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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

ACCOUNTING AND FINANCIAL MANAGEMENT DIVISION

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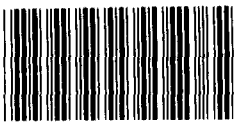
RELEASED

FEBRUARY 16, 1982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The Honorable Bob Whittaker
House of Representatives

Dear Mr. Whittaker:

Subject: Computer Outages at Air Terminal Facilities and Their Correlation to Near Mid-Air Collisions (AFMD-82-43)

In letters of July 7 and October 14, 1980, (encls. I and II) you asked us to investigate and report on (1) the adequacy of staffing patterns in the Federal Aviation Administration's (FAA's) air traffic control facilities and (2) the effects of computer failures on the safety of the air traffic control system.

Your concerns about the adequacy of staffing patterns were addressed in our report entitled "Controller Staffing and Training at Four FAA Air Traffic Control Facilities," (CED-81-127, July 9, 1981). Questions relating to the effect of computer failures on the safety of the en route system and other computer-related management issues were addressed in the U.S. Senate report "FAA's En Route Air Traffic Control Computer System," (S. Rept. 80-5, Oct. 1980).

This letter responds to your concerns about computer outages at terminal facilities that use the Automated Radar Terminal System (ARTS). We surveyed FAA's ARTS to determine

--the extent of computer outages at terminal facilities and

--whether any correlation exists between near mid-air collisions and computer outages.

We briefed you on the results of our survey and agreed to provide a written report on our findings. You also requested that our report address software problems associated with an enhanced computer system (ARTS III A) and the hardware/software problems at the New York Terminal Radar Approach Control (TRACON).

To gain insight into the frequency of computer failures at terminal facilities and the extent of correlation between these failures and near mid-air collisions, we selected nine terminal facilities for our survey. These facilities are located at or near

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airports, and they control traffic entering the airspace of one or more airports. A detailed discussion of the scope, methodology, and results of our survey are presented in enclosure III.

OVERVIEW

We found that the computers at the nine terminals were unexpectedly out of service a total of 202 times during our test periods. The duration of the outages ranged from less than a minute to nearly 10 days. These computer outages, however, did not always result from computer malfunctions. Of the 202 computer outages, 49 were caused by commercial power interruptions, radar failures, telecommunication breakdowns, and unknown conditions. Although most of the terminal facilities experienced some computer failures, we found no direct correlation between the times the outages occurred and the occurrence of near mid-air collisions.

During our visits to the terminals we found other conditions that may be impeding increased reliability of the ARTS computer system. Terminal facilities are not required to report to FAA headquarters partial outages--such as the loss of one of several controller displays or an input/output processor. Consequently, FAA does not have the data needed to easily predict when deteriorating equipment needs to be refurbished or replaced.

We also observed that new computer hardware has been installed and sitting idle for about 2 years at five of the ARTS III terminals we reviewed. This equipment is part of an FAA program begun in 1976 to upgrade to the ARTS IIIA level the performance and reliability of computer service at 29 of this Nation's busiest terminal facilities. However, completion of the program has been impeded by computer software development problems, and FAA now estimates that software will be available for testing at some sites in early 1982 with the last site to become operational by 1984.

During our work at the New York TRACON, we learned that this facility has unique problems. This TRACON has a unique version of the enhanced ARTS IIIA hardware and software. However, the ARTS IIIA computer does not have sufficient computer capacity to support the five major airports FAA originally planned for it to handle. Instead, it provides service to only three of the five. Furthermore, the ARTS IIIA lacks sufficient capacity to handle the increased traffic volume expected at these three airports in future years. Because the contractor failed to deliver an acceptable product, the TRACON also does not have a conflict-alert feature which would automatically alert controllers when two or more aircraft were on a collision course.

CONCLUSIONS

While a number of ARTS computer failures occurred at the facilities visited, we could find no direct correlation between the ARTS computer outages and reported near mid-air collisions or other

safety incidents. We believe, however, that the number of outages at some facilities is excessive and increases the potential for safety-related problems. Furthermore, it appears that FAA's ability to improve the ARTS computer reliability is restricted by existing FAA reporting practices or individual facility conditions. Lastly, we believe that the New York TRACON is experiencing some unique problems which we will address in a future review of the TRACON's operation.

As agreed with your office, we are making no recommendations at this time. We expect to make a number of recommendations addressing the problems covered in this survey at the completion of our on-going comprehensive review of FAA's automated information systems for air traffic control and our review of the New York TRACON. We expect to issue our reports on these assignments later this year.

At your request, no official comments were obtained from the FAA on our findings and conclusions. Unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from its date. At that time, we will send copies to the Administrator of FAA, the Secretary of Transportation, and the Director of the Office of Management and Budget. We will also make copies available to other interested parties.

Sincerely yours,

W. D. Campbell
Acting Director

Enclosures - 3

ENCLOSURE I

United States Senate

COMMITTEE ON
GOVERNMENTAL AFFAIRS
WASHINGTON, D.C. 20510

July 7, 1980

The Honorable Elmer B. Staats
Comptroller General
General Accounting Office
Washington, D.C.

BY HAND

Dear Mr. Staats:

The American people have for many years enjoyed a commercial aviation industry with the best safety record in the world. Much of the praise for this enviable performance belongs not only to a vital and a responsible industry but also to the diligent efforts of the Federal Aviation Administration. Since 1959, the FAA has fostered and guided the growth of U.S. commercial aviation to its present pre-eminent status as an indispensible form of mass transportation. The success of this industry relies in large measure upon the continued confidence of the traveling public as to its safety and reliability.

Recently, however, doubts have been raised as to whether commercial aviation is as safe as it can possibly be. The FAA reports that between 1974 and 1978, the number of reported near mid-air collisions has increased 76% from 283 to 503. The number for 1979 is even higher. And because many such incidents go unreported, these ominous statistics are probably understated. In fact, the National Aeronautics and Space Administration received anonymous reports of 1,500 near misses last year alone. As recently as last Monday, there was a near-miss between an Eastern Airlines aircraft and a small private plane near New York's LaGuardia Airport.

There is some evidence to suggest that the breakdown of FAA Air Traffic Control computers may be a contributing factor in the increasing number of near-misses. We are aware that there were at least three near misses in the last year which were attributable in some degree to air traffic control equipment failures:

- On October 31, 1979, an Air Florida and a Delta flight narrowly missed colliding over Wilmington, North Carolina, immediately following a computer outage, and during a time when the controllers were attempting to convert back to their primary system;

ENCLOSURE I

- On March 11, 1980, three Air Force fighters narrowly passed within 100 feet of each other over Southern California during a radio outage;

- On May 6, 1980, two aircraft suffered a near miss over Chicago when the computer malfunctioned for 19 minutes, including two total outages.

Unfortunately, data on computer failures and their effects upon aviation safety are incomplete and contradictory. But according to the best data at our disposal, there is at least one reported computer failure of air traffic control equipment every 63 minutes in the U.S. Major computer failures (over one minute in duration) occur on an average of once every 9½ hours. And, again, these figures are probably understated since many incidents go unreported.

At Chicago's O'Hare International Airport this past week air traffic control computers failed not for a matter of minutes, or even hours, but for several days. We cannot afford to underestimate the danger to public safety posed by the lengthy breakdown of air traffic control computers at the busiest airport in the world.

The serious safety questions raised by these incidents cannot be convincingly answered without the benefit of more complete and impartial data than are now available. With a tradition of thorough and impartial inquiries, the General Accounting Office is well-suited to develop this critical data. Consequently, we ask that the GAO investigate and report on the effects of air traffic control computer failure upon the safety of the aviation industry, addressing the following questions:

1) Is FAA recordkeeping for computer failures and near-misses sufficiently complete and accurate to permit ongoing evaluation of the safety of air traffic control systems?

2) Why is there a discrepancy between FAA and NASA data on near misses?

3) How might the FAA improve the reliability of its data in this area?

4) How frequently have the FAA's air traffic control computers suffered from outages or startovers in the last five years?

5) What types of outages or startovers have been experienced by the FAA's air traffic control computers in the last five years? With what durations? At what locations?

6) What correlation, if any, is there between air traffic control computer failures and near-miss collisions of aircraft? (This should be corrected for the influence, if any, of increased air traffic.)

ENCLOSURE I

7) Are the FAA's air traffic control computers adequate to insure the safe control of air traffic through 1993 as planned by the FAA?

In addition to computer malfunctions, we have received reports from inside the FAA that personnel shortages, and inadequately trained and certified air traffic controllers may be contributing factors to the deteriorating safety record of the aviation industry. Four of the twenty regionally based FAA air traffic control centers for the mainland U.S. have fewer than their authorized number of controllers. Of the 44 local FAA air traffic control terminals, 32, or over 70%, have less than their authorized number of controllers. At 15 of these terminals, including Chicago's O'Hare, Kansas City, Miami, and St. Louis, the difference between the number of actual controllers and their authorized numbers is over ten percent.

Even at current staff levels, an average of 35% of the controllers at these FAA facilities are not certified in the operation of all the equipment in the facility. In the Chicago regional air traffic control center, the situation is even more pronounced, with 39% of the controllers without full certification. At O'Hare International Airport, the busiest airport in the world, the figure soars to 49%, the second highest in the nation behind New York's 67% level. In a memorandum of May 1, 1980, the Chief of the Chicago Center, George H. Gunter stated that the Center "is critically staffed at the Full Performance Level" for air traffic controllers.

These statistics raise serious concerns about whether the FAA's air traffic control facilities are adequately staffed to maintain and improve the safety of the aviation industry. Consequently, we ask that the GAO investigate and report on the following questions regarding air traffic control personnel in addition to our questions on air traffic control equipment:

1) How many air traffic controllers at the full performance level are required to safely operate FAA air traffic control towers and centers? In what instances can controllers certified at less than the full performance level be safely substituted?

2) What is the impact upon safety of current FAA employment of fewer air traffic controllers than are authorized at FAA air traffic control facilities?

3) Are the air traffic controllers at FAA facilities adequately trained to insure the safe and competent operation of air traffic control equipment?

4) Does the FAA air traffic controller certification system adequately reflect the abilities of controllers to perform the functions for which they have been certified?

ENCLOSURE I

These are questions of grave importance to the traveling public, particularly with the continued growth of air traffic since airline deregulation. We look forward to the results of this important study. If you should need further assistance, please feel free to have your staff contact Steve Lotterer (225-3911) of Rep. Whittaker's staff, or Bill Mayer (224-8268) of Senator Percy's staff.

Sincerely,

Charles H. Percy
United States Senator

Bob Whittaker
Member of Congress

ENCLOSURE II

United States Senate

COMMITTEE ON
GOVERNMENTAL AFFAIRS
WASHINGTON, D.C. 20510

October 14, 1980

The Honorable Elmer Staats
Comptroller General of the United States
Washington, D. C.

Dear Mr. Staats:

After a meeting of Senator Percy's staff with the staff of the aeronautical division of GAO, we would like to modify our request of July 7, 1980, in order to sharpen its focus and expedite its completion. We ask that the General Accounting Office initially concentrate on an inquiry into the adequacy of staffing patterns in Federal Aviation Administration air traffic control facilities.

While we are very concerned about both FAA equipment and staffing problems, the possibility of a nationwide air traffic shutdown exists if contract negotiations between the Federal Aviation Administration and the Professional Air Traffic Controllers Organization result in a strike on March 15, 1981, the date the controllers' current contract expires. Therefore, we believe it would be in the best interest of the Congress and the nation if GAO could issue a report on FAA staffing before this crucial date and follow with a subsequent report on the status and reliability of FAA equipment, possible replacements, and a projection for the performance of FAA equipment in the years ahead.

Additionally, in conjunction with this part of our earlier request, we feel that it would be productive to coordinate the work of the several other investigating teams which are currently studying the FAA. In the near future, the Senate Appropriations Committee is planning to issue a report concerning the en route air traffic control centers, and may plan an additional examination of terminal facilities. Also, the Department of Transportation's Inspector General's office is completing an examination into discrepancies in FAA reporting systems.

ENCLOSURE II

Following the completion of the Senate Appropriations report, we would like to request that officials from your office and both our staffs meet with officials from the Senate Appropriations Committee and the IG's office in order to coordinate further examination of FAA equipment and to expedite your work on this portion of our request.

Following this meeting, it is our hope that we can develop a report which will result in a full and comprehensive examination of the FAA, its staffing, its equipment, and the impact of these factors on aviation safety in this nation.

Prior to this meeting, however -- and in order to assure that a report on the FAA is issued at the earliest possible date -- we would like the GAO to immediately begin addressing the following issues:

--What are the current standards used by the FAA with regard to the training, certification, and staffing levels of personnel in air traffic control facilities.

--Are these standards adequate? How do they compare to military and foreign systems? Are they generally considered sufficient by independent experts in the United States and overseas? Do controllers have adequate training to sort out traffic flying to satellite airports in a terminal area, for example, Midway Airport in Chicago?

--What are the existing conditions in the country's air traffic control facilities? Are all of the standards for training, certification, and staffing levels currently met? If not, why does this condition exist?

--What is the relationship between air traffic control incidents -- near misses, technical violations, etc. -- and controller training, certification, and staffing levels.

In order to simplify and speed work on the study, you may wish to restrict your inquiries to two or three air traffic control areas in different parts of the nation. We ask that you include the Chicago area in your investigation. However, we would hope that your report will enable us to draw conclusions on a nationwide basis, and that your findings and recommendations will be indicative and applicable to all areas of the nation.

We realize the constraints of personnel and budget under which the General Accounting Office operates. However, by limiting the immediate scope of the report according to the revised request above, we hope you will be able to produce a report of your usual quality and insight.

ENCLOSURE II

If you have any questions concerning our request, please have a member of your staff contact Scott Ulm of Senator Percy's staff at 224-1113, or Steve Lotterer of Congressman Whittaker's staff, at 225-3911.

Sincerely,

Charles H. Percy
United States Senator

Bob Whittaker
United States Congress

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SCOPE, METHODOLOGY, AND RESULTS OF OUR SURVEY

SCOPE AND METHODOLOGY

To obtain insight into (1) the extent to which airport terminals were experiencing ARTS computer failures and (2) the extent to which these failures contributed to aircraft accidents and other safety incidents, we selected 9 of FAA's approximately 400 major civil airport terminal facilities for our survey. Five of the airport terminal facilities have the ARTS III computer, two have the ARTS IIIA, and two have the ARTS II. Seven of the nine facilities are among the busiest in the Nation. These facilities are located at or near airports and control traffic entering the airspace of one or more airports. The TRACONs we visited include:

--Atlanta International Airport, Atlanta, Ga.

--Logan International Airport, Boston, Mass.

--O'Hare International Airport, Chicago, Ill.

--Houston Intercontinental Airport, Houston, Tex.

--New York TRACON, Hempstead, N.Y.

--Oakland International Airport, Oakland, Calif.

--Tampa International Airport, Tampa, Fla.

The other two facilities we visited are medium-size airports--John P. Mueller Municipal Airport in Austin, Texas, and Champaign Airport in Champaign, Illinois. Together, these nine facilities handle about five million aircraft operations annually (7 percent of total operations).

At FAA headquarters, the FAA Technical Center, six FAA regional offices, and each of the nine airport facilities visited, we reviewed applicable FAA national and local air traffic control policies and procedures and analyzed equipment maintenance logs, service outage reports, and reports on near mid-air collisions and other safety incidents. Also, at the nine terminal facilities, we examined records and held interviews to determine whether

near midair collisions, 1/ system errors, 2/ or system deviations 3/ occurred at or about the same time the computer failed. We interviewed FAA officials and representatives of the now decertified Professional Air Traffic Controllers Organization (PATCO).

Our analysis of outages and safety incidents reported by FAA covered the same period of time for eight of the terminals. Our review of the New York TRACON covered a different period. We examined reports of 95 computer outages occurring during the two busiest months in 1980 to determine the frequency of computer failures. We then reviewed all safety incidents (100) reported in calendar 1980 for correlation with reported computer outages that may have occurred at or near the time of the reported incident. In the case of the New York TRACON, we reviewed FAA records on 107 computer outages and 7 reported safety incidents occurring between January and May 1981. It was necessary to alter the period we selected to review because the New York TRACON was not established until January 1981. Before that, air traffic was controlled in the now decommissioned facility at John F. Kennedy Airport.

DESCRIPTION OF FAA'S AIR TRAFFIC CONTROL SYSTEM

The Department of Transportation Act of 1966 (Public Law 89-670) established the Federal Aviation Administration and made that agency responsible for, among other things, (1) controlling the use of U. S. navigable airspace and regulating both civil and military airports in the interest of safety and efficiency and (2) developing and operating a common system of air traffic control and navigation for both civil and military aircraft.

To meet this mandate, FAA has established a nationwide network of radars, terminal and en route control centers, flight service stations, and navigation and communication equipment to control aircraft movement from takeoff to landing.

The day-to-day control of aircraft movement is the responsibility of FAA air traffic controllers. Controllers at terminal facilities, such as the ones we visited, control aircraft arriving at and departing from airports.

1/A near mid-air collision is judged by a member of the air crew. The judgment that a collision hazard existed between two aircraft is reported to FAA.

2/A system error exists when two or more aircraft are closer together than the FAA-prescribed standard.

3/A system deviation is a significant departure from established air traffic control procedures but one which does not constitute a loss of standard separation.

From manual to automated air traffic control

Before 1970, control of aircraft operating in terminal airspace was a manual process aided by airport surveillance radar and beacon radar systems. The radar sent out signals which were reflected off the skin of aircraft, and the reflected information was received and presented as a spot (called a "blip") on a map-like display on the controller's monitoring console. The beacon radar assisted the surveillance radar by receiving signals from aircraft equipped with transponders indicating aircraft locations and it, too, provided an aircraft indicator on the controller's monitoring console. FAA air traffic controllers were able to guide traffic by (1) monitoring this radar and beacon information, (2) radioing and telephoning pilots and other controllers to find out the identity, speed, and altitude of each aircraft represented by the radar and beacon video, and (3) giving needed instructions to pilots. The controllers depended on their memories to make sure that information received by radio and telephone was properly matched with the radar/beacon pictures on the monitoring console.

Automated radar terminal system (ARTS) computer

Today, air traffic control at the Nation's busiest airport terminals is automated with the ARTS computer systems. FAA has installed an ARTS III system at 62 terminals where air traffic is medium to heavy. It installed an ARTS II computer at 70 low- to medium-traffic facilities. ARTS II and ARTS III computers perform the same basic functions, but the ARTS III has more operational features than the ARTS II. These computers automatically provide controllers with information which previously was manually retrieved or which was not available at all. Properly configured, they also provide automated handoffs and receipts of aircraft to and from en route centers and other terminal facilities.

The computers provide other assistance to air traffic controllers. For example, the ARTS III provides an aural warning when it reaches about 85 percent of its traffic handling capacity. The ARTS II provides this warning in printed form. The ARTS III has a "minimum safe altitude warning" feature which automatically alerts controllers when aircraft altitude becomes low relative to the ground and to ground structures, such as tall buildings. It also has a "conflict alert" feature which warns controllers when two aircraft are flying on a collision course. However, this feature is not yet installed at the New York TRACON.

FAA has an ARTS III enhancement program underway to add functional capabilities and improvements to all 62 terminals with the basic ARTS III system. According to FAA, the enhanced ARTS, designated ARTS IIIA, uses additional hardware and software to:

--Increase air traffic system safety, availability, and handling capacity.

--Improve the ability to track aircraft by providing information on aircraft being tracked by radar and to supplement the beacon tracking system. Beacon and radar information can be processed simultaneously or independently.

--Improve reliability by using backup hardware, such as input/output processors, which can be automatically called to service when an operational processor malfunctions. Unique versions of ARTS IIIA are installed at the New York and Tampa TRACONs.

OVERVIEW

The nine terminal facilities we visited experienced 202 ARTS computer failures during the period we examined. No direct correlation exists between the computer outages we identified and reported safety incidents. However, several FAA practices or conditions exist which may restrict FAA's ability to improve ARTS computer reliability. Also, the New York TRACON is experiencing some unique problems which affect its ability to effectively meet its mission requirements.

RELATIONSHIP BETWEEN COMPUTER OUTAGES AND AIRCRAFT SAFETY INCIDENTS

Most of the 202 computer failures were short lived and none was a direct cause of a near mid-air collision or other safety incident. (No mid-air collisions occurred during the period covered by our examination.) The duration of the 202 reported computer failures is detailed in the table below.

Duration of outage (note a)	Number of occurrences	Percent of total
Less than 1 minute	171	85
1 to 10 minutes	19	9
11 to 30 minutes	4	2
31 minutes to 2 hours	4	2
Longer than 2 hours	4	2

a/These figures include only unscheduled outages. The computer is periodically taken out of service for routine scheduled maintenance.

The above outages were not entirely a result of a computer hardware malfunction. We identified 49 outages that were caused by other factors. Among these factors were commercial power interruptions, radar failures, and telecommunication breakdowns between the terminal and the en route center. Software problems have been a significant factor.

To determine whether any of the computer failures resulted in aircraft accidents or unsafe conditions, we initially reviewed reports on near mid-air collisions and other safety incidents for the two busiest months in 1980. We found no direct correlation between the times the failures occurred and the occurrence of near mid-air collisions or other reported safety incidents. We then expanded our test at the terminals to include all of 1980. Here, too, we found no direct correlation between reported safety problems and computer failures.

Excessive failures increase potential safety problems in some areas

Although we found no direct correlation between computer failures and the occurrence of near mid-air collisions and other safety incidents, we believe that the number of outages at some terminals is excessive and increases the potential for safety-related problems. For example, the New York TRACON experienced 107 computer outages during its first 5 months of operational status, in 1981, but according to FAA officials, those failures have not caused any near mid-air collisions or other safety incidents.

Many of the problems at the New York TRACON appear to be software related. During hours of heavy traffic, the system will lose all or part of the alpha-numeric data blocks that provide controllers with aircraft flight information. According to a TRACON manager, the loss of ARTS data has been a source of concern since the ARTS IIIA was installed. He said that the problem has been investigated by FAA and the contractor, but the cause of the problem has not been found. FAA believes the problems are software related, but the agency has not proved this to be so. FAA investigations are still underway.

An excessive number of failures was also noted at the Tampa TRACON. The Tampa TRACON experienced 32 (or about 33 percent) of the 95 computer failures we identified at eight terminals studied in their busiest 2 months of 1980. Commercial power interruption was cited as the reason for 13 of the failures; 13 others were caused by software or memory module problems, and the remainder were caused by other problems. According to the Tampa TRACON's data systems officer, computer failures due to commercial power interruptions could be substantially reduced if the facility had a power conditioning unit. However, according to FAA plans, Tampa will not get a power conditioning unit any earlier than 1985.

ENCLOSURE III

INCREASED COMPUTER RELIABILITY MAY BE IMPEDED

During our visits to the terminal facilities, we learned of some practices and conditions that may be impeding better reliability of the ARTS computer system. Terminal facilities routinely provide reports to FAA headquarters on total losses of ARTS computer service, but no reports are forwarded in the case of partial outages or degraded computer service caused by malfunctioning components. For example, during the 8-month period ending March 4, 1981, the Boston TRACON frequently experienced ARTS component problems which degraded computer services. The most frequent problems were due to the computer's data entry and display subsystem which caused flickering, shifting, and rotating of data on controller monitoring consoles. During July 1980, the Chicago TRACON also experienced recurring problems with its communications link to the Chicago en route center and a 2-day loss of its minimum safe altitude warning feature. Although these types of component problems are recorded in facility maintenance logs, they are not in a format that readily indicates that the condition of a particular component may be deteriorating and, therefore, may need refurbishing or replacing. Furthermore, this type of information is not sent to FAA headquarters for analysis of potential systemwide reliability problems.

Another factor impeding better computer reliability is the failure to complete the software enhancement packages for upgrading the ARTS III to ARTS IIIA. In discussions with FAA personnel at ARTS III facilities, we learned that five of the seven terminals scheduled for upgrading had new computer hardware on hand. The new hardware, which has been installed for about 2 years, is not operational because the contractor has not finished developing the computer software. FAA estimates that the software will be available for testing in early 1982 at some sites with the last site to become operational by 1984.

We noted that five of the terminals which developed local software were making limited use of the ARTS IIIA hardware. For example, each facility had limited use of the reconfiguration and fault detection unit. That unit automatically identifies and switches processing from bad memory modules to other operational memory modules. The unit is also capable of identifying defective input/output processors and switching to backup units, but the final ARTS IIIA system software is needed to accomplish this.

Two components that were not in use at all were the multiplexed display buffer memory and the sensory receiver and processor. These components are designed to relieve the input/output processors of some functions and thereby reduce the number of brief computer outages. All the components, including those being used with locally developed software, need the final software package before they can function.

UNIQUE PROBLEMS AT THE NEW YORK TRACON

During our visit to the New York TRACON, we learned that facility has some unique problems. The TRACON has a full ARTS IIIA computer hardware configuration and has been operational for about 12 months. However, it does not have sufficient computer processing capability to handle the five major airports FAA originally planned for it to serve and does not have a conflict alert capability. The five airports it was intended to serve are Kennedy, LaGuardia, Newark, Islip, and White Plains. As of September 1981, the three major airports were being served but FAA had no plans or target dates for extending ARTS IIIA services to Islip and White Plains. In addition, the contractor-developed software for the conflict alert feature must be rewritten by FAA.

According to FAA officials, the contractor developed a computer software program that was accepted by FAA because it met all contractual requirements. However, air traffic personnel decided against using this software package because it did not contain provisions for the conflict alert feature. Also, airway facilities personnel stated that the contractor software could not be used because design problems and errors were found in the programs. Even without the conflict alert feature, there is inadequate computer memory storage, and the Islip and White Plains sites cannot be added to the TRACON system. FAA has elected to redevelop the conflict alert feature at the FAA Technical Center in Atlantic City, New Jersey. Also, FAA is trying to obtain additional computer memory capacity. In the meantime, however, the White Plains airport is using the less capable ARTS II computer system for air traffic control. The Islip airport has no automated air traffic control. These problems will be addressed in detail during our comprehensive review of the New York TRACON which is currently underway.

CONCLUSIONS

While a number of ARTS computer failures occurred at the facilities visited, we could find no direct correlation between the ARTS computer outages and reported near mid-air collisions or other safety incidents. We believe, however, that the number of outages at some facilities is excessive and increases the potential for safety-related problems. Furthermore, it appears that FAA's ability to improve the ARTS computer reliability may be restricted by existing FAA reporting practices or individual facility conditions. Lastly, we believe the New York TRACON is experiencing some unique problems which we will be addressing in a specific review of the TRACON's operation.

No recommendations will be made at this time. We expect to have a number of recommendations addressing the problems covered in this survey at the completion of our current comprehensive review of FAA's automated information systems for air traffic control and our review of the New York TRACON.