

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

FORWARDED TO:)
Dr. Robert M. White)
Administrator)
National Oceanic and)
Atmospheric Administration)
Main Commerce Building, Room 5132)
Washington, D. C. 20230)

SAFETY RECOMMENDATIONS A-72-9 & 10

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.

At the forecast office in Honolulu, several items came to light which were of concern to us, and we considered they would be of interest to you. It was noted that as a result of the closing of the Canton Island upper air sounding station several years ago, forecasting personnel had been operating under a distinct disadvantage when attempting to provide accurate guidance to flights south of Hawaii. It was also noted that for guidance for flights west of Honolulu, additional upper air data at a location such as at French Frigate Shoals would be most desirable. We are aware that the deficiency at Canton Island has since been corrected.

The lack of radar weather information available to the meteorologists was noted at Honolulu. It would appear that this problem could be solved in a number of ways without the installation of equipment such as a WSR-57 weather radar. It might be feasible to detail meteorological personnel to the Air Route Traffic Control Center to interpret the weather echoes displayed on the ATC radars, or the ATC radar displays could be remoted to the Weather Service offices. In view of the variability of weather conditions and the resultant intermittent need for these data at such a location as Honolulu, and because of the inherent disadvantages of a remoted ATC display, it would appear to be more practical to detail meteorological personnel to the center.

In Australia, our staff members were provided with a detailed look at the experimental Joint Approach Control Meteorological Advisory Service (JACMAS) system for the avoidance of severe turbulence. As a result of the loss of an aircraft because of structural failure in severe turbulence just after takeoff from Sydney some years ago, the Board of Accident Inquiry recommended that "when thunderstorm activity is present, the air traffic controller should be provided with the best current weather information pertinent to the assessment of the changing weather pattern." Thereafter, authorities of the Department of Civil Aviation and of the Bureau of Meteorology took joint action to provide a service which would present to the controller, in a manner suitable for immediate use, statements of the areas in which severe convective turbulence may be found within 50 miles of an airport. These statements had to be capable of being amended, when necessary, with a minimum of delay. Such a service, designated as an experimental JACMAS system was implemented at Brisbane and subsequently at Sydney and Melbourne. It is understood that several evaluations indicated that the system has in fact provided effective storm warning information in the three areas where it was in operation and that there were plans to remove the "experimental" label and possibly expand the service to include other terminal areas.

Following is a brief generalized description of the JACMAS system. Utilizing weather radar, a Storm Warning Forecaster transcribes the likely areas of severe turbulence onto a plexiglass sheet. This information is relayed to Area and Approach Control as well as to Operations (and other positions) by means of closed-circuit TV. Each controller has a small monitor above his ATC radar scope and is alerted to the JACMAS by a special aural signal which is activated whenever the plexiglass sheet is inserted in the closed-circuit TV system. The controllers use this and other available information to advise aircraft of likely turbulence areas and devise clearances which will enable aircraft to avoid these areas. When such clearances cannot be devised because of the extent of a storm system, ATC will close specific portions of the airspace to aircraft movements. Descriptions of the JACMAS areas are also broadcast on the appropriate local VOR's and NDB's.

In view of the success of the latter system in Australia and recognizing the problems associated with congestion around large U. S. terminals during periods of thunderstorm activity, it appears to us that traffic flow could be improved and air safety enhanced by a system patterned along the lines of JACMAS. Since it is the government which carries out the dispatch function in Australia rather than the carriers, as in the United States, it is recognized that for this and other reasons,

there would be many differences between the JACMAS and such a system in this country, but it would appear that the problems would not be insurmountable.

We would also like to mention that the Australians were high in their praise for U. S. weather satellites. As you know, the cloud cover photographs taken by the satellites are picked up by several receiving stations in Australia and provide invaluable data for synoptic analyses, early warning on the formation, development and direction of tropical cyclones, and for many other uses.

Travel during the Pacific safety project was accomplished by riding in the cockpits of U. S. air carrier aircraft on regularly scheduled flights. Among other things, this provided our staff members the opportunity to discuss with flightcrews their views on the myriad facilities, services and procedures in the Pacific area. One item which cropped up during many of these discussions was the apparent lack of use of aircraft meteorological reports to update prognostic upper air material utilized for flight planning, particularly on the West Coast to Honolulu route. We understand that there are plans for manual insertion of these data into the computer at the National Meteorological Center for generation of amended prognostics for transmission to users over the communication lines utilized for the original forecasts. In this connection, we are also aware of the experimental data-link system in the eastern Pacific, wherein there is automatic position-reporting information being received at Oakland from appropriately equipped aircraft. It is understood that beginning in May 1971, upper wind information, once every 32 seconds, became available from these aircraft. It occurs to us that these data could also be fed into the computer in order to update the upper air prognostics.

In view of the above, the Safety Board recommends that the National Oceanic and Atmospheric Administration:

1. In future planning for Pacific aviation weather services, give consideration to the establishment of a rawinsonde station at French Frigate Shoals.
2. Take action to update computer-developed upper air prognostic charts utilizing regular aircraft meteorological reports, as well as those upper wind reports available by means of the eastern Pacific experimental data-link system.

In coordination with the Federal Aviation Administration:


3. Examine the feasibility of detailing meteorological personnel to the Honolulu ARTC Center to interpret weather echoes displayed on ATC radar when required.
4. Examine the feasibility of developing for United States use, a system similar to the Australian JACMAS system for the avoidance of severe turbulence, at least on an experimental basis at selected locations.

We have also forwarded the latter two recommendations to the Administrator of the Federal Aviation Administration since they involve direct coordination between your two agencies.

We shall be pleased to make appropriate members of our staff available for consultation, since they have a considerable amount of detailed information on the JACMAS system.

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

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