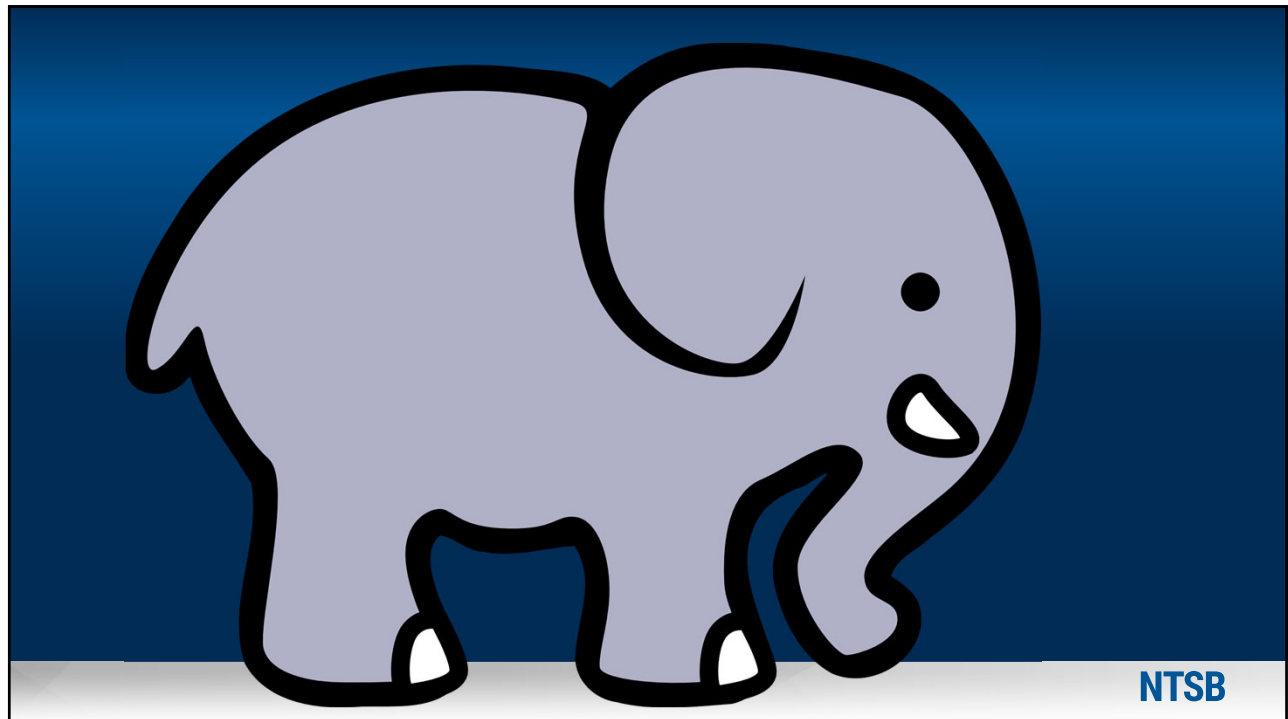


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Air Charter Safety Foundation – Safety Symposium

Member Michael Graham

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Recent Near Misses – Runway Incursions

- Six category A or B runway incursions within 2 months
 - JFK, Austin, Honolulu, Burbank, Boston, Sarasota
 - Category A - A serious incident in which a collision was narrowly avoided.
 - Category B - An incident in which separation decreases and there is a significant potential for collision, which may result in a time critical corrective/evasive response to avoid a collision.

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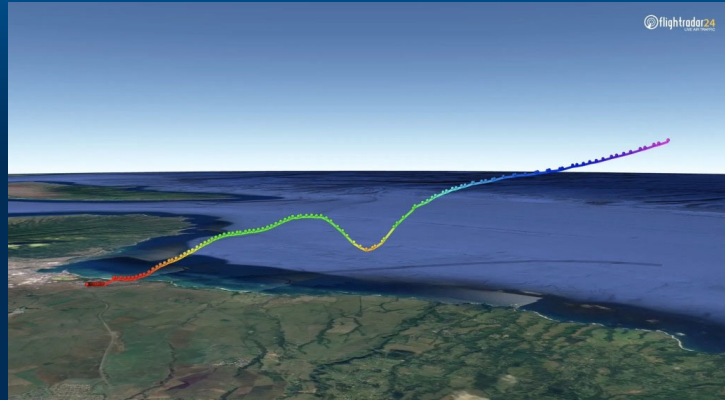
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- CVRs
 - Only 2 hours
- ATC Procedures
- Interviews

Recent Near Misses – Loss of Control

- December 18, 2022 – United 777 – Departed Kahului, HI enroute to SFO
- Dives towards the ocean during climb out
- 71 seconds after takeoff
- 2200' to 775'
- 8600fpm rate of descent



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Minor Incidents- Turbulence

- Dec 18, 2022 – Hawaiian Airlines Flight 35
 - Experienced severe convectively induced turbulence at FL 400
 - 40 minutes from landing at HNL
 - 19 minor injuries, 6 serious injuries
 - Minor damage to the aircraft
- March 1, 2023 – Lufthansa Flight 469
 - Departed AUS enroute to Frankfurt
 - Experienced significant turbulence
 - Diverted to Dulles
 - 7 hospitalized
- 37.6% of all accidents on commercial airlines caused by turbulence (2009-2018)
- NTSB Turbulence Study released 2021



<https://apnews.com/article/lufthansa-flight-469-turbulence-dulles-1177e632a5aacac0c6b29c76206e4081>

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Fatal Accidents

- Embraer 170 airplane – December 31, 2022 – Montgomery, AL
 - Airline ground worker killed by getting sucked into a running jet engine
 - FO opened cockpit window to inform ramp agent engines were still operating
 - The employee was warned multiple times not to go near the engine during safety briefing, in “safety huddle”, and by other member of ground crew
- Challenger 300 – March 3, 2022 – Windsor Locks, CT
 - Flight operating under 14 CFR 91k
 - 1 fatal

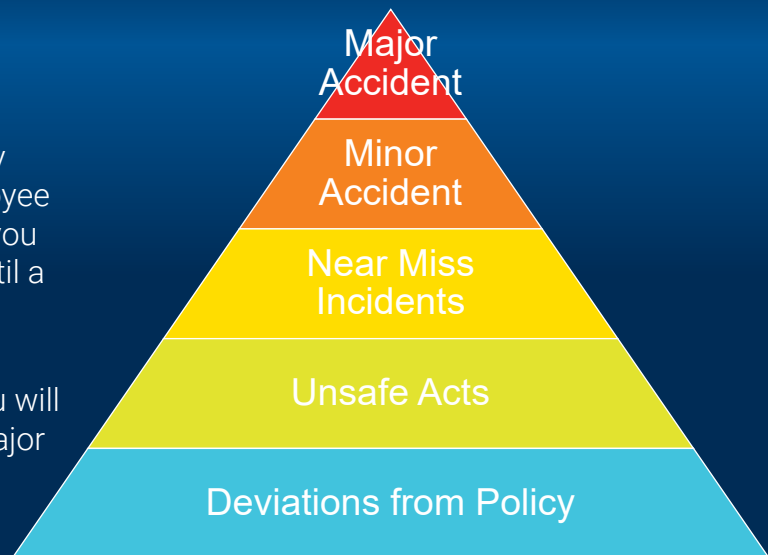
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Heinrich's Triangle

- Near misses happen at every operation, but without employee reporting and data capture, you will not know about them until a major accident occurs
- If you do not understand the incidents and close calls, you will not be able to prevent the major accident



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NTSB SMS Recommendation History

- NTSB's history with SMS recommendation Part 121 (A-07-10)
 - December 1, 2015
- 2009 recommendation for Part 91 Business Operators
 - FAA issued Info for Operators 11010 Developments for GA Operators
- Require SMS for HEMS A-09-89
 - FAA goal was to require for all Part 135, closed unacceptable in 2014
- 2016 SMS NPRM for Part 139 airports
 - Disagreed with exemption of small airports serving air carriers

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NTSB SMS Recommendation History

- Six open recommendations for SMS to FAA
 - Require all 14 Code of Federal Regulations Part 135 operators to establish safety management system programs (A-16-36), 7x Open – Unacceptable
 - Require all commercial air tour operators, regardless of their operating rule, to implement a safety management system (A-19-28) 1x Open – Acceptable
 - Expand SMS requirement to all Part 91 revenue passenger carrying operations (A-21-13 & A-21-14) Open – Acceptable
 - Require organizations that design, manufacture, and maintain aircraft to establish a safety management system (A-21-48) Open – Acceptable

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SMS Notice of Proposed Rule Making (NPRM)

- Parts 135 and 91.147 SMS
 - Strongly support without exceptions for size of operation
 - SMS for HEMS...finally!
 - Air tours...no alternatives to achieve same safety benefit (components)
 - Guidance is key
- Part 21
 - Should include Part 145 repair stations

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SMS Notice of Proposed Rule Making (NPRM)

- Guidance for Scalability on SMS
 - Develop guidance for small operators for scaling a safety management system that includes methods and techniques for implementation and specific examples applicable to several operational sectors, including air tours (A-22-15)
 - Draft revision of AC 120-92 SMS for Aviation Service Providers does not address the call for specificity
 - Guidance also needed by FAA inspectors for oversight
 - Pre-SMS, Part 121, SMS voluntary program participants (all parts)

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SMS Notice of Proposed Rule Making (NPRM)

- Agreement with FAA “waning value of voluntary compliance compared to mandated SMS”
- SMS will benefit industry and the traveling public
- FAA oversight concerns

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What Went Wrong with this Approach

Member Michael Graham

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CL-605 Accident - July 26, 2021; Truckee, CA



- Part 91 flight
- Circle-to-land approach - day
- Pilot, co-pilot and 4 passengers fatally injured
- <https://data.nts.gov/Docket?ProjectID=103554>

Mode: Aviation NTSB Number: WPR21FA286 Date of Accident: 07/26/2021
 City: Truckee State/Region: CA Country: United States
 Project Type: Investigation

Docket Information
 Creation Date: 10/06/2021 Last Modified: 06/27/2022 4:44 PM
 Public Release Date & Time: 06/28/2022 7:00 AM

Docket Table of Contents

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2	OPERATIONS GROUP CHAIRMAN'S FACTUAL REPORT	79	0	Text/Image	View
3	OPERATIONS ATTACHMENT 1 - INTERVIEW TRANSCRIPTS	347	0	Text/Image	View
4	OPERATIONS ATTACHMENT 2 - RECORDS OF CONVERSATION	11	0	Text/Image	View
5	OPERATIONS ATTACHMENT 3 - FLIGHT RELEASE INFORMATION	4	0	Text/Image	View
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7	OPERATIONS ATTACHMENT 5 - FLIGHT CREW ITINERARIES	5	0	Text/Image	View
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9	OPERATIONS ATTACHMENT 7 - TARIFF LEASE	23	0	Text/Image	View
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17	OPERATIONS ATTACHMENT 15 - CO-PILOT'S LOGBOOK (EXCERPTS)	5	0	Text/Image	View
18	OPERATIONS ATTACHMENT 16 - CL-605 CALLOUTS	5	0	Text/Image	View
19	OPERATIONS ATTACHMENT 17 - CL-605 LANDING SPEEDS	6	0	Text/Image	View
20	OPERATIONS ATTACHMENT 18 - CL-605 NORMAL PROCEDURES	15	0	Text/Image	View
21	OPERATIONS ATTACHMENT 19 - CL-605 STALL SPEED CHARTS	3	0	Text/Image	View
22	OPERATIONS ATTACHMENT 20 - P/MC MAINTENANCE DOCUMENT	2	0	Text/Image	View
23	METEOROLOGICAL FACTUAL REPORT	27	0	Text/Image	View
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26	AIR TRAFFIC CONTROL FACTUAL REPORT	9	0	Text/Image	View
27	AIR TRAFFIC CONTROL ATTACHMENT 1 - ADS-B DATA	6	0	Other	View
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33	FLIGHT DATA RECORDER - SPECIALIST'S FACTUAL REPORT	24	18	Text/Image	View
34	FLIGHT DATA RECORDER - ATTACHMENT 1 (FOR TABULAR DATA FOR EVENT FLIGHT)	0	0	Other	View
35	STATEMENT OF PARTY REPRESENTATIVES TO NTSB INVESTIGATION	2	0	Text/Image	View

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History of Flight

- Monday, July 26, 2021, at 1318 PDT
- Planned for 1 hour 19 minutes Coeur d'Alene, ID to Truckee CA
- Two pilots and four passengers (all fatal)
- Passengers were partners for the operator (Aeolus Air Charter)
- Flight was consistent with Part 91
- Accident occurred on approach to TRK



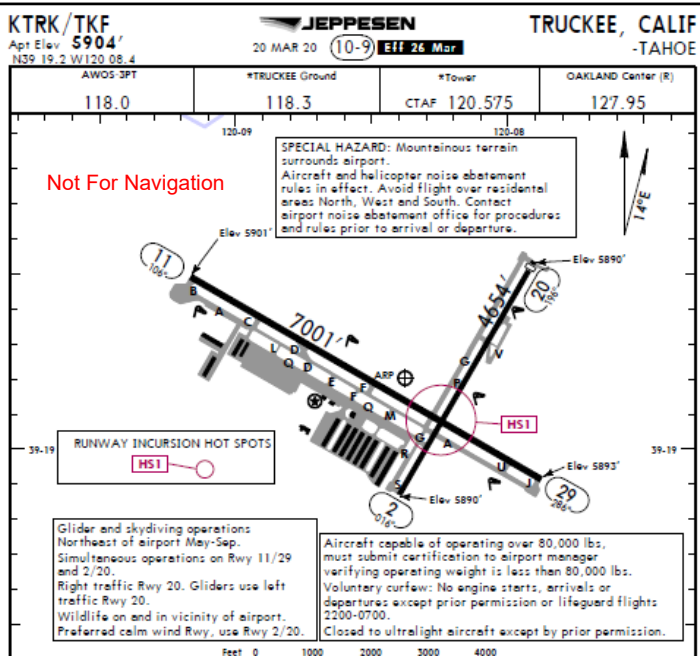
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History of Flight

- Crew planned (and briefed) straight-in for RNAV runway 11
- ATC then gave clearance for RNAV runway 20
- Crew requested a circle to land runway 11 due to runway length
 - Crew did not brief the circle approach
 - Captain was pilot flying (PF) until last portion of the approach



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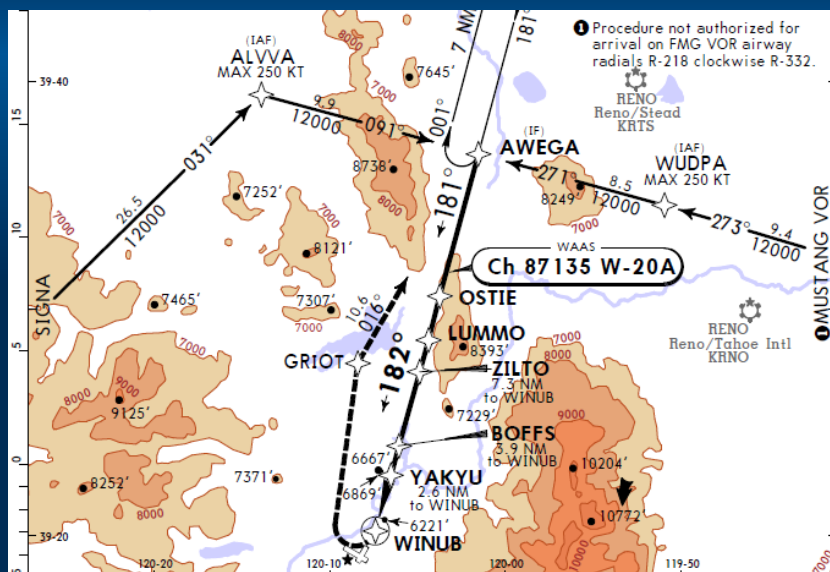
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History of Flight

CIRCLE-TO-LAND	
Max KTS	MDA(H)
90	7120' (1216') - 1 1/4
120	7220' (1316') - 1 1/2
140	7700' (1796') - 3
D	NA

Rwy 29 and east of Rwy 2.

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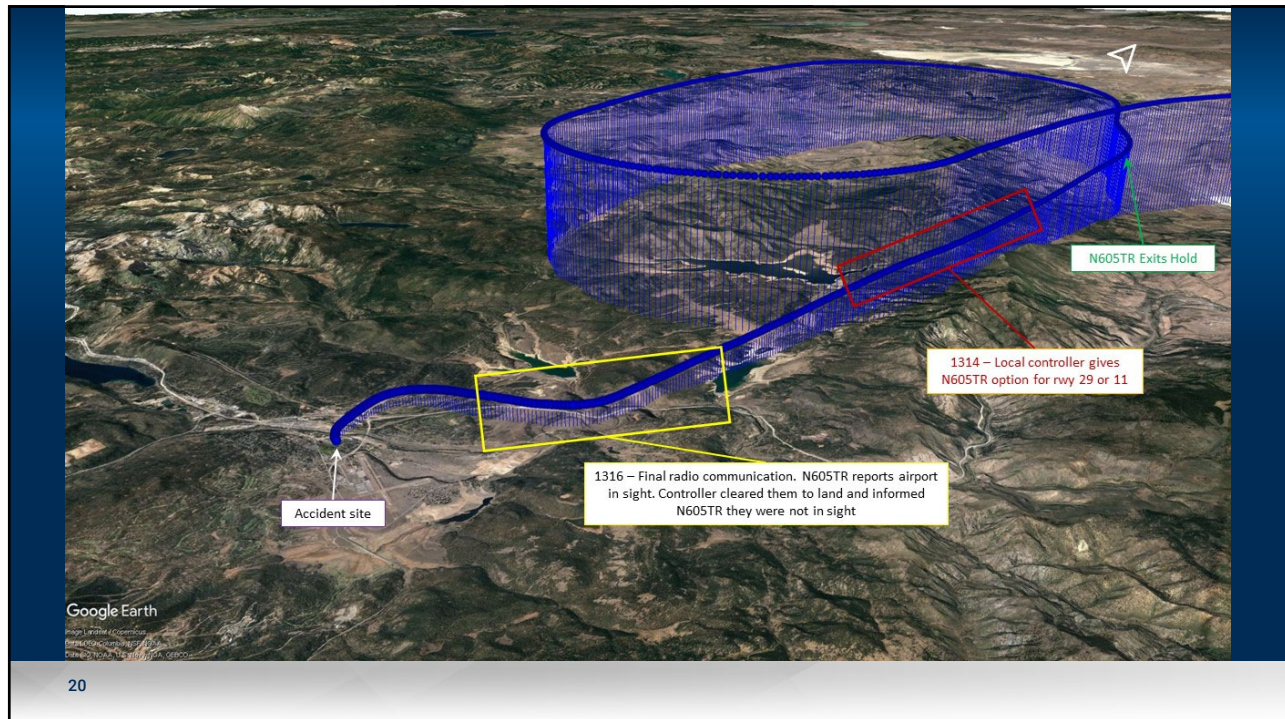
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Weather at Time of the Accident

- Day VMC conditions
- Broken ceiling 2,300 feet AGL
- Winds 280 degrees at 11-16 knots
- Visibility of 4 miles (smoke in the area)

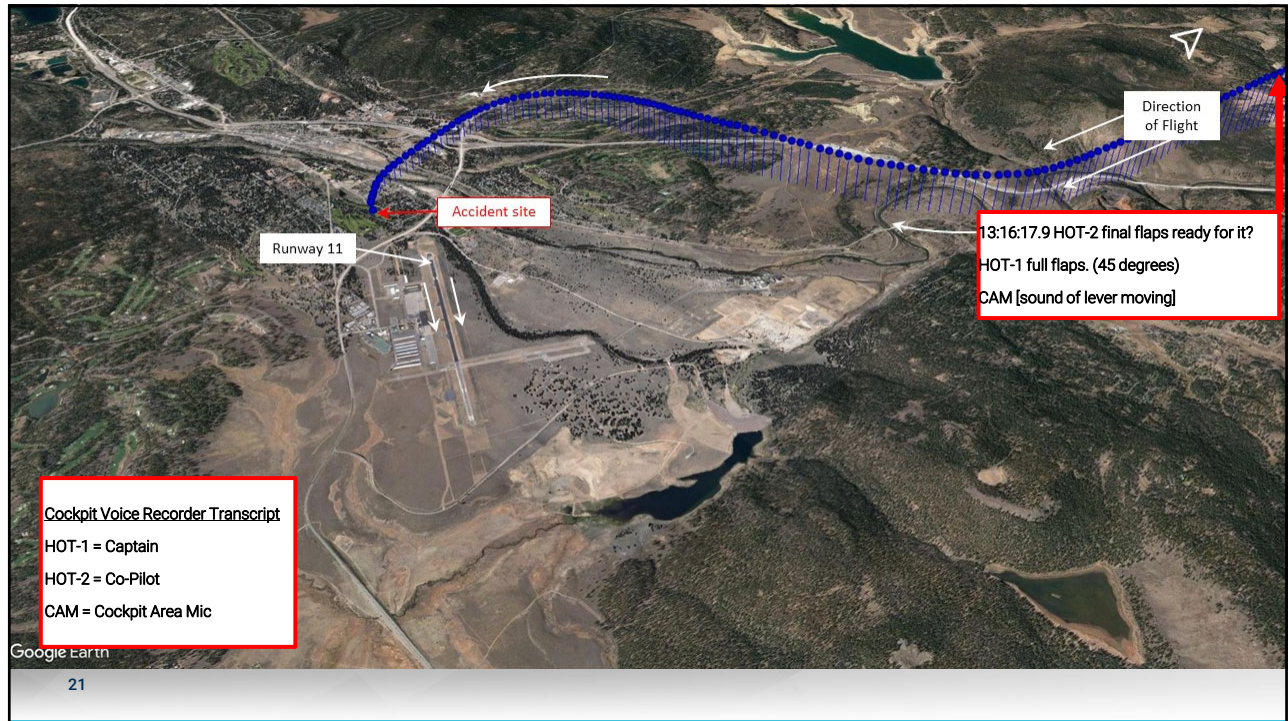
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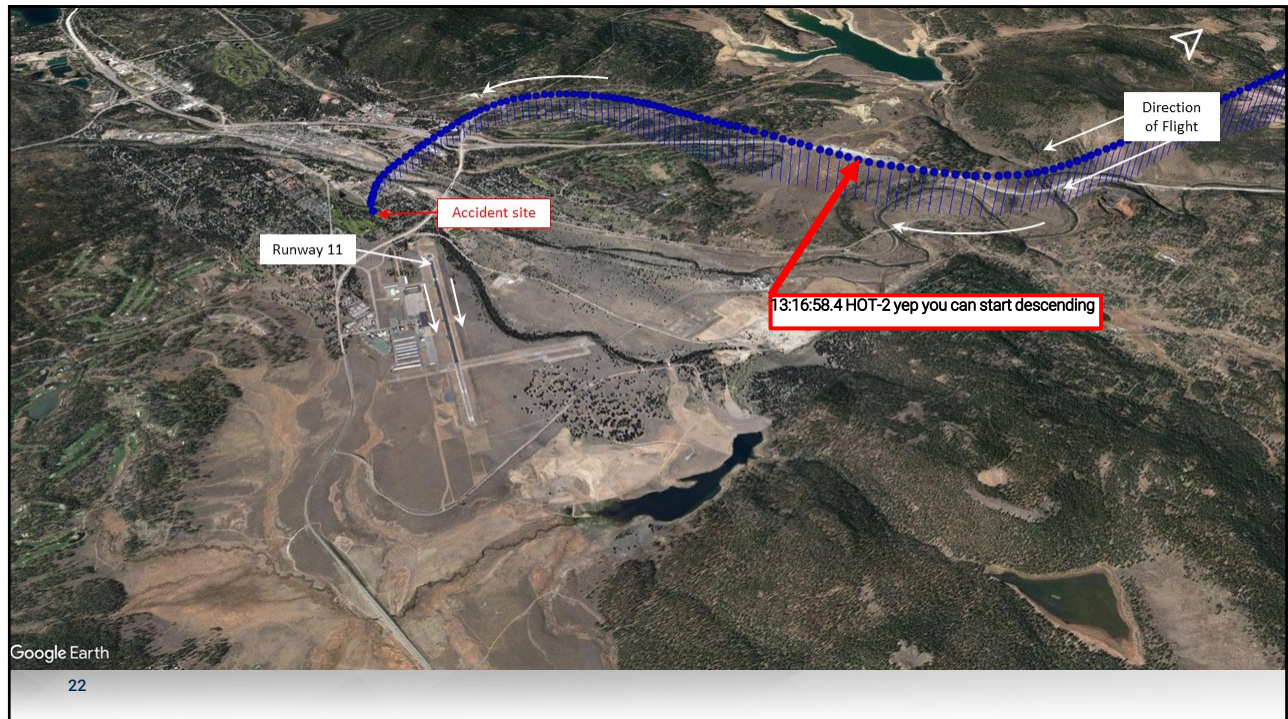


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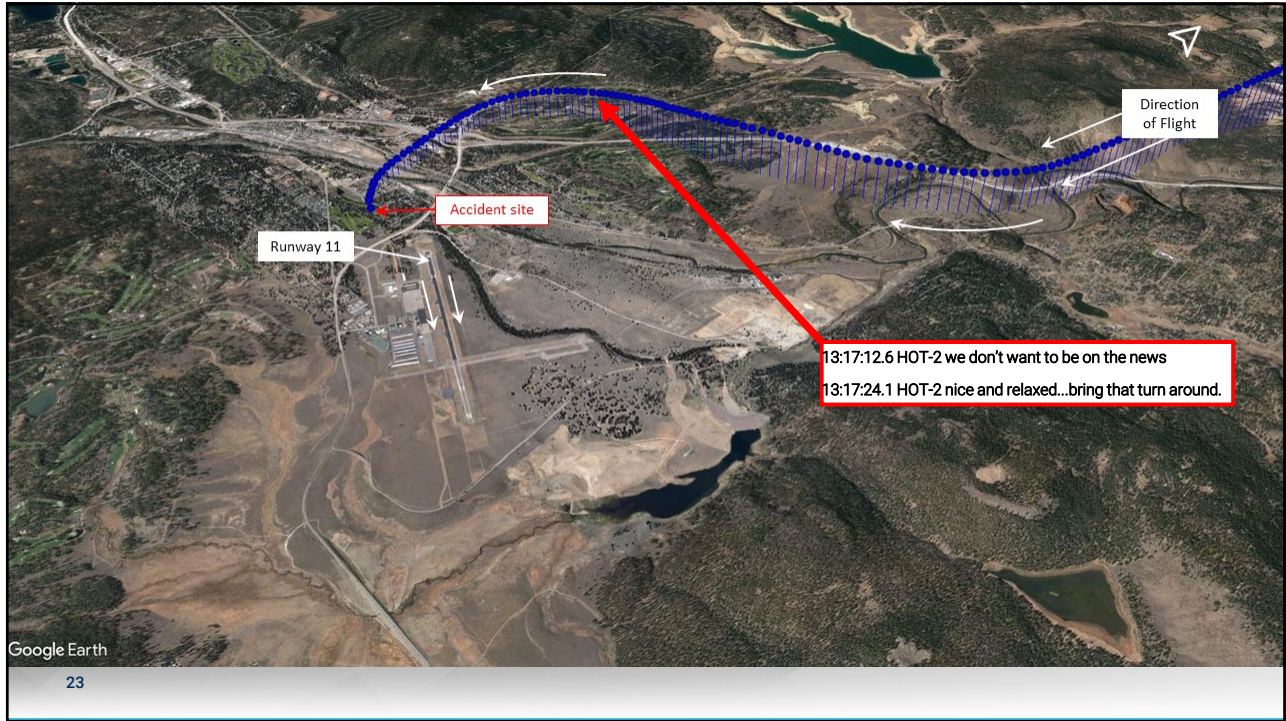
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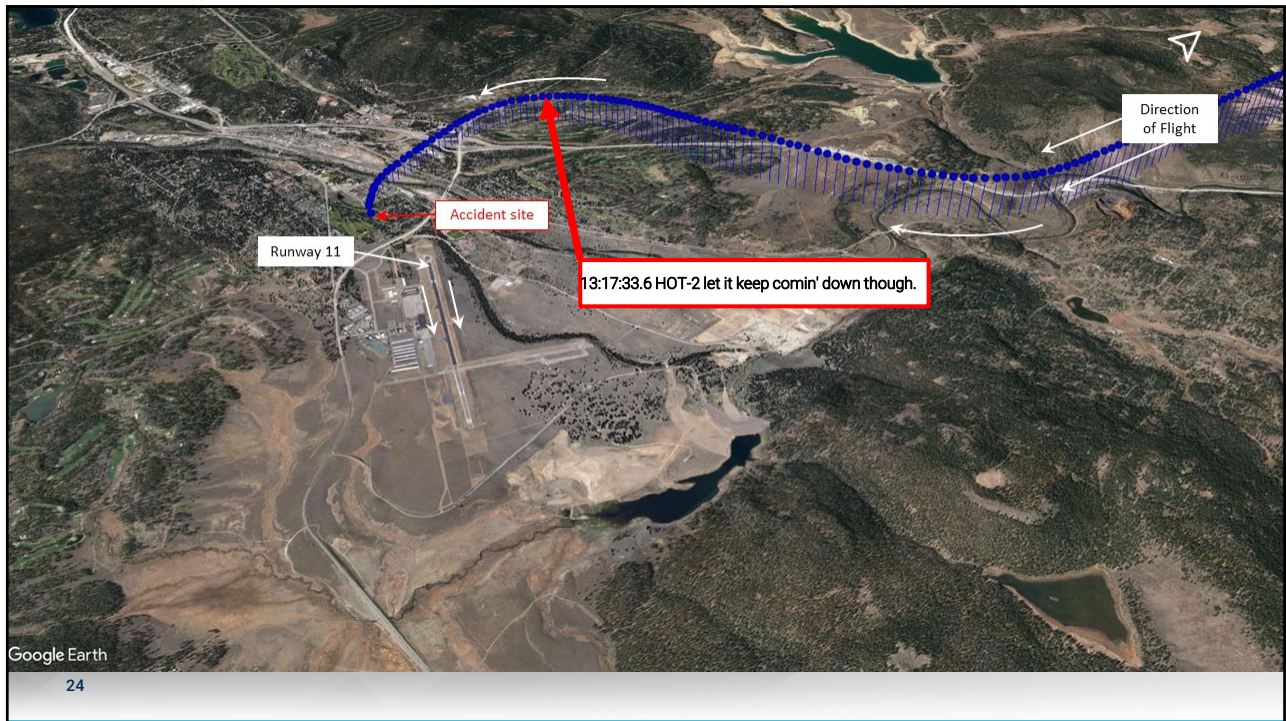
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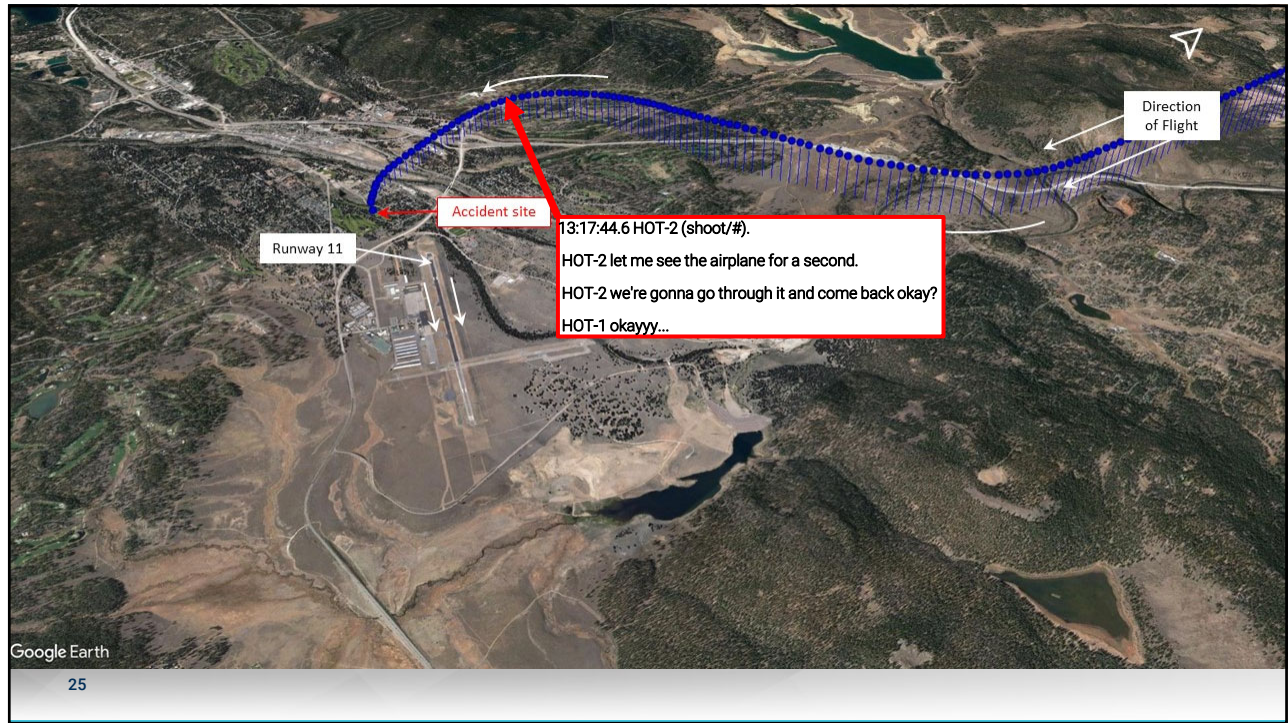
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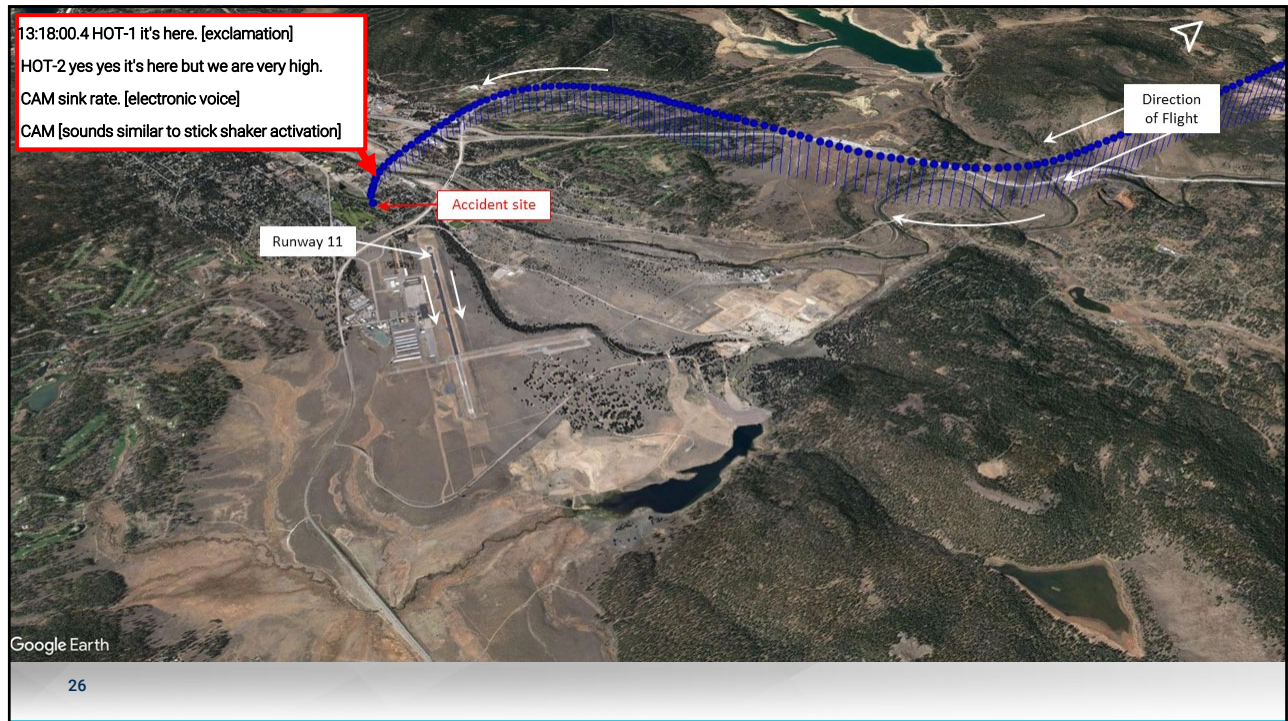
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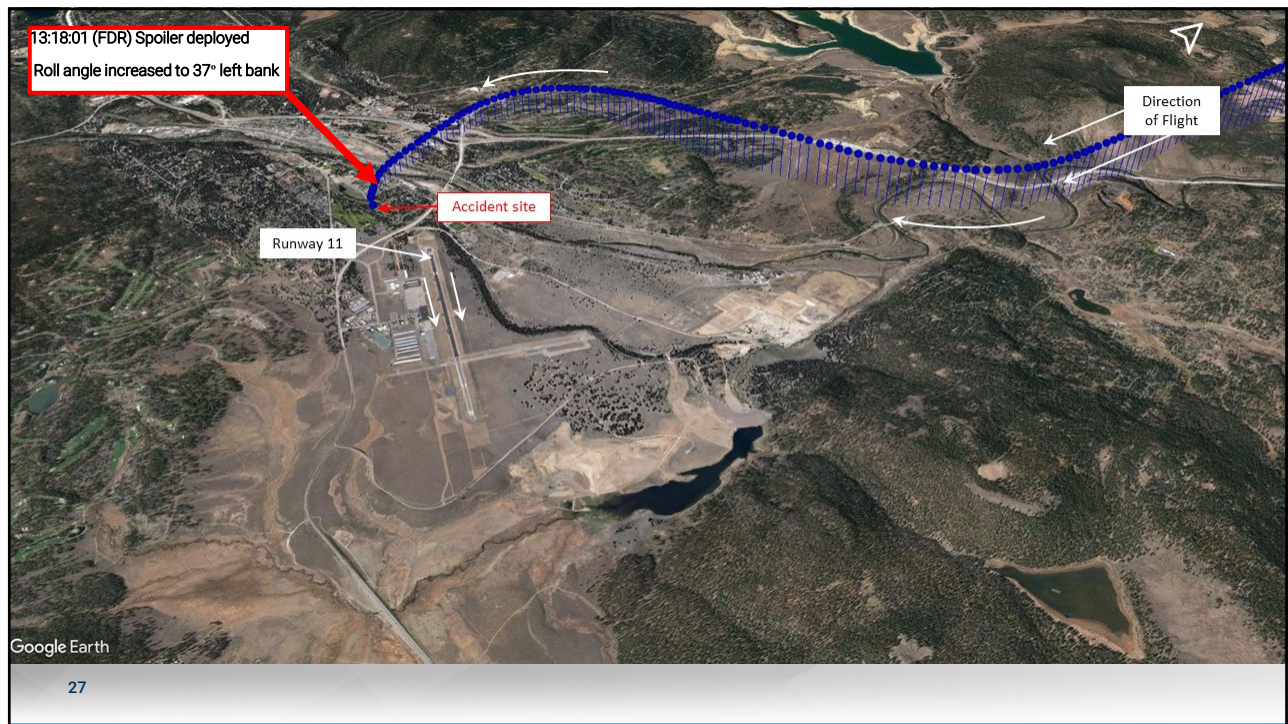
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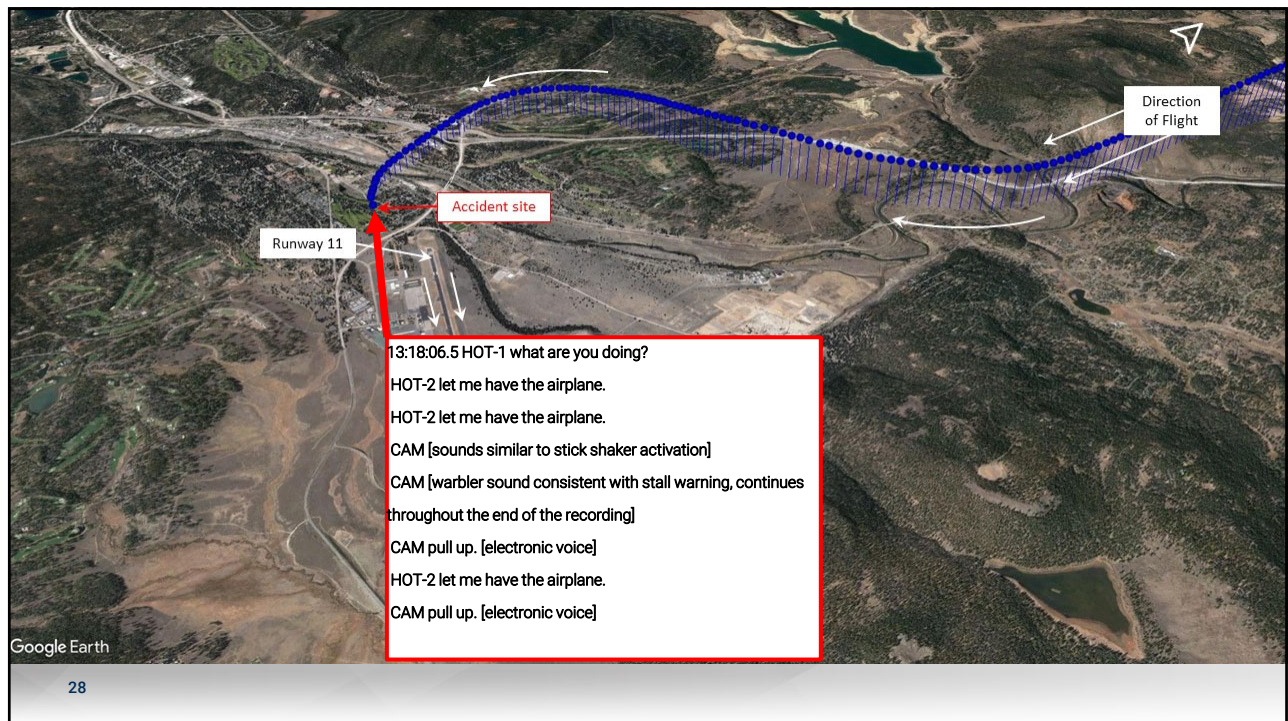
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Aircraft Performance Study

- Engineering simulation and computed performance based on FDR
- AOA exceeded the natural stall angle of attack
- Left wing stalled first and abruptly rolled left past 140 degrees
- Asymmetric stall and abrupt roll consistent with known stall characteristics
 - Aircraft is equipped with a stick “pusher” system that activates before natural stall occurs
- As aircraft crossed RWY centerline, flight spoilers were deployed to 40 degrees (full) and remained until impact

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FMS Weight and Spoiler Effects on Stall Margin

- Factory default 24,000lbs, 3000lbs lighter than actual empty weight
- Discrepancy landing weight 28,300lbs & Vref 118 KIAS
- Actual landing weight 31,294lbs* & Vref 124 KIAS
- 6 KIAS faster than computed Vref
- Maneuvering speed was +10 KIAS or 128 KIAS
 - Correct maneuvering speed 134 KIAS
- Last minute speed varied between 120 and 137 KIAS
 - Aircraft speed 130 kts first time shaker was recorded by CVR

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Safety Issues Being Reviewed

- Business aviation contract-crew pairings
- Leadership training
- Part 135 Safety Management System (SMS)
- Part 135 Flight Data Monitoring (FDM) programs
- Circling approaches for business aviation operations

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Contract – Crew Pairings

- No company basic indoctrination training
 - Crew coordination training, SOP adherence, aircraft limitations compliance
- Captain trained at FSI; Co-pilot trained at CAE
- Pilot Records Improvement Act (PRIA)
- Visa status and compensation
- Charts and Weight and Balance

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Leadership

- Failure to brief approach
 - Never asked for the approach that was briefed
- Improper speed & configuration during approach
- Co-pilot acting as instructor pilot
- PM allowed to assume control of the aircraft
- No leadership training AC-121-42
- Experience level and recent recurrent training

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Part 135 SMS & FDM

- Held operating certificate for 13 days
- Lack of experience at the leadership level
 - Deficiencies
 - visa, weight & balance, FMS updated
- “kind of” was the expectation that pilots would comply with company procedures and policies
- Overall poor safety management

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Circle-to-Land Approach

- No approach brief
- Late airport identification by PF
- Improper configuration and speed
 - Too fast until base leg
- Stabilized approach?
 - No one called for a “Go around”
- FSF CFIT study, RWY aligned apps are 25 times safer
 - Safety margin increases further 8 times with vertical guidance

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Circle-to-Land Approach Guidance

- Understand risks, use sound judgement
- Experience & limitations, aircraft capabilities & performance
 - Weather, runway configuration, geo position, altitude & airspeed
- Request a different approach if not comfortable or divert
- Training for the approach
- Brief the approach
 - Specify beginning, descent altitudes & locations, airspeed, aircraft configuration, & GA criteria and procedures, stabilized approach criteria*
- Remain at or above the circling approach altitude until aircraft is in a position from which a descent to a landing on intended runway can be made at a normal rate using normal procedures

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NTSB Safety Alert

SAFETY ALERT 084

NTSB National Transportation Safety Board

March 2023

Circling Approaches: Know the Risks!

Before conducting a circling approach, be sure it is the best option and then brief the approach, plan its execution, and acknowledge your own limitations.

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