus. Confirm FAA approval of training program. Indicators that assist in determining the quality and effectiveness of the program include the establishment of a training directorate within the airline, programs incorporating stabilized approach criteria, and cockpit resource management (CRM). Compare the policy and procedures of the operations manual with the training manual/program for continuity. Document the background and qualifications of company training personnel.

8. The airline's safety office/directorate (if applicable). Determine its authority and ability to impart safety enhancements to the flight operations. In the absence of such an entity, determine which person and/or department is delegated this responsibility and conduct interviews.

9. Company pilot bulletins or reading file. Review for data that may be relevant to the circumstances surrounding the accident/incident.

10. Dispatch and/or flight following. Determine size and scope of the dispatch or flight following function. Compare the duties and responsibilities of this function as stated in company documents with the FARs. Compare the background and qualifications of dispatch/flight following personnel with the FARs. Determine dispatch/flight following procedures.

    a. Weather briefings

        1. Review original data provided and obtain certified copies
        2. Determine source of data and method provided

    b. Flight planning forms

    c. Computer flight plan

d. Fueling record

e. Method of flight following. Advisories issued.

Flight Crew Information

1. Confirm the extent of the pre-employment checks that were performed on the flight crewmembers

2. Request and obtain FAA "blue ribbon" certification and medical packages and violation data. Confirm that the human performance group or specialist has requested the flight crew's state driving records.

3. Review company personnel files and employment history for trends (both positive and negative) that may be relevant to the investigation. This includes violations and commendations, absenteeism, and any extended periods between employment. Obtain names, addresses and telephone numbers of previous employers and physician(s) who were used for the FAA medical. Also look for possibly non-flight related events. Obtain certified copies.

4. Obtain copies of FAA pilot certificates and ratings held from company files

5. Obtain copies of medical certificates and related information from company files and compare to FAA data.

6. Training records. Review the training records to determine the quality and quantity of training given and remarks noted by the instructor. If possible, request that the instructor and pilot sign and date the forms attesting to the training given. On occasion, it may be prudent to compare the signatures of the pilot and instructor and the training documents with other sources such as payroll records and driver's licenses.

   a. Review the training records for initial, line (en route), 6 months proficiency, and annual/recurrent including ditching and emergency. Obtain certified copies.

   b. Initial focus should be on specific areas of training that on the surface may appear to be relevant to the investigation.

   c. Information that should be available and obtained from the personal, training, and flight records of each cockpit crew member includes:

      i. Date employed
      ii. Date upgraded to present position
      iii. Date upgraded to present position in particular equipment
      iv. Total pilot time

v. Total pilot time (flight and duty) last 24 hours, 72 hours, 30 days, 60 days, and 90 days
vi. Total instrument time, if available
vii. Total instrument time in type, if available
viii. Total night time, if available

7. Recency of experience with airport and approach procedure

8. Previous experience of flight crew in flying with one another

Airport Information

1. Obtain latest copy of airport master record (Form 5010) and airport planning chart

2. Latest report of FAA annual inspection

3. NOTAMs (class D, L, and FDC)

4. Construction on airport property and surrounding area

5. Inspection results on the condition of airport surface(s)

6. Local obstructions

7. Waiver of Part 77

8. Condition of airport lights and radio aids

9. Aerial photos, topographic charts

10. ATC information if no group assigned

11. Weather information, if no group assigned

12. Obtain fuel specimens for analysis

In the absence of a survival factors group, the operations group will address the following crash and rescue activities in addition to those listed above:

1. Time and method notified

2. Response time

3. Number and types of units responding

4. Fire fighting time

5. Rescue activities

6. Pictures of accident scene and cabin

7. Problems with terrain/visibility/route to accident

8. Problems with access to wreckage/passengers and crew

9. Type and quantity of fire fighting compounds used

10. How, when, and by whom security was established

11. Crowd control problems

12. Facility station log

13. Last disaster drill

14. Accident report from fire station(s) and security.

Federal Aviation Administration Information

1. Inspections planned or performed on the airline during the previous 12-month period including base, ramp, en route, ground and flight training program, crewmember; dispatcher records (including flight and rest), trip records, dispatch center/flight following/flight/locating facility. Obtain certified copies. (Planned inspection dates can be obtained from the FSDO work plan for the airline.)

2. Obtain any special safety inspection reports that were performed.

3. Latest regional aviation safety inspection program (RASIP). Obtain a certified copy.

4. Latest national aviation safety inspection program (NASIP) performed. Obtain a certified copy.

5. Frequency of surveillance. Compare the number and types of inspections performed with regional and national inspections guidelines.

6. Background, qualifications, and workload of Principal Operations Inspector (POI).

7. Authorized and current staffing level of district office.

8. Most recent pre-accident/incident flight inspection and post flight inspection results of pertinent en route and approach facilities/aids. Obtain certified copies.

9. Most recent pre-accident/incident airways facility inspection and post inspection or pertinent en route and approach facilities/aids. Obtain certified copies.

Review of FAA surveillance for Program Tracking and Reporting System (PTRS) oversight of carrier.

10. Look at the program of the POI. Document the extent of the POI's responsibilities, percentage or time spent with this operator, percentage of time spent in each major area, and any assistance provided by other inspectors (to include geographic inspectors). Evaluate the qualifications and experience of the POI and any assigned POIs or Aircrew Program Managers (APM). Include in this review the subject individual's pre-FAA operational experience.

11. Review the reports form the PTRS to document the POI's required inspections, inspection status, inspection information/comments, and any trend data for this operator. Review any action letters between the POI and the operator.

12. For an operator, review reports form the last Department of Defense inspection reports generated as part of the Civil Air Review Fleet (CRAF) program.

Review of FAA Surveillance for Air Transport Oversight System (ATOS) carrier

13. Document by name and position the FAA ATOS operations certificate management team for the subject carrier. Include in this list all geographic inspectors assigned to provide oversight of this operator. Determine the extent of the ATOS responsibilities assigned to these geographic inspections by their respective FSDOs.

14. Review the most recent Safety Attribute Inspection and Element Performance Inspection. You may want to look at the related System Safety Analysis Tool and Air Carrier Assessment Tool.

15. Interview the data evaluation program manager and analyst to determine if there are current negative trends that have not yet shown up in ATOS reporting and evaluation program reports.

16. If this carrier has been in operation for 5 years or fewer, interview the associated representative from the Certification, Standardization, and Evaluation Team to determine if there are oversight issues that have been identified but not yet adequately addressed by the Certificate Management Office (CMO).

Interviews

Guidance on conducting interviews can be obtained in the section on Witness Group responsibilities. Generally, the NTSB Operations group chairman will conduct the interview and Operations Group members will record notes of responses. An opportunity should be provided for members to ask a limited number of follow-up questions.

Questions Relating to Flight crew:

a. Events leading up to the flight in question.
b. History of the flight.
c. Operating procedures and techniques.
d. Training.

The interview should include questions of the following information or personnel:

(1) Seat belt and shoulder harness security before and after impact.
(2) Difficulty in releasing restraints.
(3) Seat adjustment position.
(4) Seat security after impact.
(5) Difficulties during egress.
(6) Aid given to flight attendants and passengers.
(7) Meals taken during the previous 24 hours.
(8) Off duty activities during the previous 24 hours.
(9) Description of injuries and how they were attained.
(10) All of the above as applicable to the flight attendants.

e. Cabin crew.
f. Other crew members who have flown with the accident crew.
g. Crews operating in the vicinity of the accident flight.
h. Families of the cockpit crew members.
i. Dispatchers/flight following personnel.
j. Other flight operations personnel who came in contact with the flight and/or cockpit crew.
k. Ramp personnel, counter personnel, etc.
l. Flight (cockpit) personnel who flew the aircraft prior to the crew involved in the mishap.
m. ATC controllers if no group assigned.
n. Training instructors and check airmen.
o. FAA POI.
p. Witnesses, if no group assigned.
q. Passengers, if no group assigned.

NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety — Operational Factors

Accident / Incident Investigation Support – Field Phase

HISTORY OF FLIGHT / BACKGROUND						
	NTSB Accident ID					
	Accident Location/Date/Time (Local)					
	Date/Time (UTC)					
	Daylight or Darkness?					
	Flight Number					
	Airplane Specific Type					
	Registration / Serial Number					
	Engine Manufacturer / Model					
	Company Call Sign					
	No. of OccupantsFlight Crew/Cabin Crew/Pax					
	Jumpseat Rider Name(s)					
	Type of Operation CFR Part					
	Flight Plan Routing Filed with the FAA					
	Departure Point & Times ID/On/In/Out/Off					
	Intermediate Stop & TimesID/On/In/Out/Off					
	Intermediate Stop & TimesID/On/In/Out/Off					
	Intermediate Stop & TimesID/On/In/Out/Off					
	Destination/Alternate					
	Clearance Received vs. Planned					
	Route/Altitude Flown					
	Document Cockpit Switches & Gauges					
	Retrieved Docs/Manuals from Accident Site					

	OPERATOR / COMPANY		
	Name		
	Address Line 1		
	Address Line 2		
	City		
	State/Zip		
	Phone		
	Total Number of Employees		
	Number of Flight Crewmembers		
	Number and Types of Airplanes		
	Crew Bases		

	CAPTAIN	
	Full Name	
	Date of Birth	
	Date of Hire	
	Date Originally Upgraded/Transitioned to Captain Position	
	Date Upgraded/Transitioned to Captain on This Airplane	
	Total Flying Time	
	Total PIC Time	
	Total Time in Type	
	Total PIC Time in Type	
	Total Flying Time Last 24 Hours	
	Total Flying Time Last 30 Days	
	Total Flying Time Last 60 Days	
	Total Flying Time Last 90 Days	
	Total Flying Time Last 12 Months	
	Date of Initial Type Rating on This Airplane	
	Date of Most Recent Recurrent Ground Training	
	Date of Most Recent Proficiency Check	
	Date of Most Recent PIC Line Check	
	Document Crew Bag Contents	
	72-Hour History	

	FIRST OFFICER	
	Full Name	
	Date of Birth	
	Date of Hire	
	Date Originally Upgraded/Transitioned to First Officer Position	
	Date Upgraded/Transitioned to First Officer on This Airplane	
	Total Flying Time	
	Total PIC Time	
	Total SIC Time	
	Total SIC Time in Type	
	Total Flying Time Last 24 Hours	
	Total Flying Time Last 30 Days	
	Total Flying Time Last 60 Days	
	Total Flying Time Last 90 Days	
	Total Flying Time Last 12 Months	
	Type Rated in This Airplane? If so, Date	
	Date of Most Recent Recurrent Ground Training	
	Date of Most Recent Proficiency Check	
	Date of Most Recent SIC Line Check	
	Document Crew Bag Contents	
	72-Hour History	

	FLIGHT ENGINEER	
	Full Name	
	Date of Birth	
	Date of Hire	
	Date Originally Upgraded/Transitioned to Flight Engineer Position	
	Date Upgraded/Transitioned to Flight Engineer on This Airplane	
	Total Flying Time	
	Total F/E Time	
	Total F/E Time in Type	
	Total Flying Time Last 24 Hours	
	Total Flying Time Last 30 Days	
	Total Flying Time Last 60 Days	
	Total Flying Time Last 90 Days	
	Total Flying Time Last 12 Months	
	Date of Most Recent Recurrent Ground Training	
	Date of Most Recent Proficiency Check	
	Date of Most Recent F/E Line Check	
	Document Crew Bag Contents	
	72-Hour History	

	WEIGHT & BALANCE / PERFORMANCE	
	Basic Operating Weight	
	Passenger Weight	
	Baggage/Cargo Weight (Shown on Form)	
	Baggage/Cargo Weight (Actual Wreckage)	
	Zero Fuel Weight	
	Maximum Zero Fuel Weight	
	Fuel Weight	
	Ramp Weight	
	Maximum Ramp Weight	
	Taxi Fuel Burn	
	Actual Takeoff Weight	
	Maximum Takeoff Weight	
	Estimated Fuel Burn to Accident Site	
	Estimated Landing Weight	
	Maximum Landing Weight	
	CG	
	CG Limits	
	Takeoff Stab Trim	
	Takeoff Flap Setting	
	Takeoff Speeds (V_1 V_R V_2)	
	Landing Flaps	
	V_{REF}	

*Manufacturer's Airplane Flight Manual Limitations

**Based on FL_____, the actual en route flight altitude.

NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety — Operational Factors

Accident / Incident Investigation Support – Field Phase

Please supply copies, or arrange for, the items checked below:

	HISTORY OF FLIGHT / BACKGROUND	DATE	ASSIGNED TO	✓
	Dispatch/Flight Release			
	Fuel Uplift Records			
	Weather Information/Briefing			
	NOTAMs			
	Computer Flight Plan			
	Weight & Balance/Load Manifest			
	HAZMAT Records			
	MX Log Pages/MEL Items (Prior 72 Hours)			
	Documentation of Flight Crew flying with one another Previously			
	ACARS or Other Company Communications			
	Dispatcher/Flight Follower Flight Control Log			
	FMS Database (Inactive and Active) in Readable Form			
	Deice record			
	Navigational Charts and Approach Charts			
	List of Pilots that Flew the Accident Airplane during 2 Days Preceding the Accident Flight			

NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety — Operational Factors

Accident / Incident Investigation Support – Field Phase

Please supply copies, or arrange for, the items checked below:

	OPERATOR / COMPANY	DATE	ASSIGNED TO	✓
	Company History			
	Organizational Chart			
	Company Stock Report or 10k Form			
	Ops Specs (Including Waivers & Amendments)			
	General Operations Manual (GOM)			
	Airplane Operating Manual (AOM)			
	Quick Reference Handbook (QRH)			
	Checklists (Normal and Emergency)			
	Weight and Balance Manual			
	Weight and Balance Computation Forms (Blank)			
	Weight and Balance Computation Device or Computer			
	Performance Manual			
	MEL/CDL Manual			
	Training Program Manual			
	Dispatch/Flight Follower Manual			
	Runway Analysis Charts			
	Flight Ops “Read” File or Ops Bulletins			
	Flight Crew Bid Sheets (Current & Previous 2 Months)			
	Most Recent Department of Defense (DOD) Inspection Report and Findings			

NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety — Operational Factors

Accident / Incident Investigation Support – Field Phase

Please supply copies, or arrange for, the items checked below:

	CAPTAIN	DATE	ASSIGNED TO	✓
	State Driving Record			
	Training Records (Back to Date of Hire)			
	Flight/Duty Times (Past 7 Days)			
	Copies of FAA Airman Certificates			
	Copy of FAA Medical Certificate			
	Drug/Alcohol Test Reports			
	Personnel Records			
	Sick Leave Record			
	Record of Company Disciplinary Actions			
	Employment History			
	Record of Management or Check Airman Experience			
	Record of Experience with Airport			
	Record of Specialized Training (Special Airports, Special Navigation, etc.)			

NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety — Operational Factors

Accident / Incident Investigation Support – Field Phase

Please supply copies, or arrange for, the items checked below:

	FIRST OFFICER	DATE	ASSIGNED TO	✓
	Document Crew Bag Contents			
	State Driving Record			
	Training Records (Back to Date of Hire)			
	Flight/Duty Times (Past 7 Days)			
	Copies of FAA Airman Certificates			
	Copy of FAA Medical Certificate			
	Drug/Alcohol Test Reports			
	72-Hour History			
	Personnel Records			
	Sick Leave Record			
	Record of Company Disciplinary Actions			
	Employment History			
	Record of Management or Check Airman Experience			
	Record of Experience with Airport			
	Record of Specialized Training (Special Airports, Special Navigation, etc.)			

NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety — Operational Factors

Accident / Incident Investigation Support – Field Phase

Please supply copies, or arrange for, the items checked below:

	FLIGHT ENGINEER	DATE	ASSIGNED TO	✓
	Document Crew Bag Contents			
	State Driving Record			
	Training Records (Back to Date of Hire)			
	Flight/Duty Times (Past 7 Days)			
	Copies of FAA Airman Certificates			
	Copy of FAA Medical Certificate			
	Drug/Alcohol Test Reports			
	72-Hour History			
	Personnel Records			
	Sick Leave Record			
	Record of Company Disciplinary Actions			
	Employment History			
	Record of Management or Check Airman Experience			
	Record of Experience with Airport			
	Record of Specialized Training (Special Airports, Special Navigation, etc.)			

NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety — Operational Factors

Accident / Incident Investigation Support – Field Phase

Please supply copies, or arrange for, the items checked below:

	FAA	DATE	ASSIGNED TO	✓
	Copy of POI Work Plan Current Year			
	Copy of POI Work Plan Previous Year			
	POI Activities at OperatorLast 24 Months			
	All Inspections at OperatorLast 24 Months			
	Copy of Last Regional Inspection			
	Copy of Last National Inspection			
	Regional/National Inspection Guidelines			
	Blue Ribbon-Certification Captain			
	Blue Ribbon-Certification First Officer			
	Blue Ribbon-CertificationFlight Engineer			
	Blue Ribbon-Medical Captain			
	Blue Ribbon-Medical First Officer			
	Blue Ribbon-Medical Flight Engineer			
	ISIS and PTRS Captain			
	ISIS and PTRS First Officer			
	ISIS and PTRS Flight Engineer			
	Violations/Certificate Actions Captain			
	Violations/Certificate ActionsFirst Officer			
	Violations/Certificate Actions Flight Engineer			
	Violations/Certificate Actions Operator			
	ATOS Information			
	Latest Pre-Accident Flight Inspection of Pertinent En Route & Approach Facilities/Aids			
	Post Accident Flight Inspection of Pertinent En Route & Approach Facilities/Aids			
	ATC Tapes and Transcripts (If no ATC Group)			
	FSS Contacts/Briefing Report			

NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety — Operational Factors

Accident / Incident Investigation Support – Field Phase

Please supply copies, or arrange for, the items checked below:

	AIRPORT (If Applicable)	DATE	ASSIGNED TO	✓
	Latest Copy of Airport Master Record (Form 5010-1) and Airport Planning Chart			
	Latest Report of FAA Annual Inspection			
	NOTAMs (Class D, L, and FDC)			
	Construction on Airport Property and Surrounding Area			
	Inspection Results on the Condition of Airport Surface(s)			
	Local Obstructions			
	Waiver of FAR Part 77			
	Condition of Airport Lights and Radio Aids			
	Aerial Photos, Topographic Charts			
	ATC Information, If No Group Assigned			
	Weather Information, If No Group Assigned			
	Fuel Specimens for Analysis			

NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety — Operational Factors

Accident / Incident Investigation Support – Field Phase

Please supply copies, or arrange for, the items checked below:

	FIRE & RESCUE (If Applicable)	DATE	ASSIGNED TO	✓
	ARFF Location and Description			
	Time and Method Notified			
	Response Time			
	Number and Type of Units Responding			
	Fire Fighting Time			
	Rescue Activities			
	Pictures of Accident Scene and Cabin			
	Problems with Terrain/Visibility/Route to Accident Site			
	Problems with Access to Wreckage/Passengers/Crew			
	Type and Quantity of Fire Fighting Compounds Used			
	Security Established: How? When? By Whom?			
	Crowd Control Problems			
	Facility Station Log			
	Last Disaster Drill			
	Accident Report from Fire Station(s) and Security			

AIRPLANE PERFORMANCE GROUP

The Airplane Performance Group will be responsible for developing factual information and conducting studies related to airplane performance issues. Normally, a Performance Group will be convened for any major aviation accident. A Performance Group should be convened for accidents involving transport- and commuter-category aircraft in the following situations:

- runway overruns,
- landing undershoots,
- windshear events, and
- any accident or incident for which a performance factor might be suspected.

The initial task of the Performance Group is to define the motion of the airplane. The group will use all available data, including cockpit voice recordings (CVR), flight data recordings (FDR), recorded radar data, recorded air traffic conversations, photographs, video recordings, witness statements, ground scars, airplane damage, airplane configuration, weights and balance, airplane aerodynamic data, airplane performance data, engine data, and weather data. Normally, the next task is to determine the various events that could have produced the defined motion, events such as weather disturbances, engine anomalies, flight control deflections, and pilot actions.

The Performance Group will not meet until the FDR, CVR, and radar data are in a useable form and sufficient information is available from the field (usually several days after the accident occurred). The group is typically formed in Washington but may meet at the manufacturer's facility.

The Performance group chairman will typically go immediately to the accident scene on most major accidents. The purpose is to become familiar with all aspects of the accident before the start of the first Performance Group meeting. While on scene, the Performance group chairman will act as an advisor to the IIC on performance-related issues and may perform preliminary calculations related to subjects such as time/distance correlations, accelerate/stop distances, or trajectories of separated parts. The performance engineer may accompany other groups and assist in gathering performance-related material, such as ground-scar measurements, radar data, or maps. The Performance Group is particularly interested in ground-scar measurements from the first contact with objects to the point of principal impact. Members of the Performance Group may be identified to accompany the Performance group chairman on scene although the group typically will not be convened to perform on-scene duties.

The Performance group chairman may leave the scene early to start the formal group functions. Any data collected by the Performance group chairman will be documented in field notes and provided to the IIC for review before he/she is released from the on-scene investigation. In many cases, the Performance group chairman's field notes will need to be coordinated with other group chairmen to ensure consistency and completeness. In general, all standard procedures and practices for group chairmen will be adhered to for this group.

Parties shall be invited by the IIC, with representation based on investigative need as determined by the Performance group chairman. Every effort should be made to limit group participation to those representatives who are absolutely essential to the development of factual performance information. The purpose of group participation is to elicit the necessary assistance to develop factual data and conduct studies. As the factual report is developed, parties are urged to comment; however, the report's content will remain under the control of the group chairman.

The Performance Group members need to be performance engineers or the equivalent. At times, airlines or pilots' unions have requested that a pilot be on the group to interface with their performance engineers. Since the Performance group chairman will insist on a direct working relationship with the performance engineers, these types of arrangements will not work. However, in cases where small airlines may not have a performance engineer, a person from the airline may be allowed to participate with the group.

A. Simulations and Flight Tests

If the Performance Group determines that simulations or flight tests are required to develop the necessary factual information, the IIC will be notified and shall coordinate the request for such activity. The actual tests or simulations shall be supervised by the Performance group chairman.

B. Visibility Studies

The IIC shall determine the need for visibility studies early in the investigation. Much work is required to prepare for a visibility study, such as acquisition and processing of ATC radar data, processing flight recorder data, and acquisition and computer digitization of the appropriate cockpit binocular photographs. The lead time to perform all these tasks is considerable.

C. Video Animations

The Performance Group may be involved in developing data for video animations. There are two prime reasons to produce a video animation:

1. Large amounts of data can be presented on a video monitor so that more people can understand the available data.

2. Video animations depict the element of time, which is not readily apparent in other forms of data.

Simple animations are relatively easy to produce. Once the DFDR data are available, some of that data can be displayed immediately on the video monitor. That type of display may be useful to operationally oriented investigators. However, once the engineers start adding ground tracks or airport scenes, the workload increases dramatically.

D. Global Positioning System (GPS)

The Board has numerous GPS receiving units that may be used in the field. In addition, the lab has a more sophisticated GPS unit that may be used for sub-meter measurements.

POWERPLANTS GROUP

The Powerplants Group is responsible for the documenting the engines, propellers, engine-related components, and auxiliary power units. Depending on the efforts or participation of the Structures and Systems Groups, the Powerplants Group might also document the engine nacelles and/or thrust reversers.

Initial investigative efforts should be focused on documenting evidence associated with the normal operation of the engine(s). A determination of normal engine operation at impact is most helpful for the investigation and can save needless documentation, tests, and analysis later on. Operating engines, especially at high power, may leave evidence such as propeller blade cuts in the ground or trees; efforts to document this evidence should be made before disturbing the accident site. If evidence suggests that the powerplant may be a causal factor, look for evidence of preimpact fire, uncontained failures, or separation of engine or engine-related components.

As the investigation progresses, the integrity of the engine, mounts, engine and propeller controls, and fuel and oil supply systems should be documented through visual examination or borescoping before disturbing the wreckage. Any potentially relevant and recoverable recorders/computers with nonvolatile memory of engine/system parameters and in-flight faults should be recovered for examination and potential data retrieval, regardless of their apparent condition. If conclusive evidence of normal engine operation before impact cannot be documented onsite, additional testing, disassembly, or laboratory examination may be required.

Document engine-related components relative to aircraft structure and to initial point impact. Include final position of each engine relative to the normal position of the engine. If parts were liberated before ground impact, document engine part distribution and path. Identify and tag all engine and engine component model and serial numbers as shown on data plates or by other identifying marks. Also document in-flight and ground fire damage.

The following is a working list of documentation items for the Powerplants Group.

A. Turbine Engine (Inlet, compressor, combustor, turbine, systems, accessories and components).

1. Inlet

a. Debris, mud distribution, foreign object damage, or ice ingestion damage; scrapes and scratches and their location inside the inlet. (Objects ejected from a rotating engine sometimes leave helical tracks as they fly forward.)

b. Bird or animal remains; if found, may be sent to an appropriate laboratory for further analysis.

2. Compressor

a. Degree, uniformity, and direction of rotor blade airfoil bending, leading/trailing edge blade breakage, and any rub marks on the leading and/or trailing edges of the blades; suspicious blade, disk, or shaft fractures.

b. Blade integrity or damage and, if visible, uniformity of mud coating on stators, blades, and cases (using borescope through bleed ports or inspection plates).

c. Inlet guide vane (IGV) damage. If engine utilizes variable IGVs, check inlet case and/or stator vane actuators for impact markings to determine stator position at impact.

d. Anti-ice valve positions and appropriate anti-ice plumbing.

e. Nose cone damage, displacement and condition of PT2 or TT2 probes. (PT2 and TT2 probes should be unobstructed and have anti or deice systems intact.)

f. Oil leakage in the vicinity of the front bearing.

g. Degree of compressor rotation or binding.

3. Combustor

a. Integrity of combustor mounting structure.

b. Combustor burn-throughs, blow outs, and large cracks. Combustors can sustain many small cracks without performance degradation. Note if distress is immediately downstream of a fuel nozzle.

c. Condition of fuel nozzle. Note any obstructions on the nozzle that may distort or disrupt spray pattern. Even minute "streaking" of spray pattern can lead to severe burner and turbine distress downstream of the nozzle.

d. Condition of igniter.

4. Turbine

a. Physical condition of all visible stages of blades and stators, including degree and direction of rotor blade bending, leading and trailing edge blade damage, rub or scrape marks, and any debris.

b. Evidence of overheat in first-stage nozzle guide vanes. Note any molten metal impinged on vanes.

c. Damage to pressure and temperature exhaust probes, cones, and struts.

d. Evidence of leakage in area of rear turbine bearing.

e. Degree of turbine rotation.

f. Twisting or bending or shaft (if visible).

5. Systems, Accessories, and Components

a. Oil

(1). Condition of engine/CSD oil, magnetic plugs in gearbox, and oil scavenge lines.
(2). Obtain oil sample from lubricating tank. Compare to previous oil samples from same engines.

b. Fuel

(1). Main fuel and fuel control filters.
(2). Fuel control linkage positions, integrity, and continuity and freedom of linkage movement. Presence of fuel in control.
(3). Obtain fuel sample

c. Bleed and Breather Air

(1). Major damage or disruptions to bleed ducts and breather tubes.
(2). Aircraft/engine bleed systems for evidence of ingestion of dirt, vegetation, or debris (might provide indication of engine speed, EPR, and thrust by relating individual engine bleed operating schedules (i.e., starter, surge, air conditioning) to bleed locations where ingested material was found.

d. Accessories

(1). Accessory gear box and tower shaft integrity (attempt to rotate N_2 rotor by means of the starter drive pad or other accessory drive pad).
(2). Check starter for evidence of in-flight engagement and possible disintegration.
(3). Check generator or alternator for evidence of high electrical loads.

e. Components

(1). Damage or displacement of various attached components and wiring.
(2). Surge bleed valve position.

B. Reciprocating Engines (Power section, Induction and Exhaust system, Accessory section)

1. Power Section

a. Impact damage and evidence of pre-impact damage to each cylinder.

b. Freedom of crankshaft rotation. If feasible, remove damaged cylinders or other obstructions to crankshaft rotation.

c. Condition of valves and piston heads, especially for indications of detonation or pre-ignition (as necessary, by borescope)

d. Remove rocker box and pushrod covers and, if possible, rotate engine to observe valve motion. Examine rocker arms, pushrods, springs, and valve keepers for breakage and wear.

e. Check compression. If necessary, remove a representative number of cylinders to determine internal condition/power train continuity within the engine.

f. Leak-check removed cylinders by placing upside down and filling with kerosene. (No leakage should be present.) Intake/exhaust valves should not be damaged.

g. Uniformity of pistons; if necessary, clean and weigh pistons. Check piston rings for movement. (Rings should not be loose, rounded, or frozen.) Note condition of cylinder walls for piston ring marks, scrapes, etc.

h. Amount of wear on crankshaft counter weight dampers, if abnormal.

2. Induction and Exhaust Systems

a. Induction system blockage.

b. Impellers/blowers (for turbo or supercharged engines). Evidence of internal blower fire, decoupling, and/or rotational scoring. Clutches and linkages of blower controls. Oil leakage at impeller seals and inside the intake pipes. (Oil deposits indicate seal leakage and may result in heavy gray or white smoke.)

c. Carburetor, position of carburetor heat door (if installed). Examine carburetor for fuel in the bowl, float level, and general condition of jets.

d. Condition of inlet air scoops, carburetor air screens.

e. Security, rigging, and position of carburetor linkages (OFF, AUTO-LEAN, AUTO-RICH)

f. Bends and folds in exhaust pipes.

3. Accessory Section

a. Fuel pump, freedom of rotation, and evidence of rotational scoring on gear housing pockets. Integrity of drive splines and coupling shafts.

b. For fuel injected engines, examine the master control, vapor vents, boost, and venturi suction.

c. For twin row fuel injection engines, examine condition of flow dividers and synchronization of injection pumps.

d. Evidence of fuel leaks, condition of injector lines, and condition of control diaphragms and diaphragm actuating devices.

e. Operation and security of fuel discharge valves.

f. Integrity and continuity of tank-to-engine fuel lines.

g. "As found" positions of the main engine, fuel, crossfeed, and firewall shutoff valves.

h. Obtain fuel samples from aircraft fuel tanks, pumps, and lines, and from fuel source tanks or trucks, as required. If necessary, obtain fuel samples from other aircraft which were refueled from the same sources.

i. Examine oil filters for contamination and proper installation.

j. Oil pressure relief valve position.

k. Oil type and quantity. Obtain oil sample if possible.

l. Integrity and condition of oil lines. (If collapsed or kinked, determine if this is pre-impact condition.)

m. Magnetic sump plugs.

n. Condition of oil pump, ability of gear drive to rotate, and evidence of rotational scoring.

o. Oil tank and cooler condition, proper installation, and condition of vents.

p. Spark plugs, ignition harness/wires, magnetos, coils, rotor caps, distributor electrodes.

C. Propellers

1. Blade condition, blade angles.

2. Associated hydraulic/electrical/mechanical controls for each propeller.

3. Presence and spacing of any propeller slash marks.

4. Propeller governors

D. Auxiliary Power Unit (APU)

Documentation and investigation of APUs will follow the general guidance provided for turbine engines.

E. Nacelles (coordinate with Structures Group)

1. In-flight and ground fire damage, include sooting or scorching on adjacent surfaces.

2. Punctures or penetrations caused by liberated engine parts.

3. Integrity and security of cowl latches.

4. Mud and debris forced into inlet cowl, or between engine accessories, and cowl pan els.

5. Position of flap and cooling door actuator shafts.

6. Major scrapes and penetrations by external foreign objects (e.g., trees).

F. Thrust Reverser (coordinate with Structures and Systems Groups)

1. Post-impact position (i.e., stowed, or amount deployed) as indicated by reverser lock latches and reverser actuator positions.

2. Operating mechanisms to determine if the final position of the reverser was due to crew actions or impact forces.

3. Impact and/or fire damage to the entire assembly including the linkages.

STRUCTURES GROUP

The Structures group chairman will usually be the point-of-contact for on-site activities. As such, he will oversee and coordinate on-site activities and assure security of the wreckage during the on-site investigation. The initial on-scene responsibilities of the Structures group chairman should include restricting access to the wreckage and ensuring that the accident site is well secured. Depending on the location of the wreckage, this may include roping or marking off the area and utilizing security guards as necessary. Arrangements should be made to restrict access to the wreckage to only those who have proper authorization. Access to the wreckage will be typically be controlled by the use of "Access to Wreckage" badges. The Structures Group might assist in locating and retrieving the cockpit voice and flight data recorders. Special care may be required to maintain the integrity of the recorders.

Basically, the Structures Group will be responsible for accounting for the total aircraft structure, documenting the aircraft damage/wreckage, and determining the pre-accident integrity of the aircraft.

The responsibilities of the Structures Group will often overlap those of other groups, especially the Systems, Performance, and Survival Factors groups. In absence of a specific agreement with another group, the Structures Group will be responsible for documenting the overall wreckage distribution and condition, relevant impact marks, and other evidence of the path of the aircraft immediately preceding impact. Coordination with other groups will be necessary during preparation of field notes and throughout the investigation.

The Structures group chairman will normally be in charge of the wreckage throughout the on-site investigation activities. He should be consulted before any wreckage is moved and should ensure that minimal damage occurs if and when it is to be moved. It may also be his/her responsibility to authorize the release of the wreckage at the end of the field phase of the investigation. Arrangements to revisit the wreckage should always be discussed in the event that additional, future documentation is necessary. Wreckage release will be to the owner or their authorized representative.

The Structures group chairman should emphasize the importance of taking proper safety precautions throughout the investigation. This will include the use of protective gear (gloves, masks, boots); the discharge of pressurized components (tires, struts, oxygen bottles); and the elimination or minimization of ignition sources (smoking, cutting equipment). Moreover, before any investigative effort is allowed to begin, the Structures group chairman should assist in identifying whether any hazardous materials are on board the aircraft or whether the area is unsafe for any reason. If so, the proper officials should be notified and the area decontaminated before any investigative work is conducted at the site.

A. Visual Survey of Crash Site and Surroundings

1. Conduct "walk-around" inspection (arrange for aerial view if necessary)
2. Note general wreckage distribution

3. Check for and document extremities of the aircraft, condition of leading edges, and evidence of pre-impact aircraft configuration
4. Determine pre-accident integrity of the aircraft
5. Document impact attitude (heading, flight path, etc.) and crushlines
6. Document pre-impact strikes on surrounding obstacles.
7. Document fire patterns and damage
8. Formulate general plan of investigation

B. Wreckage Distribution

1. Determine method of obtaining data
    a. Global Positioning System (GPS) unit
    b. Surveyor
    c. Laser transit
    d. Tape measure, compass, etc
2. Determine appropriate plotting method
    a. Airport or local map
    b. Centerline
    c. Grid
    d. Polar
3. Establish location
    a. Latitude/longitude
    b. Elevation
    c. Terrain characteristics
4. Obtain maps, charts, and aerial photographs
5. Identify group member(s) to help in identification of parts
6. Information required
    a. Note initial impact marks and heading
    b. Note major ground scars (direction, length, depth, etc.) and obstacles struck
    c. Location of significant pieces (control surfaces, cockpit, engines, "four corners of aircraft," etc.)
    d. Limits of ground fire
    e. Necessary terrain features and elevations
    f. Photograph or videotape all pertinent items
7. Numbering of Pieces
    a. Tag/identify/number parts -- include ground scars and obstacles struck
    b. Number all main parts in succession from a reference point or number opposite sides of the centerline in succession (i.e., 1L, 2L; 1R, 2R)
    c. While numbering important pieces, document the way their orientation and evidence of fire, impact angles, etc. (sketch as necessary)

C. Detailed Examination

1. Define piece/component and note its position and condition

2. Document evidence relevant to possible in-flight failure (separate ground impact damage from in-flight failure)
3. Document failure mode and sequence of failure
    4. For structural failure, document fracture characteristics
5. Determine aircraft condition at impact
    a. Control surfaces
        (1) Ailerons
        (2) Trailing edge flaps
        (3) Leading edge devices (flaps or slats)
        (4) Spoilers
        (5) Elevator
        (6) Rudder
        (7) Trim tabs
        (8) Other (canards, variable geometry, etc.)
    b. Control systems (coordinate with Systems Group)
        (1) Position of control surface at impact (jackscrews, actuating cylinders, etc.); look for witness marks
        (2) Examine all movable mechanisms for integrity prior to impact
        (3) Trace control systems from cockpit to control surface for integrity
        (4) Measure travel of rudder, ailerons, and elevator
    c. Fuselage - note telescoping, crushing, breaks
        (1) Cockpit
        (2) Entry/exit doors, emergency exits, and cargo doors (jammed, inoperable, etc.)
        (3) Fuel tanks
        (4) Windows (cracked/crazed, blown out, fracture patterns, etc.)
    d. Wings
        (1) Evidence of pre-impact marks or damage
            (2) De-icer or anti-ice systems
        (3) Fuel system (tanks, vents, dump) for integrity or evidence of leakage
    e. Empennage
        (1) Pre-impact strikes
        (2) De-icer boots
    f. Landing gear
        (1) Position
        (2) Direction of failure
        (3) Condition of tires and brakes
        (4) Wheel wells
6. Estimate impact attitude and velocity
    a. Flightpath (angles and heading)
    b. Ground scars (preserve and measure)
    c. Obstacles struck
    d. Terrain at principal impact and nature of terrain
    e. Terrain angle
    f. Crush line/angle

7. Analyze individual breaks and separations
    a. Check for evidence of preexisting cracks/corrosion
    b. Loading
        (1) Type
        (a) Tension
            (b) Compression
            (c) Bending
            (d) Shear
                (e) Torsion
        (2) Direction
        (3) Source
            (a) Impact
            (b) Aerodynamic
            (c) In-service
            (d) Explosion
            (e) Fire fighting/rescue
        c. Determine need for laboratory study
    d. Include sketches when necessary

E. Mockups

Two-dimensional mockups are generally used when a control system problem, a fire, or an in-flight structural breakup are suspected. Three-dimensional mockups are usually limited to a critical section of the airplane, rather than the complete structure, and are used to determine the locus of failure and sequence of structural breakup. No mockup should be started until the condition and location of all known parts have been documented.

1. Determine extent of mockup required
    a. Partial or Complete
    b. 3-D or 2-D
2. Identify and label pieces/parts by looking for
    a. Part numbers
    b . Type of material
    c. Shape
    d. Dimension
    e. Color
    f. Marks
3. Supervise construction of support structure and reassembly of aircraft
4. Document damage and note any patterns on associated pieces

F. Fire Damage

1. Match up parts to determine what was burned
2. Be aware of parts that were <u>not</u> burned
3. Determine location and source of ignition

4. Determine when fire started (pre-impact, post-crash, etc.)
   a. Postcrash fire may obscure or destroy evidence of in-flight fire
   b. Document soot, heat, and fire patterns
   c. In-flight fire may show effects of fire (soot, molten droplets) downstream of origin due to airflow
   d. Smoke and flames from post-crash fires will rise vertically or be blown in the direction of ground winds
   e. Caution - mishandling wreckage will obscure or destroy evidence critical to a fire or explosion investigation
   5. Determine laboratory study needs
   6. Effects of fire
   a. Flame temperatures of in-flight fires (3000°F and above) will be greater than post-crash fires due to forced draft
      b. Apply evidence against known melting temperatures for materials
   c. Soot will not attach itself to surfaces which are over approximately 700°F.

G. Composites

   1. Found mostly on secondary structures
      a. Control surfaces
      b. Leading edges
      c. Fairings
   d. Interior structure (panels, seats, etc.)
   2. Construction
   a. Skin -- resists tension and shear loads
      (1) Metal
      (2) Fiber
   b. Core -- holds skins in place; resists buckling load
      (1) Metal
      (2) Fiber
      (3) Foam
3. For composite damage, document
   - interlaminar separation
   - direction of loose fibers
   - direction of adhesive flow lines
4. Bond failures
   a. Void failure
      (1) Indicates area that was never bonded
      (2) Smooth, clean sides between core and skin are apparent (no pull-out damage)
   b. Delamination
      (1) Previously bonded
      (2) Slightly rough sides
      c. Adhesive failure
      d. Cohesive failure

e. Resin failure

5. Impact damage
   a. Localized breakage on leading edge
   b. Small areas of skin/adhesive separation
   c. Torn/crushed core
   d. Use gloves to handle (small slivers may penetrate skin)

   6. Fire damage
   a. Amount of composite burned can indicate temperature
   b. Resins may burn, leaving fiber/cloth (approximately 1200°F)
   c. Dangerous residual particles could be inhaled (respirators may be necessary in closed areas)
7. Determine need for detailed laboratory analysis--field examination may be insufficient

SURVIVAL FACTORS GROUP

The Survival Factors Group is responsible for among other things developing and documenting the following: impact and occupant dynamics including crash injury mechanisms; evacuation and post-evacuation survival; search and rescue; collecting and reviewing reports and written records; aircraft interior configuration and damage; cabin crew training; and post-mortem examinations and toxicological analyses of fatalities.

The Survival Factors group chairman should establish the following guidelines with group members so that the group can function as effectively as possible:

(1) Group members should refrain from discussing the accident in public and, in particular, the work of the Survival Factors Group. Work at times will involve extremely sensitive areas of the investigation (body recovery and identification, personal effects, injuries sustained by survivors and fatalities, etc.). Conversations, if overheard by the press, insurance representatives, or relatives of passengers and crew, could cause unnecessary grief and could be misinterpreted or misquoted.

(2) If, at any time, the work of the Survival Factors Group is of such a nature that a group member would prefer to be assigned to another task within the group or to another group, the group chairman is to be notified. Group members will remain until the completion of the on-scene investigation; however, in the event that a group member must leave before the field investigation is completed, the group chairman is to be notified immediately so that a replacement can be assigned to the group.

(3) During Progress Meetings, the group chairman may call upon group members to present certain detailed findings which they were responsible for developing or documenting.

Survival Factors Group checklist items are included in the following recommended report outline.

NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety
Washington, D.C. 20594

(report date)

SURVIVAL FACTORS GROUP CHAIRMAN'S FACTUAL REPORT

(accident number)

A. ACCIDENT

Location:
Date:
Time:
Aircraft:

B. SURVIVAL FACTORS GROUP

Chairman:	(name) National Transportation Safety Board Washington, DC
Members:	(name) (organization) (city, state)

C. SUMMARY

A synopsis of the flight will be provided by the IIC. Significant aspects of the survival factors investigation will be summarized.

D. DETAILS OF THE INVESTIGATION

1. Aircraft Configuration

Use an interior arrangement diagram that shows seating configuration, galleys, exits, etc.

Describe the location of emergency equipment including the location and type of exits, PBE, megaphone, etc.

2. Crew Information

2.1 Cockpit Crew Interviews

Flight crew interviews are conducted by the Operations Group. The Survival Factors group chairman will coordinate with the Operations group chairman to develop the following Survival Factors-related information, whether the group participates in these interviews or not:

a. Seatbelt and shoulder harness security before and after impact
b. Difficulty releasing restraints
c. Seat adjustment (position)
d. Seat security after impact
e. Difficulties during escape
f. Aided flight attendants/passengers
g. Description of injuries and how they were sustained
h. How crew evacuated aircraft
i. Describe emergency training/date of most recent training and extent of hands-on training on the use of exits, evacuation slides, etc.
j. Use of O_2, PBE, etc.

2.2 Cabin Crew

2.2.3 Training

Obtain flight attendant training and personnel records for Initial, Transition, and Recurrent Training. Describe extent of hands-on training using training devices and actual aircraft.

2.2.4 Interview (Conducted by Survival Factors Group)

Request permission to tape record the interviews. If a recorder is used, the interviewer and interviewee will identify themselves as well as the date, time, and location of the interview and others present.

a. Name and business address (trips/flights in last 24-72 hours - 30 days).
b. Position occupied.
c. Observation of flight including pre-flight duties. Location of children, elderly, obese, handicapped, mobility impaired. Were infant restraints used - seat location.
d. Pre-impact precautions by flight attendants or passengers.
e. Description of impact forces.
f. Security of cabin furnishings, debris, galleys, carry-on baggage, hat racks, seats, emergency lighting.
g. Security of seat after impact.
h. Security of seatbelt/shoulder harness before and after impact, difficulty releasing same (note any failures).
i. Behavior of passengers.
j. Description of F/A's pre- and postaccident activities.

k. Difficulty opening door, assess conditions outside, deploying and inflating slides, using O_2, rafts, etc.
l. Observations of trapped passengers.
m. Description of rescue/fire fighting activities.
n. Description of injuries and how they were sustained.
o. Were infant restraints used - seat location.
p. Trouble with passengers during flight.
q. How much liquor was served.
r. Was any emergency equipment used, i.e., flashlights, megaphones, O_2, PBE.
s. Observations of floor path emergency lights, illumination inside\outside aircraft.

3. Passengers

List the number of adult males and females, children, infants and handicapped. List the age ranges for each. Determine the location of child safety seats, the occupant's age, injuries, etc.

Obtain passenger names, addresses, and telephone numbers from carrier.

Have sufficient numbers of Passenger Statement Forms and Passenger Questionnaires for distribution to each passenger. It will be necessary to mail these forms to passengers who have left the area; every attempt should be made to interview these passengers by telephone.

3.1 General Instructions for Passenger Interviews

a. Before interviewing hospitalized survivors, permission will be obtained from the hospital administrator and the attending physician.
b. It may not always be possible for the group chairman to attend all passenger interviews. Consequently, group members will be asked to conduct these interviews or attend interviews conducted by the Operations or Witness Groups as the Survival Factors representatives.
c. The purpose of these interviews will be to elicit Survival Factors-oriented information and to secure a signed statement of the interviewee's observations at the conclusion of the interview.
d. Before the interview, group members will decide on the questions to be asked and who will take notes. The questions to be asked will be approved by the group chairman prior to any interviews. The group chairman, if present, will conduct the interviews. The person taking notes should make every effort to record only pertinent information; continuous writing can inhibit the interviewee from being completely candid and spontaneous.
e. A technique which has been successful in interviewing survivors is to permit the interviewee to discuss his/her observations without interruption. The person designated as note-taker only jots down pertinent information. At the conclusion of the interviewee's statement, some specific questions are asked to clarify certain areas of interest. Minimum notes are taken again. At the conclusion of the questions, the interviewee is asked to write and sign a formal

statement on the NTSB Form 6120.9 provided. The previously taken notes will aid in assuring the statement contains all the necessary information. If the interviewees cannot or will not write a statement, a statement may be written for him/her. If the interviewee refused to sign the statement, this will be included in the notes of the interview and/or the prepared statement form and the statement will be signed by the interviewer(s).

f. It is not suggested that every passenger interviewed be tape recorded because of the time necessary to review and summarize these interviews during the on-scene investigation.

g. Each surviving passenger will be given a questionnaire (NTSB Form 6221.1) and requested to complete the necessary information as soon as possible; arrangements should be made to collect the questionnaires during the on-scene investigation.

3.2 Passenger Interviews

a. Name, address, age, weight, height, handicapped, mobility impairment, etc.
b. Seat number - if in exit row, was passenger briefed/read exit opening instructions.
c. Read safety card, watch F/A safety demo, watch safety video
d. Noted the locations of exits other than one used to board aircraft
e. Seat numbers of traveling companions
f. Location and storage of carry-on baggage
g. Observations of flight until accident, brace position
h. Security of seatbelt (before and after impact)
i. Security of seat (after impact)
j. Description of impact forces - direction, magnitude
k. Description of cabin - location and type of debris
l. Description of escape (time, difficulties, smoke, fire, egress routes, etc.)
m. Description of fire fighting operations (location of fire, smoke, etc.)
n. Description of rescue operations
o. Description of injuries and how they were sustained
p. Obtain interviewee permission for the release of medical records
q. Description of other passengers after the accident and during egress
r. Use of child safety seats and restraint of children/infants who did not occupy child safety seats

4. Wreckage Site and Aircraft Damage

4.1 Description of Site

The following information will be obtained by coordination with the Structures group chairman. Coordination will be necessary to assure accurate documentation while avoiding redundant or conflicting information. (The Structures Group will usually

document this information, eliminating any need for the Survival Factors Group to cover the same information.)

a. Distance, heading, and relative bearing of ground scars and A/C components from main wreckage.
b. Description of group scars (length, width, depth, distance, bearing, and heading along impact path and to main wreckage site)
c. Description of obstacles/structures struck (height, construction)
d. Description of terrain (elevation, slope/grade, soil)

4.2 Aircraft Damage

Describe aircraft damage as it relates to fire pattern, egress, fuselage and wing crush, etc.

4.2.1 Exterior Damage

Describe external cockpit and fuselage/cabin damage; supplement with photographs, sketches, drawings, etc.

Direction, location, and dimensions of structural deformation

Location and damage to seats and cabin equipment outside the aircraft

Description of thermal and smoke damage

Blocked exits, deployed escape slides, and ropes

Evidence of fire fighting/rescue activity

4.2.2 Interior Damage

Describe the internal condition of the cockpit and cabin and summarize the results of any systems and component examinations. Supplement with photographs, sketches, drawings, etc.

4.2.2.1 Cockpit

a. Condition of instrument panel, pedestal, and overhead panels (crash impact and secondary impact evidence, direction and measurements of deformation, thermal damage, etc.).
b. Condition of control yoke, rudder pedals, and floor (fractures, impact evidence, direction and measurements of deformation, etc.).

c. Condition of windshields, windows, and escape hatches (impact evidence, direction and measurements of deformation, thermal damage, escape hatch locking mechanism, escape rope\slide device, etc).
d. Crew life support equipment (evidence that smoke masks, goggles or O_2 mask\system were used, direction of damaged O_2 mountings, first aid kit, crash ax, PBE, medical kit, etc).
e. Condition of crew seats (impact evidence, direction and measurements of deformation, thermal damage, integrity of tiedowns and rails, direction in which seat and tie-down components separated, etc.).
f. Record manufacturer of seats, model numbers and rated loads.
g. Condition and operability of crew's seatbelts, shoulder harnesses, release mechanisms, inertia reel.
h. Record manufacturer of restraint systems model numbers, date of manufacture, and rated loads.
i. Cockpit door (locked, direction of opening and measurements of deformation, thermal damage, operable\jammed escape panels, condition of locks, etc.).
j. Miscellaneous (securing of luggage, flight bags, etc.).
k. Examine and record location of personal effects found in cockpit.
    l. Perform tests as necessary on equipment.

4.2.2.2 Cabin

a. Description of overall cabin deformation, floor disruptions, location of upset\separated seats, location of thermal damage, location of separated ceiling panels, location of separated overhead storage bins\racks, location of separated galley\buffet equipment, etc.
b. Condition of each of exit found in place, extent of damage operational check if possible, location in wreckage, operability of power assist system, etc.
c. Compare safety card instructions against actual equipment and operation (doors, slides, rafts, life vest, O_2 systems, etc.).
d. Conditions of flight attendant and passenger seats (impact evidence, direction and measurements of deformation, thermal damage, integrity of tie-downs and rails, direction in which seat and tie-down components defamed\separated.
e. Record manufacturer of passenger and flight attendant seats, model numbers, date of manufacture, and rated loads.
f. Condition and operability of safety belts, shoulder harnesses and inertia reels.
g. Record seat belt\shoulder harness manufacturer(s) date of manufacture, model numbers, and rated loads. To facilitate on-scene tabulation of damage to seat(s), safety belts and cushions, the following (or similar) table can be used and made an attachment to the group report.

Row/Seat	Safety Belt	Seat Back	Seat Pan	Seat Legs	Floor Attach
1A					
1B					

h. Security of carry-on luggage and the security of designated storage areas (under seats, hand-held).
i. Security of cargo space in the cabin (combi aircraft).
j. Security of each galley\buffet unit (damaged latches, inserts, etc.). Record galley manufacturer and model number.
k. Record location of personal effects found in cabin.
l. Perform tests on equipment as required to determine failure mode(s).
m. Review cabin maintenance logs and obtain copies of pages as necessary. Determine what corrective actions were taken to clear the writeup(s).

4.2.2.3 Emergency Systems

Document the condition of emergency systems and the results of any testing performed on equipment\systems.

a. Condition of P.A. systems (component, system checks)
b. Condition of emergency equipment (O_2, flashlights, first-aid kits, megaphones, etc.).
c. Condition of emergency lighting systems (components, system checks, position of emergency lighting control switch).
d. Description and condition of evacuation alarm system (arming, location actuation).
e. Condition of each emergency escape slide (stowed or deployed, inflated, damaged, etc.) and record manufacturer of slides model number, and date of last overhaul, date of manufacture, incorporation of service bulletins, etc.
f. Condition of life rafts or slide/rafts.
g. Record manufacturer of life rafts and life vests, model number, dates of manufacture, TSO, etc.
h. Describe other emergency equipment on board, location and use.
i. If the aircraft is an unusual attitude, measure the height of the exit sills above the terrain.

5. Medical and Pathological

5.1 Injury Table

The following table summarizes the injuries sustained (Ref: 49 CFR Part 830.2, Definitions).

	Cockpit Crew	Flight Attendants	Passengers	Others	Total
Fatal					
Serious					
Minor					
None					
Total					

*Use footnotes to indicate number of infants (up to 24 months), children 25 months to 16 years, and handicapped/mobility-impaired passengers.

5.2 Survivor Injuries

Describe in general the injuries sustained by survivors.

a. Ask when and how their injuries were sustained.
b. In some jurisdictions it may be necessary to obtain a release from injured passengers for medical records if they are necessary to the investigation. Issue a Subpoena Duces Tecum for hospital records which show injuries sustained (NTSB Form 6100.8).
c. To facilitate on-scene tabulation of injury data, the following or a similar table can be used as Attachment 4 to the factual report.

SEAT	AGE	SEX	HT	WT	INJURIES	NTSB/ICAO CLASSIFICATION (F,S,M,N)	MAIS

*The use of NTSB Maximum Aviation Injury Scale (MAIS, based on the American Association of Automotive Medicine 1980) can further categorize injuries.

AIS (Severity)	Crewmembers	Passengers	Total
1. Minor			
2. Moderate			
3. Serious (life threatening)			
4. Severe (not life threatening)			
5. Critical (survival uncertain)			
6. Fatal			
7. Insufficient Information			
8. Unknown			
9. Total			

5.3 Fatal Injuries

Describe fatal injuries sustained by occupants.

Coordination will be necessary with the Human Performance group chairman when contacting the medical examiners\coroner's office to assure that autopsies are performed on the flight and cabin crewmembers as a minimum and that specimens will be required for toxicological analyses. (Ref: NTSB Authority, Public Law 93-633

dated 1/3/75, Title III "Independent Safety Board Act of 1974, "Sec. 304(b) Powers of Board (5) Autopsy report & Title III FAA Act of 1985, Sec. 701(c).

Post-mortem Examinations

1. Each crewmember must be positively identified.
2. Post-mortem examinations should be made on each cockpit occupant.
3. Post-mortem examination should be made on flight attendants, passengers, and persons on the ground as the circumstances of the accident indicate.
4. Gross injury descriptions should include all fractures, dislocations, lacerations, amputation, burns, and condition of clothing.
5. Toxicological and microscopic examinations, as necessary, should be performed on all cockpit occupants, selected flight attendants and passengers, and other selected victims as the situation warrants.
6. All bodies photographed should show body number.
7. The following photographs should be taken by local authorities:
   a. At the scene before body is moved.
   b. At place of examination - anterior and posterior both clothed and unclothed.
   c. At postmortem - close-up photographs of lesions, embedded foreign objects, fractures, internal injuries, etc.
8. If autopsies cannot be performed, X-rays should be made of cockpit occupants, cabin crewmembers, and selected passengers to identify fractures, imbedded foreign objects, etc., as well as gross descriptions of injuries.
9. Obtain body location charts\diagrams numbers, ID process, photos, and postmortem reports.

5.4 Toxicologic Analyses

Summarize results of laboratory test.

Specimens will be taken for toxicological, biochemical and microscopic examination. Sufficient quantities must be taken to assure adequate specimens are available for use by CAMI and\or AFIP in addition to specimens for use by local officials.

6. Emergency Response

In some instances a separate group may be formed to develop this information.

6.1 Search and Rescue (SAR)

Describe search and rescue efforts particularly if the accident occurred in a remote area and identify any problems SAR encountered (communications, weather, etc.).

a. Describe the notification, response and on scene activities.
b. Interview involved personnel as required.

c. Determine number and types of units involved and pertinent times as well as the number of responding personnel.
d. Determine how many persons were rescued alive and how many non-survivors were removed from the accident site.
e. Obtain reports on their air\ground search and rescue operations from participating organizations. Use maps and sketches to show search area. Obtain photos\video tapes.
f. Problems encountered during the SAR operation (communication, command control coordination, etc.).

6.2 Aircraft Rescue and Fire Fighting (ARFF) Response

Describe the on and off airport fire fighting operations from their notification to arrival on site and any problems responding.

a. Determine when, by whom, and how the Fire Department(s) were notified of the emergency\accident.
b. The time necessary to complete fire fighting and\or rescue operations.
c. Who was the on-scene commander and was a field command post used.
d. Describe the communications network.
e. Describe any difficulties encountered responding to the scene.
f. Obtain or make map of site indication access routes, runways, location of vehicle, wind direction, etc. Obtain photos\video tapes.
g. Quantity and type of fuel on board the aircraft.
h. Describe the origin, and propagation of the fire.
i. Describe fire and rescue conditions when ARFF units first arrived on scene.
j. Interview firefighters as required. Describe tactics used, e.g., how.
k. Obtain responding Fire Department accident\incident reports. Describe problems during fire attack.
l. Airport CFR Index - was a NOTAM issued?
m. Summarize the responding equipment as follows:

	VEHICLES/ UNIT NO.	PERSONNEL ABOARD	TRAVEL TIME/DIST	AGENT CAPACITY RATE	DISCHARGE QUANTITIES USED
Crash Trucks	1. 2.				
Quick Reaction Vehicles	1. 2.				
Engine Companies	1. 2.				
Ladder Companies	1. 2.				
Ambulances	1. 2.				
Rescue Squads	1. 2.				
Helicopters	1. 2.				

6.3 Law Enforcement Response

Describe involvement of local and airport law enforcement agency departments.

a. Interview department personnel as required.

b. Determine number of responding units, pertinent times, and number of personnel involved.

c. Obtain police accident/incident reports, photos, and video tapes.

d. Describe security perimeter and associated problems with traffic, site security, and crowd control.

e. Describe staging areas and any traffic control problems.

6.4 Medical Response

Describe the efforts of local hospitals and medical personnel.

a. Determine when and by whom hospitals were notified and the extent the hospitals implemented their disaster plans.

b. Did medical personnel respond to the scene (i.e., was a triage area established) and, if so, at what time.
c. What services did the hospital provide, i.e., ambulance, Life Flight Helicopter, equipment, etc.
d. Clock times when first and last patients arrived at each hospital.
e. Date and critique of most recent disaster drill.

6.5 Disaster Preparedness

Depending upon the circumstances, describe the community preplanning (or lack thereof) which enabled them to deal with the situation.

a. Description of local community disaster plan(s).
b. Dates of community disaster drills and, if so, were there any problems.
c. Determine which disaster plans were implemented for this emergency and, if so, were there any problems.
d. Interview appropriate personnel if necessary.
e. Obtain copies of all pertinent disaster plans, response reports, and critiques by local disaster planning offices involved in this response.
f. Describe command post(s), equipment, communications--note any command, communication, and coordination problems.

6.6 Airport Certification

a. Review airport disaster plan (copies of portions of the plan may be required). Dates of table top and full scale disaster exercises.
b. From the airport or the FAA, obtain copies of the FAA annual certification reports for past three years and related letters of correction.

7 Survival Aspects

Summarize based upon interviews and the condition of the wreckage, all aspects affecting occupant survival. Describe all aspects of the emergency evacuation process.

7.1 Cockpit Crew

Describe the crew's involvement in the post accident and evacuation processes.

a. Outline flight crew’s duties and responsibilities during evacuation.
b. Description of crew's efforts to assist passengers during evacuation.
c. Flight crew’s account on how and when they egressed the aircraft.
d. Flight crew’s observations of ARFF activity and passengers.

7.2 Cabin Crew

Describe the flight attendants' involvement in the emergency, the evacuation, and postevacuation.

a. Flight attendants' duties and responsibilities during an emergency evacuation.
b. Description of flight attendants' preparation of passengers for evacuation.
c. Flight attendants' assistance of passengers during evacuation.
d. Flight attendants' account of how and when they egressed the aircraft.
e. Flight attendants' observations of ARFF and passengers' reaction to the emergency.

7.3 Passengers

Summarize from passenger interviews and statements their observations prior to, during, and after the emergency evacuation/accident.

a. Description of how passengers exited or were rescued from the aircraft.
   b. Difficulties during egress.
   c. Observations of ARFF activities.
d. Description of how passengers were injured, i.e., what they impacted or what struck them.
e. An aircraft seating diagram of facsimile and symbols to denote injury, exit used, seat damage, etc.

E. ATTACHMENTS

The following list of attachments is but a few of the possibilities.

Each attachment has its own cover sheet.

1. Passenger List
2. Crew Statements
3. ARFF and Police Reports
4. Disaster Plans
5. Test Reports
6. Toxicology Reports
7. Safety Card
8. Injury Chart
9. Passenger Interviews, Statements, and Questionnaire

SYSTEMS GROUP

The Systems Group will be responsible for:

A. Cockpit Documentation

Documentation of postimpact control lever positions, switch positions, and instrument readings, and recovery of flight planning information and other documents related to flight operations which are found in and around the cockpit (coordinate with Operations Group).

1. No other groups or individuals will be allowed in cockpit area until system documentation is complete. Coordination is required with other groups.

2. Describe actual condition - do not state "destroyed by fire or impact." Specify fire damage and extent of mechanical deformation. Resolve what documentation of normal or abnormal system operation can be verified by the evidence, despite the fire damage.

3. Do not move levers or switches until written and photo documentation is complete and group concerns are resolved.

4. Use drawings from manuals to keep track of object identification.

5. The following information should be obtained where possible:
   - Positions of all switches
   - Positions of engine/propeller control levers
   - Positions of flap and gear levers
   - Readings from all instruments
   - Settings of all bugs (e.g. - heading, airspeed, altitude, EPR)
   - Frequencies and settings from all radio tuning panels including volume controls
   - All trim settings
   - Condition and documentation of electrical/circuit breaker panels.

NOTE: Key instrument and switch positions should be photographed before any effort is made to analyze those positions. Sooting or glass damage may temporarily obscure instrument readings but readings may be obtained by cleaning or removing the glass.

B. Subsystem Documentation

Determination of system integrity, component condition, actuator and valve positions, etc. Priority and degree of concentration on a particular system will be dependent upon particular accident circumstances. Coordination with Structures Group is a must (to coordinate access to the wreckage and to coordinate parallel group efforts). Documentation of the following subsystems and items is typically the responsibility of the Systems Group unless otherwise assigned by the IIC.

<u>ATA Spec 100</u>

Air Conditioning, Chapter 21 - air cycle equipment, valves, bearings, impellers, ducting connections, thermocouples, switches.

Auto Flight, Chapter 22 - cockpit control settings, servomotors.

Communications, Chapter 23 - operation and indications.

Electrical Power, Chapter 24 - wire integrity (continuity, shorts, arcing), switches, circuit breakers, electric generators.

Fire Protection, Chapter 26 - extinguisher bottles, discharge indications.

Flight Controls, Chapter 27 - pre-impact position and integrity, travel of control surface, control cable continuity.

Hydraulic Power, Chapter 29 - hydraulic fluid quantity and quality, valves, pumps, filters, tubing.

Ice and Rain Protection, Chapter 30 - anti-icing ducting, wiper controls.

Instruments, Chapter 31 - needle imprints, internal gears, non-volatile memory.

Landing Gear, Chapter 32 - actuators, up/down locks.

Lights, Chapter 33 - light bulb filaments, interior/exterior lights.

Navigation, Chapter 34 - frequencies, control knob positions.

Oxygen, Chapter 35 - crew/passenger oxygen bottles, lines, generators.

Pneumatics, Chapter 36 - ducting, joints.

Vacuum/Pressure, Chapter 37

1. Before documentation, ensure that immediate needs for preservation are being met (e.g., cover avionics if rain is forecast). Photograph the area and details first.

2. Use schematic diagrams from applicable manuals to document components and systems as they are identified.

3. Describe location and actual condition of each component as found. Do not move or change position of actuators, valves, switches, or controls until documented.

4. Measure actuator extended length. Be certain to be specific in describing points of measurement. Photograph actuators, valves, switches and controls that are potentially relevant to the accident. Don't assume "non involvement" of any components.

5. Record the following information from each component that is potentially involved, when possible:

   Nomenclature
   Manufacturer
   Part Number
   Serial Number
   Position in aircraft

6. Determine whether electronics/avionics may have recoverable memory. Recover electronics/avionics with 12-18 inches of wire harness, rather than simply unracking the avionics box. Only disconnect at the plug connection if airplane is salvageable and memory retrieval is not possible or necessary.

C. Offsite Component Testing

If a particular subsystem component, or components, is critical to the resolution of the accident, a more detailed investigation may be required. This may include bench testing and disassembly. The group members will be expected to participate in such activity at the determined places and times. Component testing should not begin until an appropriate test plan has been developed and the group is briefed on its content. Test results will be documented in such a way that the test plan and results will be clearly understood by the reader.

METEOROLOGY GROUP

The Meteorology Group is responsible for documenting the environmental meteorological conditions pertinent to the accident and for evaluating the meteorological products and services of the various agencies and individuals involved in the accident. Documentation efforts include gathering all relevant weather data and conducting interviews to augment and amplify the weather data.

Initial investigative efforts should center on defining and obtaining data that may be most relevant to the accident. For example, detailed surface observations should be immediately obtained for an accident that occurs at or near an airport. However, weather radar data may be immediately required for an in-flight accident when thunderstorms are suspected to have played a role in the accident. The Meteorology Group Chairman should also ensure that highly perishable data, such as high density Automated Surface Observations System (ASOS) data or Terminal Doppler Weather Radar (TDWR) digital data are immediately archived for later retrieval.

On-scene group activities will usually include site visits to the accident location, to the local National Weather Service office, and to the nearest weather observing facility to the accident location. In addition, interviews (both in person and via telephone) with National Weather Service personnel, such as forecasters and meteorological technicians, and eyewitnesses may be necessary. If an accident occurs in vicinity of an airport, contract weather observers may also be interviewed. Also, if the accident involves an air carrier that maintains a meteorological department, it may be necessary to interview the airline meteorology staff and/or dispatch personnel. In certain cases, data may be requested from Department of Defense meteorological personnel or other state or federal agencies.

Follow-on group activities often depend on the complexity of the weather associated with the accident. Activities such as breakdown and testing of weather instrumentation, meetings with researchers specializing in the various weather hazards, and review of Doppler weather radar data are examples of possible group efforts.

Close coordination will be maintained by the Meteorology Group with other investigative groups, such as Operations, Aircraft Performance, Witnesses, and Air Traffic Control throughout the investigation. This is essential since information relative to communications, pilot reports, and lay witness weather observations is of interest to the Meteorology Group, while the data it has collected may be of immediate importance to the other groups. In many cases, wind information is needed by the groups concerned with wreckage distribution, while upper wind and temperature data may be vital to the work of the Performance Group and others. Information is exchanged frequently with the Flight Data Recorder and Cockpit Voice Recorder Groups.

The Meteorology Group Chairman should maintain a list of telephone contacts of pertinent National Weather Service offices, Federal Aviation Administration personnel, and the weather research community to quickly access essential information while on–scene. Also, the chairman should have Man computer Interactive Data System (McIDAS) software installed on his/her laptop computer in order to quickly access essential weather data through the NTSB communications network. An updated list of internet web sites that provide meteorological information and data is helpful on many accidents that occur in remote locations.

Meteorological Investigation Checklist

Defining The Environment

Data Sources

- NOAA/National Weather Service
- Federal Aviation Administration
- Private Weather Companies
- TV and Radio Stations
- Utility Companies
- State and Local Weather Networks
- Universities
- Department of Defense
- Air Quality Monitoring Networks
- Witnesses - Ground and Airborne
- Meteorological Operational Tests
- Meteorological Research Programs
- Computer Graphics and Weather Analysis System (McIDAS)
- Internet Sites
- Sunrise/Sunset/Sun Azimuth/Angle Software
- Video Cameras

Data

NOAA/National Weather Service

- Surface Weather Observations
- Forecasts and Advisories
- Weather Radar Data (WSR-88D)
- Upper Air Data
- Satellite Data
- Lightning Data
- Transmissometer (visibility) Data
- Rainfall Records
- Severe Weather Reports
- Location of Meteorological Sensors
- Cooperative Weather Observers
- Time Source and Time Accuracy
- High Resolution Data from Automated Weather Observing Systems (ASOS and AWOS)

Federal Aviation Administration

- Surface Weather Observations
- Transmissometer (visibility) Records
- Low Level Windshear Alert System (LLWAS) Data
- Pilot Reports

- Data From Flight Service Station
- Weather Radar Data (WSR-88D/TDWR)
- High Resolution Data from Automated Weather Observing Systems (ASOS and AWOS)

Private Weather Companies

- Weather Radar Data
- Locally Produced Data
- Lightning Data

TV and Radio Stations

- Videotape
- Locally Produced Data
- Weather Radar Data
- Lightning Data

Utility Companies

- Lightning Data
- Weather Observation Data

Universities

- Lightning Data
- Weather Radar Data
- Weather Observation Data

Department of Defense

- Surface Weather Observations and Data
- Weather Radar Data
- Upper Air Data
- Lightning Data
- Transmissometer (visibility) Data
- Satellite Data
- Pilot Reports

Air Quality Monitoring Networks

- Surface Weather Data
- Upper Air Data
- Radar Data (Acoustic Doppler, LIDAR)

Ground Witnesses

- Wind Information
- Cloud Height Information
- Rainfall Information
- Pressure Information
- Lightning Information

- Information on the Type of Clouds
- Visibility Information
- Videotape Records (Personal, From Outdoor Security Systems, etc)
- Temperature Information
- Type of Precipitation (Frozen or Freezing)

Meteorological Operational Tests

- Weather Radar Data (Doppler)
- Lightning Data
- High Resolution Surface Data
- Upper Air Data (Profiler)

Meteorological Research Programs

- Aviation Impact Variables
- Numerical Atmospheric Modeling

Evaluating Weather Products and Services

Products

National Weather Service

- AIRMET
- SIGMET
- Center Weather Advisory
- Meteorological Impact Statement
- Area Forecast
- Terminal Forecast
- Aviation Weather Watch
- Convective SIGMET
- Local Airport Advisory
- Forecast Upper Winds
- Special Weather Statements
- Public Forecasts and Warnings
- Verbal Issuances
- Written Issuances (Transmissions NWS to Operator, computer)
- Post Accident Checks of Equipment
- Visibility Reference Charts
- Upper Air Charts and Surface Charts
- Icing, Turbulence, and Convective Graphic Products

Private Weather Companies

- Locally Produced Forecasts, Advisories and Warnings
- Verbal Issuances

Department of Defense

- Locally Produced Forecasts, Advisories and Warnings
- Verbal Issuances

Services (Provided By)

- National Weather Service
- Local NWS Office (Aviation Forecaster, Public Forecaster, Meteorological Technician)
- National Office (Aviation Weather Center)
- Center Weather Service Unit

Federal Aviation Administration

- Weather Coordinator (Center)
- Air Traffic Control Specialist (Flight Service Station)
- Controllers
- Supervisors

Private Weather Companies

- Meteorologist

Airline Meteorological Office

- Meteorologist

Airline Dispatch Office

- Dispatcher

Department of Defense

- Forecaster
- Observer
- Air Traffic Control Personnel

WITNESS GROUP

Witness Interviews

Witness interviews should be obtained as soon as feasible, since long delays between the witnesses' observations and the interviews increase inaccuracies in their statements. What may seem like insignificant information may become important when combined with facts discovered during the investigation.

Locating witnesses may vary from an overwhelming number of people volunteering statements to having to conduct a door-to-door search for witnesses. Typically, witnesses will make themselves known to someone; however, this is not always the case. Local authorities, newspapers, news media personnel, local residents, airport personnel, and passengers and crew members of other aircraft may be valuable witnesses or may aid in locating witnesses.

Regardless of the formality of the interview, the questioning of witnesses should not be conducted as an "interrogation." The interview should be conducted on a basis of courtesy, cooperation, and neutrality. Witnesses should be encouraged to freely relay everything they may have seen or heard regarding the accident. The witness should be urged to relate only their own observations and not those of other witnesses. It should be made clear to the witness that the purpose of the interview is to gather information regarding the accident/incident to prevent similar occurrences in the future. The Safety Board is not interested in court proceedings or punitive actions.

Under Part 831.7 of the Board's procedural regulations, "Any person interrogated by an authorized representative of the Board during the field investigation shall be accorded the right to be accompanied, represented, or advised by counsel or by any duly qualified representative." Sometimes an interviewee will ask to be represented by more than one person. The rule allows a single representative only and the person to be interviewed should be asked to select the representative he/she prefers.

Interviews of crew members and air traffic controllers during a field investigation should not be unnecessarily delayed. To expedite the investigation, the investigator should communicate these crewmembers' rights through their association or employer when the post-accident interviews of air traffic controllers, flight crewmembers, or flight attendants are scheduled. In the event a flight attendant or other crew member appears for an interview and is unaccompanied by counsel or other representative, the individual will be advised of his/her right to such representation.

The following guidelines will help achieve a successful interview.

- Visit the accident site prior to interviewing witnesses. This will help develop a list of areas to be covered during the interview.

- Establish beforehand with the witness a time to conduct the interview, if possible.

- Before the interview, have a general idea of information desired from the interview.

- Attempt to develop a positive rapport with the witness. Always be polite and courteous to the witness.

- Qualify the witness regarding his/her knowledge and experience related to aviation.

- Obtain information on the location of the interviewee at the time the events being described in the interview were taking place.

- If witnesses are interviewed by a group, the group chairman should act as the spokesperson and take control of the interview. The spokesperson should brief the group prior to the interview on how the interview will be conducted. Only one person should ask questions at a time, with others to follow in order.

- Limit the number of persons participating in the interview.

- A model aircraft, compass, watch, maps, and charts are valuable tools that can be used during witness interviews.

- Encourage the witness to share his/her recollections without interruption. Periods of silence by the interviewer while the witness collects his/her thoughts have been found to encourage the witness to expound more fully and avoid omissions. The interviewer's ability to be a good listener is essential in this phase. Do not interrupt the interviewee.

- Ask specific questions after the witness has completed his/her narrative. Keep questions simple and brief. Avoid aviation/technical jargon with those not familiar with such terminology.

- Be cautious that the questions are not presented in a leading manner. Don't nod your head or communicate agreement or disagreement with something the interviewee has said.

- Note-taking during the interview is advisable; however, it should only be done with the consent of the witness and in such a manner as not to be distracting.

- A tape recorder can be a valuable tool but should only be used with the witness's consent.

- When interviewing a witness under a doctor's care, always obtain permission from the attending physician before the interview. In these cases, limit the number of questions and the size of the witness group.

- After all questions have been asked, provide the interviewee the opportunity to ask questions of the interviewers.

- Following the interview, ask the witness to prepare or permit you to prepare a written statement including all the pertinent information given during the interview. Provide the witness with a "Statement of Witness" form, NTSB Form 6120.11, and a self-addressed, franked envelope. Encourage the witness to use sketches, drawings, photographs, and maps to supplement the statement. If a witness refuses to sign a statement, don't press the issue. Indicate on the statement in whose presence it was made and that the witness did not wish to sign it.

- Leave a telephone number and an address where you can be reached should the witness recall additional information.

When all information is obtained from the interviewee, review the notes of the interview with other group members who participated in the interview. The highlights of the interview should be noted in the group's report.

APPENDIX I

SAMPLE GROUP CHAIRMAN PROGRESS MEETING BRIEF

Each group chairman should briefly describe significant findings, state plans for the next day, and request any questions or suggestions from the investigative group on the information. The brief should be related to factual material only, as should questions or discussions from investigation members.

The following is an example of a Progress Meeting report the Structures group chairman might give.

> Today we documented the wreckage path and determined some aircraft configuration data. The airplane touched down about 1,000 feet from the runway end and slid about 800 feet to a stop. The crash path was oriented at 240 degrees. The first touchdown points are consistent with the right main landing gear and the right wing tip. Evidence of ground fire was noted about 100 feet after the right wing struck the ground. We have established that all three landing gear were down and locked. The left wing flaps were found in the "up" retracted position. The right wing flaps were virtually destroyed by impact and fire. The empennage is intact, and all control surfaces were found at the final resting point. One of our group members found what looks like a pilot's logbook that was partially burned. I have it here for the Operations group chairman. We will continue to examine flight control positions and continuity tomorrow. There is no evidence of in-flight fire at this point, but we would like to have input from the Witness Group and Survival Factors Group on eyewitness and passenger statements about fire. Tomorrow we will examine the flap jackscrews and actuators in coordination with the Systems Group. We will require another 2 days or more at the site before we can consider moving the wreckage to a hanger for closer examination. Are there any questions or suggestions for our group?

APPENDIX J

MATERIALS LABORATORY EXAMINATIONS

1. General

The NTSB Materials Laboratory should be the focal point for all material failures that may be a factor in an aircraft accident. Use of local outside laboratories (private, industry, or academia) should be limited to screening the component as to whether a problem exists with the part. For example, if a field investigator is unsure of the failure mode (fatigue or other preexisting cracks versus a complete overstress separation) then an outside laboratory might be used. If a preliminary examination by this outside laboratory discloses a preexisting condition, then the component should be immediately forwarded to the Materials Laboratory for detailed examination. Except for some instances of manufacture evaluations, use of outside laboratories to do a complete in-depth investigation has typically proven to be inappropriate, more time consuming, and sometimes inaccurate. The Materials Laboratory should be consulted before a manufacturer's laboratory is used.

2. Preservation of Parts

Moisture and mechanical damage are the two main causes of additional damage to components that are to receive laboratory examination. Moisture can be very harmful to fracture surfaces of ferrous alloys (steels) that rust easily, but has little effect on aluminum alloys that are more oxidation resistant. Mechanical damage to the fractures can occur when the components are mated together along the fracture planes. A slight movement while mated together will obliterate the fine fracture detail and disturb deposits often needed to establish the cause for the failure. For this reason the fracture surfaces should be kept apart from each other.

To best protect fractured components and specimens it is advisable to first air or blow dry the components (if wet) and then wrap the area of interest in clean rags or cloth to prevent any inadvertent contact with other hard surfaces. If the components will be in an outside environment for a considerable time, they should also contain an outer wrap of plastic or other water resistant material to keep the cloth dry and uncontaminated.

Because surface chemistries may be important to establish the cause of fracture initiation or establish inspection debris (e.g., dye penetrant), nobody should touch the fracture surface with their fingers (which leaves salts) or anything else that is hard or sharp or that may be contaminated. The use of preservative oils (WD-40) should be avoided for this reason except as noted below for steels.

In cases where the fractures may be encased in dirt, there may be a need to initially clean the surface for a preliminary inspection. If so, first use a soft bristle brush such as a toothbrush (wire brushes are prohibited) and gently remove the dirt. If liquid is then needed, use clean water and a soft brush. Finally, rinse with alcohol or acetone, if available, to accelerate the drying. For steels, however, cleaning the fracture surfaces with alcohol or acetone will remove any protective oils that

may be present. It is therefore recommended that a light application of protective oil (preferably WD-40, hydraulic fluid) be applied after the alcohol or acetone.

3. Submission of Parts

After adequately protecting the areas of interest against moisture and mechanical damage, ship or hand carry the parts to the Materials Laboratory Division, NTSB, Washington, DC, 20594. Use registered mail when possible for traceability. Enclose some correspondence that identifies the parts, the normal accident information (location and date of accident, NTSB accident number, and the aircraft's make, model, and registration number), a brief account of the circumstances of the accident, and an explanation of the work requested. The form on the following page can be used to record this information.

4. Development of Background Information

When a component is found to have separated and caused or contributed to the accident, much background information is needed to do a complete failure analysis. This includes part numbers and component names, maintenance history (last overhaul, inspection, rework, modification, etc.) and total (and since overhaul) time and cycles of service. The Materials Laboratory will normally contact the manufacturer about the specified material, hardness, and other material properties as well as locate any service bulletins and airworthiness directives applicable to the part. Should the investigator have such information, he/she should also submit this with the parts.

REQUEST FOR MATERIALS LABORATORY EXAMINATION

NATIONAL TRANSPORTATION SAFETY BOARD
Office of Research and Engineering
Materials Laboratory, RE-30
Washington, D.C.

A. ACCIDENT/INCIDENT INFORMATION

Location: _____

Date: _____

Aircraft: _____

NTSB No.:_____

B. COMPONENTS SUBMITTED

_____

_____

_____

C. SERVICE HISTORY OF COMPONENT(S): IF APPLICABLE

_____

_____

_____

D. EXPLANATION OF WORK REQUESTED

_____

_____

_____

E. SUBMITTED BY

Name/Office:_____

Phone/Date: _____

F. RETURN PARTS TO:

Name/Title: _____

Affiliation: _____

Address:_____

APPENDIX K

GROUP CHAIRMAN FACTUAL/ANALYSIS REPORT OUTLINES

NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety
Washington, D.C. 20594

[date]

[group] GROUP CHAIRMAN'S FACTUAL REPORT

[accident number, e.g., DCA-94-MA-001]

A. ACCIDENT

Operator:

Location:

Date:

Time:

Aircraft:

B. [group] GROUP

Chairman: [name]
National Transportation Safety Board
Washington, DC

Member: [name, organization, city, state]

Member: [name, organization, city, state]

C. SUMMARY

[This section shall contain a short summary of the accident, as provided by the IIC.]

D. DETAILS OF THE INVESTIGATION

"Group Activities": First section should include a summary of the specific group's activities as they relate to the investigation.

[Include factual documentation from on-scene phase of investigation, as well as any follow-up efforts, testing, etc.]

Report should be prepared in past tense to indicate the facts as they were at the time of the event.

Do not include personal information such as social security numbers, addresses or phone numbers; factual reports will eventually be available on the web and such personal information would be made public.

Do not include any analytical information.

If new information was learned after the factual report was approved, prepare an "Addendum." If you need to correct mistakes, prepare an "Errata."

D. DETAILS OF THE INVESTIGATION

[Include factual documentation from on-scene phase of investigation, as well as any follow-up efforts, testing, etc.]

[name, title, and signature of group chairman]

"FOR OFFICIAL USE ONLY"

NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety
Washington, D.C. 20594

[date]

[group] GROUP CHAIRMAN'S ANALYSIS REPORT

[accident number]

A. ACCIDENT

Operator:

Location:

Date:

Time:

Aircraft:

B. DETAILS OF THE ANALYSIS

1. [Give full opinion as to what each fact means and what bearing and weight such fact or evidence has to the occurrence.]
2. [Only analyze information that was documented in the factual report; do not introduce new information.]
3.

C. FINDINGS

1. [State the principal findings briefly and concisely.]
2.
3.
etc.

D. PROBABLE CAUSE(S)

[Give opinion on the relevancy of the findings to a probable cause of the accident or as contributing factors in the accident.]

E. RECOMMENDATIONS

[Mention any proposed recommendations addressing safety deficiencies discovered during the group's investigation. Supporting data for the recommendation should be included in the factual and analysis reports.]

[name, title, and signature of group chairman]

"FOR OFFICIAL USE ONLY"

APPENDIX L

HEARING OFFICER'S CHECKLIST FOR PREPARING A PUBLIC HEARING

1. Determine date of Public Hearing.

2. Notify the Office of Transportation Disaster Assistance of selected date, and later, of selected meeting place if not using the Board Room/Conference Center at headquarters.

3. Arrange for Court Reporter.
    a. AS-10 secretary will make arrangements for court reporters.
    b. Ensure that a letter of confirmation is sent to the court reporter along with a copy of the Notice of Hearing (Exhibit 1C).
    c. Confirm the availability of the court reporter about the time of the prehearing conference.

4. Obtain Docket (SA) Number from Public Inquiries.

5. If using the Board Room/Conference Center at headquarters, reserve the room by submitting a request form (see Attachment 1) that is available on the Board's intranet site under "Projects."

6. If not using the conference facility at headquarters, determine hotel or other meeting place for Public Hearing (do this as soon as a date and hearing ci ty have been established).

   Arrange for:
    a. Ballroom at hotel or other large civic meeting place
       Note: Close coordination with Public Affairs is essential to ensure good sight lines for TV cameras, ample riser size, adequacy of ballroom size, etc.
    b. P.A. system/microphone locations
    c. Table/seating arrangements (see diagram in Attachment 2)
    d. American flag
    e. Another small meeting room in the hotel, with tables and chairs, to use as an NTSB office
    f. Rental of dedicated, nonswitchboard telephone, fax, and copier
    g. Room reservations for NTSB participants
    h. Description of transportation methods to and from the hotel

   Notes:
   - If possible, travel to the city selected for the hearing to coordinate personally with hotel, convention, or sales personnel.

- Do not finalize the location or date of the hearing until all NTSB/hotel details (small office equipment rental, participant reservations, etc.) have been determined.

6. Obtain:
    a. NTSB banner, NTSB seal, gavel, and gavel striker
    b. Name tents for Board of Inquiry, parties, technical panel, Office of Transportation Disaster Assistance, press
    c. Visual aids you plan to use and the large, black artist's shipping folio for the visual aids
    d. Copies of CFR 91, 135, and 121 as appropriate
    e. Cardboard boxes to mail items to the hotel
    f. About 30 multislot file folders to house exhibits
    g. Office supplies, such as 3-hole punch, notepads, pens, pencils, telephone message pads, scissors, stapler/staples, paper clips, Post-it pads, NTSB mailing labels with return address for returning boxes, filled-out overnight mailing labels, a roll of reinforced masking tape, whiteout, etc.

7. Oversee preparation of visual aids (blown up photographs, charts, etc.), as required.

8. With the IIC:
    a. Prepare list of suggested Parties to the Hearing to be formally designated later by the Chairman of the Board of Inquiry.
    b. In conjunction with AS-1 and RE-1, determine members of Board of Inquiry.
    c. Determine Technical Panel members (usually the IIC and certain group chairmen).
    d. Determine areas of testimony to be developed at the hearing.
    e. Identify witnesses to be called.
    f. Determine exhibits to be used.
    g. Establish date for receipt of all exhibits from group chairmen.
    Note: Allow for 10 working days in advance of prehearing conference for mailing exhibits to parties.
    h. Begin a preliminary Witness List (also known as the Hearing Outline) by first determining categories, then job titles, then exact names when you and the parties decide on individual witnesses.

9. Send a memo to all group chairmen and heads of Offices specifying:
    a. Docket No.
    b. Exhibit numbers
    c. Date/time/place of hearing
    d. Exhibit page numbering procedure

10. Hold a “Hearing Planning Meeting”
    a. Attendees should include, at a minimum, AS-1 or -2, AS-10, members of the technical panel, and the IIC.
    b. Topics should include the Witness List, hearing areas of questioning, etc.

11. Brief the Presiding Officer of the hearing (the Board Member) of the planned witnesses and questioning topics (the Witness List). Rebrief him/her when subsequent major changes or additions/deletions to the Witness List occur.

12. Prepare:
    a. Order of Hearing (Exhibit 1A)
    b. Designation of Parties to the Hearing (Exhibit 1B)
    c. Notice of Hearing (Exhibit 1C)
    d. Designation of Hearing Officer (Exhibit 1D)
    e. Notice of Designation of Chairman of Board of Inquiry (Exhibit 1E)
    Note: Deliver copies of these items to MD-5 when completed. One or more of them are supposed to go into the Congressional Record.

13. Notify (in writing and with return receipt requested) each party to the hearing of the following:
    a. The Board's decision to hold a hearing, the Presiding Board Member, plans, procedures, potential issues, witnesses, etc.
    b. Time/date/place of hearing
    b. A request for the name of the party spokesman
    c. NTSB Part 845, a Notice of Hearing and a Notice of Designation of Parties
    d. A request for NTSB-desired witnesses from the party

14. Prepare:
    a. The Chairman of the Board of Inquiry's opening and closing remarks for the Prehearing Conference (see Appendix L)
    b. Prehearing Conference Outline
    c. The Chairman of the Board of Inquiry's opening and closing remarks for the Public Hearing (see Appendix M)
    d. Later version of the Witness List
    e. Exhibit List
    Note: Do not include the presiding Board Member's prepared statements with anything you mail to the parties until the statements are approved by the Board member.

15. Issue subpoenas to non-Government or non-party witnesses.
    a. Send by registered mail with explanatory letter.
    Note: A subpoena is necessary to allow the NTSB to pay travel expenses for non-party or non-Government witnesses. No subpoena will be necessary for those witnesses who are employed by one of the designated parties. Their organizations will normally request their presence at the hearing verbally or in writing.

16. Prepare a travel order for NTSB participants and, if required, for non-Government or non-party witnesses.

a. Attach a state tax-exempt form to the NTSB travel orders, if available.

17. Arrange for the assembly and tabbing of hearing exhibit packages, which will contain the following:
    a. Copies of all prepared statements by the Presiding Officer
    b. Any hearing informational memos deemed appropriate
    c. Exhibit List
    d. Latest and probably last prehearing version of the Witness List
    e. Exhibits 1A through 1E
    f. All exhibits from group chairmen

    Note: Refuse any requests for putting exhibits in three-ring binders. Drilling the holes and assembling the binders takes too much time.

18. Mail and distribute hearing exhibit packages to parties and NTSB participants.

    Distribution List for exhibit packages:

Chairman of Board of Inquiry	2 copies
Remaining Board of Inquiry Members	1 copy each
IIC	1 copy
Remaining Technical Panel Members	1 copy each
FAA	3 copies
Remaining Parties to the Hearing	1 copy each, 10 working before prehearing conference.
PA/Public	1 copy
Docket	1 copy
Spare Packages	At least 7 copies, one of which is unstapled for later copier use.

Notes:

- As a very general rule, about 30 exhibit packages are required for every Public Hearing.
- One spare package should be unstapled to facilitate copying at the hearing site.
- The public docket copy should be unstapled also and be accompanied by NTSB form 6120.3, Table of Contents. Set this exhibit package up as you would for a docket that does not have a hearing. Arrange for this package to be delivered to Public Inquiries at the time the hearing opens.
- Try to use inexpensive mailing services, if possible.

19. Mail the NTSB participant exhibit packages, supplies and miscellaneous items to the hotel.

Notes:

- If time permits, use regular mail; if not, use overnight.
- Like the CVR transcripts (see item 21), there is no good way to get your visual aids to the hearing location. For example, if you mail the artist's folio with the visual aids in it,

the folio may not arrive intact. If you put it in airline-checked baggage, it may not arrive intact. If you attempt to treat it as airline carry-on baggage, the lead flight attendant will not allow you to do so.

20. Hold the Prehearing Conference about 1 week before the hearing.
    a. Distribute corrections or amendments to exhibits, exhibits that were not previously forwarded, etc.
    b. Review Witness List to make sure the parties understand what is expected of their witnesses.
    c. Ask the parties if they desire any additional witnesses, exhibits, etc.
    d. Describe any administrative procedures that need explanation.

21. Procedures for handling CVR-related exhibits:

- Do not take possession of CVR-related material until the last working day before departure for the hearing site. Suggested methods of getting the CVR material to the hearing site follow.

Plan A	Plan B	Plan C
On the last working day before leaving for the hearing, ask RE to deliver about 80 copies (50 for PA and 30 for hearing participant use) of CVR-related exhibits to you personally. Seal them in one unmarked box and lock it in your office.	Determine if there is a commercial quick copy facility close to the hearing site that will be open the day before the public hearing begins. Remember that policy is to allow the parties 6 hours to assimilate the CVR data before the opening of the public hearing. For instance, this would preclude using a commercial facility on Monday morning if the hearing was to open early Monday afternoon.	If neither of the preceding plans is practical, obtain the 80 copies of the CVR exhibits in sufficient time to send them in an unmarked box by overnight mail to the hotel. **Obtain explicit permission from AS supervisors before proceeding with this plan and use it with great caution**. As the remainder of this plan will demonstrate, it is the least secure way to get the CVR exhibits into the hands of the parties and the public under current rules. When in doubt, ask your supervisor how he or she wants to get the CVR exhibits to the hearing site.
Alternately, obtain one copy of each CVR-related exhibit and make the 80 copies yourself or very closely supervise their production. Seal them in the box and lock it in your office.	If you find a commercial printer open at the appropriate time, obtain single copies of CVR-related exhibits from RE on the last working day before the hearing and guard them closely as you bring them with you to the hearing site.	Plan for the box's arrival at the hotel in one of two ways: either tell the hotel how to identify the box via the shipping documents and request that it be secured in a more secure area than the rest of the material being shipped to the hotel or don't tell the hotel anything about the box and its contents and have the box placed with the rest of the boxes, trusting that its security will lie in its anonymity.

Plan A	Plan B	Plan C
Take the box home and lock it up again until you depart for the airport.	Make 80 copies of the material at the quick copy facility at the site of the hearing and lock them in your hotel room.	Distribute copies of the CVR-related exhibits 6 hours before the public hearing begins.
Check the box as checked luggage at the ticket counter.		
Retrieve the box at the luggage carousel at your destination and lock it in your hotel room.		

Note: Brief the Public Affairs representative on the evening before the hearing opens, allowing the representative to read the CVR-related exhibits and answering any questions on the material. This will prepare the representative for press queries the next day. After the briefing, retrieve the copies that were reviewed.

ATTACHMENT 1

Request a reservation for the Board Room and Conference Center rooms and A/V equipment and services using the checkboxes below.

- If using the Board Room or conference rooms, *check availability first!* See Board Room calendar (In Outlook: Public Folders/All Public Folders/Board Wide Information/Calendars/Board Room Reservations)
- If using equipment in another location, be sure to indicate that location in the comments section.

REQUESTOR & ROOM INFORMATION

Name: **Phone #:** **Requestor's Office:**

Date needed:
from Month Day Year
to Month Day Year
Time needed: *from* *to*

Alternate Date:
from Month Day Year
to Month Day Year
Alternate Time: *from* *to*

Type of Event:

Select Room(s)
View Room Descriptions
New Board Room
Conference Room A+B: (21'x39')
Conference Room A only
Conference Room B only
Conference Room C (20'x25')
Conference Room D (20'x25')
Old Board Room
(Multiple selection tips)

Room Setup Requested
Indicate layout style and any special arrangements

# of Attendees: ☐ **NTSB** ☐ **Non-NTSB**

Will attendees need directions? ☐ **Yes**

Hotel Rooms needed? ☐ **Yes** **How many?**

Parking spaces needed? ☐ **Yes** **How many?**

Designation(s) of Non-NTSB group(s)
(i.e., FAA; ACME Board of Directors)

AUDIO/VISUAL EQUIPMENT AND SERVICES

☐ **Computer**
Select all that apply
Pow erpoint
CD-ROM
(Multiple selection tips)

Not all equipment is available in all locations - see detailed information for descriptions, suitability, and support options.

Operating Assistance needed? ☐ **Yes**
What kinds of Operating Assistance?

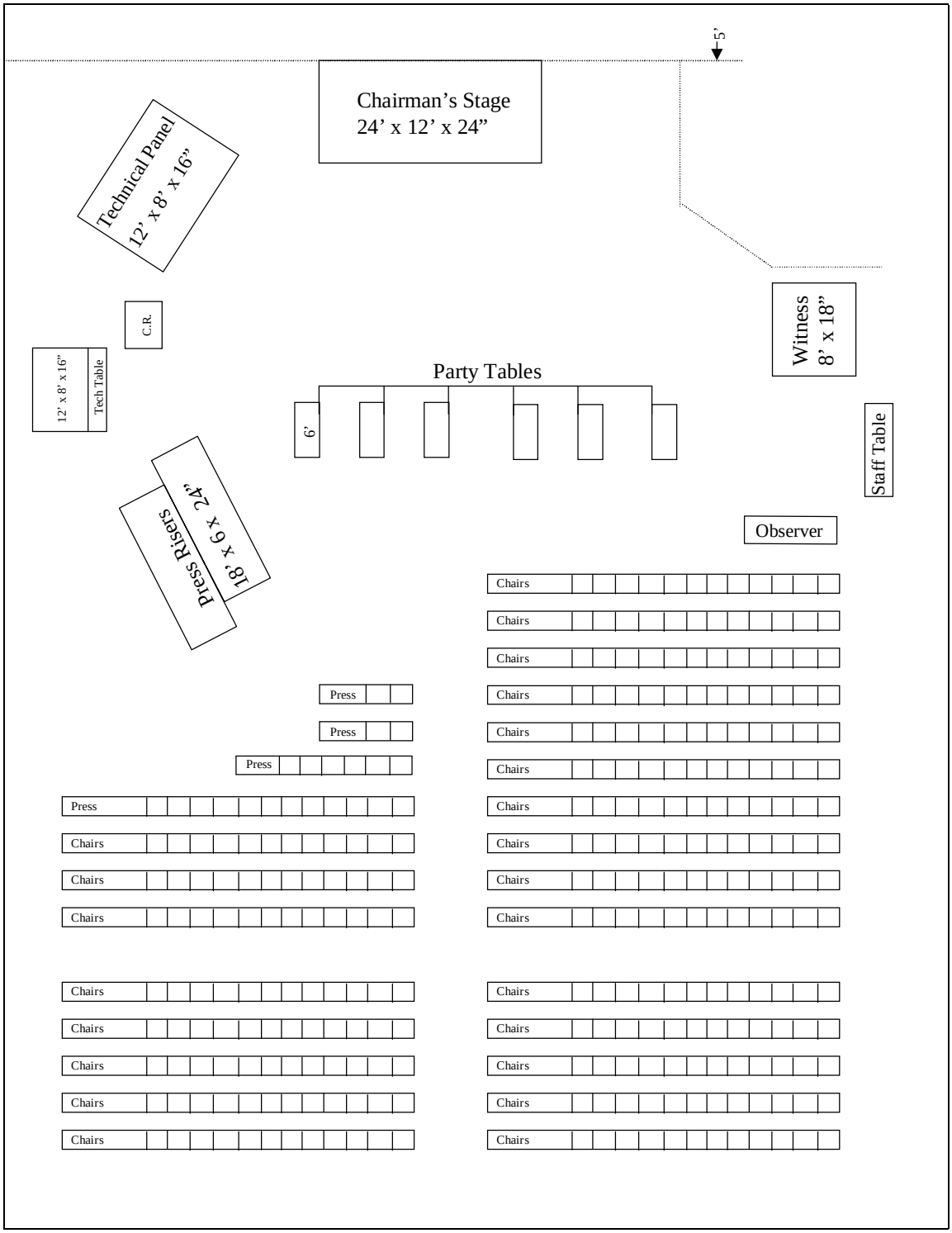
☐ **Mounted Video Cameras (Board Room only)**
☐ **Portable Video Camera**
☐ **Microphones #**
☐ **Wireless Microphones**
☐ **Large-screen TV/VCR combo on cart**
☐ **VHS player** ☐ **Beta player**
☐ **Computer Projector** ☐ **Visualizer**
☐ **Overhead Projector** ☐ **Slide Projector**

Comments:

Do not assume you have the space until it is confirmed ! **For questions, call...**

Room Reservations: **314-6305 (Carolyn Dargan)**
Room Setup: **314-6222 (Bill McGruder)**
A/V Services: **314-6557 (Antion Downs)** **list of alternates**

ATTACHMENT 2



EXAMPLE OF HEARING PREPARATION LETTER TO STAFF

National Transportation Safety Board

Memorandum

Date: March 9, 1995

To: IIC, Group Chairman, Office Chiefs, CHI 95 MA 044 -St. Louis Incursion

From: Hearing Officer, R. MacIntosh

Subject: Public Hearing Preparation Data

With reference to the Investigation Manual II, Appendix J, task # 9, please note the date, time and place of the hearing, and the Docket Number, SA-513 (see the attached Exhibit 1E). All exhibits should be identified using the group identification number followed by a dash and capital letter (A to Z sequence). An annotated Appendix K is attached for your reference. Group Chairman reports should start with a brief summary as provided by the IIC. This will ensure a stand alone document with some standardization of the initial facts.

Regarding Investigation Manual II, Appendix J, tasks # 7, 10 and 11, Richard Wentworth has distributed the first cut at a witness list (Hearing Outline). Group chairman should now prepare their edit responses to the areas of testimony and identification of exhibits. Please respond back to Richard with a copy to Jodie and me.

The prehearing conference is scheduled for April 17 in the Board Room at 1 p.m. Therefore, all exhibits must be in our hands at AS-10 by April 3 to allow for the required 10 day mailing cycle. Please plan accordingly to prepare your **factual reports** with the appropriate cover sheet and **all other exhibits** for your own group and from the witnesses (or parties) you will be addressing in sufficient time to make this schedule.

Regarding the number of copies submitted, the task #18 Notes speak of a general rule for 30 exhibit packages. From experience we find that is an absolute minimum. I also would prefer that you would provide us with 40 copies of each exhibit. Public Affairs also has levied a requirement on AS to provide 25 copies of each Exhibit A (group chairman's factual). That means that a total of 65 copies of Exhibit A's are required. Our Administrative Assistant, Carolyn Dargan, will handle the distribution, but only the support of the group chairman can make this schedule work.

Group chairman should also plan to scan their exhibits into the File Magic system before the prehearing conference. RE-20 can provide technical guidance in this task.

We need to consider the need for and preparation of visual aids (runway diagrams, signage photos, view from….illustrations or slides). Group chairman or witnesses who need these support items should make their requirements known ASAP. Perhaps there can be some resource sharing on some items.

Please try and work with your parties and witnesses to avoid last minute exhibits. Your compliance with the schedule will avoid opening the public hearing with an incomplete public docket, or with some parties or witnesses not privy to the exhibits held by or referred to by others. Exhibit confusion can reflect poorly on the Technical Panel questioner and usually results in strong negative comment from the Chairman of the Board of Inquiry. Let's all try and avoid this folly.

Out task # 10 calls for a "Hearing Planning Meeting." Are we about ready for one? We are obligated to brief the Presiding Officer on the witness list and topics when they are firmed up. I have tentatively scheduled a planning meeting for March 16, at 1 p.m. It should last about 45 minutes. Please advise!

cc: AS-2, AS-10, AS-30, AS-50, AS-60, RE-20, RE-60, NCR-A, PA, GA
J. Reeves
A. Lebo
M. Brenner
L. Roman
R. Wentworth
A. Reitan
D. Grossi
A. Pollock
L. Jones

APPENDIX M

EXHIBIT COVER SHEET AND IDENTIFICATION NUMBERS

DOCKET NO. SA [docket #]

EXHIBIT NO.

NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C.

[group] GROUP CHAIRMAN'S FACTUAL REPORT

by

[group chairman]

HEARING EXHIBIT IDENTIFICATION ORDER

GROUP	IDENTIFICATION NUMBER
Operations	2
ATC	3
Witnesses	4
Meteorology	5
Survival Factors	6
Structures	7
Powerplants	8
Systems	9
Flight Data Recorder	10
Maintenance Records	11
Cockpit Voice Recorder	12
Aircraft Performance	13
Human Performance	14
Materials	15
Airports/ARFF	16
Other	*

* Use higher exhibit numbers for other groups, as necessary.

EXHIBIT 1A

UNITED STATES OF AMERICA
(a) NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

****

In the Matter of the Investigation of		
the Accident Involving	*	
(aircraft)	*	**DOCKET NO. SA-**
(location)	*	
(date)	*	

****

ORDER OF HEARING

A public hearing is hereby ordered by the National Transportation Safety Board in connection with the above matter at a time and place to be determined by the Hearing Officer who will be hereafter designated.

Dated this _____day of _____.

FOR THE BOARD

_____
Chairman

EXHIBIT 1B

UNITED STATES OF AMERICA
NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

********** **In the Matter of the Investigation of** **the Accident Involving**	* * * * * **********	**DOCKET NO. SA-**
(aircraft)		
(location)		
(date)		

DESIGNATION OF PARTIES TO THE HEARING

The following organizations are designated Parties to the hearing in accordance with Part 845.13 of the Board's Procedural Regulations:

Dated this _____ day of _____.

_____
Chairman, Board of Inquiry

EXHIBIT 1C

UNITED STATES OF AMERICA
NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

********** **In the Matter of the Investigation of** **the Accident Involving**	* * * * * **********	**DOCKET NO. SA-**
(aircraft)		
(location)		
(date)		

NOTICE OF HEARING

Notice is hereby given that pursuant to the authority conferred by the National Transportation Safety Board, I hereby designate that a hearing on the above matter will commence at [time] on [date] in [location].

Dated this _____ day of _____.

FOR THE BOARD

_____
Hearing Officer

EXHIBIT 1D

UNITED STATES OF AMERICA
NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

********** **In the Matter of the Investigation of** **the Accident Involving**	* * * * * **********	**DOCKET NO. SA-**
(aircraft)		
(location)		
(date)		

DESIGNATION OF HEARING OFFICER

Pursuant to the authority conferred by the National Transportation Safety Board, Office of Aviation Safety, Washington, D.C., is hereby designated Hearing Officer to conduct a public hearing on behalf of the National Transportation Safety Board, to be held in the above matter. The said Hearing Officer is authorized to set the time and place of the hearing, to give notice thereof, and to exercise such other powers in connection with the conduct of said proceedings as authorized by the National Transportation Safety Board.

Dated this _____ day of _____.

FOR THE BOARD

_____
Chairman

EXHIBIT 1E

UNITED STATES OF AMERICA
NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

**********		
In the Matter of the Investigation of		
the Accident Involving	*	
(aircraft)	*	**DOCKET NO. SA-**
(location)	*	
(date)	*	
**********		

NOTICE OF
DESIGNATION OF CHAIRMAN OF BOARD OF INQUIRY

Pursuant to the authority conferred by the National Transportation Safety Board, Washington, D. C., Member _____ is hereby designated as Chairman, Board of Inquiry, to conduct a public hearing on behalf of the National Transportation Safety Board, in the above matter. The said Chairman of the Board of Inquiry is authorized to exercise such powers in connection with the conduct of said proceedings as authorized by the National Transportation Safety Board.

Dated this _____ day of _____.

FOR THE BOARD

_____
Chairman

APPENDIX N

PREHEARING CONFERENCE PROCEEDINGS

(1) Opening Statement by the Chairman of the Board of Inquiry

(2) Introduction of Board of Inquiry and Technical Panel

(3) Discussion of Prehearing Conference and Public Hearing

(4) Introduction of the Parties to the Hearing

(5) Discussion of Issues for Public Hearing

(6) Review of Exhibits by Hearing Officer and Group Chairmen

(7) Review of Witnesses by Hearing Officer and Technical Panel

(8) Resolution of Any Procedural Issues

(9) Closing Remarks by the Chairman of the Board of Inquiry

Ladies and Gentlemen, please come to order.

This prehearing conference is being held in accordance with 49 *Code of Federal Regulations* Part 845, which prescribes the National Transportation Safety Board's Rules of Practice in Transportation Accident/Incident Hearings and Reports.

I am [name], Member of the National Transportation Safety Board, and Chairman of the Board of Inquiry. On [date], we will commence a public hearing to investigate the accident involving [airline] flight [#], which occurred at [accident location] on [accident date]. The public hearing will be convened at the [hotel or other building] in [city, state], beginning at [time]. Before proceeding, I would like to introduce the other members on the Board of Inquiry and the Technical Panel, who are all employees of the National Transportation Safety Board.

Assisting me on the Board of Inquiry will be:

Mr./Ms./Mrs./Dr. [name], [title]

(other members of the Board of Inquiry to follow)

Members of the Technical Panel are safety investigators from the NTSB. They are:

Mr./Ms./Mrs./Dr. [name], Investigator-in-Charge of this investigation (if true) and Hearing Officer

[name], [Group] Investigator (or Group Chairman)

(other members of the Technical Panel to follow)

Mr./Ms./Mrs. [name], from the Safety Board's Office of General Counsel, is also with us to assist in resolution of any legal matters.

Mr./Ms./Mrs. [name], from the Safety Board's Office of Government and Public Affairs, is here to assist in matters dealing with the news media.

Mr./Ms./Mrs. [name], my Special Assistant, is also here to assist me.

(as appropriate, for the following:)

Mr./Ms./Mrs. [name] is here to handle all administrative matters dealing with the hearing. [He/she] will also be present at the hearing itself to handle administrative duties in [location of hearing]. Mr./Ms./Mrs. [name], my Confidential Assistant, will also assist me in the course of the hearing.

Before proceeding with the conference, I wish to acknowledge and thank at this time the parties for the cooperative spirit that they have displayed as we have worked together to determine the facts, conditions, and circumstances regarding this accident.

This prehearing conference will be conducted on an informal basis. The purpose is to acquaint the parties with the Safety Board's rules and procedures for the conduct of the more formal public hearing, to identify the witnesses to be called at the hearing, to discuss the areas in which the witnesses will be examined, and to review the exhibits that will be offered in evidence and used during the testimony. The Board has designated as parties to the hearing those agencies, companies, and associations whose participation in the hearing is deemed necessary in the public interest and whose special knowledge or participation will contribute to the development of pertinent evidence applicable to this investigation. I assume that all parties have copies of applicable Board regulations, a set of exhibits, and a proposed witness list. If you have any questions with regard to the issues or the procedures, they should be raised at this meeting.

Any party desiring to submit additional exhibits or to call additional witnesses should raise the matter at the appropriate time later in this conference. Any party failing to do so will be precluded from introducing additional exhibits or calling additional witnesses during the hearing unless good cause is shown why such evidence should be admitted.

We are anticipating a [#]-day hearing. In order to conclude the hearing within the allotted time, it will be particularly important to confine the hearing to the issues defined at this prehearing conference. Therefore, during the hearing, the testimony and evidence must remain within the confines of the issues as they are defined today. I will make all the rulings on the pertinence of proffered testimony, and my rulings will be final.

In order to develop a complete factual record to assist the Board in meeting its public safety obligations in an efficient and equitable manner, I request the continued full cooperation of all the parties. I am confident, and I expect that each of you has the same overall interest as that of the Board, namely to determine the facts, conditions, and circumstances of this accident and to develop a record that will enable us collectively to prevent a similar accident in the future. This is the primary focus of the hearing, and I expect the parties, in their questions, to adhere strictly to that focus and to the issues agreed upon today.

I will not permit the hearing to become an adversarial forum in which parties or organizations that may have narrow or special interests attempt to advance those interests.

The Board has designated the organizations that you represent as parties to the public hearing in the interest of advancing the conduct and the comprehensiveness of the Board's investigation. No person or organization, except the Federal Aviation Administration, has the statutory right to be designated a party to the Board's investigation of this accident. I appreciate your participation as parties and urge you to take an active role in the hearing.

The public hearing is an administrative fact-finding portion of the investigation. There are no adverse parties or interests. There are no formal pleadings. The Board does not determine

liability, nor does it attempt to do so. For this reason, questions directed to issues of liability will not be permitted. I must emphasize the fact-finding nature of the hearing. Our sole purpose is to determine how and why this accident occurred and what can be done to prevent similar occurrences in the future. The witnesses who are called will not be at the hearing to speculate as to cause or to furnish an analysis of the facts. Rather, they will be there to testify as to the facts or to give expert testimony on various subject areas germane to the investigation.

In accordance with the Board's regulations, following the hearing, the parties will have the opportunity to analyze the evidence and to make recommendations to the Board regarding the conclusions that should be drawn from the evidence and what preventative measures should be taken. Analysis of all the evidence will be accomplished by the Board following the hearing, and the Board will consider the views of the parties as submitted in their written comments. I strongly urge each party to submit such comments since it is beneficial to the Board in its analysis and offers the parties the opportunity to state their views to the Board for the record. If you decide to submit any proposed findings, conclusions, or recommendations, we ask that you submit 15 copies to us within 30 days after the receipt of the transcript of the hearing. Please note that this date may be revised depending on the need for delayed followup investigation activities that may arise during the hearing. The rules (49 CFR Part 845.27) provide that parties must also receive copies of their submissions to each of the other parties. That includes the parties to the field phase of the investigation and the public hearing. Any submission will be made a part of the public docket of the investigation.

Let me emphasize that the Board does not permit cross-examination in the legal sense. Therefore, I request that all parties and the technical panel refrain from asking questions that (1) have no factual relationship to this accident or to the prevention of similar accidents but are merely posed for their dramatic value, (2) are narrative-type questions, that is, more in the nature of testimony than a question, (3) are beyond the scope of the issues agreed upon, (4) are repetitive, or (5) are irrelevant, immaterial, or argumentative.

During the hearing, the witnesses will testify under oath. Each will be introduced by name and any special qualifications he or she may possess will be identified. Witnesses at the hearing will first be questioned by a designated member or members of the technical panel. Following this, each party in turn will have the opportunity to question the witness. I will permit a second round of questions **only** if the designated spokesperson makes the request and specifically states the reason it should be granted. There are only two reasons for a second round of questions: 1) if the record needs to be clarified or 2) if some new matter has been raised after the requesting party has taken its turn in the questioning rotation. If a party is granted the right to additional questioning, I would expect it to be very brief. There will be no repetition of previous questions. We may go off the record while the need for additional questions is explained.

Once a witness has completed his testimony, he or she should realize that he or she may be subject to recall should the need arise. Therefore, witnesses should not leave unless they or their party spokesman has checked with the National Transportation Safety Board.

The following organizations have been designated parties to the hearing. When I call the name of the party, the designated spokesperson will please respond with his or her title and

affiliation. This designation will continue in force until the completion of the hearing, except in those circumstances in which the designated spokesperson is also a witness or for other good cause.

(as applicable:)

Federal Aviation Administration -

[airline] -

[airframe manufacturer] -

[engine manufacturer] -

[pilots association] -

[machinists association] -

[flight attendants association] -

[air traffic control association] -

[local authorities] -

I would now like to address the question of the issues that will be developed at the hearing. As the Board has posed them, the relevant issues are the following:

1. (Typically) The facts and circumstances of the accident involving [airline] flight [#].

2. (other issues to follow)

If any party believes that these issues should be modified, clarified, or limited, the time to make that request is during this conference. The hearing will adhere to the issues identified and agreed upon here. Before I entertain questions about these issues, please be advised that these are the same issues that I will announce during the opening of the hearing. The issues are purposely broad in nature. The specific issues to be covered during the various witnesses' testimony are contained in the witness list that we will describe and agree upon very shortly.

Are there questions regarding these broad issues? If not, the Technical Panel members and the Hearing Officer will discuss the witness list for the purpose of explaining in detail the type of testimony that will be elicited from each witness.

[After completion of review of witnesses and exhibits by Hearing Officer]

Are there any additional comments on the exhibits or any recommendations for additional exhibits?

Are there any additional comments on the witnesses or any recommendations for additional witnesses?

I believe this brings us to the completion of our work for the day. I thank each of you for your comments and your participation and I look forward to working with you during the hearing. Should you have any questions concerning proceedings or other administrative matters between now and the hearing, Safety Board staff are available to assist you. Please direct your questions to [name of hearing officer] and [he/she] will ensure that your questions are answered. Again, I look forward to seeing you on [date] when we convene the hearing.

This prehearing conference is now completed.

APPENDIX O

PUBLIC HEARING PROCEEDINGS

(1) Opening Statement by the Chairman of the Board of Inquiry

(2) Introduction of Issues for Public Hearing

(3) Introduction of Board of Inquiry and Technical Panel

(4) Introduction of the Parties and Party Spokespersons

(5) Swearing In of Hearing Officer

(6) Swearing In and Testimony of Witnesses

(7) Closing Remarks by the Chairman of the Board of Inquiry

OPENING STATEMENT BY CHAIRMAN OF THE BOARD OF INQUIRY

Good morning and welcome.

I am [name], a Member of the National Transportation Safety Board and Chairman of this Board of Inquiry.

At this hearing we are considering an accident that occurred [accident date], at [accident location], involving [airline] flight [#].

The hearing is being held for the purpose of supplementing the facts, conditions, and circumstances discovered during the on-scene investigation. This process will assist the Safety Board in determining the probable cause and in making any recommendations to best prevent similar accidents.

This inquiry is not being held to determine the rights or liability of private parties, and matters dealing with such rights or liability will be excluded from these proceedings.

Over the next several days of this hearing, we will collect information that will assist the Safety Board in determining how and why this accident occurred. Specifically, we will concentrate on the following issues:

1. (typically) The facts and circumstances of the accident involving [airline] flight [#].

2. (other issues to follow)

At this point, I would like to introduce the other members of the Board's staff for this hearing. Assisting me on the Board of Inquiry will be:

Mr./Ms./Mrs./Dr. [name], [title]

(other members of the Board of Inquiry to follow)

Mr./Ms./Mrs. [name], from the Safety Board's Office of General Counsel, is also with us to assist in resolution of any legal matters.

The Board of Inquiry will be assisted by a Technical Panel. These persons are:

Mr./Ms./Mrs./Dr. [name], Investigator-in-Charge of this investigation (if true) and Hearing Officer

[name], [Group] Investigator (or Group Chairman)

(other members of the Technical Panel to follow)

During this hearing, neither I nor any other Safety Board personnel will attempt to analyze the testimony received nor will any attempt be made at this time to determine the probable cause of the accident. Such analyses and cause determinations will be made by the full Safety Board after consideration of all of the evidence gathered during our investigation. The report on the subject accident, reflecting the Safety Board's analyses and probable cause determinations, will be considered for adoption by the full Board at a later public meeting, which will be held at the Safety Board's headquarters in Washington, D.C.

The Safety Board's rules provide for the designation of parties to a public hearing. In accordance with these rules, those persons, governmental agencies, companies, and associations whose participation in the hearing is deemed necessary in the public interest and whose special knowledge will contribute to the development of pertinent evidence are designated as parties. The parties assisting the Safety Board in this hearing have been designated in accordance with these rules.

As I call the name of the party, will its designated spokesperson please give his or her name, title, and affiliation for the record:

(as applicable:)

Federal Aviation Administration -

[airline] -

[airframe manufacturer] -

[engine manufacturer] -

[pilots association] -

[machinists association] -

[flight attendants association] -

[air traffic control association] -

[local authorities] -

I want to publicly thank all of the parties for the assistance and cooperation that they have displayed as we have worked together in the investigation of this accident.

On [date], the Board of Inquiry held a prehearing conference in Washington, D.C. It was attended by the Safety Board's Technical Panel and representatives of the parties to this hearing.

During that conference, the areas of inquiry and the scope of the issues to be explored at this hearing were delineated and the selection of the witnesses to testify to these issues was finalized.

Copies of the witness list developed at the prehearing conference are available at the press table and a set of exhibits to be used in this proceeding is available for review there.

The witnesses testifying at this hearing have been selected because of their ability to provide the best available information on the issues. The first witness will be the Investigator-in-Charge of the accident investigation, who will summarize certain facts about the accident and the investigative activities that have taken place since then.

The witnesses will be questioned first by the Board's Technical Panel, then by the designated spokesperson for each party to the hearing, followed by the Board of Inquiry.

As Chairman of the Board of Inquiry, I will be responsible for the conduct of the hearing. I will make all rulings on the admissibility of evidence, and all such rulings will be final.

The record of the investigation, including the transcript of the hearing and all exhibits entered into the record, will become part of the Safety Board's public docket on this accident and will be available for inspection at the Board's office in Washington, D.C. Anyone wanting to purchase the transcript should contact the court reporter directly. Please note that the parties also have to order their own transcripts because the NTSB only orders copies for its own use.

(as appropriate:)

There are several other people I would like to recognize at this time. They are Mr./Ms./Mrs. [name], of the Safety Board's Office of Government and Public Affairs, who is at the press table, Mr./Ms./Mrs. [name], who will be handling the administrative matters regarding this hearing, and my Confidential Assistant, Mr./Ms./Mrs. [name], who will be furnishing the witnesses with exhibits. You may wish to contact these individuals for assistance pertaining to copies of exhibits and other items.

At this time I would like to acknowledge other officials who are observing this hearing.

[hearing officer], have all the exhibits been entered in the public docket? Thank you.

I will call the first witness. Mr./Ms./Mrs. [hearing officer], will you please come forward and take the witness stand?

SWEARING IN AND QUALIFYING A WITNESS

To swear in the witness, the hearing officer shall ask him or her: "Do you swear to tell the truth, the whole truth, and nothing but the truth, so help you (God) "?

To qualify a witness, the Hearing Officer shall ask him or her:

1. Would you please state your full name and business address?

2. By whom are you presently employed?

3. What is your present position?

4. How long have you held that position?

5. Would you briefly describe your duties and responsibilities in your current position?

6. Would you briefly describe the education, training, and experience that you obtained to qualify you for your current position?

7. What, if any, FAA aviation certificates do you hold, and what, if any, flight experience do you have, including flying time and types of aircraft flown?

EXHIBIT LIST

1A	Order of Hearing
1B	Designation of Parties to the Hearing
1C	Notice of Hearing
1D	Designation of Hearing Officer
1E	Designation of Chairman of Board of Inquiry

(list of exhibits to follow)

WITNESS/ISSUES LIST

1. Mr./Ms./Mrs. [name] Investigator-in-Charge
   Major Investigations Division
   National Transportation Safety Board
   Washington, D.C.

   a. Duties, responsibilities, and qualifications.
   b. Description of investigation.

2. Mr./Ms./Mrs. [name] [title]
   [affiliation]
   [location]

   a. Duties, responsibilities, and qualifications.
   b. [areas of which the witness has specific knowledge relating to the issues of the accident]

Exhibit: [#] Series
Questioned by: [Technical Panel questioner]

(similar format for subsequent witnesses)

EXAMPLE OF HEARING ISSUES LIST

National Transportation Safety Board
Public Hearing
Runway Incursion and Collision
Trans World Airlines MD-82, N954U and
Superior Aviation Cessna 441, N441KM
Lambert-Saint Louis Airport
Bridgeton, Missouri
November 22, 1994

1. Circumstances of the accident.

2. The scope of the runway incursion problem.

3. The status of FAA runway incursion plans.

4. A review of programs, schedule delays, AMASS/ASD.

5. R & D programs for low cost surface surveillance.

6. The status of airport improvements to reduce the runway incursion hazard.

CLOSING STATEMENT BY CHAIRMAN OF THE BOARD OF INQUIRY

With the last witness having been heard, this concludes this phase of the Safety Board's investigation.

In closing, I want to emphasize that this investigation will remain open to receive, at any time, new and pertinent information concerning this accident. The Board may, at its discretion, reopen the hearing in order that such information be made a part of the public record.

The Board welcomes any information or recommendations from the parties or the public that may assist it in its efforts to ensure the safe operation of commercial aircraft. Any such recommendations should be sent to the National Transportation Safety Board, Washington, D.C. 20594, within 30 days after the receipt of the transcript of this hearing. Please note that this deadline may be affected by unforeseen followup investigative activities that evolve during the hearing. All the evidence developed in this investigation and hearing and all recommendations received within the specified time will be presented and evaluated in the final report of the accident in which the National Transportation Safety Board's determination of probable cause will be stated.

On behalf of the National Transportation Safety Board, I want to again thank the Parties for their cooperation, not only during this proceeding but also throughout the entire investigation of this accident. Also I want to express sincere appreciation to all those groups, persons, corporations, and agencies that have provided their talents so willingly throughout this hearing.

The record of the investigation, including the transcript of the hearing and all exhibits entered into the record, will become part of the Safety Board's public docket on this accident and will be available for inspection at the Board's Washington office. Anyone wanting to purchase the transcript may contact the court reporter.

I now declare this hearing to be in recess indefinitely.

APPENDIX P

IIC'S OPENING STATEMENT TO BOARD MEETING

(example)

Good Morning. On [date] at 0326 eastern standard time, [airline] flight [#], a [manufacturer & model] freighter crashed about 3 miles northwest of [accident location] after executing a second missed approach to runway 7. Night instrument flight conditions prevailed. The airplane was destroyed, and the flight crew of three and an observer onboard received fatal injuries. The airplane was operating under 14 CFR Part 121 as a scheduled domestic cargo flight.

Flight [#] originated in [city, state], and flew the short leg to [city, state], uneventfully. The flight departed [city] at about 2330 EST. The flight into the [city, state], terminal area was without incident, and the first officer was the flying pilot. The flight was vectored for an instrument landing system (ILS) runway 7 approach.

About 0312, the [airport designation] tower cleared the flight to land. However, the first officer had trouble aligning the airplane with the ILS final approach course and a missed approach was then accomplished.

By 0320, the controller had vectored the airplane onto a base leg and then gave the flight a heading to intercept the final approach course again.

Flight [#] was again cleared to land around 0322 and about that time they inquired about the surface winds. The tower controller reported the surface winds as 100° at 10 knots, and the flight crew reported that their winds were 180° about 35 knots at their altitude.

Between 0324:01 and 0324:15, and as the first officer was attempting to stabilize the approach, the CVR recorded three ground proximity warning system (GPWS) glideslope warnings, three GPWS sink rate warnings, and three power changes. Because the first officer was again having trouble flying the instrument approach, the captain took control of the airplane and performed another missed approach maneuver.

At 0324:46, the first officer advised the controller that the flight was performing the missed approach, and then the flight was directed to climb and maintain 3,000 feet. At 0325, the captain called for climb power, and a sound similar to that of a slight power reduction was recorded on the CVR. About 30 seconds later, the tower controller directed the flight crew to turn left to a heading of 300°.

At this juncture, the angle of bank to the left steepened dramatically, eventually reaching about 60°. During this maneuver, the nose dropped to a maximum of 25° nose low. Although the exact sequence of events next is open to some interpretation, the staff believes that control of the airplane then passed to the first officer. The attitude of the aircraft then lessened in severity to about 17° left bank and 17° nose low when impact with the ground occurred at a little over 300 knots airspeed.

The Safety Board was notified of the accident shortly thereafter and dispatched an investigative team to [city]. The team was accompanied by [Member], [his/her] staff and a representative of the Office of Public Affairs. Team specialists included:

Mr./Ms./Mrs. [name], [investigative group]

(others to follow)

Mr./Ms./Mrs. [name], Report writer

No physical or empirical evidence of mechanical malfunctions could be positively identified. The weather at the time of the accident, the time of the accident itself, and the maneuvers of the aircraft just before the loss of control indicated a possibility of spatial disorientation of the captain for physiological reasons alone. However, the investigation uncovered some evidence, of a somewhat conflicting nature, that an attitude direction indicator on the instrument panel failed sometime during the accident sequence. If this attitude indicator was the captain's, and if it indeed failed, then its failure could have precipitated the captain's loss of control. The staff believes these two scenarios encompass the most likely events on the early morning of [accident date].

Parties to this investigation included: [list of parties to the investigation]. We received formal party submissions from [list of parties or others providing submissions] and their views were considered during the report writing process.

Thank you. That concludes my opening statement.

APPENDIX Q

PETITION FOR RECONSIDERATION PROCEDURES

The following steps are to be followed in the processing of reconsiderations of probable cause. The various steps and comments are based on Board Rules, policies, and established procedures (see Board Order 600A).

1. All petitions for reconsideration of probable cause must follow the Notation process.

2. Upon receipt, ensure that the correspondence is mail-controlled for the Chairman's signature. Some letters come directly to the IIC or other persons. For example, if the petition comes directly to a Field Office, forward it to the Managing Director to be mail-controlled.

3. Verify that the probable cause has been approved by the Board. Some correspondence incorrectly references reconsideration of probable cause when in fact a probable cause has not yet been determined, or the letter is intended to influence the determination of probable cause of an "open" case. This type of correspondence should be handled as a "submission" (reference 49 CFR 845.27) by a party, i.e., it should be placed in the public docket and copies provided to other parties. The reply to the petition should state that the Board will review the submission as part of its deliberations to determine probable cause. Give the petitioner an estimate of the time required for Board action, if possible.

4. If it is determined that a submission is a bona fide reconsideration (reference 49 CFR 845.41(d)), send an acknowledgment letter that the petition has been received and is being evaluated by staff. It is Board policy to assign drafting of the petition response to someone other than the original IIC or original report writer. Also send a copy of Part 845, citing the provision in 845.41 that copies of the petition be forwarded to the parties and that proof of service be provided. State that the case has been assigned to a specific person, g iving the name of the specialist assigned, if desired, and mention that the assigned specialist may contact the individual directly.

6. Request the factual and analysis reports and supporting documents from Public Inquiries.

7. If necessary, request from appropriate AS or RE personnel a written evaluation of the data in the petition and the data submitted by the parties (after the 90-day period). Many petitions refer to highly technical factors that have resulted from litigation or other non-NTSB investigators (e.g., ALPA). Although not a

mandatory step, the original IIC/report writer should be consulted for his/her evaluation of the petition.

8. Review all data after it has been received along with the original factual and analytical information. Consolidate all the information and make a determination as to whether the probable cause should be revised. It is possible to accept a petition totally, partially, or not at all.

9. Prepare a draft response for Board approval to include a summary of the petitioner's submission and the Board's decision and rationale. There is a standard format for the response letter; AS-20 or AS-70 can provide examples of format. If the report text and/or probable cause for major “blue covers” is to be revised, draft revisions with specific changed text annotated in the margin should be forwarded to the Board as part of the Notation package. For field cases, the original and the revised Accident Brief and Factual Report should be attached for Board approval.

The following attachments are included:

1. Reconsideration Checklist
2. Letter of Acknowledgment
3. Letter to AS or RE Requesting Technical Evaluation
4. Sample Notation Format
5. Sample Response Format
6. Sample Response Format (No New Evidence)

Attachment 1

RECONSIDERATION CHECKLIST

1. Petition for Reconsideration Received _____

2. Mail Control Assigned (by MD-5) _____

3. Acknowledgment _____

4. Request for AS or RE Assistance, if Necessary _____

5. Initial Draft Prepared and Circulated for Comments _____

6. Advance Copy Prepared and Concurrence Received _____

7. On Notation _____

8. Final to Chairman for Signature _____

Attachment 2

LETTER OF ACKNOWLEDGMENT

[name]
[address]

Dear Mr/Ms./Mrs. [name]:

This will acknowledge receipt of your petition of [petition date] for reconsideration of our findings in the investigation of the accident involving [aircraft, location, and date of accident].

Under 49 *Code of Federal Regulations* 845.41, (see enclosed) your petition cannot be processed until you provide a copy of your petition to all parties to the investigation shown in the factual report and provide the Safety Board with proof of service to the parties. Proof of service can be copies of mail receipts signed by the recipient, an affidavit acknowledging that the parties received the petition, or any reasonable proof that the parties received the petition. When you send us the proof of service, please provide us with current addresses and telephone numbers of each party since our information predates the report.

Following service to the parties, they are given 90 days to respond before consideration and analysis of your petition begins. In a cover letter to your petition, advise the parties that any response to your petition should be sent within 90 days of receipt of your petition and should be addressed as follows:

Chief, Regional Operations and
General Aviation Division (AS-20)
National Transportation Safety Board
490 L'Enfant Plaza East, S.W.
Washington, D.C. 20594

A response to your petition will be forwarded to you following review by the National Transportation Safety Board.

Sincerely,

[name]
Chief, Regional Operations and
General Aviation Division

Enclosure

Attachment 3

MEMO TO AS OR RE REQUESTING TECHNICAL EVALUATION

Date:

To: (applicable AS or RE Division Chief or Director)

From: Director, Office of Aviation Safety

Subject: Reconsideration of Probable Cause of Aircraft Accident--[aircraft, location, date, and accident number]

We recently completed a review of the attached petition for reconsideration from [name of petitioner]. [State which investigator or office conducted the investigation.]

The Safety Board concluded that the accident occurred as a result of [cite probable cause, circumstances of failures, FAA or manufacturer corrective action, etc.]

The petitioner claims that [cite details of the petition for reconsideration].

Please have your specialists review the petitioner's evidence and provide us with your analysis and recommendations in order for us to prepare an appropriate response. Also, provide us with a schedule completion date as soon as practical.

Attachment

Attachment 4
SAMPLE NOTATION FORMAT

FOR OFFICIAL USE ONLY

NATIONAL TRANSPORTATION SAFETY BOARD

NOTATION

NOTATION MEMORANDUM

Date:

To: The Board

Through: Managing Director

From: Director, Office of Aviation Safety

Subject: Response to Petition for Reconsideration regarding an accident at [city, state] on [date], involving [aircraft, registration number]

Action

Staff recommends that the Safety Board [grant/deny] the petition in [its entirety/part].

Petitioner and Date of Petition

The petition is [name of petitioner, who [describe petitioner's relationship to the accident]. Mr./Ms. [petitioner's name]'s letter to the Safety Board requesting modification of the Board's findings and determination of probable cause is dated [date of petition]. The petitioner provided copies of the petition to the parties to the investigation on [date petition was provided to parties]. [Name of parties] provided comments dated [date of comments]. **OR** No comments were received.

Background

[First paragraph from the factual report].

The probable cause adopted for the accident was "[statement of probable cause]."

Issues Presented by the Petitioner

[Briefly describe the petitioner's concerns.]

Evidence Presented by the Petitioner

[List any new evidence provided by the petitioner.]

Conclusions

After review of the original case material and evidence gathered during the reconsideration process, staff believes that the petition should be [granted/denied] [in its entirety/in part].

Staff

[List of staff, divisions, and office phone numbers.]

Distribution

[List of names, addresses, and fax numbers of recipients.]

[Name of Director, Office of Aviation Safety]

Attachments

Response to Petition for Reconsideration
Petition for Reconsideration
Original Brief or Report
[If applicable] Revised Brief or Report

Attachment 5

SAMPLE RESPONSE FORMAT

Mr./Ms./Mrs/Dr. [name of petitioner]
Aircraft Accident
[City, State of accident's occurrence]
[Date of accident]
File No. [#], Accident No. [#]

RESPONSE TO PETITION FOR RECONSIDERATION

In accordance with 49 *Code of Federal Regulations* Section 845.41, the National Transportation Safety Board has reviewed the [date of petition], petition for reconsideration and modification of probable cause in the aircraft accident involving a [make and model of aircraft], [registration #], in [city, state]. on [date]. On the basis of this review, the Safety Board hereby [grants/denies] the petition in [its entirety/part].

[First paragraph from original Factual Report.]

On [date of adoption of original report], the Safety Board determined that [synopsis of the accident and brief reiteration of the Board's analysis and conclusions relevant to the subject petition].

At that time, the Safety Board determined that the probable cause of the accident was [original probable cause as adopted].

The following discussion addresses the new evidence and/or errors in analysis as presented in the Petition with regard to [issue No. 1, issue No. 2, etc.]

With regard to [issue No. 1], the Safety Board's analysis shows…

As a result, the Safety Board concludes that…

[use similar format for subsequent issues]

After review of the original case material and additional evidence accumulated by the reviewing investigator, the Safety Board determines that the [Factual Report and/or Brief of Accident] should be modified as follows:

Factual Report

Page [#]: [Note change]

[use similar format for subsequent changes]

Brief of Accident

Narrative

[Note changes in narrative, if any]

Findings

[Note changes in findings, if any]

Probable Cause

[Note changes in probable cause, if any]

OR

After review of the original case material and additional evidence accumulated by the reviewing investigator, the Safety Board finds no basis to grant any part of the petition.

Based on the above, the petition for reconsideration of the Safety Board's findings in connection with the aviation accident involving a [make and model of aircraft], [registration #], at [city, state], on [date of accident], is [granted/denied] in [its entirety/part].

[Members' concurrences to follow]

Enclosures [if any]

[writer] [routing] draft typed [initials and date]
File name
cc: C(2), V, ME's

Attachment 7

SAMPLE RESPONSE FORMAT (No New Evidence)

[name and address of petitioner]

Dear Mr./Ms./Mrs. [name]:

The National Transportation Safety Board has evaluated the information you provided in your letter requesting that the Safety Board reconsider its probable cause of the accident at [location and date of accident].

Your letter does not contain any new factual information but only your interpretation of facts already in the factual report of the investigation.

Accordingly, the Safety Board hereby denies your request that the probable cause of this accident be changed.

Sincerely,

[name]
Chairman

APPENDIX R

POLICY ON FREEDOM OF INFORMATION ACT

The following guidance should be followed in accordance with the policy of the Safety Board's Freedom of Information Action (FOIA) Officer, Public Inquiries Branch:

Retention of Material in Connection with an Ongoing Investigation of an Aviation Accident

1. As soon as a FOIA request is received, the IIC must retain all information (documents, materials, and photographs) that he or she possesses or controls, as well as any such information received in the future, that is responsive to the request.

2. If the IIC has original documents or receives such documents in the future (logbooks, etc), he or she must make copies before returning them, even if the IIC would not have kept them in the absence of the FOIA request.

3. The IIC must ensure that other Board employees working on the investigation are aware of the information as specified in the above paragraphs and that they also are responsible for gathering or maintaining responsive material.

4. The IIC shall:

   a) Gather all the information collected, including the information collected by other Board employees working on the investigation;

   b) Develop the docket as usual, putting in the docket only the information that would normally be included for any investigation; and

   c) Send all other information that responds to the FOIA request and that was not included in the docket to the FOIA Officer, Public Inquiries Branch. Place material in folders and/or boxes, as appropriate, with the custodian's name, FOIA number, and accident number on the folder(s) or box(es). This material will not be returned, so a copy should be made and retained if future use is anticipated.

d.) The IIC must keep track of the amount of search time required to respond to the request and identify it with the name, grade, and office of the searcher.

Certain information gathered specifically in response to the FOIA request will not automatically be released to requesters. The Public Inquiries Branch has not departed from the previous policy of withholding from public disclosure analytical and working papers, for example.

Provision of Material in Connection With a Completed Investigation of an Aviation Accident

1. In response to a FOIA request, the IIC must search his or her files for all information (documents, materials, and photographs) now in his or her possession or control that is responsive to this request and that was not included in the docket.

2. The IIC must keep track of the amount of search time required to respond to the request and to identify it with the name, grade, and office of the searcher. (Searcher's Name, Grade, and Office:_____; Total Search Time:_____).

3. The IIC must ensure that other Board employees working on the investigation are aware of the information as specified in the above paragraphs and that they also search for and gather responsive material.

4. When the investigation is completed, the IIC should:

a) Following the search of all areas for files with potential responsive material, gather all the information obtained, including the information gathered by other Board employees working on the investigation; and

b) Send all information that responds to the FOIA request and that was not included in the docket to the FOIA Officer, Public Inquiries Branch, along with the search information for each employee involved. Place material in folders and/or boxes, as appropriate, with the custodian's name, FOIA number, and accident number on the folder(s) or box(es). This material will not be returned, so a copy should be made and retained if future personal use is anticipated.

Certain information gathered specifically in response to the FOIA request will not automatically be released to requesters. The Public Inquiries Branch has not departed from the previous policy of withholding from public disclosure analytical and working papers.

APPENDIX S

EXCERPT FROM ICAO'S
MANUAL OF AIRCRAFT ACCIDENT INVESTIGATION

2.4 The Accredited Representative

The accredited representative is the essential link between the State conducting the investigation and the States which have a direct interest in the accident: State of Registry, State of Manufacture and any other States which are providing information relevant to the accident. Annex 13 specifies the conditions under which these States are entitled to appoint an accredited representative and their rights of access to information and documents relevant to the inquiry. The essential guide in the conduct of investigations in which accredited representatives participate is one of a full spirit of co-operation, participation, availability of full information, mutual trust and consultation.

The primary function of the accredited representative is to be able to communicate to the appropriate authorities in his State all necessary information concerning the accident and to provide the liaison and legal authority for the acquisition of information that is only obtainable within the jurisdiction of his government. It is therefore a position in which there are responsibilities towards the inquiry as well as rights of information from the inquiry.

It is obviously desirable that the accredited representative should be able to arrive at the accident scene with the least possible delay and in this connection Annex 9 relating to facilitation provides for the temporary entry into a Contracting State for the purpose of participation in an investigation. In normal circumstances, he would be well advised to proceed direct to the accident site and make contact with the Investigator -in-Charge. Upon his arrival, the State conducting the inquiry should have already received, in accordance with Annex 13, a communication indicating the intention to nominate an accredited representative and stating the probable date of his arrival. During the investigation phase of an inquiry, it is preferable that the accredited representative should be on close contact with the Investigator-in-Charge rather than in a particular group in order that he might have an overall appreciation of all the facts relating to the accident. He should be considered free to communicate any information thus obtained to his own government authorities though he should exercise considerable care to ensure that the confidential nature of any information, which the State conducting the inquiry might wish to preserve, is maintained. To this end, the accredited representative would be well advised to use the communications facilities which might be available at the nearest diplomatic or consular establishment of his government, since the security of communications by telex or Aeronautical Fixed Telecommunications Network (AFTN) and other public services cannot be guaranteed.

On those occasions when the Investigator-in-Charge requires documents, information or aircraft component examinations to be carried out in the State of Registry or Manufacture, it is the responsibility of the accredited representative to endeavor to comply with the requirement and to use his authority in his own State to ensure that the requirements are met in so far as they are compatible with the policy of his government. The more frequent use of

flight recorders of complex design necessitating use of particularized readout equipment is an example of one area in which the active co-operation and participation of the State of Registry or Manufacture is necessary through the activities of the accredited representative.

During the later stages of the inquiry in which the significance of the established facts are under examination, it is desirable that the accredited representative is kept fully informed and invited to express his views particularly when conclusions are being developed which bear upon persons, organizations, or activities within his State. It is equally beneficial to coordinate data related to safety recommendations to ensure timely incorporation of intent.

APPENDIX T

OCCUPATIONAL SAFETY AND HEALTH INFORMATION

Exposure Control Plan (ECP)

The ECP is the Safety Board's plan for protecting investigative staff and other participants engaged in on-scene accident investigation activities. The Safety Committee will update the plan annually. The following is a copy of the ECP, which can also be found under "Employee Safety" on the Safety Board's intranet system.

NATIONAL TRANSPORTATION SAFETY BOARD
490 L'Enfant Plaza, East, SW
Washington, DC 20594

April 15,1998

EXPOSURE CONTROL PLAN

PURPOSE

The purpose of this Exposure Control Plan (ECP) is to set forth the means to protect transportation accident investigators from bloodborne pathogens that might be encountered during the course of their investigations in the field or during examination of wreckage specimens at a location remote from the accident site.

This will be accomplished by mandating the use of **universal precautions** implemented by Work Practice Controls, Engineering Controls, Personal Protective Equipment (PPE), and Biohazard Labeling. Hepatitis B vaccine and post-exposure evaluation will be offered free of charge. Annual training on bloodborne pathogens will be required. Records will be maintained in accordance with the Occupational Safety and Health Administration (OSHA) bloodborne pathogens regulations (29 CFR 1910.1030).

In addition to compliance with OSHA regulations the Safety Board has created an occupational safety and health committee to insure safety and health issues concerning Safety Board employees and participants in our investigations. The NTSB Occupational Safety and Health Committee has been charged to assist in identifying safety concerns and developing mitigation plans for Safety Board employees.

EXPOSURE DETERMINATION LIST

The Exposure Determination List (Exhibit1) contains the positions (i.e.; job classifications) of office staff who have been offered the Hepatitis B Virus (HBV) vaccination series and who may have contact with blood or other potentially infectious materials during the on-scene conduct of an accident/incident investigation or the examination of wreckage specimens.

WORK PRACTICE CONTROLS

The following work practice controls are in place:

a. Hand washing is required. Employees shall avoid contact and use universal precautions, wash hands and any other skin with soap and water or flush mucous membranes with water immediately or as soon as feasible following direct contact with blood, body fluids, or other potentially infectious materials. Employees have been instructed in this procedure and know the

location of the wash facilities. In the field, employees will use antiseptic towelettes for this purpose followed by thorough washing as soon as facilities are available.

b. Handling of wreckage and other specimens. After examination, all contaminated specimens are placed in appropriate receptacles for disposal. The containers meet the requirements as outlined in the OSHA Regulations for Engineering Controls, Title 29 of the Code of Federal Regulations (CFR), paragraph 1910.1030(d)(2) (See Exhibit 2). Employees have been trained and shall follow these procedures.

c. Personal Prohibitions and Decontamination Practice. During the conduct of the accident investigation that has been declared a biohazard by the IIC or a designated group chairman or the investigation of wreckage that is potentially contaminated, personnel are prohibited from eating, drinking, smoking, manipulating contact lenses, applying cosmetics or lip balm, or sun blocking lotion and doing any actions where a mucous membrane may be touched. In the event that there is a requirement to leave the biohazard area the employees have been instructed and shall:

1. exit the investigation site via the defined entry/exit point,

2. remove contaminated PPE per the trained procedures,

3. place disposable PPE in the identified biohazard bags,

4.immediately following the removal of all PPE, cleanse hands and face with the antiseptic wipes and, as soon as possible, wash hands and face with soap and water.

d. Storage of food and drink is prohibited in places where potentially infectious materials (such as contaminated specimens) are kept or are in the process of transport. This applies to containers such as refrigerators, shelves, cabinets, countertops, and storage compartments in cars and trucks.

e. Closeable, leak-proof containers with appropriate labeling are available for all other regulated waste such as disposable gloves or contaminated specimens. In the event that regulated waste or specimens contain sharp objects, an appropriate container will be utilized and will be available at the accident site. The Regional Office Director or Field Chief will ensure the availability of appropriate containers for accident investigations.

f. Transportation of physical evidence from the accident site to the NTSB Laboratory shall be accomplished in the following manner:

1. Whenever possible the evidence will be decontaminated on-site except for cases where to do so would destroy or degrade the evidentiary value.

2. All evidence submitted to the NTSB Laboratory shall be packaged in accordance with DOT regulations (49CFR173.196).

3. Prior to shipment of evidence the investigator submitting evidence for examination shall via e-mail, fax, or in other written form provide the Chief of the NTSB Laboratory with specifically what was sent for examination, whether or not the evidence was decontaminated; if not, why, what examination is being requested, and the company or service by which the evidence was shipped and the expected date of arrival at the NTSB Laboratory.

4. Upon arrival of any evidence at the NTSB Laboratory the laboratory staff will review the aforementioned documentation concerning the evidence and note specifically whether or not the evidence was decontaminated before the package is opened. In the absence of documentation packages will not be opened until such documentation has been received and reviewed by the laboratory staff.

ENGINEERING CONTROLS

A task analysis was conducted and identifies the engineering tasks necessary for accomplishing the field investigation and shop/bench inspection activities (Task Analysis for Transportation Accident Investigators the last section of this document). The following engineering controls apply to the examination of vehicle instruments, seats, restraints, vehicle interior, and any other vehicle component that is examined during the conduct of the accident investigation:

a. Where hand washing facilities are not readily available, as in the conduct of an accident investigation, antiseptic towelettes (wipes) are available for employee use. The towelettes are immediately available to the employee as part of the PPE kit that is provided for accident investigations. Regional, Field, and Division supervisors will ensure the establishment of a location for and manage the resupply of the PPE kits. Guidelines for the type and quantity of PPE to keep on hand are in Exhibit 3 - Personal Protective Equipment. The Regional Directors, Field Chiefs, or Division Chief will ensure the accessibility of PPE by investigators within his/her office.

b. Specimens of blood or other potentially infectious materials are kept in leak-proof containers during collection, handling, and storage. When packages that contain blood or other potentially infectious materials are shipped, a biohazard label is affixed to the exterior of the package and all applicable DOT (49CFR173.196 or 197) shipping requirements are met. An example is a toxicology specimen box. In addition investigators shall contact the laboratory or teardown facility to which the evidence is being sent for examination prior to shipping to insure personnel receiving the evidence are aware of the contents, whether or not it is contaminated, how it is to be shipped, and when it is expected to arrive.

c. Other regulated waste includes used gloves, soiled laundry, and other contaminated specimens. It is kept in a red biohazard plastic bag inside a cardboard box in a closed container that can hold all contents without leakage during handling, storage, and transport and is labeled. The Director of the Office of Research and Engineering and Regional Directors are responsible

for establishing procedures for the management of biohazard waste. These procedures are to include coordination with local licensed agents for pickup or receipt and disposal of the regulated waste. This action will most often occur as soon as practical following departure from the accident site. The office manager will identify the contacts for disposing of regulated waste and ensure employee awareness of the arrangements.

1. NTSB Offices have contracted with certified waste removal contractors for the removal of contaminated waste.

2. The NTSB Investigator-In-Charge (IIC) is responsible for ensuring the disposal of the regulated waste at accident sites in accordance with the procedures presented in this document. This may be accomplished with the assistance of local emergency response agencies or private contract.

d. Maintenance of proper engineering controls will be the responsibility of the headquarters Office Directors, Regional Directors, Field Chiefs and Division Chiefs .

PERSONAL PROTECTIVE EQUIPMENT

There are a number of considerations that shall be applied in the selection, care, and use of PPE as follows:

a. Disposable PPE, such as moisture proof glove liners, particulate mask, coveralls, boot covers, goggles, and utility gloves in appropriate sizes, are available for all employees at risk of exposure and are provided as part of the accident investigation kit. They are used whenever exposure to infectious material is possible as specified by "Universal Precautions" (see 29 CFR, paragraph 1910.1030 (b)(3)). Liquid-proof glove liners (hypoallergenic gloves, if required) are available to affected employees. Modal Office Directors, Regional Directors, Field and Division Chiefs are responsible for maintaining inventories and will ensure the availability of PPE in their office for the conduct of an accident investigation. Managers will establish methods and means for resupply of PPE and assure a readily accessible location for storage of all PPE. All disposable items will be discarded whenever they are removed or damaged and will be immediately placed in biohazard waste containers.

b. Face protection, including eye shields or goggles, will be used when the risk of splatter or aerosolization of contaminated material may occur.

c. Characteristics and quality requirements of certain items of PPE include fluid and puncture resistance. The waterproof glove liners meet or exceed Food and Drug Administration 510k requirements; i.e., assured quality level of more than 98 percent pin hole free.

d. Guidelines on the type and quantity of PPE items will be provided upon request from the NTSB Occupational Safety and Health Coordinator.

HOUSEKEEPING

The following housekeeping procedures are generally applicable on or off the accident site and for the storage of accident investigation specimens that may be contaminated:

a. Housekeeping procedures for cleaning and decontaminating work stations, and accident investigation equipment are conducted only by the accident investigators while wearing appropriate PPE.

b. Employees are responsible for ensuring that equipment or surfaces that were used to examine specimens are cleaned with an appropriate disinfectant such as 10 percent solution of household chlorine bleach.

c. Employees have been instructed to clean reusable receptacles that have a reasonable likelihood for being contaminated with an appropriate disinfectant and replace protective coverings for surfaces and equipment after decontamination or at the end of the work shift.

d. Broken glass from specimens that may be contaminated will be picked up using a brush, dust pan, forceps, and/or tongs. Implements used for cleaning will be cleaned and decontaminated if necessary.

e. Containers for contaminated material are closeable, puncture proof, and leak proof.

f. Color-coded and labeled bags/containers are available for laundry storage prior to cleaning. Most items used are disposable. Those contaminated items that may require laundering are handled as little as possible and only while wearing appropriate PPE.

g. Contaminated laundry that is wet and presents a reasonable likelihood of soak-through or leakage from the bag or container is disposed of in containers that prevent soak-through and/or leakage of fluids to the exterior. Protective gloves are used by all workers who have contact with contaminated laundry. Other protective equipment is available as required.

h. In the event that there is a requirement to examine contaminated accident wreckage specimens, the examination will be conducted in an area suitably isolated from the normal work areas and precautions taken to ensure that all contact with the specimen(s) is amenable to disinfection.

HEPATITIS B VACCINE

The Hepatitis B vaccine has been offered free of charge to the employees identified in Exhibit 1 and an NTSB Hepatitis B Virus (HBV) Vaccination Consent/Decline Form (Exhibit 4) has been completed for each employee listed. The employees have had the opportunity to read the information on the Hepatitis B Virus presented on the form before they receive their first injection. Prior to the first injection of the HBV vaccine an evaluation has been made of the

exempt status of the consenting employee who may have previously received the complete Hepatitis B vaccination series, for whom antibody testing has revealed that the employee is immune, or for whom the vaccine is contraindicated for medical reasons. At risk employees who consent or decline the Hepatitis B vaccine have signed the appropriate NTSB form. Office Directors will ensure that the signed consent/decline form is included in the employee's Occupational Safety and Health Training and Medical File. As a general practice the NTSB personnel will receive Hepatitis B vaccinations via contractual medical services, however with prior approval from the employees immediate supervisor the employee may receive the inoculations by other medical service providers. In the event the employee is vaccinated at a medical facility with which the NTSB has no contractual agreement, the employee will be reimbursed after submitting a voucher.

LABELS AND SIGNS

Red color coding and/or biohazard labels are used to mark all hazardous items. Hazardous items marked with red color coding and/or biohazard labels include sharp object containers, containers of other regulated waste (laundry, used gloves, etc.), and refrigerators or freezers that hold potentially infectious materials. Containers that are used to transport, ship, or store potentially infectious materials, including U.S. Postal Service such as Express Mail packages, UPS, or Federal Express packages, are also marked with red color coding and/or biohazard labels. Contaminated areas at the accident site shall be mar ked with biohazard labels to warn personnel who follow. (Biohazard Labels shall be properly disposed of once the container(s) are to be discarded.

INFORMATION AND TRAINING

All employees with occupational exposure to bloodborne pathogens are required to participate in a training program at no cost to the employee and during working hours. Training shall be provided at the time of initial assignment to a job task where occupational exposure may occur and at least annually thereafter. The office manager is responsible for recording the training received by the employees and establishing a schedule for recurrent training.

The training program shall contain at least the following elements:

a. A copy of the OSHA bloodborne pathogens rule for each employee and an explanation of its contents;

b. A general explanation of the epidemiology and symptoms of bloodborne diseases;

c. An explanation of the modes of transmission of bloodborne pathogens;

d. An explanation of the Safety Board’s ECP and the means by which the employee can obtain a copy of the written plan;

e. An explanation of the methods for recognizing tasks and other activities that may involve exposure to blood and other potentially infectious materials;

f. An explanation of the use and limitations of methods that will prevent or reduce exposure;

g. Information on the types, proper use, location, removal, handling, decontamination, and disposal of PPE;

h. An explanation of the basis for selection of PPE;

i. Information on the Hepatitis B vaccine, including its efficacy, safety, method of administration, benefits, and how the employee will be reimbursed for the cost of the vaccination;

j. An explanation of the procedure to follow if an exposure incident occurs, including persons to contact, the method of reporting the incident, and medical followup that will be made available;

k. Information on the exposure incident evaluation and followup that the employer is required to provide for the employee following an exposure incident;

l. An explanation of the signs and labels and/or color coding required by the standard; and

m. An opportunity for questions and answers with the person conducting the training session.

NOTE: A trainer conducting the training shall be knowledgeable on the topic of transportation accident investigation on-site safety, to include bloodborne pathogens precautionary measures, or have immediate access to an expert on the subject matter covered by the elements contained in the training program as it relates to the employees' respective work places. The trainer shall provide answers to questions of a medical nature , in writing, if necessary to insure the trainee is provided with accurate information.

RECORDKEEPING

Vaccination, medical, and training records are maintained by the NTSB Occupational Health and Safety Coordinators Office for all employees with occupational exposure.

a. Vaccination Records. The HBV Vaccination Record will be inserted in the employee’s safety and health file and maintained in the same matter as other medical records; (i.e., sealed in a manila envelope). It will include the following:

1. Employee's name and social security number;

2. Hepatitis B vaccination status (including date of vaccinations, records relating to employee's ability to receive the vaccine, and signed declination form, where applicable).

b. Medical Records. In the event that an exposure incident occurs, an accurate record shall be maintained for the affected employee and include HBV vaccination status. These confidential medical records are kept for at least 30 years after the person leaves employment. The guidelines provided in the "Privacy Act" will be followed when maintaining these records. Written permission from the employee is required for access to these medical records except as provided by law. Employee medical records are available upon request to the Assistant Secretary of Labor for Occupational Safety and Health or designated representative (Assistant Secretary) and the Director of the National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services or designated representative (Director). The exposure incident records are kept by the NTSB Occupational Safety and Health Coordinator's office. The exposure incident records include the following:

1. Employee's name and social security number;

2. Hepatitis B vaccination status (including date of vaccinations, records relating to the employee's ability to receive the vaccine, and signed declaration form, where applicable);

3. All information given to evaluating health care professional in the event of an exposure incident; and

4. A copy of the evaluator's written opinion.

c. Training Records. Records of the training received by employees at risk of occupational exposure are kept in this facility located at National Transportation Safety Board, Occupational Safety and Health Coordinator, 490 L'Enfant Plaza, East, SW, Washington, DC 20594. The records are kept for 3 years from the date of the training sessions. These records are available upon request to all employees or their representatives. These records include the following information:

1. Dates of training sessions;

2. Material covered;

3. Names and job titles of the trainees;

4. Name and qualifications of the trainers.

EXPOSURE INCIDENT EVALUATION AND FOLLOWUP

An "exposure incident" is defined as "contact with blood or other potentially infectious materials that results from a worker's job duties, and creates some potential for infection. Such exposures may include injection through the skin or contact with the eye, mouth, other mucous membrane, or non-intact skin." In the event of such an incident, the following procedures are followed:

a. The employee shall inform the investigator-in-charge (IIC) and their supervisor as soon as possible of an apparent exposure incident. Following the initial contact with the immediate supervisor, the supervisor shall contact the Safety Board's Medical Officer and provide available details. The Medical Officer will coordinate after care for the employee as per 29 CFR 1910.1030.

b. The Safety Board's Medical Officer will conduct an evaluation of the circumstances of the exposure and qualify whether or not it was an exposure incident and is responsible for completion of the exposure incident evaluation (Exhibit 4 - Bloodborne Pathogen Exposure Incident Evaluation).

c. When possible, the source individual is identified and source blood collected.

d. After consent of the source individual is obtained, HIV and HBV blood or specimen testing will be performed as soon as possible unless the source in known to be infected with HIV or HBV.

e. The employee is informed of source blood test results and of applicable laws governing disclosure of this information.

g. The employee is offered blood collection and/or testing. The employee has the right to refuse either or both. However, if the exposed employee gives consent for the blood collection but not for HIV testing, the blood is kept for 90 days during which time the employee can choose to have the sample tested at no cost to the employee.

h. Appropriate post-exposure prophylaxis is offered to the exposed employee and may include immune globulin for Hepatitis B. The recommendations of an evaluating physician who is familiar with current U.S. Public Health Service guidelines on post-exposure prophylactic treatment for HIV are followed in the event of HIV exposure.

i. Counseling and evaluation of any reported illnesses is provided at no charge to the exposed employee.

j. A written opinion by the evaluating health care professional stating that the exposed employee has been informed of the results of the evaluation and about any exposure-related conditions that will need further evaluation and treatment is included in the employee's medical record.

k. Forms CA-1, CA-2, and CA-16 (Exhibit 5) are completed by the appropriate personnel after an exposure incident has been confirmed by the organization conducting the initial evaluation.

l. The respective Office Director will direct the completion of required documentation for every exposure incident. A memorandum including the following shall be completed:

1. Name of individual exposed;
2. Name of source of exposure;
3. Description of how the incident occurred and route of exposure
And the names of witnesses to the exposure incident and PPE
utilized;
4. Location, date, and time of the incident;
5. Written evaluation of exposure incident including:
Suggestions for changes in procedures, and
A record of how these changes are implemented for each incident.

TASK ANALYSIS FOR TRANSPORTATION ACCIDENT INVESTIGATORS

Each accident scene is unique and by its nature is disorderly. The tasks required of the accident investigator cannot be itemized as precisely as those in the clinical or laboratory setting, and the IIC in consultation with local authorities shall use his or her best judgment as to what PPE will be needed at a specific site. The biohazard nature of the accident site can range from no readily apparent evidence of blood or body fluids to obvious presence of blood or body fluids. As a minimum, latex gloves, shoe/boot covers, protective mask, and eye protection should be used during the initial site survey (adverse weather conditions may require additional PPE during this initial survey). If it is determined that blood or body fluids are present, additional PPE will be required as directed by the IIC or group chairman. The areas of investigation where there is gross contamination with blood or body fluids should be approached with gloves, shoe/boot protection, disposable body cover, breathing mask, and eye protection.

Where possible the **"Buddy System"** or working in small groups of two or three investigators is advisable. The concept has proved successful in that one person monitors other investigators and serves to identify unseen hazards and or other danger signs and prevents injury. Some examples include heat related injuries, unseen sharps hazards, and stress. It is important to remember that oftentimes we are not the best judge of our own level of fatigue.

When operating in a two or three person group each person should have a designated task such as photography, note taking, or wreckage handling. All members can visually examine the wreckage, however, only one should be designated to handle it using the other(s) for photographic and note taking documentation tasks. When employed properly the "Buddy System" will provide an additional margin of safety and provide better efficiency in performing work- related tasks.

a. If contaminated specimens are brought back to the office for further

examination, the specimen shall be isolated and all appropriate precautions taken. Prior to shipment the laboratory or facility to which the evidence is to be shipped shall be contacted in the manner prescribed and the package appropriately wrapped and labeled.

b. The additional task definitions contained herein are not meant to be all inclusive. When it is apparent that additional steps should be taken, it is the responsibility of the investigator to apply common sense consistent with the objective of controlling the exposure to the bloodborne pathogens and potential personal injury as a consequence of the nature of the wreckage and the environment.

c. The following additional tasks in the conduct of an accident investigation along with the use of proper PPE should be used to control the potential exposure to bloodborne pathogens:

1. On-Scene Accident Investigation Tasks

a**.** The IIC or a qualified designee will survey wreckage and the site for biohazard potential utilizing the Site Survey Checklist (Exhibit 6).

b**.** If a biohazard exists, the site will be secured and a point of entry/exit established. The IIC will coordinate the biohazard nature of the accident site with the participants to the investigation and local authorities. The area(s) of possible contamination will be determined, and a biohazard placard will be placed on or in the vicinity of the wreckage nearest the most visible entry to the biohazard areas. The IIC will identify investigative tasks needing PPE and the extent of use of PPE. The IIC and group chairman will also advise on personal prohibitions in the conduct of the accident investigation and the contacts that have been made for the disposal of the regulated waste.

NOTE: It is preferred that the conduct of investigation in the biohazard area and the handling of contaminated wreckage or parts should be accomplished at the same time. The number of participants should be kept to a minimum.

c. PPE shall be worn while packaging of contaminated parts, instruments, or equipment will minimize contamination.

d. If practical, recordkeeping will be assigned to investigators outside of the biohazard areas to minimize contamination of recording equipment. If this is not possible, procedures should be used to ensure personnel handling wreckage are not responsible for manipulating recording equipment and thereby minimize the potential for contamination. Proper procedures would then be followed in decontamination or disposal of equipment.

e. Upon exiting the accident site for any reason investigators shall: disinfect nondisposable PPE like boot covers, goggles, and work gloves with 10 percent bleach solution or equivalent. Remove inner gloves, re-glove, and then remove PPE and equipment covers as trained. Place all disposable items in the biohazard bag for disposal.

f. Immediately following the procedures in (v), re-glove and place nondisposable PPE in containers marked as suitable for disinfected PPE. Clean recording equipment and tools with disinfectant wipes and remove and dispose of inner glove. Wash hands and face with disinfectant wipes. As soon as practical, wash hands and face with soap and water.

g. Nondisposable items that have been decontaminated may require further cleaning before reuse.

2. On-Scene Minimum Personal Protective On-Scene Equipment

a. Wear waterproof latex-type glove liners under utility work gloves. If the environmental conditions warrant liquid-proof boots, boot covers mask and goggles may be appropriate.

b. Mark entry/exit point with a biohazard placard. Investigators identified to enter biohazard areas should apply PPE as directed by the IIC; i.e., gloves, goggles, mask, body cover, and work boot covers. Removal of PPE should take place at the enter/exit point.

c. All containers for disposable and non- disposable items and disinfectant wipes are utilized as identified during the training program.

3. Off-Site Accident Investigation Tasks

a. In the event that the wreckage is moved to a different location and that it has not been clearly shown to the IIC that the wreckage has been decontaminated wholly or in part, the on-site procedures will be followed.

b. If the wreckage is not contaminated or has been declared decontaminated by the IIC of their designee, normal procedures should be followed in the conduct of the accident investigation.

4. Requirements for Moving or Transporting Wreckage Specimens

a. Ideally, all parts that are examined away from the accident site will be cleaned and disinfected before they are transported. If it is permissible to decontaminate parts, a 10 percent solution of household bleach or equivalent disinfectants should be applied to all exposed areas. However, when cleaning and disinfecting can destroy evidence or damage parts, it will be necessary to transport parts that are contaminated. Appropriate PPE will be used in preparing parts for transport. All sharp edged parts will be padded to protect personnel and preserve evidence. Depending on the size of the part and environmental conditions, PPE in excess of waterproof latex-type gloves and work gloves may be required as determined by the investigator. Contaminated sharp objects that are to be transported should be put in appropriate containers apart from nonsharp contaminated objects.

b. When applying a disinfectant to contaminated parts, a minimum of 30 minutes should elapse or as prescribed by the manufacturer of the disinfectant before the parts are handled with uncontaminated gloves. Approved shipping containers identified during training should be utilized as appropriate and labeled as biohazard if containing contaminated parts.

5. Security of the Accident Scene

a. During on-scene accident investigations, local officials will be requested to establish and maintain security of the site. The IIC and the local authorities will establish the size of the secured area.

b. Security will be maintained to prevent entry into the area that is a biohazard or a personal hazard.

c. In most cases the biohazard area will be located within the secured area. Secured areas will be identified separate from the biohazard with appropriate markers and signs.

d. Spectators and news media will not be allowed to enter the biohazard area.

6) Remote Area Accidents

In remote areas where spectators and news media are not likely to be a factor, the IIC and group chairman will take reasonable precautions to avoid the possibility of anyone unknowingly walking into the accident scene.

2. Safety Information Assistance

Inquires concerning bloodborne pathogen related safety issues or other occupational safety questions should be directed to the NTSB Associate Managing Director for Safety and Development, Occupational Safety and Health Coordinator located at headquarters.

_____ April 15, 1998
Peter Goelz, Managing Director

EXHIBIT 1

EXPOSURE DETERMINATION LIST

OFFICE POSITIONS COVERED BY ECP

JOB CLASSIFICATION S

Aviation Accident Investigators
Highway Accident Investigators
Pipeline Accident Investigators
Marine Accident Investigators
Hazardous Material Accident Investigators
Materials Science Investigators
Vehicle Performance Investigators
Railroad Accident Investigators
Survival Factors Investigators
Human Performance Investigators
Engineering and Computer Services Specialist
NTSB Occupational Safety and Health Personnel
Operational Factors Investigators
Management Personnel
Media and Public Affairs Officers
Family Assistance Personnel

All personnel assigned to duties at transportation accident sites are potentially at risk and as such are provided with the opportunity to receive Hepatitis B vaccinations, bloodborne pathogens training specifically addressing transportation accident investigation, NTSB provided PPE, and recurrent annual training.

Based on the facts, circumstances, and issues of an investigation personnel may be temporarily assigned to participate from other offices within the NTSB. Such assignments shall be considered as investigative or investigative support in nature. All employees assigned are required to fully comply with applicable NTSB and OSHA safety guidelines.

Exhibit 4

Bloodborne Pathogen Exposure Incident Evaluation

Date of accident _____ Time of accident _____

Date of exposure incident _____ Time of incident _____

Location of exposure incident_____

Employee's name _____ SS# _____

Facility location _____ Facility telephone # _____

Description of exposure incident: include route(s) and circumstance(s):

Source name (if known):

Source HBV/HIV status (if known):
HBV [ ] positive [ ] negative [ ] unkn
HIV [ ] positive [ ] negative [ ] unkn

Employee Hepatitis B immunization status: immunized [ ] yes [ ] no
Immunization date #1 _____ #2 _____ #3 _____
Antibody titer 1: _____ date: _____

Determination of exposure: [ ] exposure incident [ ] non-exposure incident

Initial exposure incident report to:
[ ] employee date:_____ [ ] manager date: _____

Information sent to healthcare provider evaluating exposed employee:
Healthcare provider name: _____
Street address: _____
City, State, ZIP: _____
Phone: _____

[ ] copy of 29 CFR 1910.1030 [ ] employee's vaccination status
[ ] description of employee's duties relevant to incident

Information from healthcare provider to NTSB medical Officer:
l. Written opinion - date _____
2. Copy of written opinion to employee - date _____

3. Recommendation for Hepatitis B vaccination/immune globulin [ ] yes [ ] no
4. Recommendation for further test and/or treatment [ ] yes [ ] no
5. Statement that employee has been informed of evaluation results [ ] yes [ ] no
6. Other information

Signature of NTSB Medical Officer _____ Date _____

As part of the Safety Board's Occupational Safety and Health Program, the following procedures have been established to make the purchase of Personal Protection Equipment (PPE) both easy for the staff and to streamline procurement procedures. PPE is defined as specialized clothing or equipment worn by an employee/investigator as protection from bloodborne pathogens at accident sites. General work clothes (e.g., uniforms, pants, shirts, or blouses) not intended to function as protection against hazardous and/or potentially infectious materials are not considered to be PPE.

Please adhere to the following:

1. Supervisors and administrative officers should order an adequate quantity of PPE of the next larger size for investigative personnel for a projected period of not more than 6 months. This will allow for warm clothing in cold weather and provide some measure of ventilation in warmer temperatures. As a rule of thumb an investigator spending an entire day on-site could be expected to use three complete PPE kits.

2. Once the investigative staff is consulted to determine what sizes and approximately how many PPE kits to order, the process of ordering the PPE kits will be is accomplished in the following manner:

    - Regular resupply of the PPE kits will be ordered via a requisition (SF4400) which is faxed to my attention at (202)314-6406.

    - The SF-4400 and authorize funding approval under organization code 1201 object class 2615. Then the requisition will be returned via fax to the supervisor or administrative officer directly to place the order. Delivery time for normal orders is approximately 4 to 7 days.

    - <u>Emergency orders</u>, such as an order because of a major transportation accident, can be ordered directly by the supervisor without faxing a SF4400 for review or pre-approval. The delivery time for an emergency order is usually no more than overnight.

    - At present, equipment can be ordered from the following vendors with blanket purchase orders established:

        <u>General Employee Safety Equipment</u>
        Lab Safety Supply, Inc., 401 S. Wright Road, PO Box 5004, Janesville, WI 53547-5004, 1-800-356-0783, NTSB12-98-BP-8100

        <u>PPE Kits</u>
        Med Protect, Inc., 1900 Preston Road #267, Plano, Texas 75093, 972/612-1515, NTSB12-98-BP-8098

3. Check order completeness upon receipt of the PPE kits. If the order is complete, the administrative officer is to issue a rapidraft to the vendor. Send a copy of the invoice and rapid draft via fax to Ms. Mody Duckett to close the transaction in the fund control system.

Any questions can be directed to:

Sherri Filbin (x6623)
Mody Duckett (x6404)
Dianne Campbell (x6400)

APPENDIX U

FOREIGN TRAVEL INFORMATION

Department of State Notification

Before Safety Board personnel can travel overseas for investigative or other official purposes, they must notify and receive approval (country clearance) from the Department of State (DOS). Federal employees must also obtain country clearance for business trips to Canada. If travel is on an official U.S. passport, many countries require visas (see Obtaining Passports/Visas below for more information). Safety Board staff planning to travel overseas on official business must also receive the approval of the Safety Board's Managing Director, as explained below in Notification to Safety Board.

Approved travel is important from the standpoint of both the U.S. Ambassador to that country and to the Safety Board. As the chief spokesperson for the United States, the U.S. Ambassador should be well informed about U.S. Government activities and personnel in the country. Depending on the nature of the work in the country, Safety Board staff should offer to conduct an out-briefing of the appropriate embassy staff about the general nature of investigative activities. Refrain from speculation during this briefing. Country clearance information typically includes phone numbers for embassy personnel, health and security precautions for the traveler, and other guidance or limitations on travel within the country.

Routine country clearance should be obtained well in advance by contacting the DOS's Aviation Transportation Policy Office. That office will, in turn, contact the respective country's desk officer, who deals directly with the embassy in that country. To notify the DOS, a memo describing the proposed trip should be e-mailed or faxed to the DOS's aviation liaison at (202) 647-4324. Call (202) 647-9341 for a current e-mail address. The memo should contain the following information:

- Full name of traveler(s)
- Title(s)
- Official passport info (number, date/location of issue, expiration date)
- Destination
- Reason for trip
- Dates of travel

If the information is known, the memo should also contain the flight number, name of the hotel, and a phone number or point-of-contact. The memo should be signed by the employee's supervisor. A sample memo is provided below.

The clearance request should be forwarded to the DOS in sufficient time for a message to be prepared that will go to the embassy—ideally, more than 1 week before the travel begins. DOS guidance in this regard recommends a statement, such as: *"Unless a negative reply is received in seven calendar days, clearance is assumed."* Further, if no assistance is anticipated

from the embassy, the message should include a statement *"No assistance from the embassy is anticipated at this time."* Other appropriate notes such as *"current health and security information"* would be appreciated.

The 7-day requirement should be no problem for conference, training, and followup investigation travel that is planned in advance. For urgent travel, such as responding to accident investigations, clearances and notifications can be obtained verbally; however, a country clearance memorandum still needs to be prepared and sent to the DOS to be used to generate a message to the embassy. This can be done at any time of the day through the DOS's duty officers. The phone numbers for the DOS's aviation liaison and duty officers are provided at the bottom of the Safety Board's Go Team sheet.

If embassy assistance is anticipated or if the nature of the business of the Safety Board staff involves alerting the embassy, the staff should contact the respective desk officer at the DOS to obtain a contact point [fax, e-mail, and telephone number] in the embassy. There is always someone responsible for transportation-related matters. The embassy numbers are also available on the Internet; however, staff should not contact the embassy directly without first contacting the desk officer in Washington, D.C.

Copies of country clearances and other related documents, such as trip reports, should be forwarded to the appropriate supervisor.

The following is a sample template for a country clearance and an actual sample for guidance:

TEMPLATE COUNTRY CLEARANCE MESSAGE

TO: Department of State, Office of Transportation Policy (Aviation), EB/TRA/AVP
FROM: Your name or the name of the team leader if more than one.
SUBJECT: Country Clearance

Mr. *[full name and title, date of birth, with passport number, and dates of issue and expiration and place of issue of passport]* and Ms. *[full name and title, date of birth, passport number, with date of issue, expiration, and place of issue of passport]* will be traveling to *[city and country]* for the purpose *of [state briefly the reason for the trip—for example, to tear down an engine at the XXX factory, or attend a seminar entitled XXX]*.

The U.S. delegation will be arriving via *[airline and flight number]* on [date of arrival] and staying at *[name and city of hotel]*. The delegation will be departing on *[date of departure]*. The primary point of contact will be *[name, title, and organization of host]*.

The delegation does not anticipate requiring any assistance from the U.S. Embassy during the visit. *[This is the usual language; however, if you need assistance, describe it, such as health, transportation, security, interpreters, introductions, etc.]*

If there are any questions about this request, please contact me at*: [full name, title, telephone, email address, and fax numbers]*.

Country clearance will be assumed if no response to this request is received in 7 calendar days. *[NOTE: The request would be used for routine planned travel and should be sent via e-mail or FAX to the DOS's Aviation Liaison Office to be forwarded to the Embassy. Call the following number for a current e-mail address for the processing officer. The telephone number is 202-647-9341; the FAX number is 202-647-4324. Allow sufficient time to get it to the Embassy at least 1 week before travel.]*

[For urgent requests for which the above time frame cannot be met, contact the DOS's Aviation Liaison Office directly and ask that office to coordinate your urgent request with the respective country desk officer. You will then fax the country clearance letter for expeditious handling.]

National Transportation Safety Board
Washington, D.C. 20594

May 19, 1998

Department of State
Office of Transportation Policy (Aviation)
EB/TRA/AVP
Washington, D.C. 20520

Dear Ms. Gravatt,

This is a request for foreign travel on official business. ROBERT McKINLAY MACINTOSH JR., a Senior Air Safety Investigator of the National Transportation Safety Board, with Official Passport Number 801086813, expiration date 16 December, 2002, is scheduled to proceed to Lima, Peru, to make several presentations at the Air Safety Symposium presented by the International Aviation Management Training Institute (IAMTI) to the Directorate of Civil Aviation, Peru. His DOB is 5 August 1936, and his security clearance is SECRET. He will be en route May 26 - 30, 1998.

Mr. MacIntosh will arrive in Lima via AA flight 2111 on May 27 at 0415. He will depart Lima via AA flight 948 at 1000. IAMTI has arranged for group lodging with other presenters at Hostal "El Doral", Miraflores. Mr. MacIntosh does not anticipate the need for any American Embassy assistance.

If you have any questions or need any additional information, you may contact me on 202-314-6311. Mr. MacIntosh can be reached at 202 314 6312.

Sincerely,

Thomas E. Haueter
Chief, Major Investigations Division

Notification to Safety Board

The Managing Director must approve any planned official foreign travel by Safety Board employees. Employees should prepare a memo to the Managing Director (through their respective division chiefs and the OAS Director) that provides details of the planned trip. A sample memo is provided below.

Obtaining Passports/Visas

OAS employees who plan foreign travel on official business should obtain official passports after receiving authorization to travel. The Safety Board's Human Resources Division will initiate an application for the passport and can arrange for the requisite photographs to be taken. Many countries also require visas, which have to be processed before employees can travel. Some countries, such as France, require visa forms to be filled out, and the Human Resources Division has copies of these forms. The Official Travel section of the passport office requests 4 weeks to process passports. However, in a situation requiring urgent travel, the Human Resources Division can sometimes arrange for passports to be provided within several hours.

If a visa is required, Safety Board personnel should visit the State Deparatment's web site (http://www.travel.state.gov/foreignentryreqs.html) to determine foreign entry visa requirements. The respective embassy must be informed when an employee plans to travel under an official passport because visa requirements often depend on whether an official or tourist passport will be used. There is no apparent Safety Board policy on whether to travel on an official or tourist passport. Generally, however, official U. S. Government business should be conducted using an official passport, and it will be easier to use embassy facilities, such as the commissary, and medical and travel offices, if necessary.

A letter on official Safety Board letterhead must be prepared to accompany the visa application. If the Human Resources Division is unable to prepare the letter , it can be prepared by the employee(s) and signed by the Director of the OAS. When appropriate, the letter should name other Safety Board or Federal officials who will be traveling together. The letter, application, and other required items (passport(s) and photographs) are then submitted to the embassy. Processing times for a visa range from 1 to 10 days. If urgent travel is required, embassies will often accelerate the processing time. See the sample letter below requesting a visa.

National Transportation Safety Board

Memorandum

April 27, 1998

TO: Managing Director
Thru: Director, Office of Aviation Safety
FROM: Deputy Director, International Aviation Safety Affairs

SUBJECT: Approval for Foreign Travel

The purpose of this memorandum is to request approval for travel of Ron Schleede and Dennis Jones to the ICAO Accident Investigation and Prevention Seminar to be held in Cairo, Egypt, from May 25 to 28, 1998. The seminar is the 6th in a series of regional meetings at which government, airline, and manufacturing industry accident investigation and prevention officials meet to discuss improved techniques for accident prevention. The previous seminars have been held in Singapore, Miami, Moscow, Panama City, and Johannesburg.

According to the Cairo Seminar organizers, they expect a very large turnout in Cairo; 300 plus officials have pre-registered, representing about 55 countries. The attendees represent the senior aviation officials from the Middle East, as well as Europe, Africa, and Asia. Many "third world" airline and government officials also plan to attend; some of which are sponsored by ICAO technical assistance funds.

The general venue of the Seminar involves presentations by several government officials about accident investigation and prevention techniques, followed by presentations by airline and manufacturing aviation safety officials on the same subject. Additionally, there will be presentations on human factors issues in accident causation and prevention.

Dennis Jones and I will present a paper on the *NTSB Role in International Accident Investigation and Prevention.* I believe it is essential that we have an appropriate presence at this Seminar to show the support of the NTSB for such forums.

I believe this travel is necessary and valuable to our current goals. Please advise if you approve.

Approved_____

Disapproved_____

Attachment: Country clearance request
cc: AS-2, International Aviation Safety Affairs

National Transportation Safety Board
Washington, D.C. 20594

The Embassy of Egypt
3521 International Court
Washington, D.C. 20008

April 30. 1998

Dear Consulate:

Enclosed is a visa application form for Mr. RONALD L. SCHLEEDE, along with the official passport, number 801150546. Mr. Schleede is the Deputy Director for International Aviation Affairs in the Office of Aviation Safety of the National Transportation Safety Board. He will be traveling to Cairo, Egypt, on May 23, 1998, for the purpose of attending the International Civil Aviation Organization Aircraft Accident Prevention/Investigation and Safety Seminar to be held in Cairo, May 24 to 28, 1998.

If you have any questions or need any additional information to process this visa application, please contact Ms. April Hart at 202-314-6300.

Sincerely,

Dr. Bernard S. Loeb
Director
Office of Aviation Safety

APPENDIX V

OFFICE OF TRANSPORTATION DISASTER ASSISTANCE TASK LIST

The Office of Transportation Disaster Assistance provides a significant and varied level of support during an accident. The following information will be coordinated and shared with the IIC, as needed.

1. Launch

- Establish contact with the affected airline and begin to gather information about the flight, crew and passenger counts, and status of manifest reconciliation. May request, on a case-by-case basis, that a copy of the preliminary manifest be faxed to TDA-1.
- Information obtained from the air carrier will be made available to the IIC and others on a need-to-know basis. This information will be available for review on the status board in the situation room, which is located adjacent to the Communications Center.
- Establish contact with the following agencies and, if applicable, request their assistance as defined by current MOUs:
  - American Red Cross (ARC)
  - Department of Health and Human Services (D-MORT)
  - Department of State (DOS)
  - Department of Justice-FBI-Interpol (DOJ)
  - Department of Defense
  - Federal Emergency Management Agency (FEMA)
- Office of Transportation Disaster Assistance maintains a list of all domestic and international air carrier's 24-hour flight control telephone numbers.
- Coordinate information and resource needs with local/county/state emergency management agency, coordinate with the IIC to prevent duplication of efforts.
- Coordinate arrival of go-team with local/county/state law enforcement agencies to provide transportation and liaison support for NTSB personnel. Coordinate with the IIC to prevent duplication of effort.
- Coordinate information and response needs with local coroner/medical examiner. If applicable, arrange for D-MORT response and deployment of mobile morgue equipment.
- Coordinate, with survival factors, all information pertaining to victims at scene and how they are to be handled before movement/documentation.

2. On Scene

- Establish full-time liaison with IIC and local/county/state/Federal agencies at the on-scene command post

- Establish full-time liaison with local coroner/medical examiner. With concurrence of the IIC, ensure proper FAA toxicology samples are taken
- Ensure airline is meeting the requirements established in the ADFA or Foreign Air Carrier Support Act to assist families
- Set up Joint Family Support Operations Center (JFSOC) at location of Family Assistance Center (FAC)

A. JFSOC

- Conduct regular operational meetings for members of JFSOC

B. FAC

- Conduct daily briefings for families at the FAC
- Provide telephone conference-bridge service during family briefings for families that do not travel to accident location
- Coordinate translation services through DOS, if necessary
- Coordinate time and transportation requirements for IIC to brief families at the FAC, if necessary
- Coordinate DNA sample collection from families, if applicable
- Establish a special Web site for families
- Provide unlisted 800 number for families to reach TDA-1

C. Plan Site Visit

- Coordinate site visit and advance/time date by family members with IIC
- Coordinate motorcade route, access points and contingency planning for site visit
- Establish security requirements and temporary flight restrictions for site visit
- Coordinate any VIP movements

D. Personal Effects

- Coordinate personal effects recovery documentation procedures with airline and/or contracted vendor

3. Return to HQ

A. Communication with Families

- Establish an accident-specific e-mail address for families, if applicable
- Provide a voicemail information hotline for investigative updates, as needed
- Issue information letters to families on the process/progress of the investigation

- Act as a first point of contact for questions from families. All questions will be answered with factual information only. TDA staff will take technical question to the IIC and relay response to family members, as requested by IIC.
- Coordinate with IIC for periodic release of factual information and the progress of the investigation
- Coordinate release of written ATC transcripts to families
- Coordinate with IIC the release of the written transcript of the CVR
- Once the docket is opened, provide copies of the factual reports

B. Public Hearings and Board Meetings

- Provide information to families about upcoming Board meetings
- Provide support and coordination at public hearings. Preview any animation that will be shown at the hearing
- Provide support and coordination at Board meetings
- Coordinate with IIC to meet with families just before a Public Hearing commences

C. First Year Anniversary

- Coordinate with IIC wreckage viewing on first-year anniversary, if applicable
- Establish procedures and protocols for wreckage viewing
- Inspect wreckage appearance for issues for viewing by relatives, if applicable

D. Victim ID/Medical Issues

- Assist with interpretation of information on toxicology reports
- Coordinate any issues on the victim identification process

In accidents that do not require full Transportation Disaster Assistance response (that is, high-profile accidents, multiple fatalities but not Part 121 carriers), there may be unique demand upon the IIC. The Transportation Disaster Assistance staff may be requested to provide assistance/consultation.

In addition to the skills and assistance noted above, the staff has experience and training in accident photography, survival factors investigation, mental health support, and victim/witness interviewing.