

12. The AR-1 controller had a heavy workload which was aggravated by radio transmission interference.
13. The AR-1 controller lost track of the aircraft in an area of precipitation. In an effort to reidentify the aircraft, he vectored it toward mountainous terrain at an altitude too low to provide obstruction clearance.
14. The AR-1 controller and his family had been subjected to inadequate living conditions for about 5 weeks prior to the day of the accident.
15. Environmental and personal factors beyond his control lowered the AR-1 controller's performance capability to the extent that he could no longer safely handle a heavy workload.
16. In 1966, the AR-1 controller was referred for a psychiatric and psychological assessment, as a result of the outcome of a psychological screening test, and subsequently cleared for controller duty.

(b) Probable Cause

The Board determines that the probable cause of this accident was the vectoring of the aircraft into mountainous terrain, under IFR conditions, without adequate obstruction clearance altitude by a controller who, for reasons beyond his control, was performing beyond the safe limits of his performance capability and without adequate supervision.

3. RECOMMENDATIONS

The complex man-equipment-environment interfaces in this accident sequence make it difficult to convert each of the conditioning events into an effective and practicable recommendation. The Board believes that most of these events represent departures from accepted procedures, standards, and practices which became critical only in the total context of the circumstances. In that respect, this accident is a dramatic reminder of the fact that in aviation, every form of complacency with regard to the quality of equipment or the performance of personnel, be it in the cockpit or in the control room, should be treated as an error-provoking and accident-inducing factor. There is no need to belabor this point with recommendations which would only be repetitious of what has been said in the past after similar occurrences. The answer lies in sound management and operational policies.

With regard to the critical event in this accident, the Board is of the opinion that prevention of its recurrence has to be sought in steps that preclude the assignment of distressed personnel to vital tasks. This not only implies management awareness of the immediate and cumulative effects of stress-producing environmental factors on workload and performance capability, but the judicious application of proven norms to the methods of selecting, training, screening, assigning, and medically supervising controller personnel.

Although this accident revealed several areas where supervisory alertness could have eliminated, or reduced the seriousness of, several of the conditioning events and thereby minimized the probability of the accident, it emphasizes particularly the medical area and the need for compatibility between a controller's stress tolerance and his anticipated workload. The Board is of the opinion that this accident proves, although in a negative manner, that properly administered and interpreted psychological tests can be invaluable in achieving such compatibility which, eventually, would serve the welfare of the controllers as well as the public. The Board therefore recommends that the psychiatric and psychological assessment of controllers under the Air Traffic Controller Health Program be expanded. Not only should personnel entering on duty be assessed, but all controller personnel should be periodically tested. The program should be under the strict supervision of qualified psychiatrists and psychologists.

Shortly after this accident, the Board made recommendations to the Federal Aviation Administration dealing with the operation of aircraft without distance measuring or transponder equipment in instrument flight conditions in the San Juan area. A review of approach control procedures in locations with a similar topography was also recommended. (See Appendix E.)

In response to these recommendations, the FAA took several actions which satisfied the intent of the Board. (See Appendix F.)

By the National Transportation Safety Board:

/s/	<u>JOHN H. REED</u>	Chairman
/s/	<u>OSCAR M. LAUREL</u>	Member
/s/	<u>FRANCIS H. McADAMS</u>	Member
/s/	<u>LOUIS M. THAYER</u>	Member
/s/	<u>ISABEL A. BURGESS</u>	Member

April 24, 1970.