



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: June 16, 2000

In reply refer to: A-00-32 through -40

Honorable Jane F. Garvey
Administrator
Federal Aviation Administration
Washington, D.C. 20591

On April 3, 1998, about 0821 eastern standard time, US Airways flight 920 (USA920), a McDonnell-Douglas DC-9, and Air Canada flight 703 (ACA703), an Airbus Industries A-319, nearly collided above the intersection of runways 22 and 31 at LaGuardia Airport (LGA), Flushing, New York (see figure 1). Both aircraft were scheduled passenger flights; USA920, as a domestic carrier, was operating under 14 Code of Federal Regulations (CFR) Part 121, and ACA703, as a foreign air carrier, was operating under 14 CFR Part 129 while in U.S. airspace. The incident occurred in visual meteorological conditions, and no injuries were reported.

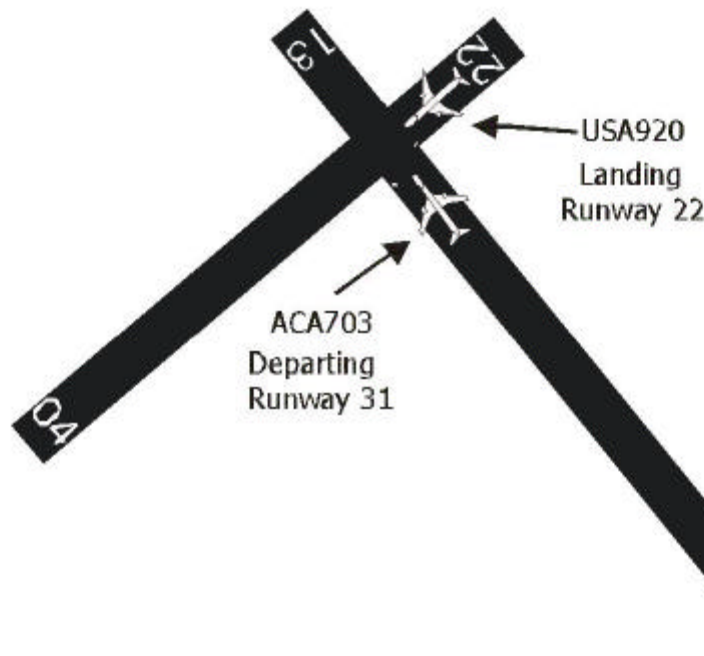


Figure 1. Approximate aircraft orientation for April 3, 1998, near midair collision (NMAC) at LGA

At the time of the incident, aircraft landing at LGA were using runway 22 and departing aircraft were using runway 31. Runway 22 intersects runway 31 approximately 5,300 feet from the threshold of runway 31. According to the LGA tower local controller, USA920 was executing a visual approach to runway 22 and had been cleared to land. The local controller then cleared ACA703 for takeoff from runway 31. Approximately 30 seconds later, he reassessed the traffic situation and decided that ACA703 would not clear the intersection before USA920 crossed the threshold of runway 22.¹ The local controller then instructed USA920 to go around.² ACA703 was airborne and climbing before it reached the intersection with runway 22; consequently, USA920 and ACA703 were in the air when their paths crossed. The captain of USA920 saw ACA703 on his left and alerted the first officer, who was flying the airplane. The first officer immediately took evasive action to avoid a collision. Radar data were not available because both airplanes were below radar coverage at the time of the incident; however, in the NMAC report he filed with the FAA, the captain of USA920 estimated that his aircraft passed 85 feet below ACA703 with horizontal separation of 75 feet. The local controller estimated the separation distance at 20 feet.

On January 23, 1998, about 1819 eastern standard time, US Airways flight 1186 (USA1186), a Boeing 737, and American Airlines flight 350 (AAL350), a McDonnell-Douglas MD-80, nearly collided at the intersection of LGA runways 4 and 13 (see figure 2). The reported weather was ceiling 600 feet and visibility 2 miles. According to an NMAC report filed by the captain of USA1186, his aircraft was on a 2.5 mile final for an instrument landing system approach to runway 13 when the local controller cleared AAL350 for takeoff from runway 4. The USA1186 captain reported that AAL350 did not pass through the intersection of runways 4 and 13 until after USA1186 had crossed the runway 13 threshold. The runway 13 threshold is 1,700 feet from the intersection with runway 4 or 7.5 seconds flying time at an estimated approach speed of 135 knots.

¹ Federal Aviation Administration (FAA) Order 7110.65, "Air Traffic Control," section 3-10-4, "Intersecting Runway Separation" states in part, "Separate an arriving aircraft using one runway from another aircraft using an intersecting runway or a nonintersecting runway when the flight paths intersect by ensuring that the arriving aircraft does not cross the landing threshold or flight path of the other aircraft until one of the following conditions exists: ...The preceding aircraft has departed and passed the intersection/flight path or is airborne and turning to avert any conflict."

² The FAA Pilot/Controller Glossary defines a go-around as "instructions for a pilot to abandon his approach to landing. Additional instructions may follow. Unless otherwise advised by air traffic control [ATC], a visual flight rules aircraft or an aircraft conducting a visual approach should overfly the runway while climbing to traffic pattern altitude and enter the traffic pattern via the crosswind leg. A pilot on an instrument flight rules flight plan making an instrument approach should execute the published missed approach procedure or proceed as instructed by ATC."

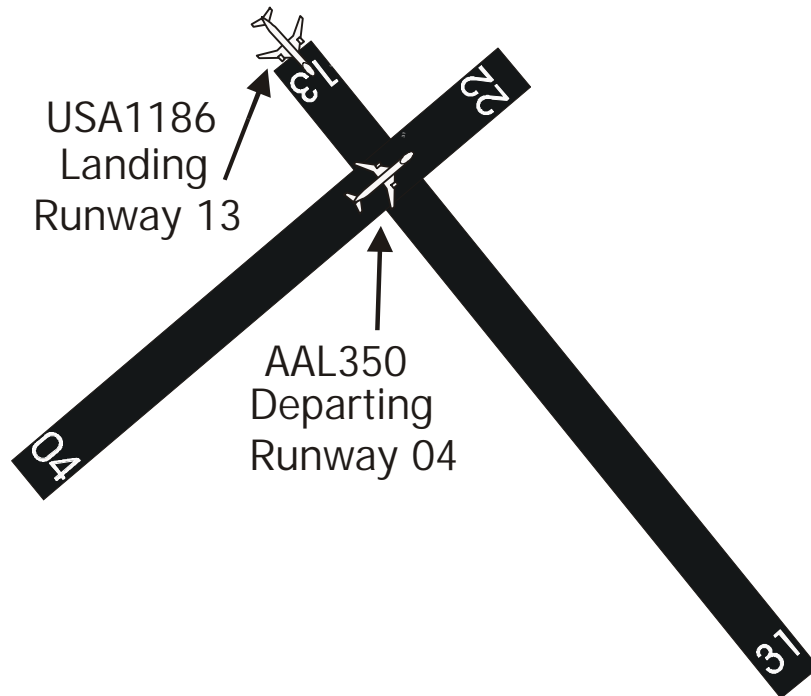


Figure 2. Approximate aircraft orientation for January 23, 1998, NMAC at LGA

The captain of AAL350 stated that he looked to his left as his aircraft passed through the runway 4/13 intersection and saw USA1186 approximately over the runway 13 threshold. Recorded air traffic control (ATC) communications indicate that after departure, one of the pilots of AAL350 said to the local controller, “that was close.”

After USA1186 cleared the runway, the ground controller commented to the flight crew, “close call, huh?” One of the pilots replied in a laughing manner, “it sure was,” then asked, “what’s going on?” The ground controller replied, “I’m not sure, he [the local controller] just took the shot and, whew.” The ground controller then said, “it was a slow roller, sir,” (suggesting that the pilot of AAL350 was tardy in responding to the takeoff clearance). The USA1186 pilot then asked what kind of airplane AAL350 was; after being told it was an MD-80, he replied, “okay, thank you, that’s what we thought.” The ground controller then asked, “what color were his eyes?” The pilot replied, “it was pretty dark everywhere out there I couldn’t quite see his eyes

During the investigation of the April 1998 incident, the National Transportation Safety Board requested that LGA tower personnel provide it copies of all formal NMAC reports filed by pilots since the beginning of the calendar year along with voice recordings of the control positions involved in the incidents. Examination of this material revealed the January NMAC report. Quality assurance personnel at the Federal Aviation Administration’s (FAA) eastern regional office had reviewed the pilot’s report and associated controller statements but had not replayed the recorded ground control communications. The regional office investigators, therefore, were not aware of the content of the controllers’ conversation with the crew of USA1186 and the seriousness of the incident.

The Safety Board's investigation of these incidents has identified several areas of concern that the FAA should address. Although the local controllers in both incidents were reportedly applying visual separation procedures, those procedures nonetheless resulted in unsafe situations. Both incidents were reported by the flight crews involved in them as NMACs, but LGA tower management did not report them as operational errors or as any other type of incident that would warrant internal notification to Air Traffic Service management.

Air Traffic Control Operational Procedures

Air traffic controllers are required to separate aircraft by using standards contained in the ATC handbook. The particular standard to be applied depends on the type of operation in progress. The local controller involved in the April 1998 incident stated that under the runway configuration in use at LGA at the time, the separation standard applicable to USA920 and ACA703 required that ACA703, departing from runway 31, pass through the runway 22/31 intersection before USA920 crossed the runway 22 threshold. When he decided that the required runway separation would not exist if he allowed USA920 to land, the local controller instructed its flight crew to go around. With both aircraft airborne, he was then required to provide visual separation between USA920 and ACA703; the runway-based separation standards no longer applied. However, there are no specific FAA standards for minimum horizontal and vertical separation distances applicable to tower use of visual separation between airborne aircraft. Further, the go-around instruction issued in the April NMAC incident to avoid violating runway separation requirements may have, in fact, increased the level of risk. Had the local controller involved in the January NMAC instructed USA1186 to go around, an incident very similar to the April NMAC might have occurred.

According to the LGA tower supervisor and the local controller involved in the April incident, LGA tower controllers are taught during on-the-job training that no aircraft should be cleared for takeoff from runway 31 once a turbojet arrival is within 2 miles of the runway 22 threshold. The supervisor characterized this practice as a "technique," rather than a procedure that is mandatory or documented in the facility's standard operating procedures. The local controller stated that USA920 was approximately 2 to 2.5 miles from the runway 22 threshold when he cleared ACA703 for departure; however, radar data indicate that USA920 was about 1.6 miles from the runway 22 threshold when the local controller issued the takeoff clearance to ACA703 and 2,000 feet from the runway 22 threshold at an altitude of 200 feet when the controller issued the go-around instruction.

By the time the Safety Board initiated the investigation of the April 1998 incident, radar data for the reported January 1998 NMAC between USA1186 and AAL350 were no longer available; therefore, investigators were unable to confirm USA1186's proximity to runway 13 when AAL350 was cleared for takeoff from runway 4. However, the circumstances of both incidents suggest that the spacing being used by LGA tower personnel between arriving and departing aircraft using intersecting runways may not provide an adequate margin for error in controller technique.

According to the FAA, in response to the April 1998 incident, all FAA terminal supervisors and controllers, including those at LGA, received additional training on intersecting runway operations and incident reporting requirements. However, the rules and procedures for application of visual separation remain unchanged, preserving the possibility that aircraft engaged in operations on intersecting runways may come within unsafe proximity. By the time a controller determines that two aircraft operating on intersecting runways will not meet runway separation requirements, it may be too late for an approaching aircraft to execute a go-around maneuver as a safe alternative to landing in violation of runway separation standards. A collision was averted in the April 1998 incident mainly because of last-second maneuvers by the crew of USA920.

Situations in which ATC and flight crews are essentially without safe alternatives cannot be permitted to occur; air traffic procedures must allow sufficient spacing to guarantee adequate separation between converging aircraft. It appears that the 2-mile converging operations spacing standard used at LGA may be inadequate to prevent incidents such as those described in this letter. Therefore, the Safety Board believes that the FAA should amend LGA tower procedures to extend the spacing standard used to separate converging arrivals and departures to a distance greater than 2 miles. Further, because an undocumented facility practice was inadequate to ensure proper separation during intersecting runway operations under visual flight conditions at LGA and because this situation may not be unique to LGA, the Safety Board believes that the FAA should review intersecting runway operations at all airports served by scheduled air carriers. The review should determine, for instrument and visual operations, if a formal restriction on clearing departing aircraft for takeoff when an arriving aircraft is a specified distance from the threshold would reliably provide safe separation between arriving and departing aircraft on intersecting runways.

FAA Order 7110.65 does not require terminal controllers to issue traffic advisories to pilots when applying visual separation between arriving or departing aircraft on intersecting runways. Accordingly, the local controllers in the January and April 1998 incidents did not provide advisories about traffic using the intersecting runway to any of the crews involved. If the controllers had done so, the crews may have been able to take more timely evasive action and may have done so with less risk. To improve pilots' awareness of other traffic, reduce the risk of startling crews during a critical phase of flight, and permit advance consideration of an alternate course of action should one become necessary, controllers should be required to advise pilots involved in intersecting runway operations of the location and direction of flight of any crossing traffic. Therefore, the Safety Board believes that the FAA should amend FAA Order 7110.65, "Air Traffic Control," to require that controllers provide traffic advisories to the flight crew of each aircraft operating on intersecting runways where flightpaths converge. Further, the Safety Board believes that the FAA should amend the Aeronautical Information Manual to inform pilots that controllers will issue traffic information about aircraft operating on intersecting runways where flightpaths converge and explain the rationale for the procedure.

Reporting and Investigation of ATC-Related Events

The local controller involved in the April 1998 incident told Safety Board investigators that he informed the tower supervisor about the NMAC, even though the supervisor was standing

directly behind him monitoring the operation from the coordinator position.³ The supervisor told Safety Board investigators that he first saw USA920 near the departure end of runway 22, which was after the aircraft had crossed ACA703's path. Despite the controller's report, the supervisor decided not to conduct any further inquiry. This decision concerns the Safety Board because, even if the supervisor did not actually see the near-collision, other indicators should have alerted him that an unsafe incident had occurred. For example, he received calls expressing concern about the event from USA920's captain, the FAA's eastern regional office, and the chief pilot's office of US Airways. Even after this, he did not investigate further, and the incident was not reported to FAA management.

On the basis of other incidents that have occurred since the NMAC incidents at LGA, the Safety Board remains concerned about the adequacy of the FAA's processes for identifying and categorizing ATC errors. For example, on June 22, 1998, the captain of American Airlines flight 758 (AAL758), a Fokker F-100, filed a formal report with the ATC tower at Tulsa International Airport (TUL), Tulsa, Oklahoma, after experiencing what he believed to be an NMAC. The Safety Board learned that a Cessna 172 had been cleared for takeoff from runway 18R with ATC approval for an eastbound turn on course, crossing the extended centerline of runway 18L. AAL758 was then cleared for takeoff from runway 18L. According to the captain's report, he was retracting the landing gear when the local controller provided a traffic advisory on the Cessna. The captain sighted the Cessna about 500 feet above ground level, just as AAL758's Traffic Alert and Collision Avoidance System issued a resolution advisory alerting the crew to the potential collision threat. AAL758 turned right to avoid the Cessna and continued to climb.

In his NMAC report, the captain estimated that the aircraft were separated by 100 feet vertically and 200 feet laterally. Although this incident clearly compromised safety of flight and was directly related to unacceptable ATC performance, the FAA processed the incident as an NMAC rather than as an operational error⁴ because Tulsa tower personnel and the FAA's Air Traffic Division headquarters staff contend that separation standards were met. NMACs not associated with an operational error are investigated by FAA flight standards personnel, who primarily focus on pilot performance rather than possible ATC shortcomings. It appears from the two incidents at LGA and the one at TUL that there is no FAA requirement to investigate and report on the ATC aspects of NMAC incidents that occur while controllers are applying visual separation.

³ FAA Order 7210.3, "Facility Operation and Administration," section 5-2-7, states in part, "Any employee who is aware of an occurrence that they believe to be an operational error/deviation shall immediately report that occurrence to the supervisor/manager-in-charge, or in their absence, any available supervisor or controller-in-charge."

⁴ An operational error is an ATC action that results in loss of required separation between aircraft. An operational deviation occurs when a controller fails to comply with a rule, but the error does not result in a loss of separation between aircraft. Allowing an aircraft to enter restricted airspace without proper coordination is one example of an operational deviation. Either type of incident triggers an internal ATC investigation and may result in retraining or disciplinary action against the responsible controller. The LGA and TUL incidents do not technically qualify as operational errors or deviations because no separation standard or mandatory procedure was violated.

Monitoring of the quality of air traffic services could be greatly enhanced by the establishment of a consistent process for handling incidents that may expose ATC performance deficiencies. Such incidents include operational error reports, pilot deviation reports, NMAC reports involving at least one aircraft in contact with ATC, complaints from pilots or passengers about ATC services, execution of evasive action maneuvers by aircraft under ATC control, issuance of emergency control instructions to resolve potentially hazardous situations, or other reports related to the safety of the ATC system received from internal or external sources. A central review function could be assigned responsibility for screening all such incidents to ensure that issues of concern are identified and addressed by the appropriate FAA organizations.

The FAA Office of Accident Investigation may be an appropriate location for this evaluation function because it is not part of the Air Traffic Service and can make independent decisions on the evaluation and classification of incidents. Therefore, the Safety Board believes that the FAA should formally evaluate all reported safety-related events for potential ATC performance deficiencies and assign responsibility for the classification of all such events that occur within the National Airspace System to an internal oversight function that is independent of the Air Traffic Service.

Near Midair Collision Reporting

FAA Order 8020.11, "Aircraft Accident and Incident Notification, Investigation, and Reporting," states that, "control personnel shall not ask flight crewmembers if they intend to file a[n NMAC] report." The Safety Board notes that controllers in contact with aircraft involved in NMAC incidents are often the first official recipients of information that a potentially hazardous situation has occurred; therefore, they are in a position to help ensure that an NMAC is reported and investigated. The Board is concerned that the FAA's policy may negatively affect the number of NMAC incidents that are reported. Therefore, the Safety Board believes that the FAA should amend FAA Order 7110.65, "Air Traffic Control," to require that controllers ask any member of a flight crew receiving ATC services who expresses concern about the proximity of another aircraft if he or she desires to file a formal NMAC report. Further, although the current reporting form does establish that one or both aircraft involved in an NMAC were in contact with ATC, it does not provide information on ATC's specific role and actions in the event, if any. To help identify incidents for which investigation into ATC performance or procedures may be needed, the Board believes that the FAA should modify FAA Form 8020-21, "Preliminary Near Midair Collision Report," to include a section describing ATC actions relevant to the incident.

Air Traffic Control Data Retention

FAA Orders 7210.3, "Facility Operation and Administration," and 8020.11, "Aircraft Accident and Incident Notification, Investigation, and Reporting," require that FAA radar data and recorded voice communications be retained for a period of 15 days before the recording media is returned to service. Although the current 15-day retention limit did not adversely affect the Safety Board's investigation of the incidents at LGA and TUL, it has limited the information available for the investigation of other incidents. The Board is concerned that it may continue to do so in the future. Additionally, under International Civil Aviation Organization procedures,

foreign air carriers and their respective governmental agencies have the right to request information for their investigations of incidents involving foreign aircraft that were operating under FAA control. Under current requirements, the 15-day retention period may expire by the time such a request reaches the Safety Board through investigative channels.

The Safety Board notes that currently available recording and storage technology should enable the FAA to lengthen the retention period for operational data beyond 15 days. For example, the FAA is now able to use digital voice recording systems and, in most facilities, personal computer software to quickly retrieve and review recorded radar data. This technology has also made it possible to remove from service older recording media, such as reel-to-reel recorders and large computer disk packs. Because of the compact size of modern storage media, additional space requirements would be minimal and should not impose an undue burden on facilities required to retain additional data.

The Safety Board considers an extended retention period of 45 days to be adequate to meet investigative needs for data. Therefore, the Safety Board believes that the FAA should amend FAA Orders 7210.3, "Facility Operation and Administration," and 8020.11, "Aircraft Accident and Incident Notification, Investigation, and Reporting," to require that ATC facilities retain recorded voice communications and radar data for 45 days.

Use of Unrecorded Telephone Lines in ATC Facilities

After landing, the captain of USA920 asked ATC to provide a telephone number for the LGA tower and was given a number for an unrecorded line.⁵ When he called the tower, the captain asked to speak with the tower supervisor to discuss the incident. According to the supervisor's description of the conversation, the captain asked what had happened and why his flight was instructed to execute a go-around. The supervisor said that he told the captain that ACA703 had been slow in departing. The captain then asked if ACA703's crew knew that USA920 was on final approach for runway 22. The supervisor replied that he could not answer the question.⁶ According to the supervisor, USA920's captain then asked him to tell the local controller that he had done a good job.

In a subsequent telephone interview with Safety Board investigators, the captain of USA920 refuted the supervisor's account of the conversation. According to the captain, the supervisor told him that the local controller was distracted by a spilled cup of coffee after clearing ACA703 for takeoff. When the local controller looked up, he decided that ACA703 would not pass through the runway intersection before USA920 crossed the threshold of runway 22. The local controller then instructed USA920 to go around. According to the captain's account, the supervisor complimented him on the "outstanding job of missing ACA703" and on the "good job

⁵ FAA Handbook 7210.3, "Facility Operation and Administration," states, "Air traffic facilities shall record operational communications to the maximum extent practicable." Telephone calls on nonoperational lines normally are not recorded.

⁶ In a subsequent interview with Safety Board investigators, the supervisor denied witnessing the NMAC and stated that he had not discussed the incident with the controller before speaking with the captain; therefore, he was not aware of the details of the incident.

of getting back around to land.” Because the conversation was not recorded, the discrepancies between the two accounts of the conversation could not be resolved conclusively.

After the initial investigation at LGA, the Safety Board informed the manager of the Air Traffic Services evaluation and investigations staff at FAA headquarters of the discrepancies between the LGA tower supervisor’s account of the conversation and the account provided by the captain of USA920. The supervisor was subsequently relieved of his management duties for 10 days during an internal FAA investigation, which found that the incident had not been properly reported or investigated.

The Safety Board is concerned that valuable information about the April 1998 incident was lost because the conversation between the tower supervisor and the captain of USA920 was not recorded. Recording conversations of personnel from ATC facilities that pertain to an accident, incident, or ATC performance creates an official record that can be used in case the event is investigated. Therefore, the Safety Board believes that the FAA should amend FAA Order 7210.3, “Facility Operation and Administration,” to require that all telephone conversations with personnel at ATC facilities relating to an aircraft accident, incident, or ATC performance shall be conducted on recorded telephone lines.

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Amend LaGuardia tower procedures to extend the spacing standard used to separate converging arrivals and departures to a distance greater than 2 miles. (A-00-32)

Review intersecting runway operations at all airports served by scheduled air carriers. The review should determine, for instrument and visual operations, if a formal restriction on clearing departing aircraft for takeoff when an arriving aircraft is a specified distance from the threshold would reliably provide safe separation between arriving and departing aircraft on intersecting runways. (A-00-33)

Amend Federal Aviation Administration Order 7110.65, “Air Traffic Control,” to require that controllers provide traffic advisories to the flight crew of each aircraft operating on intersecting runways where flightpaths converge. (A-00-34)

Amend the Aeronautical Information Manual to inform pilots that controllers will issue traffic information about aircraft operating on intersecting runways where flightpaths converge and explain the rationale for the procedure. (A-00-35)

Formally evaluate all reported safety-related events for potential air traffic control performance deficiencies and assign responsibility for the classification of all such events that occur within the National Airspace System to an internal oversight function that is independent of the Air Traffic Service. (A-00-36)

Amend Federal Aviation Administration Order 7110.65, "Air Traffic Control," (ATC) to require that controllers ask any member of a flight crew receiving ATC services who expresses concern about the proximity of another aircraft if he or she desires to file a formal near midair collision report. (A-00-37)

Modify Federal Aviation Administration Form 8020-21, "Preliminary Near Midair Collision Report," to include a section describing air traffic control actions relevant to the incident. (A-00-38)

Amend Federal Aviation Administration Orders 7210.3, "Facility Operation and Administration," and 8020.11, "Aircraft Accident and Incident Notification, Investigation, and Reporting," to require that air traffic control facilities retain recorded voice communications and radar data for 45 days. (A-00-39)

Amend Federal Aviation Administration Order 7210.3, "Facility Operation and Administration," to require that all telephone conversations with personnel at air traffic control (ATC) facilities relating to an aircraft accident, incident, or ATC performance shall be conducted on recorded telephone lines. (A-00-40)

Chairman HALL and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in these recommendations.

By: Jim Hall
Chairman