Transportation Safety Board of Canada
Bureau de la sécurité des transports du Canada

REASSESSMENT OF THE RESPONSE TO AVIATION SAFETY RECOMMENDATION A90-87

Weather recording and briefing facilities

Background

Accidents in which the aircraft was operated under visual flight rules (VFR) into adverse weather conditions (or instrument meteorological conditions – IMC) occur regularly, claiming a disproportionately high number of fatalities each year. They involve professional pilots, private pilots and business pilots who fly general aviation aircraft and chartered commercial aircraft, including fixed-wing aircraft and helicopters.

The regularity with which these accidents have occurred, and the seriousness of the continuing loss of life, prompted the Canadian Aviation Safety Board (CASB) to initiate a comprehensive and systematic examination of the issue. In March 1990, when this report was nearing completion, the CASB was replaced by the Transportation Safety Board of Canada (TSB), under whose auspices this report was published on 13 November 1990.

During the last two decades, a number of foreign government agencies have undertaken measures to more fully understand these types of accidents. Recent studies emphasize both the complex decisional nature of continued VFR flight into adverse weather and the often fatal consequences. This safety study is the first comprehensive review of the topic in Canada in recent years, and builds upon these earlier works.

The Board authorized the release of Recommendation A90-87 as part of its report entitled *Report of a Safety Study on VFR Flight into Adverse Weather* (90-SP002) on 13 November 1990.

Board Recommendation A90-87 (December 1990)

The adequacy of weather recording, forecasting and briefing as it pertained to VFR-into-IMC accidents was examined. Limitations in the accident data sometimes hampered the analysis of this issue; however, weather forecasting was found to be generally accurate, and inaccuracies seldom played a significant role in the occurrences.

Weather observation sites logically tend to be located at or near airports, where the regular measurement of weather phenomena is required for aircraft movements. Conversely, few observation sites are located in sparsely inhabited areas. In mountainous terrain, local conditions may vary widely from valley to valley, and differ significantly from the general area forecast. Such variations, particularly if they occur en route, are apt to go undetected.

Advances in technology are leading towards automated measurement of weather phenomena. Transport Canada (TC) plans to have an Automated Weather Observation System (AWOS) partially in place by 1993. However, it will be well into the new century before fully functioning

AWOS are installed at the locations initially designated for AWOS across Canada. TC will initially locate AWOS only in support of instrument flight rules (IFR) operations; once these IFR sites are in place, a limited number of observation sites may be positioned in locations such as selected mountain passes to support VFR operations. The Board is concerned that TC's introduction of AWOS to support IFR operations only may not take adequate account of the Canadian accident experience, and may not be the most effective utilization of this technology. In light of the frequency of fatal VFR-into-IMC accidents involving aircraft operating en route through mountains and sparsely inhabited regions, where deteriorating local weather conditions go unobserved with often fatal consequences, the Board believes that en route VFR flights warrant a higher priority in being served by AWOS. Accordingly, the Board recommends that:

> The Department of Transport locate automated weather measuring devices in support of VFR operations in the areas of highest risk in mountainous terrain.
>
> **TSB Recommendation A90-87**

Transport Canada's response to Recommendation A90-87 (March 1991)

Transport Canada has reviewed the report and concluded that the implementation of the recommendations regarding visual flight rules (VFR) would result in a major change of the concepts in the conduct of visual flight operations. The regulatory actions required to institute these changes will require extensive consultation with the aviation community as a normal part of the rule-making process.

Transport Canada therefore intends to establish a VFR Working Group to address and develop, in conjunction with suitable representation from the aviation community, the changes required to incorporate the TSB recommendations regarding VFR operations into the Air Regulations.

This working group will be considering the TSB recommendations A90-65, A90-66, A90-67, A90-68, A90-69, A90-70, and A90-71 relating to VFR, as well as recommendations A90-78 and 90-81 on licence privileges, and will also include recommendations A90-83 and A90-84 concerning the mandatory equipment for rotary winged aircraft. Transport Canada will provide the responses to these recommendations when the Working Group has concluded its activities.

With the exception of the responses that depend on the Working Group, Transport Canada is pleased to provide the responses as required under subsection 24(6) of the CTAISB Act to the remainder of the 14 TSB Recommendations contained in this study.

The Automatic Weather Observation System (AWOS) is being developed and certified for Transport Canada by the Atmospheric Environment Services (AES) and will reach the initial operational capability stage by 1994. These systems will be capable of sensing most of the meteorological data necessary for the production of standard aviation terminal and area forecasts.

The AWOS has certain technical limitations and will not be a stand-alone system insofar as the production of standard aviation forecasts is concerned. These limitations are being addressed but the interim use of this system will require some human observer intervention to allow for unrestricted use of this weather data.

Once the AWOS is fully operational, they will be considered for support to VFR operations.

Board assessment of the response to Recommendation A90-87 (June 1991)

Weather observation sites are generally located at or near airports. Very few observation sites are located in sparsely settled areas. In mountainous terrain, where many en route accidents occurred, local conditions may vary from valley to valley, and differ significantly from the general area forecast. Recent technological developments have led to means by which automated weather observations can be recorded and transmitted from remote locations where the maintenance of a manned site is not feasible.

The TSB sought Transport Canada (TC) to reassess their policy of using Automatic Weather Observation System (AWOS) as a means of weather forecasting with automated weather measuring devices in support of instrument flight rules (IFR) operations. The TC policy calls for the implementation of AWOS in support of IFR operations, and has not been formulated with regard to the safety of visual flight rules (VFR) operations. Only after AWOS has been fully implemented, sometime in the next century, would consideration be given to locating a limited number of AWOS sites to enhance the safety of VFR operations. It was believed that if TC policy-makers viewed the pertinent accident data, they might substantially modify the existing policies and priorities.

TC responded by presenting known weaknesses in the technological development of AWOS for producing weather forecasts. It does not address any of the information contained in the safety study report. TC will not take any steps to reassess the AWOS policy as a result of the safety study or the Board's recommendation.

In that the TC response to this recommendation does not address the safety deficiency identified by the Board, nor does it suggest means of enhancing the reporting and dissemination of en route weather in remote locations, TSB staff proposes that the response to Recommendation A90-87 be considered **Unsatisfactory**.

Board reassessment of Recommendation A90-87 (November 1996)

TC is still trying to fix the problems with AWOS already installed.

Therefore, the assessment of the response Recommendation A90-87 remains **Unsatisfactory**.

Board reassessment of the response to Recommendation A90-87 (November 1997)

The Automatic Weather Observation System (AWOS) Performance Evaluation Group studied the problems of AWOS and submitted its recommendations to Transport Canada (TC). TC disagreed with some of their recommendations and will not lift the moratorium on the new commissioning of stand-alone AWOS until the problems are fixed.

Therefore, the assessment of the response to Recommendation A90-87 remains **Unsatisfactory**.

Board reassessment of the response to Recommendation A90-87 (January 2004)

Transport Canada's ASTRA states that any future aviation Automatic Weather Observation System (AWOS) change of level of service will only be done through a site-specific aeronautical study that includes a climatological study.

There have not been any apparent measures taken since the last reassessment. This recommendation is 1 of 15 recommendations still "Active" (out of the original 36) made in the 1980s study of "VFR into Adverse Weather" accidents (ref: recommendations A90-65, A90-66, A90-68, A90-69, A90-74, A90-75, A90-77, A90-78, A90-81, A90-83, A90- 84, A90-87, A90-88, and A90-89). Some safety deficiencies associated with original recommendations may not have the same degree of risk and urgency if analyzed by today's priorities and standards (the original study used statistics of recreational and commercial flying). It is suggested that these recommendations be treated as a "unit", their individual assessments remain as stated, identified as FOLLOW-UP status pending statistical research/analysis to determine if the "macro" issue of "VFR into Adverse Weather" continues to be a major safety issue in "today's" Canadian aviation system.

Therefore, the assessment of the response to Recommendation A90-87 remains **Unsatisfactory**.

Board reassessment of the response to Recommendation A90-87 (March 2005)

Automatic Weather Observation System (AWOS) has had a history of technical problems and in the late 1990s, Transport Canada (TC) had put a temporary moratorium on commissioning stand-alone AWOS sites. The Aviation AWOS Performance Evaluation Group, established in 1995 to "determine the extent to which AWOS meets aviation requirements" concluded in 1997 that AWOS performance has markedly improved and recommended the TC moratorium be lifted.

The Safety of Air Taxi Operations Study (SATOPS) done by TC addressed many weather-related concerns facing the Air Taxi community, such as pressure to "press-the-weather" and visual flight rules (VFR) flying on Canada's West Coast. TC has produced a series of "Weather to Fly" video clips that deal with many VFR issues highlighted by the 1990 TSB study; issues such as "Mountain Flying", "AWOS", "Avoiding the Trap", and "Judging Ceilings, Fog, & Visibility". It could not be determined whether AWOS have been installed in high-risk mountainous areas (as specifically called for by Recommendation A90-87), or with any certainty that such installations would/should have prevented 32 mountainous region weather-related accidents from the recent 1995–2004 data.

However, several other relevant initiatives have been undertaken, and the assessment can be at least categorized as "Satisfactory in Part". Moreover, given that the data used to support Recommendation A90-87 is more than 20 years old, the TSB will, through ongoing and/or future investigations, attempt to better define the role that weather information is now playing in VFR flying in mountainous and remote areas of Canada, and if necessary, make "new" recommendations.

As such, "Further Action is Unwarranted" with respect to Recommendation A90-87 and the status is set to Inactive.

Board review of Recommendation A90-87 deficiency file status (April 2014)

The Board requested that Recommendation A90-87 be reviewed to determine if the deficiency file status was appropriate. After an initial evaluation, it was determined that the safety deficiency addressed by Recommendation A90-87 still needed to be reassessed.

A request for further information was sent to Transport Canada and a reassessment will be conducted upon receipt of Transport Canada's response.

Therefore, the assessment remains Satisfactory in Part.

Consequently, the status of Recommendation A90-87 is changed to Active.

Transport Canada's response to Recommendation A90-87 (July 2015)

Subsequent to the previous update, Transport Canada has developed technical criteria and a regulatory framework for automated weather observation systems. The details can be found in Notices of Proposed Amendments 2004-031 and 2004-032 and in the global exemptions based upon them that remain in effect pending final regulatory revision. Over 100 such systems are currently in operation nationally, including several in mountainous areas. In addition, numerous video cameras have been installed to assist pilots, and these can be accessed on the internet. It should also be noted that the Department of Transport no longer has a role in the operation of the air navigation system which is now the responsibility of commercial operators such as NAV CANADA.

Transport Canada believes the objectives of Recommendation A90-87 have been met and suggests closing this item.

Board reassessment of the response to Recommendation A90-87 (March 2016)

As of June 2015, all of the legacy automated weather observation systems (AWOS) have been replaced by the new improved AWOS. This, along with the installation of numerous video cameras that can be accessed on the internet to assist pilots, should substantially reduce or eliminate the safety deficiency identified in Recommendation A90-87.

Therefore, the response to Recommendation A90-87 is assessed as **Fully Satisfactory**, and no further action is required.

This deficiency file is **Closed**.