



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

LOG 2150

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In reply refer to: A-89-33 through -43

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Acting Administrator
Federal Aviation Administration
Washington, D.C. 20591

The National Transportation Safety Board has completed a special investigation following an air traffic control (ATC) operational error 1/ involving the Coast Terminal Radar Approach Control (TRACON) that occurred on February 13, 1989, about 1908 Pacific standard time. The operational error resulted in the loss of standard ATC separation between British Airways flight 282 (BAW282), a Boeing B-747, and American Airlines flight 1262 (AAL1262), a British Aerospace 146, when both airplanes passed near the Seal Beach, California, VORTAC 2/ at 9,000 feet msl.3/

BAW282 was an east departure from the Los Angeles International Airport, California, with 268 passengers and 18 crewmembers on board, en route to London, England, climbing out on a route of flight direct to the Seal Beach VORTAC and subsequently to the Thermal, California, VORTAC. AAL1262 was diverting to the Ontario International Airport, California, with 66 passengers and 4 crewmembers on board, because the runway lights had gone out of service at the Santa Ana/John Wayne Airport, California, its original destination. AAL1262's route of flight was from over the Santa Catalina, California, VORTAC direct to the Seal Beach VORTAC direct to the Paradise, California, VORTAC direct to the Ontario Airport. BAW282 and AAL1262 were operating on instrument flight rules (IFR) flight plans and in accordance with ATC clearances. Recorded radar data showed that the closest proximity between the two airplanes was zero feet vertical and 1 9/10 miles horizontal.

1/An error that results in less than the applicable separation minimum between two or more aircraft, or between an aircraft and terrain or obstacles and obstructions as prescribed by FAA Handbook 7110.65E and supplemental instructions.

2/Very high frequency omnidirectional range/tactical air navigation (VORTAC)--A ground station navigational aid that provides pilots with azimuth and distance-to-station information.

3/All altitudes are expressed in terms of mean sea level (msl) unless otherwise indicated.

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The preliminary findings of the operational error investigation prompted the Safety Board to expand its inquiry and conduct a special investigation of the Coast TRACON. The special investigation identified numerous deficiencies and problems related to ATC operations, which include inadequate size and poor physical condition of the operational quarters, inadequate controller staffing, excessive use of overtime, the pending implementation of two major airspace projects,^{4/} airspace design and procedures, training programs, and the program for quality assurance and safety oversight of the ATC system. The special investigation determined that these deficiencies and problems have been documented and verified by Federal Aviation Administration (FAA) management personnel throughout the past 3 years. The Safety Board believes that these deficiencies and problems and the FAA's failure to address and correct them contributed to the operational error on February 13, 1989. The Safety Board believes that these safety problems warrant immediate attention and corrective actions by the FAA to prevent a diminished level of safety in the high traffic density of the southern California basin area.

This is the eighth operational error since March 1988 involving controllers at the Coast TRACON (seven in CY 1988, one in CY 1989). The number and rate of errors at Coast TRACON is substantially higher than at other TRACON facilities with similar annual air traffic volume. For example, preliminary data provided by the FAA indicate that for the 12-month period ending December 31, 1988, the operational error rate, per 100,000 air traffic operations, was 0.56 at Seattle TRACON (three errors); 0.56 at Ontario TRACON (three errors); 0.17 at Sacramento TRACON (one error); and 1.31 at Coast TRACON (seven errors). The Safety Board does not know the specific reasons for this difference among facilities; however, the Board believes that as the number of operational errors increases, the potential for a catastrophic accident also increases.

The FAA's Air Traffic Service completed a national evaluation and on-site review of Coast TRACON following the eighth operational error in accordance with its Notice 7210.336. The report of this review, which was made available to the Safety Board on April 14, 1989, focuses on many of the deficiencies that were identified during the Safety Board's investigation, including problems relating to facility size, physical condition and ventilation, staffing, overtime, airspace, and equipment. Specifically, the review determined that access to the facility is through one or more military checkpoints, the facility is run down, noise from military jets is a problem, rotary phone equipment is out of date and inadequate, and the facility manager "questions the health hazards" of the environmental control system. The report also states that controllers have been working scheduled overtime since 1985, 6-day work weeks are required 66 percent of the time, and sick leave usage averages from 60 to 65 percent of the sick leave earned. Finally, the report concludes that the TRACON "operates extremely complicated airspace" including 13 shelves of airspace delegated from the Los Angeles Air Route Traffic Control Center (LAX Center), which are further broken down into 38 to 41 shelves that are split among 6 radar sectors. The report contains no recommendations for corrective action or headquarters followup.

^{4/}Airport Radar Service Area (ARSA) at John Wayne Airport, and the Southern California Terminal Airspace Realignment (STAR) project.

Safety Board investigators reviewed reports of the previous seven errors at the Coast TRACON to determine if they involved common parameters or causal factors that were evident during the February 13, 1989 operational error. Five of the previous errors involved inattention to duty, three errors involved controllers who were certified on the control sector for less than 8 months, and two errors involved inadequate or incomplete coordination with adjacent sectors or facilities. Although these factors were also prevalent during the February 13, 1989 error, the Safety Board did not use findings from investigations of previous operational errors to support the conclusions and safety recommendations contained in this letter.

Coast TRACON is a Level V radar approach control facility providing IFR and ARSA services for the Marine Corps Air Stations (MCAS) at El Toro and Tustin; the Los Alamitos Army Airfield; and the John Wayne, Long Beach, Torrance, and Fullerton airports. The facility is located at the MCAS El Toro in the operations building (#372) that also houses the air station's tower and ground control facility. Building 372 is adjacent to the runways, the aircraft refueling unit, and several taxi and parking ramps. The TRACON has 6 operational radar displays (positions) and is presently being reconfigured to 10 displays to accommodate two major airspace projects that will affect the facility. The TRACON control room is about 33 by 35 feet. The actual working area, which excludes radar consoles, desks, and flight data stations, is about 15 by 20 feet. Traffic activity at Coast TRACON is increasing about 15 percent per year. An ARSA was implemented at El Toro during January 1986, and the facility was upgraded during February 1988, from a Level IV (intermediate activity) to a Level V (high activity) TRACON. Air traffic activity is projected to increase 63 percent or more as a result of the two major airspace projects. Authorized staffing at Coast TRACON was increased recently to provide added controllers to accommodate the additional workload associated with the two major airspace projects. The facility is now authorized to have 66 total controllers; yet as of January 1989, it has only 24 FPL and 27 developmental controllers. FAA's target level for FPL controllers is 75 percent of the authorized number, which would equate to 50 FPL controllers at Coast TRACON.

AIRSPACE PROJECTS AFFECTING COAST TRACON

ARSAs at John Wayne and Long Beach Airports

During 1985, the FAA's Western-Pacific Region initiated a staff study to determine the feasibility of an ARSA for the John Wayne and Long Beach airports. When the study was prepared, the Long Beach airport did not qualify under FAA criteria for the establishment of an ARSA. Under new guidelines set forth by the FAA on July 14, 1986, the Long Beach airport qualified for an ARSA. Another regional staff study, dated October 1986, reviewed the facts and recommendations contained in the 1985 study and provided current information that verified the requirement for establishing an ARSA at both airports. As a part of the implementation effort, the ATC tower at each airport would be reclassified as a limited radar approach control in order to share ARSA responsibility with Coast TRACON, with the 5-mile inner circle of each ARSA controlled by its respective tower.

The ARSA at the John Wayne airport is scheduled to become operational during July 1989. This will be followed by implementation of the ARSA at the Long Beach airport during July 1990. The proposed ARSA for the John Wayne airport indicates that the ATC tower will be responsible for operations from the surface to 4,400 feet msl within the inner circle. The outer area will be delegated to Coast TRACON from 4,400 feet down to 3,500 or 2,500 msl depending on which area the aircraft will traverse. This airspace will adjoin that of the ARSA established for the MCAS El Toro.

Southern California Terminal Airspace Realignment

The Southern California Terminal Airspace Realignment program, better known as STAR, was developed during late 1986 by the FAA and representatives from a cross section of the aviation community. Their objective was to identify issues that affect air traffic movement in the southern California basin and to develop solutions and recommendations that would minimize traffic delays, sector saturation, and frequency congestion. These efforts were to be accomplished through the restructuring of terminal and en route airspace that would include changing facility boundaries, internal sectorization, redelegation of specific airspace, and dual use agreements for restricted airspace.

The representatives determined that STAR would be implemented in four phases. The first phase, which was implemented during July 1988, affected operations at the Los Angeles and Ontario airports. The second phase, implemented during February 1989, affected the airspace within the San Diego terminal area and redelegated all airspace 13,000 feet and below except that south of Los Angeles airport to approach controls. The third phase, expected to be implemented during July 1989, redelegates airspace 13,000 feet and below south of Los Angeles airport to Coast TRACON. Recently, the STAR project was modified to require that the Coast TRACON assume control of airspace (sectors 21 and 22) that is presently under the jurisdiction of the Los Angeles Air Route Traffic Control Center. The fourth phase is a conceptual phase consisting of long-range items that bridge the gap between STAR and approach control consolidation. This phase will also eventually provide tower en route coverage from Sacramento to Tijuana, Mexico.

INVESTIGATION OF THE OPERATIONAL ERROR

The operational error of February 13, 1989, involved air traffic controllers in three ATC facilities: LAX Center, the Los Angeles Terminal Radar Approach Control (LAX TRACON), and the Coast TRACON. BAW282 was under the control of the LAX TRACON, and AAL1262 was controlled by the LAX Center while holding at the Santa Catalina VORTAC; control of AAL1262 was transferred to the Coast TRACON while the flight was en route toward the Seal Beach VORTAC. Safety Board investigators interviewed area managers, area supervisors, controllers, and management staff at these facilities who were either directly involved or had knowledge of the operational error.

The operational error resulted because of incomplete and misunderstood coordination between controllers at LAX Center and Coast TRACON and because the Harbor sector radar and handoff controllers at Coast TRACON failed to comply with the provisions of letters of agreement between Coast TRACON and adjacent facilities. After receiving control of AAL1262 from the LAX Center, the Coast controllers cleared the flight into airspace delegated to the LAX TRACON without providing that facility with a radar handoff or pointout as prescribed by the Air Traffic Control Handbook 7110.65E.

Los Angeles Air Route Traffic Control Center

AAL1262 had departed from San Jose, California, and had been issued the TANDY1 standard terminal arrival routing that would take the flight west of Los Angeles airport for sequencing into the John Wayne airport. Difficulties with the runway lighting had been encountered at the John Wayne airport for several days, and the evening of February 13, 1989, was no exception. About 1753 it was learned that the runway lights would not illuminate. Later, as darkness approached and the lights were required, aircraft destined for the John Wayne airport were established in a holding pattern over Santa Catalina Island pending determination of whether the lights would be returned to service. When AAL1262 entered the airspace of the R-22 sector at the LAX Center, the flightcrew was advised of the situation and they requested to join the other aircraft that were holding. Holding instructions were issued to the flightcrew and the flight was instructed to maintain FL 200. The R-22 radar controller was subsequently relieved.

An FPL controller and a developmental controller were assigned to the radar position at R-22 to perform on-the-job training. Before assuming their duties, a position relief briefing was given. The FPL controller advised Safety Board investigators that both he and the developmental controller were aware that the runway lights at the John Wayne airport were not in service. At 1855, the flight crew of AAL1262 was informed, "...the runway one left will be out for the rest of the night...and runway one right is open I believe that's three thousand feet." The flightcrew responded that they could not land on that runway and that they requested to go to Ontario but that they would have to notify dispatch first. The flightcrew was then issued a vector out of the holding pattern in addition to a descent clearance to 15,000 feet.

At sector R-22, an associate radar controller was also on duty; his responsibilities were to take and receive handoffs and to coordinate with adjacent center sectors and terminal facilities. While monitoring the radar controller, the associate radar controller heard the flightcrew of AAL1262 make the request to land at Ontario. He amended the route of flight in the computer to show the aircraft routed over Seal Beach VORTAC, direct to Paradise VORTAC, direct to the Ontario airport. The associate radar controller also called the Coast TRACON to determine if that facility could approve the revised routing. After receiving an affirmative reply, the associate radar controller made another computer entry to show the aircraft at 9,000 feet. He advised the R-22 radar controller of what he had accomplished.

After the associate radar controller had coordinated with the Coast TRACON, a pointout ^{5/} was given to the radar controller at the R-21 sector, which had airspace adjacent to and was responsible for the separation of east departures from Los Angeles airport. The R-21 controller was also advised that AAL1262 would be descended to 9,000 feet, handed off to Coast TRACON, and would be en route to the Ontario airport. All controllers at the R-22 sector were satisfied that they had coordinated this particular flight with all possible affected parties. The flightcrew of AAL1262 was then issued the revised routing to Ontario airport and was also cleared to descend to 9,000 feet. An automated handoff to the Coast TRACON was initiated and accepted. The flightcrew was then advised to contact the Coast TRACON.

Los Angeles TRACON

The DR-1 (Manhattan) position was staffed by both a radar and handoff (HO-1) controller. A controller was also at the coordinator position (CI-1). The radar controller described his workload as light to moderate and of routine complexity. Before assuming his duties, he had received a position relief briefing and stated that everything was operating normally. He was providing radar services to BAW282 which had just departed Los Angeles and was en route to London, England. The flight had been cleared to climb to FL 230 and was flying southeast to intercept the 080° radial of the Seal Beach VORTAC and to then proceed eastbound to the Thermal VORTAC. Subsequently, the flight was issued a climb clearance to a revised altitude of 14,000 feet.

The DR-1 controller stated that he observed an unknown target about 2 miles southwest of the Seal Beach VORTAC that was tracking nearly eastbound. The target had a mode C readout which initially indicated 8,900 feet and then changed to 9,000 feet. He was aware that this target would soon penetrate the lateral confines of his sector at an altitude that was assigned to him. Although the R-21 controller at the LAX Center had accepted an automated handoff on BAW282, the DR-1 controller did not advise the flightcrew to change to the Center frequency because he had not received a pointout on the unknown target and he perceived that a conflict within his airspace was imminent. At that time, BAW282 was ascending through 8,000 feet and was on a converging course about 5 miles away from the unknown target. The DR-1 controller stated that his immediate concern was that a potential conflict was evident and that immediate action was necessary.

The DR-1 controller instructed the flightcrew of BAW282 to turn left initially to 070° and then to 060° "immediately," to connote expeditious compliance. The flightcrew asked if the turn was being issued to them and the controller then instructed them to turn left to 030°. The flightcrew acknowledged the turn. The controller then issued a traffic advisory to the flightcrew of BAW282, "...at two o'clock three miles turning northeastbound altitude indicates eight thousand niner hundred." The controller again issued

^{5/}An action taken by a controller to transfer the radar identification of an aircraft to another controller if the aircraft will or may enter the airspace or protected airspace of another controller and radio communications will not be transferred.

a traffic advisory at "...one o'clock two and a half miles northeastbound altitude indicates niner thousand." The flightcrew responded that they were in an immediate turn to 030° to avoid the traffic. While in the turn, the flightcrew of BAW282 climbed above the unknown traffic, thus avoiding a possible collision.

While the radar controller at the DR-1 sector was issuing traffic avoidance vectors to the flightcrew of BAW282, the CI-1 coordinator called the R-21 sector controller at the LAX Center to determine whether he had control of the unknown traffic. The R-21 controller responded that the unknown aircraft was being handled by the controllers at Coast TRACON. The HO-1 handoff controller, who was assisting the DR-1 controller, advised Safety Board investigators that he did not observe the unknown target until the DR-1 controller issued avoidance vectors to the flightcrew of BAW282. The HO-1 controller stated that he believed the airplanes passed less than 2 miles apart while at the same altitude.

Coast TRACON

The Harbor sector at the Coast TRACON was staffed by a developmental controller who had been certified on the position for 5 months. Prior to assuming his duties at the Harbor radar position, he had been on a 30-minute lunch break. He was assigned to work the Harbor sector by the area supervisor on duty. He received a position relief briefing and was advised that the runway lights at the John Wayne airport were out of service.

Initially he was working both radar and handoff positions combined, but about 15 minutes before the incident, an area supervisor was assigned to the Harbor sector to work the handoff position. The radar controller described his workload as very heavy and the complexity as high. He stated that he did not accept the handoff from the LAX Center on AAL1262. The area supervisor, who had accepted the radar handoff and had effected the coordination, advised him that the airplane was descending to 9,000 feet and to verify the routing, which he did. When the aircraft was in the vicinity of the Seal Beach VORTAC, the Harbor radar controller initiated an automated handoff to the adjacent sector (Shore). When the handoff was accepted, he advised the flightcrew to change to that sector's frequency. The Harbor radar controller advised Safety Board investigators that he "assumed" that the proper coordination with the LAX TRACON had been accomplished by the controllers at the LAX Center. He also stated that he did not observe the incident and was not aware of it until the Manhattan sector at the LAX TRACON called him to ask if he was working the airplane. The Harbor radar controller advised Safety Board investigators that he had been decertified as a result of the incident, removed from operational duties, and assigned to the training department for remedial instruction. He resumed normal duties on February 21, 1989.

The area supervisor who was working the handoff position at the Harbor sector advised Safety Board investigators that he had received a call from the LAX Center concerning AAL1262. The Center controller asked him if they would work the airplane to Ontario and advised him they had routed the airplane over Seal Beach to Paradise to Ontario. There was no discussion about the altitude of the aircraft. He then accepted the handoff on AAL1262 from the LAX Center and advised the Harbor radar controller that AAL1262 would be going to Ontario

and to "see what altitude the Center gave him." He stated that the Harbor radar controller never gave him a confirmation of the assigned altitude. He then made a handwritten strip on the flight, but he believed he might have been "walking around" with the flight strip in his hand. He stated that he was busy with other coordination duties and that he did not clearly indicate to the Harbor radar controller what the actions of the flight would be and that "he didn't get done what needed to be done." He also stated that he advised the controller at the Shore sector that "we're going to give you American," but that this action did not constitute coordination. He was aware that an operational error had occurred within "minutes" after it happened. The radar controller at the Harbor sector asked him, "didn't twenty two [LAX Center] coordinate that?" He went to the area manager on duty and advised him, "...we just blew off Manhattan" [violated LAX TRACON airspace]. The area supervisor said that as a result of the incident he had been decertified, removed from operational duties, and assigned to the training department for remedial instruction. He resumed normal duties on February 20, 1989.

SPECIAL INVESTIGATION OF COAST TRACON

The seriousness and magnitude of the deficiencies and problems associated with the operational error prompted the Safety Board to expand the investigation of the Coast TRACON. Additional controllers, who were not involved in the error, were interviewed to further define the issues and to identify specific recommendations necessary to increase the operational efficiency and safety of the facility. Safety Board investigators also interviewed the former Facility Manager of Coast TRACON, FAA regional and headquarters staff, and personnel at the MCAS El Toro concerning the history of deficiencies at Coast TRACON and the plans for implementing two major airspace projects during July 1989. Documents relevant to Coast TRACON were also reviewed by Safety Board investigators.

Controllers from Coast TRACON

Selected controllers at Coast TRACON were interviewed and asked to respond to 45 predetermined questions. The interviews were not intended to be a scientific inquiry, but rather a survey of opinions by the workforce of safety related issues at Coast TRACON. Fifteen controllers were interviewed by Safety Board investigators. They included three area supervisors, nine FPL controllers, and three developmental controllers. The area supervisors were all FPL-rated at Coast TRACON and indicated that they worked radar positions as part of the job. The remaining FPL controllers all began work with the FAA after the 1981 strike, and the developmental controllers began work at Coast TRACON as their first assignment after training at Oklahoma City. Six of the controllers indicated that they had been involved in previous operational errors. The controllers submitted to the interviews voluntarily.

Nearly all controllers rated the overall safety of the ATC system at their facility as "good" or "adequate," although two controllers described it as "poor." All of the FPL controllers and supervisors stated that they were scheduled to work overtime almost every week, and several controllers believed that the work schedule did not allow adequate rest away from the job. The majority of controllers that were interviewed believed that staffing was a problem at Coast TRACON and that to increase the margin of safety, the number

of FPL controllers needed to be increased. Controllers stated that nearly all developmental controllers arrived at the facility with no prior experience and required extensive OJT. They cited training problems due to lack of an adequate radar control simulator and the lack of a separate room for training and debriefing. More than half of the controllers interviewed indicated that during peak periods they were required to handle more traffic than they should be handling. Controllers were unanimous in agreeing that the Coast TRACON airspace is very complex and that changes that would simplify operational procedures and airspace configurations would be welcome. Controllers voiced strong concerns about the physical condition of the facility, describing cramped conditions, crowded control room, a small break room, and an inadequate ventilation system with poor heating and cooling control. All controllers interviewed indicated a strong concern about the scheduled airspace changes being introduced in the summer of 1989 as a result of the STAR and John Wayne ARSA projects. They agreed unanimously that the facility was not prepared to absorb the changes in the time period available. A more comprehensive synopsis of the controllers' views concerning overtime, staffing, training, traffic volume, airspace and procedures, facility and equipment, and major airspace projects is available in the public docket of this investigation.

Former Facility Manager of Coast TRACON

During the investigation at the Coast TRACON, Safety Board investigators were informed that the former Facility Manager had retired on December 31, 1988. After learning that the former manager had remained in the local area after retirement, Safety Board investigators contacted him to ask if he would allow an interview concerning issues at the Coast TRACON. He stated that he would welcome an interview with the Safety Board. Because he was no longer an FAA employee, the Safety Board granted his request that FAA personnel not be present.

In accordance with the former manager's request, Safety Board investigators met with him on February 17, 1989. The former manager spoke at length about Coast TRACON and problems that he, as Facility Manager, was confronted with during his 3-year tenure in the position. He contended there were problems with training, staffing, improvement of the working quarters and administrative offices, and other issues relevant to Coast TRACON. He stated that he had made numerous requests to the Air Traffic Division Manager, Western-Pacific Region, asking for support in rectifying problem areas. He provided his personal copies of official correspondence that he had written during his tenure as Facility Manager of Coast TRACON.

A second meeting with the former Coast TRACON Manager was held on February 28, 1989, with the Safety Board's Chief of the Operational Factors Division and his staff. Again, the former manager requested that FAA personnel not be present. The former manager provided an overview of his FAA experience and again discussed his concerns about a variety of issues that he had addressed during the period he was Facility Manager. He provided personal copies of additional documentation to support his position.

Western-Pacific Region of the FAA

On February 19, 1989, Safety Board investigators interviewed the Manager and the Assistant Manager of the Air Traffic Division for the Western-Pacific Region of the FAA concerning the Coast TRACON. When asked about the facility quarters and working conditions, the Manager responded that "getting things done through the Marine Corps was impossible." She also stated that the region was expanding the present facility by adding additional work stations but indicated the region's primary focus was on the implementation of the Terminal Los Angeles Basin Study (TLABS) program which had been approved and partially funded and which she anticipated would be completed by 1992.

The Manager indicated that the proposed implementation of the two major airspace projects for Coast TRACON during July 1989 would not be delayed. She had made this decision as a result of an earlier conversation in which the current Facility Manager at the Coast TRACON had assured her that they would be able to assume the added responsibilities generated by both the ARSA and STAR programs. When asked about acquiring additional help for the facility through the use of air traffic assistants, the Assistant Manager replied, "We're trying to get away from that [the use of assistants]."

The Manager stated that Coast TRACON had recently received a new state-of-the-art enhanced target generator (ETG) and that through the use of site-specific training the facility would be able to produce better qualified developmental controllers before they would begin OJT. When advised that this equipment was presently contained in very cramped quarters, she stated that if it were deemed necessary, the equipment could be placed in a trailer outside the current quarters. The Manager visited the facility for a dedication of this new training equipment. Safety Board investigators were informed by Coast TRACON personnel that the ETG would not function properly because of overheating as a consequence of its location in confined quarters that lack adequate ventilation and cooling.

FAA Washington Headquarters

Safety Board investigators twice met with FAA officials in Washington, D.C., during the course of this investigation. The first meeting held on February 21, 1989, was with the Associate Administrator for Air Traffic and his headquarters staff who were briefed on the deficiencies and problems identified at Coast TRACON. They were, for the most part, aware of the working environment at the facility and agreed "that something had to be done," but generally their response was that the only solution to the problem was to relocate the TRACON off the Marine Corps Air Station. The FAA was asked to provide a history of the environmental and space problems at Coast TRACON. In their response dated February 24, 1989, the FAA officials stated that "because the Marine Corps personnel at El Toro must function within the constraints of the Marine Corps and their budgeting restraint, modernization and environmental improvement to the quarters allocated to the FAA at Coast TRACON, Building 372 has not always been accomplished," and "because of the overall mission of the USMC and their budget cycle, it has been difficult to get results." When asked if senior staff from the Western Pacific Region and the FAA headquarters had met with the Marine Corps recently to discuss these problems, the FAA responded negatively.

The Safety Board has been advised that, on March 14, 1989, the Western-Pacific Regional Administrator and Assistant Manager, Air Traffic Division, met with Marine Corps personnel at El Toro to discuss the working conditions at Coast TRACON. As a result, two or three more rooms will be made available for FAA use, equipment will be rearranged in the control room to add 4 to 5 feet of additional space, and a portable building may be moved near the TRACON to be used as a break room.

Another meeting was held on February 22, 1989, with the Director, Air Traffic Operations Service and his staff. Safety Board investigators provided a briefing concerning the deficiencies and problems identified at the Coast TRACON. The Director was asked about the status of the two major airspace projects that would affect the TRACON; he stated that both the region and facility had informed him recently that the scheduled implementation dates would be met.

Marine Corps Air Station--El Toro

Safety Board investigators met with the Commanding General, MCAS El Toro, and his staff on February 27, 1989, to discuss the physical size and the potential to renovate and expand the control and equipment rooms at the TRACON. The Safety Board was provided with a copy of the support agreement between the Marine Corps and the FAA. This agreement contains provisions whereby the Marine Corps would, if requested, provide minor construction, improvements, alterations, and modifications to the TRACON's quarters subject to the FAA providing separate funding to accomplish the project. The Marine Corps acknowledged that the TRACON quarters are cramped; however, the current staff had not been advised that the workplace was inadequate or unacceptable. They also stated that the FAA had not written or met with them to discuss any deficiencies, or to request alterations or expansion of the facility to accommodate additional controller workstations. At the conclusion of the meeting, the Marine Corps officials stated that they would be pleased to meet with the FAA immediately to discuss solutions to renovate, rehabilitate, and expand the TRACON's quarters.

Documents Relevant to Coast TRACON

Safety Board investigators also reviewed FAA memoranda, staff studies, management reviews, Administrator's Hotline correspondence, and quality assurance evaluations pertinent to Coast TRACON's operations during the last 3 years. These documents provide a comprehensive record by FAA management personnel of the problems and deficiencies relating to the size and condition of the facility quarters, controller staffing, overtime use, major airspace projects, airspace design and procedures, training programs, and the quality assurance program. The Safety Board has accepted these FAA documents as factual and accurate and has used them as part of its support and rationale for the safety recommendations contained in this letter. A list of the documents, with selected quotations and recommendations from them that are relevant to these issues, is attached to this letter. The documents have been numbered and are referred to by number in this letter. Copies of the complete documents are available in the public docket of this investigation.

DISCUSSION

The Safety Board notes that the LAX TRACON DR-1 controller, who was controlling BAW282, observed an unknown target southwest of Seal Beach VORTAC with a mode C altitude readout at 9,000 feet. The DR-1 controller perceived that a potential conflict between BAW282 and the unknown target was imminent, and he took immediate and decisive actions to issue traffic advisories and vector "his flight" away from the other unknown "flight." The Safety Board's investigations of midair collisions have determined that controllers failed to detect pending conflicts and to take positive action under similar circumstances.^{6/} The Safety Board commends the DR-1 controller for his vigilance and timely avoidance vectors that ensured positive separation from the unknown traffic.

The Safety Board's investigation determined that the operational error resulted because of deficient and substandard performance by controllers and supervisors at the LAX Center and Coast TRACON. The communication and coordination between the two facilities, which was required to reroute and clear AAL1262 to the Ontario airport, were incomplete, misunderstood, and not in accordance with the controllers handbook. The coordination failed to establish a clear understanding of the route of flight and altitude that would be given to the flight and the specific responsibilities required of each facility. Appendix C of the Air Traffic Control Handbook, 7110.65E, prescribes a step-by-step process to be used when transferring radar identification and control (handoff) and completing a radar pointout from one controller to another. The controllers did not follow the process, and as a result the coordination was incomplete and misunderstood. The Safety Board notes that the controllers at Coast TRACON, who were involved in the operational error, received remedial training and instruction on the importance of complete and accurate coordination prior to their return to control duties.

The size and environmental condition of the TRACON's control room have been reported as inadequate and unacceptable on numerous occasions. Facility, regional, and national reports and evaluations for the past 3 years have concluded that the existing facility is inadequate for the provision of present services and that prior to implementing any airspace projects would require relocation to a site that meets FAA's standards for a high activity Level V TRACON (documents 2-7). The FAA Administrator was concerned following a tour of the facility in 1986 and discussed ATC operations and the condition of the facility with the Facility Manager (document 5). Controllers who were interviewed during the investigation voiced serious concerns about noise, the working environment, and the general condition of the facility. A supervisor commented, "Terribly inadequate; heating and ventilation is bad; there are times at 8:30 P.M. when it is hot as hell; very hot in the control room." The working area of the control room is approximately 304 square feet;

^{6/}Aeronaves de Mexico, S.A., McDonnell Douglas DC-9-32 XA-JED and Piper PA28-181, N4891F, Cerritos, California, August 31, 1986, NTSB/AAR-87/07. Skywest Airlines Sweringen Metro II, N163SW, and Mooney M20, N6485N, Kearns, Utah, January 15, 1987, NTSB/AAR-88/03. U.S. Army U-21A, 18061, and Sachs Electric Company Piper PA-31-350, N60SE, Independence, Missouri, January 20, 1987, NTSB/AAR-88/01.

FAA's standards recommend 800 to 1,200 square feet for a Level V TRACON (document 9). The Safety Board believes that the FAA should take prompt action to address the working conditions at Coast TRACON. Short-term solutions should involve immediate renovation, rehabilitation, and expansion, if possible, of the existing quarters. The Safety Board believes that senior air traffic staff from the FAA headquarters and the Marine Corps El Toro MCAS should meet as soon as possible to discuss solutions to achieve this goal.

On the longer term, the FAA should accelerate its efforts to construct a new terminal control facility to manage the southern California approach and departure airspace. As early as 1983 the FAA selected Coast TRACON to be relocated from El Toro (document 15); however, this effort was subsequently abandoned. In 1987, a regional STAR project outline (document 8) recommended that the Western-Pacific Region select a site in 6 months and sign a lease in 12 months for the new terminal IFR facility. The outline projected moves to the new facility in 30 months for LAX TRACON and in 36 months for Coast TRACON. More recently the FAA's Western-Pacific Region has completed a study to examine the operational need and requirements for consolidation of terminal air traffic control facilities in the Southern California area.^{7/} This study concludes that a consolidated facility will substantially improve the operational effectiveness of the ATC system through the application of more uniform airspace, more effective training of controllers, enhanced traffic management capability, improved equipment failsafe and backup capability, fewer delays, and significant cost savings. The study recommends that the four TRACONs--at Burbank, Coast, Los Angeles, and Ontario--be consolidated into one new terminal facility. The study's transition plan includes the following dates: select site 10-88; purchase land 5-90; award construction contract 12-90; complete construction 12-92; and recommission Los Angeles 12-93, Coast 3-94, Burbank 10-94, and Ontario, 12-94. The Commanding General, El Toro MCAS, advised Safety Board investigators that he had recently offered to provide, at no cost to the FAA, sufficient acreage with independent access to be used as a site for the new facility.

The Safety Board's investigation determined that, at the time of the operational error, a site selection for the new facility still had not been made. The Safety Board believes that consolidating the four TRACONs will greatly enhance safety and that the FAA should assign a high priority to selecting a site and constructing a new Terminal IFR Facility.

Coast TRACON has had a history of inadequate controller staffing levels, both authorized and on board (documents 1, 2, 4, 5, 7, 9-13). Following the controller's strike in August 1981, the FAA reduced the level of authorized controllers from 48 to 30. In January 1986, the facility had 21 FPL and 9 developmental controllers on board, and requested that the authorized level be increased from 30 to 40. Three years later, in January 1989, 24 FPL and 27 developmental controllers were on board while the authorized level had been increased to 66. Staffing remains a critical issue for several reasons: the response to vacancy announcements is poor; some selectees withdraw after visiting the facility; candidates have limited controller backgrounds with little or no radar experience; and release dates have been as long as a year between selection and arrival of new controllers. This continual staffing

^{7/}Los Angeles Basin Study (LABS), Western-Pacific Region, April, 1988.

problem has resulted in several undesirable situations: inexperienced controllers working high activity radar positions unassisted by handoff controllers; excessive use of overtime resulting from a scheduled 6-day work week for all controllers; abnormal use of sick leave; and a serious reduction in morale among the controller and supervisor workforce. Some controllers said they were "stunned" when they were informed by the region in August 1988 that compulsory overtime would be required for another 36 months (document 11). Controllers who were interviewed voiced strong concerns about the staffing problem, and they were critical of the FAA for ignoring the issue. Typical comments from controllers were, "we're hanging on barely as it is now" and "we're being asked to do too much before we're ready."

The Safety Board believes that the lack of adequate controller staffing is Coast TRACON's most critical problem and that the FAA should give top priority to resolving it. Principal resources should be directed to training and "seasoning" the controller workforce. The Safety Board continues to support the use of incentives to attract controllers to hard-to-staff ATC facilities. In addition to the pay demonstration proposal, the FAA should also consider the use of other personnel incentives such as additional credits toward retirement, a one-time transfer bonus, priority toward reassignment to a controller's choice of facility after a fixed time period at the hard-to-staff facility, and cost-of-living pay differentials based on geographic locations. The Safety Board believes that the Western-Pacific Region should expedite the identification, selection, release, and transfer of controllers to the Coast TRACON to achieve the full staffing level authorized for the facility. Also, the FAA should hire sufficient air traffic assistants (ATAs) to perform flight data and other noncontrol duties. These ATAs would replace the recently hired developmental controllers presently assigned these tasks so they can be trained on a full-time basis. The Safety Board believes that the FAA should conduct a staffing study to determine if aviation-oriented persons from the local area, such as retired pilots or military personnel, could be hired to perform the duties of ATAs and release the developmental controllers so they can complete their training and work control positions.

Also, the Safety Board believes that the FAA should postpone implementation of the ARSA at the John Wayne airport and the transfer of sectors 21 and 22 from LAX Center until controller staffing reaches authorized levels and until the control room is expanded or relocated to adequately accommodate the additional radar positions. These two major airspace projects would require three new radar sectors with a radar and handoff controller to staff each position. Facility and regional evaluations have reported repeatedly that prior to implementation of these two projects, controller staffing must be increased and the facility must be relocated to larger quarters (documents 1-4, 6-10, 11-14). All controllers interviewed stated they were "greatly" concerned about the airspace changes scheduled for July 1989. A typical comment was, "we're working 6 days a week; we are not ready to pick up STAR/ARSA; it is being politically shoved down our throat." The Safety Board notes that Coast TRACON traffic would increase more than 210,000 operations annually following implementation of the ARSA (document 11). While the Safety Board supports the positive control and separation assurance that would be realized from the ARSA program, it believes that Coast TRACON lacks the proper work environment and an adequate number of trained and experienced controllers to provide the radar service required by the program. The Safety Board

believes that implementing the ARSA in July 1989 would be detrimental to safety. The transfer of sectors 21 and 22 from the LAX Center was not included in the original STAR plan and was added only recently. The FAA stated the reason for the transfer was several operational errors that had occurred in those sectors at LAX Center. The Safety Board believes that this reason alone is insufficient justification for the transfer and, in view of the space problems and staffing shortages at Coast TRACON, it would be best to delay this airspace project. Therefore, the Safety Board believes that the scheduled implementation of an ARSA at the John Wayne airport and the transfer of sectors 21 and 22 from the LAX Center should be postponed until the staffing and space deficiencies at Coast TRACON have been resolved.

A significant number of controllers interviewed stated that improvements were needed in airspace design, arrival and departure routes, and operational and coordination procedures. Typical comments were, "we're a Level V facility with Level III procedures," "resectorize the airspace," and "[procedures] keep us having to de-conflict traffic." A regional management review during September 1988 states that the TRACON has an extremely complex airspace structure that requires a considerable amount of in-house coordination (document 12). At times operational delays are excessive because of the amount of coordination required between control sectors and other ATC facilities. The Safety Board believes that the airspace and sector design, traffic flow, and coordination procedures are too complicated at the Coast TRACON. The Safety Board is aware that the Western-Pacific Region has recently developed a study which produced recommendations that could boost capacity, ease congestion, and reduce delays in Los Angeles airspace through the use of the simulation model (SIMMOD) program. The Safety Board is encouraged by this effort and believes that if the Coast TRACON is not already included in this program, consideration should be given to assigning this facility a higher priority. In addition, the Safety Board believes that the FAA should establish a national task force of airspace and procedures specialists, including controllers from the facility, to evaluate, develop, and implement changes in airspace and procedures to facilitate a safer and more efficient flow of arrival and departure traffic and to reduce coordination workload between controllers and sectors.

The Coast TRACON training program was completely restructured during 1986 because of a previous negative training trend that existed at the facility (document 2). The training process was changed to a "building block" system in which students progress to the next lesson block after successful completion of the previous one. Training was divided into three major segments that include classroom, ETG, and OJT training with progression through a basic, intermediate, and advanced phase in each segment. All lesson plans were changed and rewritten. A regional evaluation (document 7) in January 1987 described the overhaul of the training program and concluded that "the Coast TRACON training program, although not totally in place, is considered to be outstanding." With the new training program operational, there were no training failures at the TRACON during calendar year 1988. Despite this record, the region recently directed that changes be made to the total training program. Following a management review of Coast TRACON (document 12), the region directed the facility to, in part, rewrite the present training order, accelerate the training process, and expedite the certification of developmental controllers to FPL status (document 13). In the regional memorandum, dated October 3, 1988, the Assistant Manager of the Air Traffic

Division concluded that with these total changes, "I look forward to several significant improvements including a 20% decrease in overtime usage, a notable reduction in controller check-out time, and a timely implementation of STAR and the Orange County ARSA." The Safety Board is concerned that these changes may be directed, in part, to ensure that sufficient controllers are qualified so that the two major airspace projects can be implemented on their scheduled dates. The Safety Board believes that the fundamental knowledge and job skills specific to the facility should be provided to all controllers prior to commencing OJT with "live" traffic. Therefore, the Safety Board believes that the FAA and its Western-Pacific Region should monitor the training program at the Coast TRACON during the transition to increase controller staffing to ensure that it conforms with national policy and standards in accordance with FAA Order 3000.6, Training; the appropriate Instructional Program Guide (IPG); and FAA Order 3120.4G, Air Traffic Training.

The Safety Board's special investigation has determined, again, that FAA's quality assurance and safety oversight of the ATC system, as administered by the Air Traffic Service, is inadequate and ineffective. FAA documents (documents 1-16) attest that everyone from the Facility Manager to the Administrator observed the deficiencies and problems at Coast TRACON and reported them to all levels of air traffic management during the past 3 years. The Safety Board notes that despite this knowledge, the Air Traffic Service and its quality assurance program has, to date, failed to address and correct the problems. The FAA is currently adding 3 additional radarscopes to the control room, which will increase the total positions to 10. Under this new configuration, 31 controller personnel 8/ could be in the operational quarters. The Safety Board believes that 31 controllers working in such cramped quarters would be intolerable and could result in a diminished level of operational safety. At a meeting with the Associate Administrator for Air Traffic on February 21, 1989, Safety Board investigators urged him and his senior staff to meet with Marine Corps personnel at MCAS El Toro to seek immediate solutions to the environmental and space conditions at Coast TRACON. The Safety Board notes that, while the Western-Pacific Regional Administrator met with the Marine Corps at El Toro on March 14, 1989, and secured some additional room for administrative use, the FAA's senior air traffic staff has not, to date, scheduled a meeting to discuss immediate solutions to improve the working conditions in the control room. The Safety Board also notes that Air Traffic Service's recent national evaluation and on-site review of Coast TRACON (document 16) identifies numerous problems involving the facility, staffing, overtime, airspace and equipment; however, it contains no recommendations for corrective action or headquarters followup that are required by its Notice 7210.336. Also, the former Facility Manager at Coast TRACON provided Safety Board investigators with 8 documents (documents 1, 2, 3, 4, 6, 8, 10, 11) that are referred to in this letter but, despite repeated requests, were not made available by the Air Traffic Service. The Safety Board believes these illustrations, collectively, exemplify an inadequate, ineffective, and unresponsive quality assurance and safety oversight program.

8/Personnel would include 10 radar and 10 handoff controllers, 5 trainees, 2 area supervisors, 2 flight data controllers, 1 area manager, and 1 traffic manager.

The Safety Board's previous investigations of operational errors have identified similar concerns about the FAA's quality assurance of the ATC system. These issues were discussed in safety recommendation letters 9/ in which the Safety Board recommended that the FAA:

A-88-90

Establish an independent national division that would be responsible for the quality assurance of the air traffic control system and that would report directly to the Administrator of the Federal Aviation Administration.

The Safety Board continues to believe that the responsibility for quality assurance and safety oversight of the ATC system should be organizationally independent of the Air Traffic Service and report directly to the Administrator. The Safety Board's staff received a briefing on March 7, 1989, from the Associate Administrator for Aviation Safety concerning proposed organizational changes, in response to recommendation A-88-90, within the Office of Aviation Safety. In part, the Office of Aviation Safety Quality Assurance was established to provide enhanced quality assurance and safety oversight to the ATC system. While the Safety Board is encouraged by these changes, it is concerned that only two ATC specialists are included in this new office to conduct quality assurance of the total ATC system. The Safety Board believes that this office, given the responsibility and adequate staff, could monitor the ATC system and ensure that deficiencies and problems are identified and corrected. Therefore the Safety Board recommends that the FAA implement, and provide adequate staff and funding for the Office of Safety Quality Assurance which is located organizationally under the Associate Administrator for Aviation Safety and which is responsible for the quality assurance and safety oversight of the ATC system.

In summary, the Safety Board's special investigation following the operational error occurring on February 13, 1989, has determined that numerous deficiencies and problems concerning ATC operations are evident at Coast TRACON. These problems have existed for several years and have been documented and verified repeatedly by FAA management at the facility, regional, and national levels. Although these deficiencies remain uncorrected, Coast TRACON's traffic activity has increased dramatically. The Safety Board notes that, despite the recurrent record of shortcomings, the FAA has failed to plan and implement programs to address and correct the problems. Also, the Safety Board is concerned that the FAA is planning to implement two major airspace projects at the facility that will impose additional workload on the controller workforce and further exacerbate an already serious situation. The facility deficiencies and the projected additional workload have undermined controller morale in recent years by what is perceived as a lack of planning and accountability by FAA management. A ninth operational error occurred at Coast TRACON on April 6, 1989, involving a Boeing B-727 and a military C130 that came within 400 feet vertical and 1 mile horizontal of each other. The Safety Board believes that the numerous deficiencies and problems have contributed directly

9/Safety recommendation letter A-88-81 through -91, dated August 8, 1988; and safety recommendation letter A-88-157, dated November 15, 1988.

or indirectly to the increase in operational errors at Coast TRACON and that this increase should serve as a warning or precursor to a potential accident. The Safety Board has issued the safety recommendations contained in this letter so that the FAA can act before an accident occurs. The Safety Board believes that the seriousness and magnitude of the deficiencies and problems at Coast TRACON justifies the highest level of FAA attention and action.

OTHER ISSUES

During the course of the investigation at LAX TRACON, Safety Board investigators learned that the facility was using ATC separation criteria and control procedures that vary from national standards and handbook guidelines. Interviews with controllers and staff disclosed that the LAX TRACON had been selected as the sole facility to test the use of reduced separation between IFR and VFR aircraft operating in the TCA. The Safety Board notes that the use of ARSA separation standards in the LAX TCA was not related to the operational error on February 13, 1989. Also, the LAX TRACON has not identified any problems in using the ARSA procedures in the TCA and it has received no reports on operational errors or near midair collisions when the reduced separation was in use. Finally, the Safety Board has not investigated any incidents involving the use of this reduced separation standard. The Safety Board believes that it lacks sufficient operational experience and investigative background which could provide the basis for properly evaluating this test program. The Safety Board will monitor this test program in its future accident and incident investigations.

Also during the investigation, the Safety Board learned that the LAX TRACON has implemented a procedure that allows a controller to use airspace delegated to another controller through pre-arranged or silent coordination. Specifically, when the LAX TRACON is in a west configuration, traffic under the control of the Departure Control Two (DR-2) controller is authorized to enter airspace delegated to the Arrival Radar Two (AR-2) controller without verbal coordination or a pointout, provided DR-2 "quick looks" 10/ all AR-2 traffic or AR-2 points out all nontagged aircraft. This procedure also applies between the DR-2 and AR-1 controllers when the LAX TRACON is in an east configuration. Since this investigation, the Safety Board has learned that this procedure is used at a number of other ATC facilities across the country. The Safety Board is aware that without this procedure, a controller's workload may increase. Even though this procedure was not related to the operational error on February 13, 1989, the Safety Board is concerned that a procedure that places two aircraft in the same airspace while radar control is being provided by two different controllers who do not have a clear understanding of each other's intent increases the potential for conflict. The Safety Board believes that this procedure, known as look and go, is in conflict with the intent of the Air Traffic Control Handbook 7110.65E, is a remedy for poor airspace utilization and configuration, and may allow for the development of poor work habits among controllers. Therefore the Safety Board believes that the FAA

10/A feature of Automated Radar Terminal System (ARTS) that provides the controller the capability to display full data blocks of tracked aircraft from other control positions.

should review the use of pre-arranged or silent coordination procedures at those ATC facilities where the procedure has been put into effect to determine if there is any degradation to safety.

As part of the special investigation, Safety Board investigators reviewed current and forecast traffic activity for the United States and the southern California basin area. Figures recently released by the FAA forecast that the number of passengers flying on U.S. airlines will increase 70 percent by the year 2000. The aircraft fleet of U.S. air carriers is projected to increase from 3,542 in 1988 to 4,791 in the year 2000. Los Angeles International Airport, the largest hub airport in southern California, is forecast to handle 666,000 aircraft operations annually by the year 2000 and will be ranked as the Nation's fifth busiest airport. The STAR project outline (document 8) estimated in 1987 that commercial air traffic will increase 38 percent and general aviation will increase 37 percent in southern California by the year 2000. A recent report by the California Commission on Aviation and Airports states that airport capacity is stretched to the limit, aviation gridlock is inevitable, and "the necessary aviation-related infrastructure has not kept pace with the demand."¹¹ Further, the report recommends the need for comprehensive system planning to meet the State's future aviation transportation demands. The Safety Board believes that the FAA should start now to develop a strategic long-term plan so that air traffic control, airways facilities, and airspace systems are developed and implemented to accommodate this dramatic increase in air traffic. The plan should focus on the need for increased controller staffing and training; optimum airspace design with efficient departure and arrival traffic flows; and new ATC facilities that have advanced radar, communications, and traffic management equipment and technology. Proper planning now will enhance the FAA's ability to meet the traffic demands with a high level of safety and a minimum of traffic congestion and delay. Therefore the Safety Board believes that as a start toward achieving this goal, the FAA should conduct a System Safety and Efficiency Review of the southern California basin area and the facilities that provide ATC services in this high traffic density area.

Therefore, as a result of its special investigation of the Coast TRACON, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Assign a high priority to the Western-Pacific Region's Terminal Facility Consolidation and Relocation Project that will provide a new facility for consolidation of the Los Angeles, Coast, Burbank, and Ontario Terminal Radar Approach Controls. This high priority should include accelerated site selection, land acquisition if necessary, facility design and construction, and facility equipment purchase and installation. (Class II, Priority Action)(A-89-33)

¹¹/Aviation and Airports: California's Gateway to a Global Economy, A report to the California State Legislature by the California Commission on Aviation and Airports, January 31, 1989.

Expand, renovate, and rehabilitate the Coast Terminal Radar Approach Control (TRACON) control room and operational quarters to accommodate the increased number of radar positions required to implement the John Wayne, Orange County Airport Radar Service Area (ARSA), and the Southern California Terminal Airspace Realignment (STAR) project. (Class II, Priority Action)(A-89-34)

Expedite the identification, selection, release, and transfer of air traffic controllers to the Coast Terminal Radar Approach Control in order to achieve the full staffing level authorized for the facility. (Class II, Priority Action)(A-89-35)

Conduct a staffing study to determine if aviation-oriented persons from the local area, such as retired pilots and military personnel, could be hired at the Coast Terminal Radar Approach Control to perform the duties of air traffic assistants so that developmental controllers presently performing those tasks can complete their training and work control positions. (Class II, Priority Action)(A-89-36)

Postpone implementation of the John Wayne, Orange County Airport Radar Service Area (ARSA) until the Coast Terminal Radar Approach Control staffing level of full performance level air traffic controllers has increased to 75 percent of the number authorized, and until the facility has been expanded or relocated to accommodate the increased number of radar positions associated with the ARSA project. (Class II, Priority Action)(A-89-37)

Postpone implementation of the Southern California Terminal Airspace Realignment (STAR) project and the transfer of control sectors 21 and 22 from Los Angeles Air Route Traffic Control Center to the Coast Terminal Radar Approach Control (TRACON) until the Coast TRACON staffing level of full performance level air traffic controllers has increased to 75 percent of the number authorized, and until the facility has been expanded or relocated to accommodate the increased number of radar positions associated with the STAR project. (Class II, Priority Action)(A-89-38)

Establish a national task force of airspace and procedures specialists--including controllers from the Coast Terminal Radar Approach Control (TRACON)--to evaluate, develop, and implement changes in airspace and procedures at Coast TRACON to facilitate a safer and more efficient flow of arrival and departure traffic and to reduce coordination workload among controllers and sectors. (Class II, Priority Action)(A-89-39)

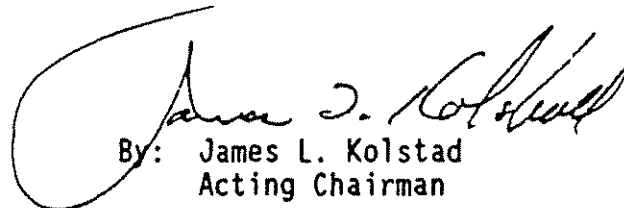
Monitor the training program at the Coast Terminal Radar Approach Control during the transition to increase controller staffing to ensure that it conforms with national policy and standards in accordance with FAA Order 3000.6, Training; the appropriate Instruction Program Guide (IPG); and FAA Order 3120.4G, Air Traffic Training. (Class II, Priority Action) (A-89-40)

Implement and provide adequate staff and funding for the Federal Aviation Administration's Office of Safety Quality Assurance, which is located organizationally under the Associate Administrator for Aviation Safety, to monitor the air traffic control system and to ensure that operational and managerial shortcomings are identified and corrected. (Class II, Priority Action)(A-89-41)

Review the use of pre-arranged or silent coordination procedures at air traffic control facilities where these procedures have been put into effect to determine if there is any degradation to safety. (Class II, Priority Action)(A-89-42)

Conduct a System Safety and Efficiency Review of the southern California basin area and the facilities that provide air traffic control services in this high traffic density area. The review should focus on the adequacy of regional airspace system plans--control facilities; equipment and technology; airways and airspace design; controller staffing and training; and operational procedures--to accommodate the current and forecast increase in air traffic. (Class III, Longer Term Action) (A-89-43)

KOLSTAD, Acting Chairman, BURNETT and NALL, Members, concurred in these recommendations. DICKINSON, Member, did not participate. LAUBER, Member, disapproved in part.


By: James L. Kolstad
Acting Chairman

Member Lauber filed the following comments:

There are several conclusions in the letter report that are not adequately supported by data or analysis. Two of these are discussed below.

(1) It is not at all demonstrated that "...these deficiencies and problems and the FAA's failure to address and correct them contributed to the operational error on February 13, 1989," as stated on page 2. There are no data presented that show that inadequate staffing, or improper training, or excessive use of overtime, or the size and physical condition of the facilities, or the FAA's Quality Assurance program had anything to do with this controller or this operational error. Furthermore, it is not obvious that any of these factors had anything to do with the other operational errors that have occurred recently at Coast TRACON. The only common factor would appear to be airspace complexity, and even that is not universally represented in these operational errors.

(2) It is not at all demonstrated that "...implementing the ARSA [at John Wayne] would be detrimental to safety," (p. 15), or that implementation of the STAR plan, including the transfer of sectors 21 and 22 from LAX center, will have an adverse impact on system safety in the affected airspace. Although it is true that the traffic volume will increase significantly, the FAA is adding equipment and staff in anticipation of this. More importantly, the whole objective of the STAR is to restructure terminal and en route airspace, presumably, in part, to streamline and simplify the airspace. I suspect that this could have a far greater impact on operations at Coast TRACON than any expected change in traffic volume. In any event, in the absence of specific data or analysis that show any relationship, adverse or beneficial, between these planned airspace projects and overall system safety in the LA basin, it seems unwise to do more than urge the FAA to carefully review the situation to make sure they understand what the net impact of implementing or delaying these projects will be, and then to take appropriate action.

I strongly support the recommendations regarding the Western-Pacific Region's Terminal Facility Consolidation and Relocation Project, and the recommendations dealing with the chronic workspace and personnel and staffing problems at this facility and elsewhere. From all appearances, a great deal of worthwhile effort has gone into the TLABS study, which appears to represent a viable long-term plan for dealing with many long-standing problems in southern California airspace. The FAA should be encouraged to move forth with these plans.

FAA DOCUMENTS REVIEWED
AND SELECTED QUOTATIONS

The National Transportation Safety Board reviewed the following documents as part of its special investigation of the Coast TRACON. The documents are listed chronologically by date issued. The quotations selected from each document are relevant to safety issues involving Coast TRACON.

Document 1. Memorandum dated January 15, 1986, from Air Traffic Manager, Coast TRACON to Acting Manager, Resource Management Branch, Western Pacific Region. Subject: Request for Increased Staffing at Coast TRACON.

A review of FAA policies concerning the establishment of ARSA's indicates that an ARSA may be recommended for both the John Wayne and Long Beach airports.

When the decision to implement these ARSA's is made, three additional radar control positions with associated radar handoff positions will be needed to handle the additional workload.

At that time, the TRACON will be operating nine radar positions--using the standard staffing formula, for two shifts plus one for midnight shift equals 37; $1.6 \times 37 = 59.2$ --current authorized controller staffing is 30.

Document 2. Memorandum dated May 27, 1986, from Air Traffic Manager, Coast TRACON to Director, Western Pacific Region, through Manager Air Traffic Division. Subject: Coast TRACON Program Review.

Morale has been negatively e[affected] over the past several years by what employees have perceived as poor planning, or a lack of planning, and the many decision changes on the part of management as to when and where this facility will be housed.

The physical plant is in a deplorable condition; the operations area is crowded; the enhanced target generator lab has been incorporated into the TRACON because of lack of space elsewhere; the controller break room modernization project, which has been stalled for nearly a year, leaves the room in a less than desirable condition.

The staff is crowded into inadequate space; training is hampered by not having dedicated classrooms; there is no available space for a computer based instruction lab.

Document 3. Memorandum dated August 4, 1986, from Air Traffic Manager, Coast TRACON and Manager, San Diego Airway Facilities Sector to Manager Air Traffic Division and Manager Airway Facilities Division. Subject: Project Submission for 1989 F & E Budget, WP N 2500.53.

The size and shape of the present TRACON operational quarters will not support the addition of three displays and the necessary associated equipment as recommended in current ARSA studies.

The physical condition of both the control room and the equipment room is poor and not conducive to a professional work environment; the equipment room is overcrowded; equipment items have been installed in aiseways as there is not sufficient space available elsewhere in the room.

We concluded that major deficiencies exist in all areas of the facility in its present location; we request that a Regional Multi-disciplinary Team be sent to Coast TRACON to conduct their evaluation.

Document 4. Western Pacific Region Staff Study dated October 1986. Subject: Establish Regulated Airspace at the John Wayne and Long Beach Airports.

The recommendation of this study is that an Airport Radar Service Area be established at the John Wayne and Long Beach airports, but prior to any airspace action Coast TRACON, the parent approach control facility, requires relocation to a site that meets current FAA design standards for a high activity Level V TRACON.

The size and shape of the present TRACON operational quarters will not support the addition of three additional displays and associated equipment as recommended in this study; sufficient space is not available to accommodate new equipment in the operational control consoles, there is not enough existing space to provide adequate support for OJT training at all control positions.

Airspace action at John Wayne or Long Beach would dictate a major expansion of space and services at the TRACON; the existing TRACON, however, is unacceptable for the provision of present services; additional required expansion of equipment and resources is impossible; prior to acceptance of any added task services, the TRACON will need to be relocated to a site that meets the FAA's design standards for a high activity level TRACON.

The current authorized controller complement is 36 [and]; there are 31 on board (19 FPLs and 12 in training); with the decision to establish any form of regulatory airspace at either John Wayne or Long Beach, the TRACON will qualify for an upgrade to a Level V TRACON and will necessitate an increase in controller complement from 36 to 61.

Document 5. FAA Administrator's Personal Visit and Tour of Coast TRACON, October 1986.

The FAA Administrator made a personal visit to Coast TRACON during October 1986. He was escorted on a tour of the facility by the Manager of the TRACON. Following the tour, the Administrator met with the Manager to discuss ATC operations, the facility and the operational performance of the TRACON.

Document 6. Memorandum dated December 23, 1986, from Air Traffic Manager, Coast TRACON to Director Western-Pacific Region through Manager, Air Traffic Division. Subject: Coast TRACON Major Program Review.

The traffic activity at Coast TRACON continues to climb; current controller staffing is 20 full performance level controllers with an authorized complement of 36.

We continue to have a heavy use of overtime brought on by those staffing problems and by the increasing traffic workload; nearly all employees are working a six day week.

Low morale is evident due to the staffing shortage and due to the perception of poor management and planning; e.g., the plans for TRACON relocation and consolidation, and the subsequent cancellation of those plans.

A recently completed staff study has recommended an Airport Radar Service Area around both the John Wayne and Long Beach airports.

The existing operations and administrative quarters at Coast are unacceptable for the performance of current operations and would be compounded by the additional traffic resulting from any airspace action.

Expansion of existing facilities at Coast is physically impossible; the only cost effective alternative would be to relocate the TRACON to another site which is capable of expansion, and one that meets the FAA's design standards for a Level V TRACON.

Document 7. Memorandum dated January 9, 1987, from Manager, Quality Assurance Staff to Manager, Air Traffic Division. Subject: Full Facility Check and Evaluation of Coast TRACON, California, December 2-5, 1986.

The facility is in dire need of rehabilitation or relocation; the control room is cramped, dark, and in need of carpet; the break room is small and needs to be refurbished; the administrative areas are small; office space is at a premium.

Because the facility is in such disrepair and poorly maintained, controllers are very critical of the lack of interest shown by the FAA and the USMC in resolving this situation.

The fact that the facility is in a critical staffing posture creating a situation whereby inexperienced controllers are working high activity radar positions unassisted by handoff personnel on a scheduled six day work week is a significant problem that must be addressed immediately and with creativity.

The facility being located on a military base and the lack of physical improvements to the working environment is creating a morale problem among the controller and operational supervisory workforce.

Document 8. Southern California Terminal Airspace Realignment (STAR) Project Outline dated May 14, 1987.

First is the need for one integrated Terminal IFR Facility to manage the Southern California approach and departure airspace.

There is perhaps no decision that will be made in the next 20 years for the Southern California area that will have as great an impact on our ability to work air traffic as the location of a Terminal IFR Facility.

[The] following recommendations are given in a chronological order to show how SCARP will evolve over a four year period:

- ...three month[s]--Western-Pacific Region will decide on a Terminal IFR Facility.
- ...six month[s]--Western-Pacific Region will complete site selection for the Terminal IFR Facility.
- ...twelve month[s]--Western Pacific Region will complete a lease on the Terminal IFR Facility.
- ...thirty months--Los Angeles TRACON moves to the Terminal IFR Facility.
- ...thirty-six months--Coast TRACON will move to the Terminal IFR Facility.

Document 9. Coast TRACON Implementation Plan dated November 1987. Subject: Establish Airport Radar Service Area at the John Wayne Orange County and Long Beach Airports (DRAFT).

The FAA's TRACON has approximately 304 square feet of working area; Order 6480.17 recommends between 800 and 1200 square feet for a Level V TRACON.

The building that houses the operational and administrative quarters has many major defects which were revealed through an evaluation by facility staff personnel and noted in prior studies.

A long overdue rehabilitation project of the building by the Marine Corps, that would have corrected some of the lesser deficiencies, has been postponed indefinitely due to concerns by the Marine Corps that it lacks adequate earthquake standards.

Document 10. Memorandum dated July 28, 1988, from Air Traffic Manager, Coast TRACON to Manager, Air Traffic Division. Subject: Orange County ARSA and STAR Project.

Coast [TRACON] will be responsible for operation of the ARSA at John Wayne and for increased control responsibility and assignment of the current Los Angeles ARTCC Sector 21 and 22 airspace (STAR).

Staffing remains a critical issue in determining when either of the current projects will be implemented; response to recent controller bids remains a problem; response to recent controller bids brought in only 19 bids, few have had any previous radar experience, this lack of experience increases time in training; release dates for selected individuals is also a continuing problem--there is sometimes as much as a year between selection of bidders and their arrival at the facility.

If the John Wayne ARSA is implemented on schedule in 7/89, the earliest possible date for the STAR project will be 4/90; if the John Wayne ARSA is not implemented first, then the earliest date that staffing resources could be available for the STAR project would be 9/89.

Document 11. Memorandum dated August 9, 1988, from Manager, Air Traffic Division to Dennis Decker, Coast TRACON. Subject: Information: Administrator's Hotline Item, Control No. 8807280002, Mr. Dennis Decker.

We share your concern about scheduling of overtime and shortage of full performance level controllers at Coast TRACON; we anticipate the end of compulsory overtime assignments within 36 months.

There are several reasons why it will take time to get staffing at Coast TRACON up to where you will not have to work overtime. There are nine radar and nine associated handoff positions for which these 28 developmentals must certify; training cannot be conducted on all positions at the same time since there are not enough OJT instructors to accomplish the task.

Additionally, there are two major airspace programs that will soon be implemented for which the current controller work force must be trained; these programs include the ARSA for the Orange County airports and the STAR project.

Document 12. Management Review of August 28-September 2, 1988. Subject: Coast TRACON's Training and Resource.

Coast TRACON has an extremely complex airspace structure; the facility's traffic flow and significant amount of enroute traffic requires a considerable amount of in-house coordination.

Operational delays are occasionally excessive due to the amount of coordination required between positions and facilities.

With the projected increase in airspace and the additional services associated with the John Wayne ARSA implementation, Coast will expand from six to ten dedicated control positions plus associated handoffs; FPL certification requirements must be reduced to meet program objectives.

Document 13. Memorandum dated October 3, 1988, from Assistant Manager, Air Traffic Division to Manager, Coast TRACON. Subject: Facility Training and Resource Management Requirements.

Implement an action plan requiring a daily minimum of five and one half hours of time on position per controller; require a daily minimum of four hours of live OJT training per Developmental Controller who is in an accelerated training status.

Establish two areas of specialization which will reduce FPL certification requirements.

Review sick leave usage and identify the efforts you are taking to reduce abuse.

Document 14. Memorandum dated November 3, 1988, from Manager, Evaluation Branch to Manager, Air Traffic Division. Subject: Follow-up Evaluation of Coast TRACON, October 27-28, 1988.

Even though several improvements have been made in the break room and facility offices, the control room area remains very cramped and dark.

With the additional acquired airspace, ARSA's, and control position requirements, the facility does not appear to have room to expand or accommodate a larger workforce (7210.3H para 251).

Document 15. Summary Report dated February 24, 1989, from Planning Requirements and Automation Branch, Western-Pacific Region to Office of Associate Administrator for Air Traffic. Subject: Environmental and Space Conditions at Coast TRACON.

In 1983 the Western-Pacific Region selected Coast TRACON to be relocated from El Toro MCAS to Los Angeles ARTCC; Coast TRACON was selected because of its location and environmental condition (facility in very poor condition); a staff study was completed and initially approved but later abandoned.

After the decision was made to remain at El Toro MCAS, the FAA began a dialog with El Toro Marine Corps personnel to modernize and improve the environmental conditions at the facility.

In summary, the overall cooperation of the personnel at the El Toro MCAS is good; however, because of the overall mission of the USMC and their budget cycle, it has been difficult to get results.

Document 16. Coast TRACON (NZJ) Onsite Review With NTSB 2/16/89 to 2/18/89. Subject: Report of an onsite operational error review at Coast TRACON conducted by the Office of Air Traffic Evaluations and Analysis (ATS-220). Report release date--April 14, 1989.