effect expedited egress of passengers from the cabin or if improved fuel system crash fire protection systems had been in use to preclude the rapid propagation of fire upon impact.

(b) Probable Cause

The National Transportation Safety Board determines that the probable cause of this accident was the captain's intentional descent below the prescribed minimum descent altitude under adverse weather conditions without adequate forward visibility or the crew's sighting of the runway environment. The captain disregarded advisories from his first officer that minimum descent altitude had been reached and that the airplane was continuing to descend at a normal descent rate and airspeed. The Board was unable to determine what motivated the captain to disregard prescribed operating procedures and altitude restrictions and finds it difficult to reconcile the actions he exhibited during the conduct of this flight.

3. RECOMMENDATIONS

As a result of this investigation the Safety Board recommended that the Federal Aviation Administration take the following actions:

(a) Initiate action to incorporate in its airworthiness requirements, a provision for fuel system fire safety devices which will be effective in the prevention and control of both in-flight and postcrash fuel system fires and explosions.

(b) It was further recommended that rulemaking action in this matter specifically apply to future passenger-carrying aircraft in the transport category, and that consideration be given to an adaptation to all other passenger-carrying aircraft now in service. (See Appendix H.)

On November 12, 1971, the acting Administrator of the Federal Aviation Administration responded to the recommendation stating in part ". . . that protection against the occurrence of fire and explosion, whatever the ignition source, would be an important safety improvement" and that ". . . we will develop a course of action regarding rule

promulgation, both with respect to new transport category aircraft and passenger carrrying aircraft in service." (See Appendix I.)

The Safety Board further recommends to the Federal Aviation Administration that:

(a) Federal Aviation Regulation 121.571 be revised to state that the appropriate crewmember must physically point out the location of all emergency exits on each aircraft PRIOR TO EACH TAKEOFF. As a general rule passengers do not listen to the oral announcements. This was testified to during the public hearing relative to this accident. However, passengers will tend to watch a flight attendant who physically points out the area of exits and will retain therefore a general idea of the location of such exits particularly those nearest to them.

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(b) Chime systems or other audible devices be installed and used on Convair Models 240, 340, 440 and 580 airplanes to allow the flight attendant sufficient time to be seated before takeoff and prior to landing. Additionally, the chime system should be sufficiently loud to alert the flight attendant in the forward part of the aircraft as well as in any rest room or work areas in the aft part of the aircraft. Presently, no formal signal is used to alert flight attendants.

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(c) Some means (either lights or lighted signs) be installed and used on the CV-580 forward galley to allow the flight attendant visual reference to the "No Smoking" sign. This would indicate to the flight attendant the necessity to secure her galley and return to her assigned seat.

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(d) Previously effective Federal Aviation Regulation 121.391, "Flight Attendants," requiring two flight attendants for more than 44 passengers be reinstated without any waivers, exemptions or deviations (as allowed under Exemption 1108B). As we have previously pointed out in our comments regarding Notice of Proposed Rule Making 70-35 (See Appendix J), the Board did not recommend a

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permanent rule change but rather that the partial exemption should be extended for a period of time during which a program for collection of appropriate data can be accomplished. The exemption allowed certain carriers to operate a 50-passenger aircraft with one flight attendant for a 44-passenger seating capacity and two flight attendants for a 44- to 99-passenger seating capacity. Flight attendants should be so distributed within the cabin of the CV-580 so as to assure safe evacuation of passengers should the injury or fatality of one flight attendant during the impact sequence render her partially or fully incapacitated. As demonstrated in this accident, two flight attendants, offering leadership and assistance from all available window exits and the main cabin door, would expedite any evacuation.

(e) The instructions for opening the Convair 580 rear service door which are presently affixed to this door should be subjected to a thorough study and reevaluation. The present instructions are misleading. Simple and clear language should be substituted, such as "Remove plastic cover, open door, pull red inflate cord." Additionally, the locking mechanism (which is easily mistaken for a door handle) should be covered with an opaque light-weight material or some other device which would blend with the cabin interior material and could not be mistaken as part of the egress system in an emergency situation. A complete modification of the door handle to simplify its operation should be considered as an alternate solution.

(f) Present provisions for emergency exit lights for utilization during darkness or smoke conditions be evaluated. During darkness or smoke conditions, it is vitally important to have some form of light available to direct and conduct emergency evacuations as well as to read operating instructions. Surviving passengers indicated that the cabin was dark, and exits were difficult to see.

(g) Standardized instructions to flight attendants be used during training. The practice of using the

main cabin door for both the planned and unplanned emergency tends to confuse the flight attendants. It is recommended that the sequence and procedure for a planned practice emergency be identical to that which is to be used in actual emergency. It is further recommended that the Allegheny Airlines Hostess Manual be revised accordingly.

(h) Adequate shoulder harnesses be provided on all airplanes for the flight attendants at their assigned seats. This would give added protection, assure survival and prevent additional injuries to flight attendants and assure leadership for passenger evacuation.

(i) The emergency instructions for the individual airplane be displayed on the back of the seats in eye level sight of the passenger, to provide added assurance that the passenger is fully aware of vital safety and survival information. Efforts should also be exerted by the industry in cooperation with regulatory and consumer protection agencies to ascertain that all vital safety information be disseminated to the traveling public in a straightforward, clear, and explicit manner.

(j) Establish a procedure to require air carrier management to establish and implement a system that would provide a method for continual assessment of the pilot-in-command's performance in executing management's operational control responsibility.

Furthermore, review and revise where necessary the operations manuals of air carriers to clearly state management's operational control procedures with regard to the pilot-in-command and other crewmembers and the manner in which each crewmember is expected to execute his duty.

(k) The Board also recommends to the Air Transport Association of America and to the pilot labor organizations that: they review existing wage agreements any clauses which provide any form of monetary reward to the pilot for a faster than scheduled flight operation to assure that they do not derogate safety.

(l) Combined efforts and resources of government and industry be applied toward the expeditious application and use of technological advances in the field of all weather flight navigation and approach/landing systems. Although it cannot be stated unequivocally that this accident would not have occurred if an instrument landing system or more advanced landing system had been in use, it is the Board's belief that the probability of the occurrence of such an accident would have been greatly reduced.

(m) That the Air Line Pilots Association and the Allied Pilots Association implement a program within existing professional standards committees to provide an expeditious means for peer group monitoring and disciplining the very small group of air carrier pilots who may display any unprofessional (including hazardous) traits as exemplified by this accident.