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NASA AVIATION SAFETY REPORTING SYSTEM QUARTERLY REPORT NUMBER 76-1 APRIL 15, 1976 THROUGH JULY 14, 1976

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16. Abstract

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SUMMARY

The origins and development of the NASA Aviation Safety Reporting System (ASRS) are briefly reviewed. The results of the first quarter's activity are summarized and discussed. Examples are given of bulletins describing potential air safety hazards, and the disposition of these bulletins. During the first quarter of operation, the ASRS received 1464 reports; 1407 provided data relevant to air safety. Over 99 percent of these contained reporter identification. All reports are being processed for entry into the ASRS data base. During the reporting period, 130 alert bulletins describing possible problems in the aviation system were generated and disseminated. Responses were received from FAA and others regarding 108 of the alert bulletins. Action was being taken with respect to 70 of the 108 responses received. Further studies are planned of a number of areas, including human factors problems related to automation of the ground and airborne portions of the national aviation system.

INTRODUCTION

Pursuant to a Memorandum of Agreement signed on August 15, 1975 by the Federal Aviation Administration and the National Aeronautics and Space Administration, the NASA Aviation Safety Reporting System was implemented on April 15, 1976. The Memorandum of Agreement requires the System's managers to report statistical and other data relating to the System at quarterly intervals. This report is the first of that series. It describes the management and conduct of the program from its inception in August, 1975, to its implementation in April, 1976, and covers reports submitted to the System from April 15, 1976 through July 14, 1976. The report contains sections devoted to the structure and management of the ASRS, the materials and methodology of the research, the results to date, and a discussion with examples of information submitted and of its uses to date. Because the computer facilities to be utilized by the System were not available during this period, few quantitative analyses of the data were possible. Subsequent reports in this series will provide more detailed and precise statistical information.

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The authors wish to express their gratitude to several people whose assistance has been crucial to the success of this research thus far. Mr. James Rudolph, former Associate Administrator for Safety in the Federal Aviation Administration, was primarily responsible for the concept of a confidential, non-punitive Aviation Safety Reporting Program. His successor, Mr. Marion Roscoe, Assistant Administrator for Aviation Safety, has given valuable advice and support since his appointment. Mr. Larry Youngren has been most effective in managing the FAA's Aviation Safety Reporting Program, which the ASRS serves, and has been a valued member of our Advisory Subcommittee. Dr. Alan Lovelace, Deputy Administrator of NASA, has been extremely supportive; his wise counsel has been critical to the development of the research program. Mr. John Winant, President of the National Business Aircraft Association and the Chairman of our Advisory Subcommittee, has given unstintingly his time and effort to help move the ASRS from concept to reality. Without the help of these individuals and of the other members of the Advisory Subcommittee, the NASA ASRS could never have come into being.

STRUCTURE AND MANAGEMENT OF THE ASRS

Objectives

The objectives of the NASA Aviation Safety Reporting System (ASRS) program as set forth in the original ASRS proposal of June 1975 are as follows:

1. To design and implement a confidential reporting system which can be used by any person in the national aviation system

2. To design and implement a computer-based system for storage and retrieval of processed data

3. To design and implement an interactive analytical system for routine and special studies of the data

4. To design and implement a responsive system for communication of data and analyses to those responsible for aviation safety

    a. regulatory and other government agencies
    b. airlines and commercial operators
    c. aviation manufacturers
    d. civil and military pilots
    e. air traffic controllers
    f. aviation safety research and development groups

Approach

The ASRS receives voluntary reports from any person who has observed or been involved in an occurrence which he or she believes poses a threat to flight safety. These reports are processed as shown in figure 1. Briefly,

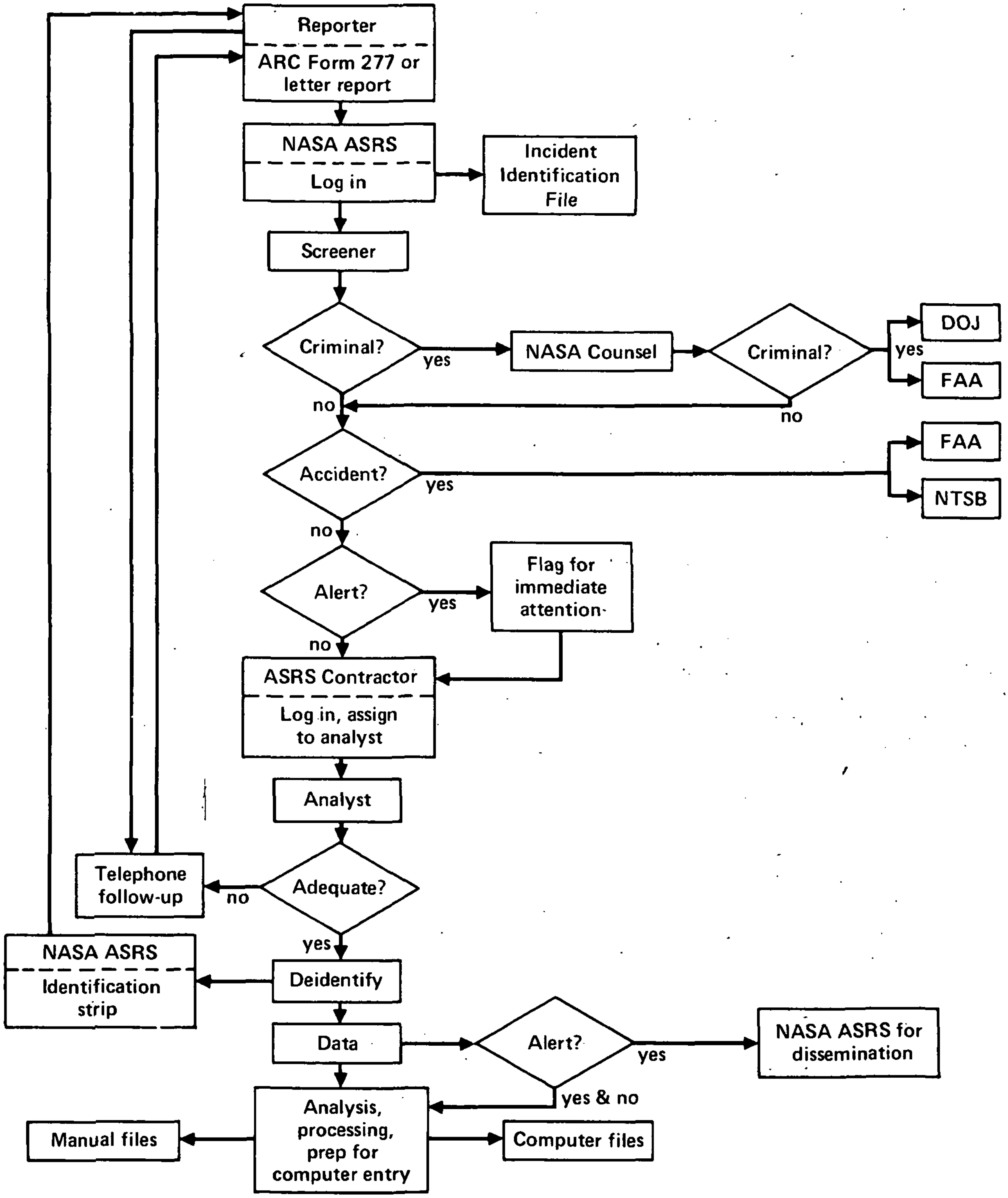

Figure 1.- Handling of NASA Aviation Safety Reports.

each report is scrutinized in accordance with the Memorandum of Agreement. If a report describes or relates to a criminal offense under Title 18 of the U.S. Code of Federal Regulations, it is referred through the NASA General Counsel to the U.S. Department of Justice and to the FAA; if it describes an accident, it is referred to FAA and NTSB. If it does not describe a criminal offense or an aircraft accident, it is analyzed to determine whether the information contained is complete. Further contact with the report's author may occur at this point.

The report is then de-identified. Identifying material is returned to the reporter. The remaining information is analyzed further, summarized and classified, and prepared for computer entry. If the report contains information that requires its prompt dissemination to the FAA and the aviation community, an alert bulletin is prepared and forwarded. The report's contents may subsequently be retrieved for use in analyses of collated data.

An incident identification file, containing date, time, location, and characterization of occurrence, is maintained to satisfy the need of the FAA ASRP for information with which it may extend waivers of enforcement action for violations of the Federal Air Regulations, as specified in FAA Advisory Circular no. 00-46A. Reporter's names are not recorded in the incident identification file or elsewhere in the ASRS files. The information in the incident identification file is destroyed 46 days after the date of each occurrence.

A security log is maintained to ensure that all incoming reports have been de-identified and that the identity strips are returned. This log contains only identity strip numbers and dates of reception and return. The identity strip serial numbers bear no relationship to control numbers assigned to the information contained in ASRS reports.

Management

ASRS functions are assigned to the Aviation Safety Research Office (ASRO) at NASA's Ames Research Center, Moffett Field, California. The Aviation Safety Research Office is a part of the Man-Vehicle Systems Research Division, one of four divisions in the Directorate of Life Sciences at Ames Research Center. The ASRO contains two groups: (1) an Aviation Safety Information Group, which has cognizance over the Aviation Safety Reporting System, and over other programs that gather retrospective and historical data bearing on aviation safety; and (2) an Aviation Safety Research Group, which is charged with prospective and analytical research in support of aviation safety.

In October, 1975, a competitive procurement was initiated for a contractor to assist NASA with the processing and analysis of ASRS reports. On April 6, 1976, a contract for these services was awarded to the Columbus (Ohio) Laboratories of Battelle Memorial Institute. On July 6, 1976, the Battelle staff, numbering seven persons, demonstrated its ability to perform the processing and analysis of individual reports as required by the contract; they began to process incoming reports the following day.

MATERIALS AND METHODS

The ASRS was designed as an analytical information system in support of aviation safety. Although its designers are acutely aware of the potential value of data derived from individual occurrences in highlighting deficiencies and discrepancies in the national aviation system, they also believe that other, perhaps more valuable, insights into system problems can be gained only by study of a large body of occurrence data. The ASRS has therefore been structured to facilitate such studies. The System will make use of a data management system called BASIS (Battelle's Automated Search and Information System), developed by the Battelle Memorial Institute of Columbus, Ohio, for such applications.

During the period from August, 1976, through March, 1977, all data now resident in ASRS manual files will be transferred to BASIS files; the BASIS files will permit automated retrieval of information based on a wide variety of qualitative and quantitative descriptors. Subsequent efforts will be devoted to development and refinement of a number of statistical and other tools for analysis of the data to answer questions related to aviation safety. A long range aim of this research program is to facilitate interactive analyses of the data by members of the aviation community in support of their own efforts to improve safety.

RESULTS

During the first 3 months of ASRS activity, 1464 reports were received from the aviation community. Disregarding 57 reports that were not responsive to the aims of the program, 1407 reports provided data perceived by their originators as having a direct bearing upon aviation safety. These reports have come from nearly every segment of the aviation community. The sources of the reports, based on a recent sampling of the data, were as follows:

Pilots and other aircrew	62%
Air traffic control personnel	34%
Others, including passengers	4%

As shown in the following table, the reports have described occurrences in nearly every type of aviation operation.

Air carrier, domestic & international	24%
Corporate & personal business flying	20%
Pleasure flying & flight training	20%
Military flying	11%
Reports applicable to all types of flight operations	25%

The phases of flight during which occurrences were observed were as follows:

Preflight and ground taxi	6%
Takeoff and climb	18%
Cruise	22%
Descent	16%
Approach and landing	27%
Applicable to all phases of flight	11%

Virtually all reports received have been submitted with full identification of the reporter attached. About 99 percent of the reporters identified themselves in sufficient detail to permit personal follow-up when such follow-up was required. Further contact with reporters was initiated in over 150 cases. The proportion of follow-up contacts to the number of reports submitted will increase as full staffing of ASRS is attained and ASRS analysts reach full proficiency.

Twelve reports concerning aircraft accidents were identified and forwarded to NTSB and FAA in identified form, as required by the Memorandum of Agreement. One report was sent to NASA Counsel for an opinion as to whether the report contained information relating to a criminal offense; a negative opinion was rendered and the report was de-identified and processed. All other reports received by the ASRS during the first quarter have been de-identified.

The FAA has queried the Incident Identification File 169 times. Reports responsive to these queries have been on file in 16 cases.

During this period, information contained in ASRS reports prompted the submission to the FAA and others of 130 alert bulletins. Four of the alert bulletins were submitted for information only, and work on the remaining 126 is in progress. Responses have been received to 108 bulletins (83 percent); these responses are summarized in table 1.

ASRS intake for the last several weeks of the first quarter averaged 100 reports per week. It is expected that this figure will increase gradually as further promotional efforts are applied and as the aviation community becomes more familiar with the System's availability and uses.

DISCUSSION

The numbers cited above indicate clearly the broad base of support for the ASRS program within the aviation community. They suggest also that those who have used the ASRS are not concerned that their names or identifying details will be revealed; there have been virtually no anonymous reports.

More important by far has been the quality and diversity of the reports sent to ASRS. Particularly during the early phases of the program, when comparatively few reports could be followed up, the high quality of the reports

TABLE 1.- RESPONSES TO ASRS ALERT BULLETINS

As of July 14, 1976, total alert bulletins submitted:		130
Submitted for information only:	4	
No response received to date:	18	22
Responses received as of August 15, 1976:		108 (83%)
Content of 108 responses received to August 15, 1976:		
Information insufficient to permit investigation or problem:	6	
Information in bulletin apparently was incorrect or incomplete:	6	
After study, no system problem was found; no action required:	15	27 (25%)
Alert bulletin information is under investigation:	9	
Investigation is complete; action on the problem is not within FAA purview:	2	11 (10%)
Action to resolve the problem was in progress when alert bulletin was received:	19	
Action has been or will be initiated to resolve the problem:	31	
Action has been taken and is complete:	20	70 (65%)
		108 (100%)

made it possible to gain an appreciation of the problems being described without extensive research. The System has thus been able to disseminate information concerning these problems promptly and effectively soon after they were submitted. This is the primary aim of the Aviation Safety Reporting System and of the FAA's Aviation Safety Reporting Program which it supports.

Several examples of the kinds of information reported to ASRS and disseminated in alert bulletins are shown in the appendix, together with paraphrases of the answers received in response to the bulletins. Numbers in parentheses in the following discussion relate to the example numbers in the appendix.

Many of the reports sent to ASRS have dealt with procedures. Some involve flight safety directly (items 1 and 2, appendix); others relate to pilot (3) or controller (4) workload. Still others are concerned with hazards to others on the ground (5). The structure of the airspace system is discussed in a number of reports. Some perceptive discussions of air traffic control sectors have been received and acted upon (6, 7). Problems have been observed with regard to the designation of waypoints (8), airways (9), and aircraft (10).

The gradual emergence of categories of high-density airspace has resulted in situations in which the roles of pilots and controllers differ somewhat from those in other parts of the airspace. The regulations and procedures that apply to air traffic in these airspace categories have an increased potential to result in problems because of misunderstandings between pilots and controllers (11, 12).

Navigation and communication equipment problems have been described in a number of reports. Some (13, 14) concern equipment malfunctions; others describe a need for reconfiguration (15, 16) or supplementation (17). In some cases, computer software updates introduce automated equipment problems (18).

Physical obstructions to air navigation have been identified. One such potential hazard was described in reports which led to an alert bulletin (19) and cooperative action. Temporary obstructions occur in the course of repairs and renovations to airports and other facilities (20).

It appears from the first quarter's experience that the existence of the ASRS and of the FAA's limited waiver of disciplinary action have led at most a small effect on that agency's enforcement program. Though the FAA has submitted 169 queries of the incident identification file, only 16 reports have been on file. Very few reports have been received that might be construed as evidence of a deliberate or willful violation of Federal Air Regulations; in contrast, there have been many in which an inadvertent violation of regulations or recommended operating practices was described. A substantial fraction of ASRS reports involve human error. The careful analyses by reporters of why they erred suggests that many of them have learned from their experiences. Some of these reports will be very useful instructional tools in future airman education programs. Others have provided insights into system factors that contribute to the commission of such errors, and these system factors have been described in alert bulletins (21-23).

Even without computer assistance, a careful manual review of reports to date has begun to yield insights into certain less obvious problems in the national aviation system. Analytical studies of these problems are underway or are planned for the near future.

Among these problems is the following:

> Increasing automation within the national aviation system, both in the air and on the ground, has brought with it certain human factors problems whose potential for causing serious system problems may not be fully understood. These problems relate to warning and alerting functions, coordination among the people in the system as affected by automatic information transfer devices, and similar functions. We believe these have important implications for system management, operation, and training and we will conduct studies of ASRS data to elucidate such factors. Some examples of relevant reports include

items (24-26) in the appendix. A report of a warning system problem illustrates both the detail and the perceptive analyses found in many ASRS reports. It is quoted verbatim to preserve its flavor (27).

CONCLUDING REMARKS

This discussion is necessarily narrative rather than statistical. The tools required for detailed studies of ASRS data are under development and were not available during the first quarter of operation of the System. During coming months, the implementation of these tools will improve the quality and utility of the data provided by ASRS to the aviation community and the responsiveness of the System in areas of special interest and need. While a great deal remains to be done, the perceptive comments of advisors in the community have been invaluable in producing an auspicious beginning.

Ames Research Center
National Aeronautics and Space Administration
Moffett Field, Calif. 94035, September 9, 1976

APPENDIX

EXAMPLES OF ASRS REPORTS AND ALERT BULLETINS

The following is a representative sample of Alert Bulletins generated on the basis of reports submitted to the ASRS. In those cases where responses have already been received from the FAA we have included paraphrased summaries of those responses. Item 27 is presented verbatim because it is an excellent example of the high quality of many reports submitted to the system.

1. Kansas City Center is responsible for coordination and control of civil use of R-3602, an artillery range west of Manhattan Airport. A reporter describes problems in coordinating range status; current information may not be available from Manhattan or Salina Flight Service Stations, or even from Center. Report describes seven recent occurrences.

Response: A recent review of joint use restricted area procedures revealed no standard format for Manhattan FSS to use as guidelines to ascertain the status of R-3602 when commencing daily operations. It was agreed that the Manhattan FSS should request the status of R-3602 from the KC Center at the beginning of daily operations. We have briefed our supervisors on this procedure.

2. Recent reports suggest confusion among pilots and controllers as to the validity of a previously issued clearance, specifically altitude and crossing restrictions, following handoff and issuance of an amended clearance. Examples given included: descent to Philadelphia, cleared to cross Bucktown at 6,000 ft. During descent through 11,000 ft, handoff to Philadelphia Approach Control, which issued clearance to maintain 5,000 ft. Approach Control had not meant to lift the 6,000 ft crossing restriction. It appears that there may be an area of pilot-controller misunderstanding as to ATC Handbook 7110.65, para. 191, and Airmen's Information Manual part 1, Adherence to Clearances. The problem may also relate in part to minimal controller interaction during automated handoffs.

Response: The following GENOT was dispatched by Air Traffic March 23, 1976: Controllers shall review the provisions of Handbook 7110.8D-721B, 9D-268B, (7110.65-191B). Reports have been received that controllers are failing to restate all applicable altitude restrictions or to state that altitude restrictions are cancelled when issuing descent clearances to arriving aircraft turned over by another facility or controller. Facility chiefs shall include this item in the next team briefing.

A subsequent GENOT was issued; action was also taken by the Air Transport Association and a number of air carriers to disseminate information regarding this problem.

3. Los Angeles, CA; ILS Runway 24L/R approach: An airline report questions the wisdom and practicality of a complicated missed approach procedure for this approach, which involves tuning two VOR's, executing three

heading changes and observing three altitude restrictions within 18 miles of the LAX VORTAC on the airport. The report offers use of simulators to reevaluate the procedure and to assist in its redesign and simplification.

Response: This missed approach procedure is in the final stages of being revised. Recommendations have been sent to Washington Headquarters for approval. The recommended new missed approach procedure is:

"CLIMB VIA RUNWAY HEADING TO 2000' MSL, THENCE VIA LAX VORTAC 260 RADIAL TO MONEY INTERSECTION AND HOLD"

4. Controller report from Seattle, WA, describes a recent occurrence involving loss of separation during a period of very heavy workload. The report asks (1) whether arrival procedures to Seattle can be redesigned so that all inbound traffic need not be on radar vectors; (2) whether some level of flow control can be utilized to minimize overloading of inbound sectors.

Response: Investigation of this report revealed that traffic arriving in the Seattle area is normally vectored to an arrival sequence. Team supervisors are responsible in the sector to implement flow control procedures when deemed necessary by the traffic flow. Controllers are responsible to advise Team Supervisors when they feel flow control is necessary. An air traffic task force has been formed at Seattle-Tacoma Tower to examine metering and traffic flow in the Seattle area.

5. Melbourne Airport, FL: Pilot-flight instructor states traffic usually takes off to the east because of prevailing winds. He mentions a junior high, shopping center and senior high school within one-fourth mile of the airport boundary, and alleges that the fixed base operators on the field teach student pilots to start turns at 300 ft, which places them directly over these facilities, especially for touch-and-go pattern work. He expresses concern about the potential for an accident if one of these students stalls in a turn close to the eastern boundary of the airport.

Response: This matter was referred to the Accident Prevention Specialist in the applicable General Aviation District Office. He in turn contacted an accident prevention counselor, fixed base operators, and the air traffic control tower at Melbourne. There was agreement that there has been some deviation from an established policy which is to make a 20° right turn immediately after breaking ground to avoid the congested area off the end of runway 4. A cooperative effort is being made now to bring this procedure to the attention of all pilots operating to and from the Melbourne airport.

6. New York Center, area G, sector 72: Intermittent operation of this sector (during peak hours only) and its complex stratification are alleged to be leading to coordination and handoff errors. The controllers reporting believe the sector should be reexamined.

Response: New York Center is aware of the problem with this sector. The problem is mainly one of coordination. This is brought about by the comparatively small amount of time that this sector is operational, which in turn leads to a lack of familiarization with the sector operation. New York Center is in the process of evaluating this sector for either modification of the sector or complete elimination.

7. Kansas City Center, sectors C-7 and C-12; Kansas City Approach Control: Controller describes a near loss of separation at the border of the C7 and C12 sectors. The Conflict Alert did not operate because Center did not have track control on either aircraft (the inbound had been handed off to Mid-Continent ARTS, the outbound had not yet been handed off to C12). He states that sector C7 is unaware of 3000-5000 ft traffic between Mid-Continent International Airport and sector C12, and that C12 does not normally know about inbound traffic on airway V-10N. He suggests moving the C12 sector boundary to parallel V-10N on south side, which he states would ensure that the C12 controller was aware of all aircraft descending to altitudes below 6000 ft in an area of potential conflicts, and would make two sector controllers (C12 and MCI Approach) responsible for these aircraft, rather than the three now involved, of whom only the approach controller is aware of all traffic below 6000 ft.

Response: The Kansas City Center, Central Area Officer of FATTAC has reviewed this problem and coordinated with MCI Approach Control. They are in agreement that a situation of potential conflict exists as described above. Therefore, action has been initiated to adjust the sector C12 boundary to parallel V-10N to alleviate the potential conflict. Hopefully, the boundary change will be completed by the next NAS charting date July 15, 1976.

8. Dallas-Fort Worth Approach: Boyd Two Arrival Route: An arrival aircraft passing the Bridgeport, TX, VOR station was cleared as follows: "When able 5,000 ft." Pilot began descent. Controller meant "when ABELS (intersection) 5,000 ft." Abels intersection name causes confusion due to the similarity of "able" and "Abels."

Response: The Dallas-Fort Worth TRACON was contacted about the ABELS intersection name being a problem when included in clearance delivery. The required paperwork is to be sent to the Oklahoma City FIFO Office requesting a new fix identifier. That office has been contacted and apprised of the situation, and it has no objection to changing the identifier. A date for the change has not been established at this time.

9. Miami Center, sector 81, Amber-17 airway: A recent series of reports cites multiple aircraft south of course on A-17, due, apparently, to the use of Bimini VOR for navigation instead of Bimini low frequency radio beacon. Area charts are open to misinterpretation in that the VOR and the radio beacon appear to be nearly co-located, whereas in fact the distance between them is sufficient to place aircraft using the VOR, up to 20 miles south of the A-17 centerline at King Intersection, in potential conflict with traffic on A-16. It is suggested that a cautionary note on IFR charts might be of help in resolving this problem.

Response: All government enroute charts depict VHF airways in blue color and low frequency airways in brown color. This has been a standard for some time. It is also followed by commercial charts - green for LF/MF airways, blue for VHF airways. There is, however, a difference between government and commercial charts in the bearings used to make up the LF/MF airways. Government charts use the variation at the facility or intersection to indicate the bearing. Commercial chart manufacturers use a different method.

We are taking action to more clearly differentiate navigational facilities on our charts. This should correct the problem. We have also brought this to the attention of commercial chart manufacturers. We shall also bring the problem to the attention of pilots by publication in the Airmen's Information Manual.

10. A report from St. Thomas Tower mentions three inbound aircraft, all of the same type and belonging to the same air carrier, carrying flight numbers XX 2068, XX 2268 and XX 2368. The potential for confusion with such similar flight numbers is serious.

Response: San Juan Center is coordinating with the air carrier to affect a change in aircraft identifications. This will eliminate the similar radio call signs.

11. Las Vegas TCA (Terminal Control Area), Las Vegas Approach Control, NV: A pilot on a night flight into Las Vegas on a VFR flight plan on a moonless night called for clearance into the TCA over Boulder City at 5,000 ft. He was cleared direct to Las Vegas Airport to descend to 3,500 ft at pilot's discretion. After clearing the mountains he descended to 3,500 ft and was then given a turn to heading of 340°. He became concerned about terrain clearance because of obstruction lights ahead, requested the MSA (minimum safe altitude) three times and was then told it was 4,800 ft. After landing, he was informed that VFR traffic is responsible for its own terrain clearance regardless of radar vectors in the TCA. He states that when radar vectors take a pilot off a published route at night, it may not be possible to know the MSA and adhere to the Airmen's Information Manual admonition to maintain appropriate obstruction and terrain clearance, since radar vectoring altitudes may differ from the data available to pilots. This is the second report of this potential area of misunderstanding with respect to the Las Vegas TCA. In both reports, vectors and assigned altitudes of 3,500 ft took the pilots into areas where terrain clearance was not assured.

Response: We have investigated procedures at Las Vegas in response to the Aviation Safety Report. The following actions have been taken by the Western Region Air Traffic Division:

a. Las Vegas Tower shall not assign an altitude to a VFR aircraft that is below the minimum safe altitude as defined in FAR 91.79.

b. Las Vegas Tower shall not assign a VFR nighttime departure an altitude that is below the appropriate minimum vectoring altitude.

Las Vegas Tower will issue a facility directive containing these instructions. In a subsequent communication, FAA advised this matter is under further review for possible national application of revised procedures for the handling of VFR traffic in terminal control areas (TCA's).

12. Spokane, Washington, ATIS advises VFR traffic to use approach control for VFR traffic advisories. A reporter did so, required evasive action to avoid a light twin-engine aircraft also working approach control. The pilot was then informed that calling traffic was a discretionary function, although the pilot states the frequency was not busy at the time.

Response: We discussed this report with both the Geiger Tower and Spokane RAPCON. The message on Spokane ATIS is as follows: "VFR arrivals contact Spokane Approach Control on 123.7, VFR departures say direction of flight and expect radar service unless otherwise requested. . ."

As you probably know, the information provided in the NASA report lacks enough detail to properly trace the issue. However, we offer the following comments:

a. If the aircraft was operating outside of the TRSA (terminal radar service area), it is possible that traffic was not exchanged due to higher priority controller workload.

b. If the aircraft was in the TRSA, we can only guess what happened; possibly: the aircraft were being separated by 500 ft and the complaining pilot was not aware of it; or one of the aircraft involved was not participating in the stage III radar program.

We recommend that a national Notice be issued advising field facilities to encourage pilots to provide more detail in their NASA reports (date, time, altitudes, etc.). Also, we should encourage pilots to immediately inquire with the local facility whenever there is a question concerning his handling so that we may properly resolve these problems.

Subsequently, FAA advised that this matter is under further review with respect to possible national application of revised procedures for handling VFR traffic in TRSA's (terminal radar service areas).

(Note: This alert bulletin was written to call attention to a possible area of pilot-controller misunderstanding in the TRSA environment, rather than to highlight a particular incident. Alert bulletins do not usually include dates and times in order to prevent possible inconvenience to the pilots and controllers involved in such occurrences.)

13. A pilot report regarding the Georgetown non-directional beacon at Brown County Airport, Ohio, whose Morse Code identifier is broadcasting the letters DEO. Charts and the Airmen's Information Manual indicate the identifier is GEO. The facility is listed as a non-Federal navigation aid.

Response: The Georgetown, Ohio NDB Morse Code identifier was changed from DEO to GEO on May 27, 1976.

14. Standiford Airport, Louisville, KY: Controllers report problems with UHF radios for several months, which in combination with UHF transceiver

problems in KY Air National Guard RF-4 aircraft are leading to potentially serious problems in control of these aircraft on IFR flight plans in the Louisville area.

Response: Prior to your alert bulletin, no report of problems with UHF communications at the Standiford Tower had been received by this office. A preliminary investigation into the UHF communications system at the Standiford Tower indicates that some problems may exist that had not been previously reported beyond the facility level. We plan a more extensive investigation. Action will be taken to correct all problems identified.

15. San Francisco, CA, Modesto-Four standard arrival route: Reporter describes VOR-DME (distance measurement equipment) interference from Lake Hughes VORTAC (108.4 MHz) while using Modesto VORTAC (also 108.4 MHz). He notes the cautionary notice regarding this in the arrival information chart, but asks whether one or the other frequency can be changed to eliminate the DME interference, since the Coaldale and Fresno transitions require good DME information for descent planning.

Response: The reported "interference" has been a long-standing problem caused by pilot use of the facilities outside their frequency protected service ranges. However, the difficulty does constitute a safety problem. A fortunate frequency availability made a new frequency possible and action has been initiated to change Modesto VORTAC to 114.6 MHz and convert it to a high altitude facility. We hope to have it commissioned by the Nov. 3, 1976, charting date. This will eliminate the problem.

16. Jacksonville, FL, Center, sectors R24 and R23: Reports state that transmitter power has been reduced from 50 W to 10 W on the primary communications frequencies of 134.0 and 120.6, and that these reductions have appreciably reduced the ability to communicate with aircraft under control of these sectors, especially R24.

Response: On June 21, 1976, the power on one of the 134.0 transmitters was increased from 10 W to 50 W to determine the additional coverage provided at the higher output. Subsequently, air and ground checks indicate satisfactory coverage at 6,000 ft and above. Action has been taken to increase the power on the other transmitter to provide the required air/ground coverage in sector R23. The coverage provided R24 by the 120.6 transmitter is being reviewed to determine if it is adequate for the sector requirements. If it is found inadequate, action will be taken to increase the transmitter's power output.

17. Endicott, NY, Tri-Cities Airport: A recent occurrence involving five aircraft in the air awaiting clearances and one jet on a VOR approach at a time when NY Center was saturated, prompts a request for prompt installation of a remote transceiver either at Binghamton VOR or on the airfield which can be used by Binghamton approach controllers to handle IFR clearances and releases on the ground at Tri-Cities Airport.

Response: Aside from the incident described in the subject report we agree that a remote transceiver at Tri-Cities Airport is warranted. The airport is eligible under present criteria and we will include this item in our planning for airport improvements.

18. Seattle, WA, Center, sector 4 (Portland north): A report cites problems with computer software when the runway in use is changed from 10 to 28 or vice versa. All flights are programmed for a specific preferential departure route (PDR). When the runway is changed, the other runway's PDR's are still assigned to proposed flight plans, including flight plans in bulk storage. When these flights depart, they are set up for the wrong PDR. Portland Approach Control also has handoff problems because the aircraft do not fall within the prescribed geographic parameters for handoffs.

Response: The problem cited in this bulletin was noted when Seattle Center became operational on system A3d2.2. Research indicated a patch to resolve this problem in earlier systems was not carried over to 2.2. We now have the pitch in our system and have generated the necessary instructions to pass the information to the appropriate Air Traffic authorities. Operation is now normal.

19. Savannah Airport, TN: An unmarked, unlighted silver water tower 1 mile northwest of the airport is cited as a potential hazard during circling instrument approaches at night and during poor visibility unless approaches are conducted with rigorous accuracy. Airport has VOR-DME and ADF approaches. A pilot asks whether obstruction lights can be installed on the water tower.

Response: Southern Region Air Traffic authorities are approaching the owners of the tower to see if the owners can be persuaded to light the tower, even though it is not required to have lights under the provisions of Part 77 of the Federal Air Regulations. (Note: The Aircraft Owners and Pilots Assn. has also been active in attempting to secure such voluntary action.)

20. San Francisco, CA: Pilot report mentions frequency closure of runways 28L and 28R during repairs, but describes extreme difficulty in rechecking the validity of his other information by a check of the runway closed markings. He states the "X" is not the proper size and is sometimes placed over the runway numbers where it is difficult to see prior to reaching the threshold.

Response: The airport has acquired four orange rubberized cloth panels 10 ft by 60 ft to be used for runway closures and is in the process of acquiring sandbags or other means for anchoring these panels to form a 10 ft by 60 ft closure cross. Estimated time to set these crosses in place is approximately 20 min.

21. (Note: The original ASRS report concerned a pilot returning to his home airfield at night with his family. He was unable to activate the runway lights by means of the transmitter-keyed lighting switch. In order to avoid having to fly 50 miles to another field and face the problems of getting surface transportation back to his home, he decided to attempt to locate the runway by reference to the lighted tetrahedron on the airport. He narrowly escaped a serious accident while trying to locate the runway with his landing lights.)

Text of alert bulletin: Transmitter-keyed runway lighting system at Xxxxxxxxx Airport, IL, is reported to be unreliable (lights often cannot be keyed "on").

Response: The runway lighting at Xxxxxxxxx Airport, IL, is being checked by the Illinois Aeronautics Authority. If malfunctions are found the system will be repaired or replaced.

22. (Note: The original report concerned a pilot who was told to hold outside an airport control zone during marginal VFR weather, over a landmark which was also being used as a holding point by several other VFR aircraft. Because of the congestion, the reporting pilot chose to hold elsewhere and was reprimanded by controllers when he received his clearance to enter the control zone for landing. Other similar reports were received subsequently.)

Text of alert bulletin: The problem of holding VFR outside the airport traffic area is discussed in several reports. Pilots are concerned about the use of a single VFR surface fix for several holding aircraft, leading to concentrations of airplanes in a small geographic area, uncontrolled and at random altitudes beneath a low overcast.

Response: Selection of VFR surface fixes for holding VFR aircraft is based on the prominence of the fix, its location in relation to the aircraft's position and accessibility from the fix to the traffic flow. Although controllers are not required to assign specific fixes as a matter of procedure, they do so for several reasons:

a. it enables the controller to establish and maintain the position of aircraft awaiting SVFR clearance;

b. it relieves the pilot of uncertainty with regard to his geographic position and expected action;

c. it results in a more orderly expeditious flow of traffic.

Use of a single VFR fix for several holding aircraft is not uncommon and generally is unavoidable. There are too few prominent fixes, geographically separated, near to but outside of control zones. The most direct route to the closest fix is generally required to avoid IFR traffic in the control zone.

Although a concentration of VFR aircraft in the same geographic area, uncontrolled, and at random altitudes beneath a low overcast may result, the concept of "see and be seen" has to apply in this situation. Separation of aircraft is the primary purpose of ATC, but under Visual Flight Rules, the controller is limited by Federal Aviation Regulations which apply to pilots.

We plan no action to prohibit the use of a single VFR fix for holding several VFR aircraft awaiting SVFR clearance. We will, however, publish an Air Traffic Service Bulletin item emphasizing the importance of effective controller utilization of available VFR fixes and the desirability of providing traffic information to the extent permitted by circumstances.

23. (Note: Several reports have been received from pilots who have landed on taxiways parallel to active runways. It has been pointed out in these reports that a variety of factors can contribute to such a mistake, including high workload during final approach, restricted visibility, etc.)

Text of alert bulletin: Various locations: Marking of wide parallel taxiways to prevent inadvertent landings is requested by both pilots and controllers in several reports. Recently cited locations include Atlanta-Hartsfield, taxiway between runways 9L and 9R, and Pontiac, MI, taxiway parallel to and south of runway 9R, where attempted landings are common enough to require a warning on ATIS (the automated terminal information service broadcast).

Response: The Southern Region has looked into the situation at Atlanta-Hartsfield and believes that the runway markings are sufficient to prevent landings on the taxiway which is unmarked. In the case of Pontiac, MI, the words "taxiway only" have been painted on the offending taxiway.

24. Miami Center, FL: A failure of RDP (radar data processing) at Miami Center on May 16 at 1450 hours, lasting 5 min, was accompanied by failure of safety features including "display frozen" indication, leaving apparently normal display on scopes with no indication of failure to controllers.

Response: Air Traffic Service implemented CCD 3729A (a computer program change), *Improved Notification of Display Program*, in the A3d2.2 system. This system has been delivered to all 20 Centers. Miami Center is scheduled to become operational with this system on June 17. As each Center becomes operational with this new system the problem identified in the Aviation Safety Report, dated May 20, should be resolved. (There follows a short description of a much more comprehensive series of fault messages which are displayed whenever RDP system performance is degraded because of a partial failure.)

25. O'Hare Airport, IL: Pilot using O'Hare reports that approach controllers are not always aware of the ILS configurations set up by Tower, or of ILS (instrument landing system) status. In one case, the Localizer beam was positioned on runway 4L while parallel approaches were in progress to runways 22L and 22R (the reciprocal runways). The pilot expected normal sensing and overshot the centerline because of reverse sensing; he then had to locate the 4L approach plate to verify the correct identifier (the frequency is the same). In another case the pilot was instructed to track inbound on a Localizer which was off the air after a late switch from runways 27 to runway 22. He requests that approach controllers be kept aware of tower-initiated changes in navaid configuration.

A follow-up bulletin was submitted later: Two additional reports are received in which ATIS and local control cleared aircraft for an approach while the ILS Localizer was oriented in opposite direction on the same runway. In both cases pilot workload was high; identification was checked comparatively late and was found to be wrong. Airports concerned are Robert Mueller, Austin, TX, runway 12R-30L, and LaGuardia runway 4-22. VOR-C approaches to 22 were in use in the latter case; the ILS Glide Slope was used for vertical guidance. Erroneous indications alerted both pilots. In both cases, Approach Control was unaware of the ILS configuration.

Note: Other reports have been received since the last alert bulletin was sent. A response has not yet been received.

26. Coast Approach Control (NZJ), El Toro Marine Apt, CA: Report discusses computer software problems with handoffs from Los Angeles Center to Coast Approach Control in the vicinity of Dana Point intersection. It appears that such handoffs are flagged at the Harbor sector, whose scope does not cover the Dana Point area, rather than at the sectors to which the aircraft are being handed off. Latter sectors must rely totally on a verbal handoff from Los Angeles, then acquire the targets manually. The problem appeared about 1 year ago on computer tape AO-9, and has persisted since despite continuing attempts to correct it.

Response: The situation described above was noted approximately 1 year ago when computer tape AO-9 was placed in use. Studies of probable causes revealed that amended routing or late altitude changes for inbound aircraft affects the (computer) assignment of the handoff sector. Timely entering of FDEP amendment messages is required to update the computer.

Representatives of Coast TRACON and Los Angeles Center have made a number of changes to preclude recurrence, and supervisory personnel have been briefed on the need to be alert for similar discrepancies. In addition, controllers have been re-briefed on the requirement to effect a manual handoff whenever the ARTS handoff is not satisfactorily completed.

27. (De-identified text of original report): The following is a statement of an incident which occurred on July XX, 1976.

I. STATEMENT OF INCIDENT: Xxxxxxx Airlines Flight XX of July XX, 1976, Xxxxxxxxx to San Francisco, aircraft no. XXXX. Time of incident, 0900 PDT.

Description: This incident occurred on final approach to SFO Airport landing on runway 28L. The approach was being conducted under visual approach clearance from Bay Approach Control. The flight had been advised to keep its speed up to the outer marker by Bay Approach Control and the flight crossed abeam of the outer marker on the visual approach profile at 220 knots. At this point, the altitude was approximately 1400 ft, the gear was extended and the flaps were extended on flap schedule to flaps 5 position. Out of approximately 1000 ft flaps were called for 15. Copilot positioned the flap handle to 15 but the flaps did not move. Both inboard and outboard indicators maintained their 5° reading and no extension was indicated by operational feel of the aircraft. At this point several factors became involved: (1) there was a fog bank obscuring the hills and the gap west of the airport in the missed approach departure path; (2) the aircraft was being operated in a TCA under positive control; (3) departures were being made on runways 1L and 1R; (4) the landing check had been completed up to full flap extension of flaps 30; and (5) since landing clearance had been received and the aircraft was positioned on profile and at flap 5 maneuvering speed the continuation of approach for landing seemed appropriate.

I would like here to make note of some operational characteristics of this aircraft. On a 3° glide slope the aircraft will maintain glide slope and flap 5 maneuvering speed with the engines unspooled and spooling up of the engines for a landing will necessitate an increased airspeed. A transition to a 2° glide slope will permit spooling the engines for landing early in the approach in the event a go-around becomes an absolute necessity. To reduce this to usable figures: the aircraft at 900 ft on a 3° glide slope is approximately 3 nautical miles from the runway. The transition that is necessary to a 2° glide slope requires that the aircraft be positioned at 400 ft 2 miles from the end of the runway. Increasing the sink rate to approximately 1500 ft/min and spooling the engines simultaneously provides a good stable platform 2 miles from the runway. This was the maneuver that was in progress at the time the Ground Proximity Warning System was triggered to a Pull Up alert because of the increased sink rate. Since there is no means of silencing the GPWS system and since the audio level is extremely high, all cockpit and tower communications were blocked at this point in time. Speed call-outs, sink rate call-outs, height above the runway call-outs were not possible. This, in effect, denied a coordinated crew function. The landing was effected without incident and, as a further follow-up, the maintenance department reported that a new type of chemical being used to clean the aircraft had stripped the flap jack screws and mechanisms of lubricant. After being properly lubricated, they functioned normally.

II. THE HAZARDS INVOLVED IN A GO-AROUND: In past discussions with controllers in various TCA's, it has become apparent that with the required separation of traffic within the TCA, a go-around will invariably be required to conform to the missed approach procedures listed for the approach in use. Also involved on any missed approach is a frequency change from tower to departure controller and then from departure controller to approach controller and back to tower again. In this particular instance certainly the normal missed approach procedure for runway 28L would have put the aircraft into an IFR environment. Assuming that the aircraft functions normally and that the GPWS switches from mode 4 to mode 3 upon application of maximum power and a climb established, then communications would be possible. Any attempt to remain VFR on a go-around would certainly place the aircraft into the departure path of runways 1L and 1R. The inability to communicate at the time that the GPWS is functioning in the alert condition tends to block any radical action being taken. This is not to say that a go-around would not have been the best course of action to take. It does seem that in the final analysis a pilot will react to conditions and execute the action that appears to be appropriate at the time regardless of GPWS or possibly any other warning system alert.

III. THE GPWS SYSTEM: This system has proven to be of immense benefit. However, that benefit, it is becoming more and more apparent, is one of conformity to operational standards of approach, descent and profile rather than of reaction to terrain proximity. In this writer's opinion there are inherent dangers within the system. The system contains four pull-up modes and two sub modes. These multiple modes are not identified. Since the pilot is fully aware that the system will be triggered by excessive sink rate, aircraft not in the proper configuration of gear and flaps for the altitude, any sink after takeoff, as well as terrain closure, the reaction to pull up immediately upon activation of the system is simply not there. It now becomes a guessing game as to what triggered the system. Is it the configuration of flaps or gear? Is it sink rate for the altitude? Or is the aircraft about to hit the ground? Admittedly this reaction is not appropriate to the requirement stated operationally for the GPWS: "Any time the GPWS issues a pull-up command a pull-up will be made." The next danger of the system is when the aircraft is being operated under unusual circumstances of which the pilot is fully aware, the need to communicate is even greater than usual; the triggering of the system will absolutely prevent that communication.

IV. HOW TO MAINTAIN THE BENEFITS AND REMOVE THE HAZARDS: This writer has had the advantage of flying with a modified GPWS system. The first modification involves the voice identification of the mode being activated: 1. Terrain. 2. Sink rate. 3. Don't sink. 4a. Flaps. 4b. Gear. This identification is given by voice twice and then the pull-up command becomes continuous. Secondly, there is the ability to override or cut out the voice portion when necessary or appropriate.

After several months operation with this system, the vast majority of the time the system was found to operate normally. There were a few isolated instances of system malfunction. But it only takes a few malfunctions in order to create a very real doubt in the pilot's mind as to the veracity of the system and its reliability. It would seem that voice identification of the mode being activated would remove much of the doubt in the pilot's mind, and particularly in the case of terrain closure, would cause a more appropriate action by the pilot, again, particularly in terrain closure identification. Certainly an added benefit would be that when a malfunction occurs the malfunctioning mode can be identified and remedied far easier. The ability to cut out the voice portion is absolutely necessary if coordinated crew action is to take place in unusual circumstances where it is most vital.

In summary, it is certainly fair to say that the GPWS system is of great benefit and that, with minor modification, the hazards presently inherent can be removed and the benefits increased. In closing, I would like to ask this question: With present attention being given to the "sterile cockpit," is it fair to say that the GPWS system as it is now installed may, in the most critical of circumstances, completely defeat the concept of the "sterile cockpit?"

Again my personal appreciation and thanks for the reporting system of incidents which has made this report possible.

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