AIRCRAFT ACCIDENT REPORT

NORTHWEST AIRLINES, INC.,
BOEING 747-151, N606US
OVER THE NORTH PACIFIC OCEAN
105 NAUTICAL MILES WEST OF 150° EAST
LONGITUDE AT 36° NORTH LATITUDE
APRIL 12, 1972

NATIONAL TRANSPORTATION SAFETY BOARD
Washington, D. C. 20591
REPORT NUMBER: NTSB-AAR-72-27

FILE NO. 1-0007

AIRCRAFT ACCIDENT REPORT

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BOEING 747-151, N600US
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165 NAUTICAL MILES WEST OF 150° EAST
LONGITUDE AT 36° NORTH LATITUDE
APRIL 12, 1972
ADOPTED: OCTOBER 4, 1972

NATIONAL TRANSPORTATION SAFETY BOARD
Washington, D. C. 20591
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15. Supplementary Notes

No new Aircraft Safety Recommendations are included in this report.

16. Abstract

Northwest Airlines Flight 22 of April 12, 1972, a Boeing 747-151, N[illegible], encountered unforecast light-to-severe, clear air turbulence for a period of 55 seconds while cruising at flight at 31,000 feet en route to Honolulu, Hawaii, from Tokyo, Japan. There were 146 passengers and a crew of 18 aboard. Seven of the passengers received minor injuries, and two received serious injuries. Five cabin attendants received minor injuries. The aircraft was undamaged. The accident occurred at approximately 1140 Greenwich mean time.

The National Transportation Safety Board determines that the probable cause of this accident was the entry of the aircraft into an area of unforecast and unexpected severe clear air turbulence when numerous occupants did not have their seatbelts fastened.

This accident supports previous recommendations made to the Federal Aviation Administration and to pilots' associations.

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NORTHWEST AIRLINES, INC.,
BOEING 747-151, N601US
OVER THE NORTH PACIFIC OCEAN
105 NAUTICAL MILES WEST OF 150° EAST LONGITUDE
AT 36° NORTH LATITUDE
APRIL 12, 1972

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SPECIAL NOTICE

This report contains the essential items of information relevant to the probable cause and safety message to be derived from this accident/incident. However, for those having a need for more detailed information, the original factual report of the accident/incident is on file in the Washington office of the National Transportation Safety Board. Upon request, the report will be reproduced commercially at an average cost of 15¢ per page for printed matter and 85¢ per page for photographs, plus postage. (Minimum charge is $2.00.)

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File No. 1-0007

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D. C. 20591
AIRCRAFT ACCIDENT REPORT

Adopted: October 4, 1972

NORTHWEST AIRLINES, INC.,
BOEING 747-151, N600US
OVER THE NORTH PACIFIC OCEAN
105 NAUTICAL MILES WEST OF 150° EAST LONGITUDE
AT 30° NORTH LATITUDE
APRIL 12, 1972

SYNOPSIS

Northwest Airlines Flight 22 of April 12, 1972, a Boeing 747-151, N600US, encountered unforecast severe turbulence at cruise altitude approximately 50 minutes after departure from Tokyo, Japan, while en route to Honolulu, Hawaii. There were 146 passengers and a crew of 18 aboard the aircraft. Seven of the passengers received minor injuries, and two received serious injuries. Five cabin attendants received minor injuries.

The aircraft was in level flight at 33,000 feet in smooth air when it encountered turbulence which ranged in intensity from light to severe for approximately 55 seconds. The "Fasten Seatbelt" sign was illuminated immediately when the turbulence was encountered; however, during the period of the turbulence, some of the passengers and flight attendants were thrown about in the cabin and sustained the aforementioned injuries.

The aircraft was undamaged and continued on to Honolulu where the injured persons were examined and hospitalized.

The National Transportation Safety Board determines that the probable cause of this accident was the entry of the aircraft into an area of unforecast and unexpected severe clear air turbulence when some occupants did not have their seatbelts fastened.

Subsequent to the investigations of previous B-747 accidents involving turbulence, the Safety Board recommended that the Federal Aviation Administration require regulatory improvements concerning seatbelt discipline, air carrier policy on deviation of flight with injured passengers, and reassessment of the required number and types of on-board first-aid kits and adequacy of their contents. Also, as the result of a special study in the Pacific area to review meteorological, communications, and air traffic control facilities and services of the United States, a recommendation was made to various pilots' associations for improvement of the reporting of meteorological information in in-flight pilot reports.

INVESTIGATION

Northwest Airlines, Inc., Flight 22, of April 12, 1972, a Boeing 747-151, N6038, was a regularly scheduled passenger flight between Tokyo, Japan, and Minneapolis, Minnesota, with intermediate stops at Honolulu, Hawaii, and Los Angeles, California. There were 146 passengers and a crew of 18 aboard the aircraft.

The flight departed from Tokyo at 1050 G.m.t. 1/ on an Instrument Flight Rules flight plan and was cleared to climb to and maintain flight at an altitude of 33,000 feet (flight level 330). According to the crew, light turbulence was encountered during the climb to approximately 29,000 feet. At this level the aircraft was on top of an overcast. The air was smooth, the visibility was excellent, and the stars overhead were clearly visible. Lightning was observed to the left or north of the aircraft, as well as below and rearward of the aircraft. The distance from the lightning was estimated to have been at least 50 miles or more. The flight deck crew continued operating the No. 2 weather radar system with one and one-half increments of down tilt to the antenna. The climb continued to 33,000 feet where the flight leveled off at its assigned altitude.

Shortly before the flight reached the cruising altitude, the crew turned off the seatbelt sign. The purser made an announcement to the passengers, stating that although the seatbelt sign was off, for their personal safety, the passengers should leave their seatbelts fastened while in their seats.

At 1140, approximately 20 minutes after reaching the cruise altitude, unexpected light-to-severe turbulence was encountered for a period of 55 seconds. Weather radar provided no forewarning of the turbulence. Immediately upon encountering the turbulence, the seatbelt sign was illuminated, the autopilot was disengaged, and the aircraft was flown manually by the captain. The captain experienced no difficulty in controlling the aircraft during this encounter.

At the termination of the turbulence encounter, the second officer went back to the cabin to assess the situation and reported to the captain that a total of nine passengers and five stewardesses were injured.

1/ All times are Greenwich mean, based on the 24-hour clock.

Despite the purser's advisory announcement, some of the injured passengers had their seatbelts fastened, although the majority of them were in their seats. The five stewardesses were standing. All those injured were located in rear cabin areas.

The two most severely injured passengers were a young boy who sustained a fracture of his left arm just above the elbow and a young girl who sustained a dislocated right shoulder. The other injured passengers, and the stewardesses, received bruises, abrasions, and small lacerations 2/. The captain visited the injured persons and discussed with the parents of the two most severely injured passengers the advisability of returning to Tokyo or continuing on to Honolulu. The parents requested that the flight continue on to Honolulu. Flight 22 landed at Honolulu at 1738. The injured persons aboard were taken to a hospital where they were examined and treated for their injuries.

While at Honolulu, the aircraft was given a maintenance check for turbulence damage and none was found. Following this maintenance inspection, the airplane was returned to service and continued its flight to Los Angeles, California, and Minneapolis, Minnesota.

A readout of the aircraft's flight data recorder for the period covering the turbulence encounter disclosed that acceleration reached a maximum of + 1.42 g's, and a minimum of -0.91 g's. The duration of the turbulent period was 55 seconds. Approximate penetration values for altitude, speed, and heading were 31,000 feet, 300 KIAS 3/, and 190° magnetic, respectively.

The gross weight of Flight 22 at takeoff was 610,000 pounds and the center of gravity was 19.6 percent of MAC (Mean Aerodynamic Cord). At the time of the turbulence encounter, the gross weight was 578,000 pounds and the center of gravity was 20.0 percent of MAC. The gross weight and the center of gravity were within allowable limits during the entire flight.

The 1200 surface weather chart prepared by the National Meteorological Center at Suitland, Maryland, showed a low-pressure system centered near the accident site, an occluded front extending eastward from the low-pressure center to near 152° East, a warm front extending east-southeastward from the point of occlusion, and a cold front extending southward and then southwestward from the point of occlusion.

2/ Attachment 2 depicts the positions and degree of injury of the personnel injured at the time of the turbulence encounter.

3/ KIAS - Knots Indicated Air Speed.

The 300 millibar chart (approximately 30,000 feet m.s.l.) which was prepared by the National Meteorological Center showed a low-pressure system centered over the northern Sea of Japan with troughs extending southward and southeastward from the low.

The Yatsuo and Sendai, Japan, 1200 radiosonde ascents showed the tropopause at 260 millibars (approximately 33,000 feet m.s.l.)

The captain received a weather briefing from Northwest Airlines' Meteorological Department prior to departing from Tokyo. Additionally, he was provided with weather documents which included appropriate terminal forecasts, winds and temperatures aloft forecast, and a 300-millibar prognostic chart. The prognostic chart contained the following: temperature, wind direction and speed, tropopause height and stratospheric lapse rate, vertical wind shear, turbulence, and quality of ride. A smooth ride was forecast for the area of the turbulence encounter. There were no in-flight reports of turbulence from other flights regarding turbulence in the area in which it was encountered by Flight 22.

ANALYSIS

Northwest Airlines Flight 22 was routine as it climbed out of Tokyo toward Honolulu. The climb was through an overcast where the aircraft encountered light turbulence, which the flightcrew anticipated. At flight level 290, the aircraft was on top of the overcast where excellent visibility and smooth air prevailed. Twenty minutes after reaching its assigned flight level 330, it encountered severe turbulence for a very brief period of time.

Nine passengers and five stewardesses received injuries during this turbulence encounter.

The seatbelt sign was not on at the time the turbulence was encountered, but the passengers had been advised to keep their seatbelts fastened while they were in their seats. All of the injuries were sustained by persons not secured by seatbelts. Most of the injured passengers were seated, but all of the injured stewardesses were standing.

Deficiencies were reported in the first-aid equipment aboard the aircraft. There were not enough large bandages nor pain-relieving medication for children, and there were no appropriate splints for immobilizing fractured limbs.

The Boeing Company's recommended severe turbulence penetration speed for the B-747 is 280 KIAS or 0.82 Mach, whichever is lower, and it is also recommended that the autopilot be used in turbulence mode. The aircraft encountered this unforecast and unexpected turbulence at approximately

300 KIAS, and the flight data recorder airspeed trace indicated that the flightcrew made every effort to reduce to turbulence penetration speed as soon as the turbulence was encountered. The captain elected to fly the aircraft manually rather than to use the autopilot on turbulence penetration mode.

The flight data recorder indicated that the aircraft was in level flight at approximately 33,000 feet when it encountered turbulence, which lasted about 55 seconds and ranged in intensity from light to severe. One brief, severe jolt produced a positive load factor of 1.32 g and a negative load factor of minus 0.91 g. The aircraft gained about 1,000 feet of altitude during the turbulence encounter. Changes in heading were minor. Upon entry into the turbulence, the airspeed increased to a peak of 318 knots, then decreased to 283 knots, increased again to a peak of 302 knots, and decreased again to 272 knots at the end of the turbulence. The characteristic sine waves exhibited in the acceleration and airspeed traces suggest that the aircraft encountered two waves in the atmosphere.

The aircraft encountered the turbulence near the tropopause, near an upper level trough, and near a jet stream, all of which are likely locations for clear air turbulence. The turbulence encountered was probably produced by gravity waves in the tropopause boundary.

A smooth ride was forecast for the area of the turbulence encounter and the aircraft's weather radar showed no echoes which might have produced convective turbulence. Some of the pilot weather reports that were reviewed pertinent to the area and time of concern indicated any turbulence; however, it appears that only wind and temperature data were being transmitted in these reports. The inclusion in these reports of information concerning turbulence and other supplementary weather data would have been very helpful to the forecaster, dispatcher, and all others concerned. The science of forecasting has not advanced to the point that accurate, clear air turbulence forecasts can be made, particularly over large oceans where meteorological data are very sparse.

PROBABLE CAUSE

The National Transportation Safety Board determines that the probable cause of this accident was the entry of the aircraft into an area of unforecast and unexpected severe clear air turbulence when seat occupants did not have their seatbelts fastened.

RECOMMENDATIONS

Although no specific recommendations resulted from the Board's investigation, this accident does support those previously made to the Federal Aviation Administration and pilots' associations regarding seatbelt

discipline, deviation from flight plan when injuries occur aboard aircraft, the adequacy of first-aid equipment on large aircraft, and pilots' in-flight meteorological reporting. Copies of these previous recommendation letters to the FAA, and FAA's responses, and the recommendation letter to the pilots' associations are included in Attachment 3.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD:

/s/ JOHN H. REED
Chairman

/s/ FRANCIS H. McADAMS
Member

/s/ ISABEL A. WALKER
Member

/s/ WILLIAM R. HALEY
Member

Louis M. Thayer, Member, was absent, not voting.

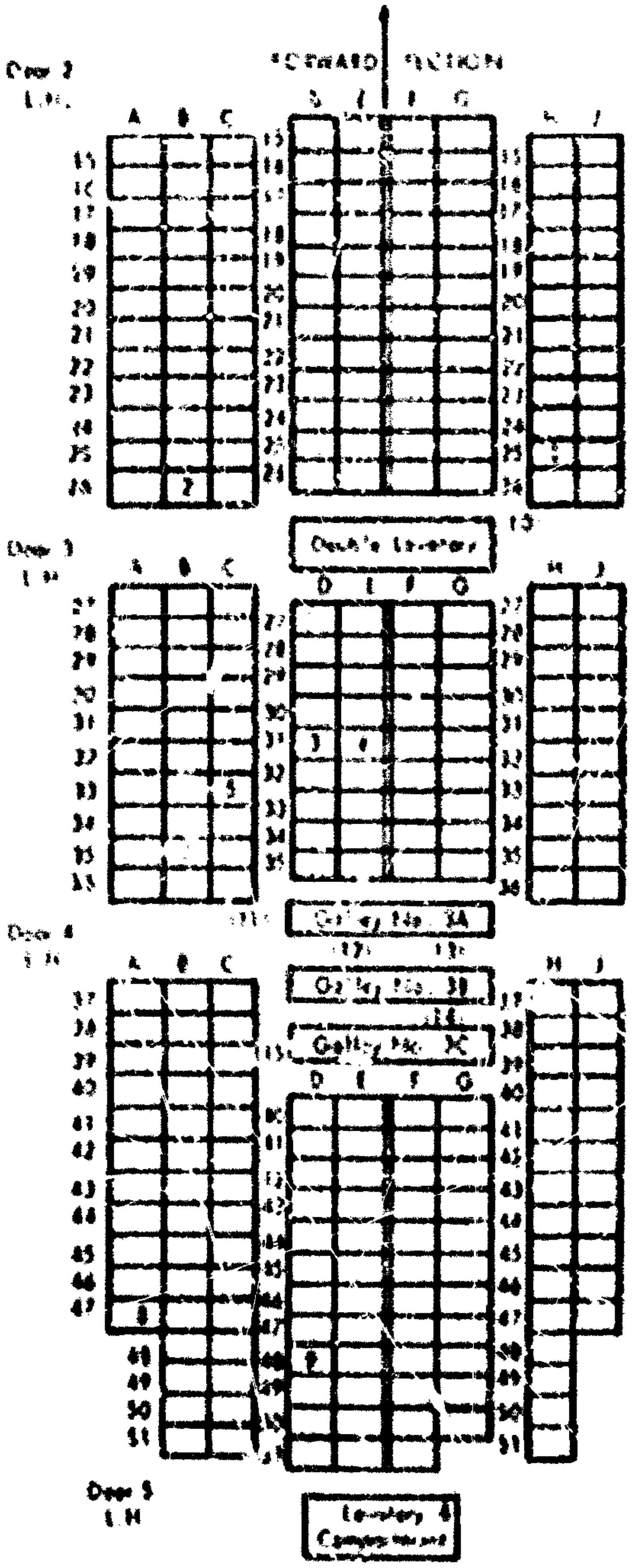
October 4, 1972

CREW INFORMATION

Captain William Hazen Arnold, aged 54, holds Airline Transport Pilot Certificate No. 32721-CO. The date of his last proficiency check was April 18, 1972. His first-class airman's medical certificate was dated October 20, 1971, with the limitation that he possess corrective glasses for near vision while exercising the privileges of his airman certificate. Captain Arnold, at the time of the accident, had a total of 23,378 flight hours, of which 952 were in the Boeing 747.

First Office Harry L. Camm, aged 40, holds Commercial Pilot Certificate No. 1032006 for airplane single- and multiengine land. His last proficiency check was in May 1971. His first-class medical certificate was dated April 24, 1971, with no limitations. He had, at the time of the accident, a total of 4,664 flight hours, of which 1,272 were in the Boeing 747.

Flight Engineer John D. Kelley, aged 44, holds Flight Engineers Certificate No. 1603001. His last proficiency check was on September 7, 1971. His first-class medical certificate was dated December 2, 1971, with no limitations. He had a total of 10,872 flight hours, of which 372 were in the Boeing 747. Additionally, Mr. Kelley holds Commercial Pilot Certificate No. 1578704 for airplane single- and multiengine land and instrument rating.



LEGEND

Passenger Number	Name	Seat & Row	Extent of Injury
1.	Ferdinando W. Huber	25H	Minor
2.	Chen Ching Chang	26B	Minor
3.	Tedo Bracci	31D	Minor
4.	Anita Pena	31E	Serious
5.	Moon Sang Dong	33C	Serious
6	Augusto H. Sasillo	AFT LAVATORY	Minor
7.	Back Soon Chung	31B	Minor
8.	S.E. Lai Ag	47A	Minor
9.	Christina Beasley	48D	Minor
Stewardesses.			
10	Shirley Haley	(10)	Minor
11	Lina Yoe Ngan	(11)	Minor
12.	Linda Marshall	(12)	Minor
13.	Courtney Martin	(13)	Minor
14	Becky Tolliver	(14)	Minor
15.	Rose Ann Herman	(15)	Minor

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

INJURY LOCATION CHART
NORTHWEST ORIENT AIRLINES, INC.
BOEING 747-151, N606US
OVER THE NORTH PACIFIC OCEAN
105 NAUTICAL MILES WEST OF 130°
EAST LONGITUDE AT 36° NORTH LATITUDE

UNITED STATES OF AMERICA
NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: April 28, 1971

Adopted by the NATIONAL TRANSPORTATION SAFETY BOARD
at its office in Washington, D. C.
on the 7th day of April, 1971

FORWARDED TO:
Honorable John H. Shaffer
Administrator
Federal Aviation Administration
Department of Transportation
Washington, D. C. 20590

SAFETY RECOMMENDATIONS A-71-25 thru 30

As a result of a recent incident involving a Boeing 747 which encountered severe turbulence, six passengers and one stewardess were hospitalized, and 15 passengers and one stewardess were treated for minor injuries. All injuries were the result of the severe turbulence encountered while climbing through flight level 280 at an indicated air speed of 200 knots.

The National Transportation Safety Board believes the following areas require review by the Federal Aviation Administration:

Seatbelt Discipline: During this accident, seatbelt signs were on throughout the flight; however, of two hospitalized passengers, one indicated she did not have her seatbelt fastened, and another had his seatbelt fastened, but it was very loose because he was not able to take up the slack of the belt. Both of these passengers were injured when their heads struck the ceiling on the initial sharp downdraft but were able to maintain their seated position during the remaining turbulence encounter.

The Safety Board recommends that:

1. Seatbelt discipline be strictly enforced when the seatbelt sign is on. Attendants should make

a careful visual inspection of all seatbelts before takeoff and offer assistance to anyone encountering difficulty with a snug fit. When the seatbelt sign is on for prolonged periods, a public address announcement should be made at regular intervals.

747 Overhead Bin Failures: During this encounter with turbulence, several of the overhead storage bins in the passenger compartment dropped open, allowing their contents to spill out. It is not known if these reported failures contributed to any injuries of cabin occupants. However, the Safety Board recommends that:

3. Locking mechanisms be inspected and either be replaced with locks of a new design or the defective lock mechanisms be returned to serviceable condition by rework or repair.

3. The FAA correct any crashworthiness deficiencies in Boeing 747 overhead storage bins by establishing a deadline date for compliance with any modification requirements.

Economy Seat Headrest Separation: During this accident, several seat headrests were reported to have been thrown from their seat units. Examination of like headrests in another PAA 747 revealed that all such units tested were easily removed by hand without deactivating the lock mechanism. It is not known if these reported failures contributed to injuries, but the Safety Board recommends that:

4. FAA examine these seats with a view toward improving the crashworthiness of seats/headrests and establishing a deadline date for compliance with any modification requirements.

Narrow Aisle Stretchers: Following the abort of the flight and the landing, difficulty was encountered in removing from the aisle passengers suspected of having back injuries. This was because the aisle widths were too narrow for standard stretchers, resulting in great difficulty transferring patients from lying positions in the aisle to stretchers. The Safety Board recommends that:

5. The FAA advise medical facilities serving airports to stock narrow "carrying boards" or narrow stretchers that can be easily used in the space of an air carrier passenger compartment aisle to facilitate removal of non-ambulatory patients.

Air Carrier Policy on Deviation of Flight: Following this encounter with turbulence, the flight service director went forward to the cockpit and advised the captain that several passengers were severely injured or ill. The captain requested the service director to return to the passenger compartment and to reassess the situation. After reassessing the cabin injuries, the attendant reported to the captain a second time that several persons appeared to be severely injured. Ten to fifteen minutes elapsed between the initial report of passenger injuries and the captain's decision to divert the flight and return to his destination. The aircraft was met by the only physician at John F. Kennedy International Airport. The Safety Board recommends that:

6. The FAA review and, where appropriate, amend air carrier policy concerning in-flight assessments of injury or illness of passengers in order to preclude unnecessary delays in securing necessary medical assistance.

Members of the Safety Board staff would be pleased to discuss these recommendations with your staff should you feel further clarification is required.

These recommendations will be released to the public on the issue date shown above. No public dissemination of the contents of this document should be made prior to that date.

Reed, Chairman; Laurel, McAdams, Thayer and Burgess, Members, concurred in the above recommendations.

By: John H. Reed
Chairman

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WASHINGTON, D.C. 20590

OFFICE OF THE ADMINISTRATOR

7 MAY 1971

Honorable John H. Reed
Chairman, National Transportation Safety Board
Department of Transportation
Washington, D. C. 20590

Notation 600

Dear Mr. Chairman:

This is in reply to your communication issued 28 April 1971 containing safety recommendations A-71-25 thru 30 resulting from a B-747 turbulence encounter in which passengers were injured. We have carefully reviewed these recommendations and their rationale and have the following comments to offer.

Seatbelt Discipline

FAR 121.317(b) requires that "..... each passenger shall fasten his seat belt and keep it fastened while the seat belt sign is lighted." It is apparent that some passengers do not abide by this rule especially when the seat belt sign is [illegible] lighted for protracted periods. We will issue an operations bulletin to all of our inspectors having certificate responsibility for air carriers and their training programs, emphasizing the importance of oral announcements and better surveillance to assure compliance with seat belt fastened commands and security. FAR 121.317(a) requires that seat belt signs be visible to all passengers.

747 Overhead Bin Failures

During the B-747 type certification program special attention was given to the adequacy of the latching mechanisms for the new type overhead storage bins. The investigation currently underway has revealed that the stationary latch pins in the bin supporting structure failed, allowing the bins to fall open under flight loads. A corrective retrofit modification has been prepared by Boeing in Service Bulletin number 25-2014. We are studying this matter and assessing the need for mandatory action.

Separation from Restraint Fasteners

The buckles which become separated from seats are parts of the Aerotherm seats installed in the coach sections of Pan American's B-747's. We understand the problem is limited to these Pan American coach seats only. A corrective service bulletin is being prepared and retrofit modification parts for 14 airplanes, about 40 percent of the Pan American B-747 fleet, have been delivered. A deadline for accomplishment of the retrofit will be established as soon as details of the retrofit are finalized. No delay is anticipated.

2.

Narrow Aisle Stretchers

We will include this item in our Operations Bulletin and have our inspectors recommend to the operators that narrow stretchers be stocked at each station not only for B-727's, but all aircraft having narrow aisles.

Air Carrier Policy on Deviation of Flight

We will request our inspectors to review current air carrier directives and policies on this subject. Where necessary, directives will be amended, and policies developed to minimize delays in securing medical assistance for injured passengers, as recommended.

Sincerely,

J. H. Shaffer
Administrator

UNITED STATES OF AMERICA
NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: February 4, 1972

Adopted by the NATIONAL TRANSPORTATION SAFETY BOARD
at its office in Washington, D. C.
on the 15th day of December 1971

ADDRESSED TO:
Air Line Pilots Association
Air Transport Association of America
Allied Pilots Association
National Air Carrier Association

SAFETY RECOMMENDATION A-72-11

The National Transportation Safety Board conducted a special study in the Pacific area to review meteorological, communications, and air traffic control facilities and services of the United States, as well as those of other countries. As a part of the special study, the staff members involved rode in the cockpits of various U.S. air carrier aircraft on regularly scheduled flights and discussed with flightcrews their views on the myriad facilities, services, and procedures in the Pacific area. In order to improve operating conditions over the Pacific for all flights, we would like you to know that we are transmitting, to various agencies, a number of safety recommendations.

Discussions with personnel of the International Forecast Office at Honolulu brought to light a problem they are having which concerns meteorological information derived from in-flight pilot reports. It appears that little if any weather information, except wind and temperature data, is being received from civilian aircraft as compared with that from military flights. Since such information is helpful to the meteorologist in updating himself in order better to serve the man in flight, it would certainly benefit all concerned if additional information could be made available.

Accordingly, the Safety Board is soliciting your assistance by recommending:

> Bringing to the attention of your members operating in the Pacific, the desirability and importance of including in Section 3 of their air reports, supplementary information which is authorized under Item 12 of the recording and reporting instructions of the ARINC item, a copy of which is enclosed for your convenience.

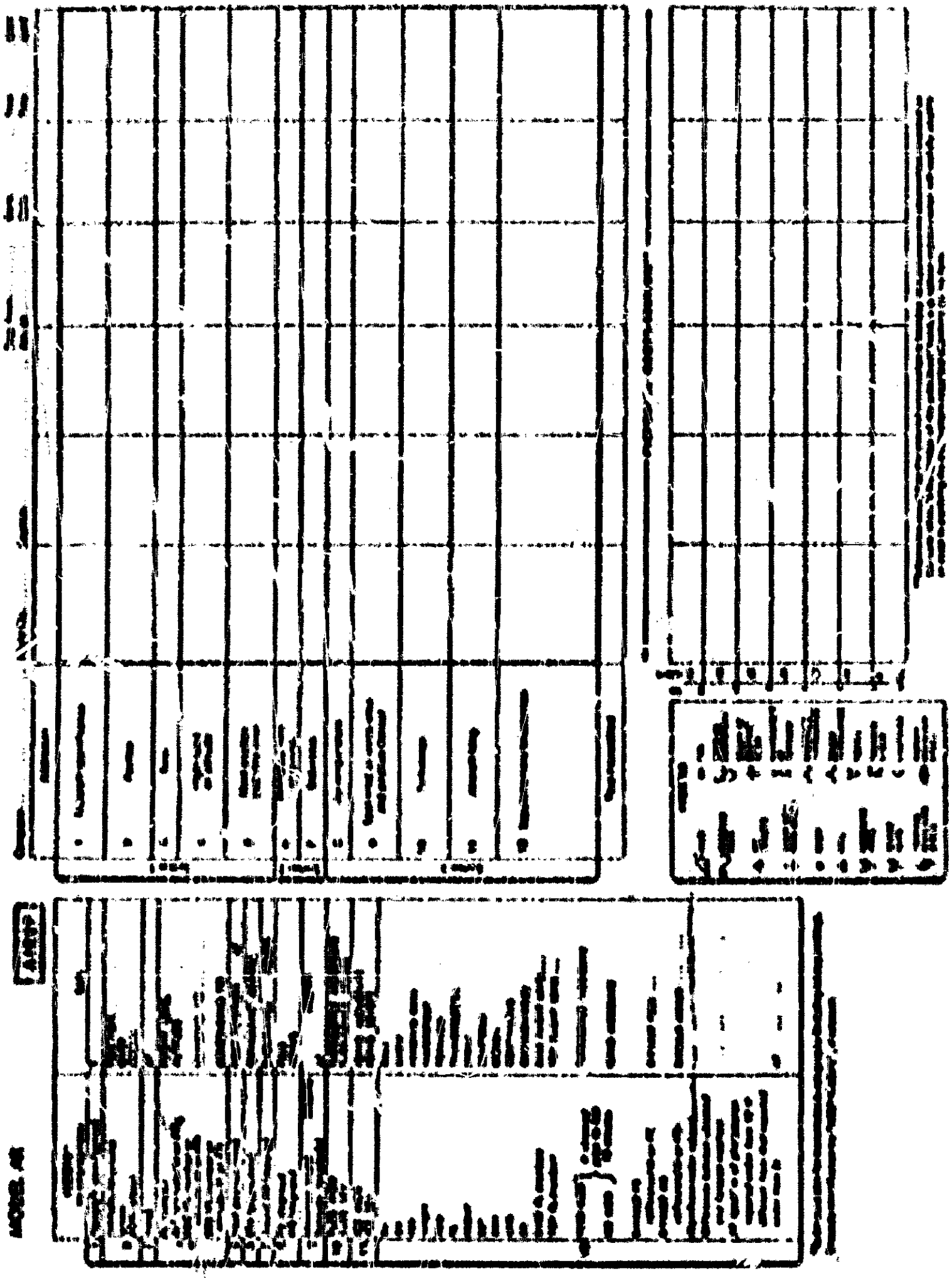
This recommendation will be released to the public on the [illegible] date shown above. No public dissemination of the contents of this document should be made prior to that date.

Reed, Chairman; Leavel, McClane, Thayer and Burgess, Members, concurred in the above recommendation.

By: John J. Reed
Chairman

Enclosure

ATTACHMENT B. — MODEL FOR RECORDING AND REPORTING IN THE AIREP FORM OF AIR-REPORT



RECORDING AND REPORTING INSTRUCTIONS—AIREP

END

UNITED STATES OF AMERICA
NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: July 11, 1972

Adopted by the NATIONAL TRANSPORTATION SAFETY BOARD
at its office in Washington, D. C.
on the 14th day of June 1972

FORWARDED TO:
Honorable John H. Shaffer
Administrator
Federal Aviation Administration
Washington, D. C. 20591

[redacted] A-72-101 & 102

The National Transportation Safety Board has under investigation the National Airlines Boeing B-747, Flight 41, turbulence accident which occurred on January 4, 1972, near Grand Isle, Louisiana.

Our investigation has disclosed an area of concern regarding the adequacy of first-aid supplies on board the airplane. The number of first-aid kits, as well as the contents of the kits, appeared to have been inadequate to treat the 38 passengers and four stewardesses who sustained injuries. It was necessary for more than 2 hours to use makeshift arrangements to immobilize fractures, stop bleeding, and dress wounds.

As you know, the requirement for providing first-aid kits is contained in FAR 121.309. Appendix A of Part 121 specifies the type of first-aid kit and the kit contents based upon the capacity of the airplane. Thus, a No. 1 kit is required for airplanes of one to five persons capacity, a No. 2 kit is required for airplanes of six to 25 persons capacity, and a No. 3 kit is required for airplanes of over 25 persons capacity. The types of supplies in these kits are essentially the same; however, the quantities of items are in ratios of approximately one, two, and three, respectively.

Although the rationale of relating kit size to aircraft occupant capacity is logical, it appears to us that the present requirement does not consider adequately the large difference in capacity of

today's airline aircraft. In this regard, it would seem highly unlikely that one kit size would be appropriate for capacities ranging from 26 to the more than 300 passengers. We believe that a ratio specifying some minimum number of revised No. 3 kits should be required for airplanes capable of carrying 26 to 300 plus occupants. Two further considerations are suggested. First, kit size should be kept to a minimum to assure ease of handling in confined spaces. Second, kits should be strategically located throughout the cabin to permit ready access for treatment of in-flight injuries. Also, the location of kits should be considered from the standpoint of accessibility following cabin deformation resulting from survivable takeoff and landing accidents, as well as ditchings.

Although the stewardesses on National Flight 61 were aided by trained medical personnel, assistance of this type is not always available, nor can it be expected. A sufficient supply of materials should be available to permit the treatment of lacerations and immobilization of fractures without having to rely on makeshift arrangements to compensate for the lack of certain supplies. Additionally, existing first-aid kit contents should be augmented by including, for example, larger compresses, adhesive tape, additional triangular bandages, aspirin, cough depressors, and inflatable splints.

Moreover, although a large percentage of accidents occur in the vicinity of airports, the aforementioned accident illustrates that two or more hours' time may elapse from the time that injuries are incurred until ground-based treatment is administered. Current requirements for on-board medical supplies appear inadequate to afford appropriate means for treatment for such time periods.

In view of the situation illustrated by this accident, the Safety Board recommends that the Federal Aviation Administration:

1. Amend FAR 121.309 to provide a more appropriate basis for determining the number, type, and location of first-aid kits required on airplanes capable of carrying more than 25 persons.

2. Upgrade the required first-aid kit contents to ensure satisfactory capability for treatment of fractures and severe lacerations for extended periods of time.

Our technical staff is available for any further information or clarification, if required.

These recommendations will be released to the public on the issue date shown above. No public dissemination of the contents of this document should be made prior to that date.

Reed, Chairman; McAdams, Thayer, Burgess, and Haley, Members, concurred in the above recommendations.

By John H. Reed
Chairman

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WASHINGTON, D.C. 20590

OFFICE OF THE ADMINISTRATOR

14 JUL 1972

Honorable John H. Reed
Chairman, National Transportation
Safety Board
Department of Transportation
Washington, D. C. 20591

Dear Mr. Chairman:

This is in response to the recommendations contained in your transmittal of NTSB Safety Recommendations A-72-102 and 103 referring to the National Airlines Boeing B-747, Flight 41, turbulence accident which occurred 4 January 1972 near Grand Isle, Louisiana.

The substance of Safety Recommendations A-72-102 and 103 has been reviewed by our technical personnel in consultation with the Aeromedical Applications Division of the Office of Aviation Medicine. The wide-bodied transport aircraft may necessitate a reconsideration of the first aid supplies currently required in FAR 121 operations. We are currently working with the ATA Medical Committee on this problem in conjunction with our program of improving overall cabin safety. If the documented service history after our joint study indicates a need for a change, we will initiate the necessary action to modify the regulation.

Sincerely,

J. H. Shaffer
Administrator