



# National Transportation Safety Board

Washington, D.C. 20594

## Safety Recommendation

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**Date:** July 17, 2008

**In reply refer to:** A-08-51 and -52

The Honorable Robert A. Sturgell  
Acting Administrator  
Federal Aviation Administration  
Washington, D.C. 20591

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On November 6, 2007, about 1148 eastern standard time, a Cessna 208B, N701SE, registered to RJR Transport Logistics, LLC, and operated by Florida Air Cargo, Inc., and a Beech E18S, N18R, registered to Aircap Management Company, Inc., and operated by Island Air Service, collided on taxiway C at the intersection with taxiway N at Opa Locka Airport (OPF), Miami, Florida. There were no injuries; both airplanes sustained substantial damage. Both airplanes were operated under 14 *Code of Federal Regulations* Part 135 as cargo flights. Visual meteorological conditions prevailed.

The National Transportation Safety Board's review of recorded voice communications revealed that, at 1147:48, the OPF ground controller cleared N18R to reposition from the parking area at the east end of the airport to the fuel farm, via taxiways P, E, and T. (See figure 1 for a diagram of taxiways and runways at OPF.) The ground controller did not instruct N18R to hold short of any taxiways. In a postaccident interview, the pilot of N18R, who was on ground control frequency, stated that he taxied at a slow rate of speed and that he did not hear any transmissions made to N701SE. The pilot of N18R said that, as he was taxiing across taxiway C, he felt a large bump.

The recorded voice communications also revealed that, at 1148:37, the OPF local controller instructed N701SE to taxi via taxiway C to U.S. Customs after landing on runway 9L and to remain on the local control frequency. In a postaccident interview, the pilot of N701SE stated that he crossed taxiway P, saw N18R to the left out the corner of his eye, and tried to pull away by turning right but "was impacted."

According to interviews with the local controller and the ground controller working in the temporary air traffic control tower (ATCT), neither of them observed the collision. In addition, although N701SE was entering the ground controller's area of responsibility, the local controller

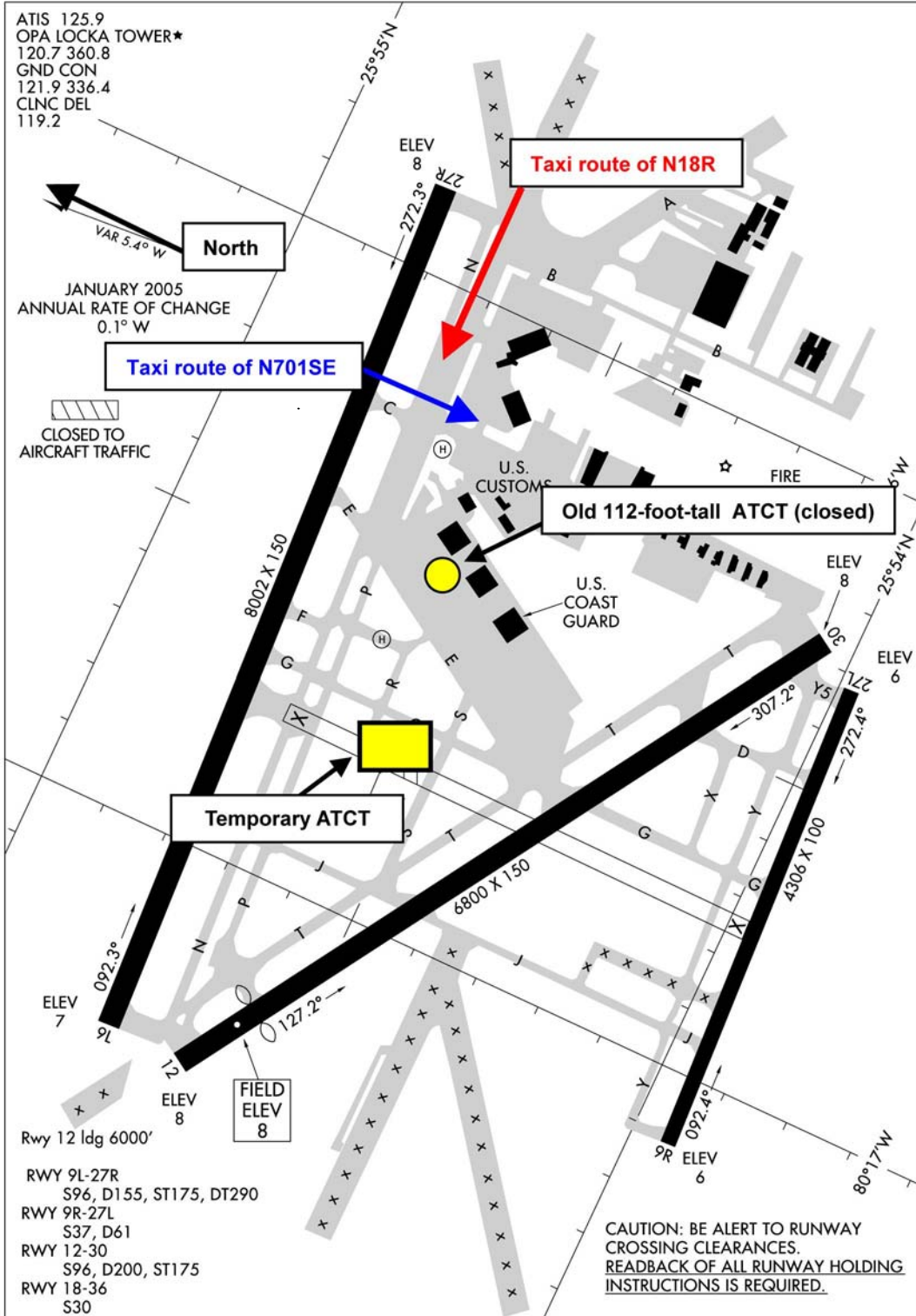


Figure 1. Diagram of Opa Locka Airport.

did not coordinate with the ground controller,<sup>1</sup> as required by Federal Aviation Administration (FAA) Order 7110.65, paragraph 3-1-4, “Coordination between Local and Ground Controllers.” Both aircraft should have been on ground control frequency, but the local controller directed N701SE to remain on the local control frequency. Thus, the two aircraft involved in the accident were not initially aware of each other because N18R was on ground control frequency and N701SE was on local control frequency. The local controller’s failure to coordinate with the ground controller, as required by FAA Order 7110.65, was addressed via refresher training for the local controller. Additionally, on November 14, 2007, an OPF ATCT operational directive was issued that specifies where radio communications transfers between local control and ground control must occur.

Although the investigation is ongoing, the Safety Board has identified deficiencies in the temporary OPF ATCT’s compliance with FAA Order 6480.4, “Air Traffic Control Tower Siting Process,” and in OPF air traffic control’s (ATC) ability to provide ATC services from its temporary ATCT. The Safety Board’s investigation, thus far, has revealed that the temporary ATCT at OPF has numerous deficiencies (some of which were factors in the November 6, 2007, accident), which contribute to an overall unsafe operating environment.

### **Opa Locka Airport’s Temporary Air Traffic Control Tower**

OPF conducts about 130,000 operations annually. On May 12, 2006, a temporary ATCT was installed as an interim measure until construction of a new 226-foot ATCT was complete. According to the OPF airport manager, the construction of the new ATCT was to commence by December 2006 and was estimated to be completed approximately 2 years later. As of February 2008, construction had not started. The OPF airport manager estimated that construction of the new ATCT would begin in June 2008, which would push estimated completion to June 2010. According to the OPF ATCT manager, funding for the new ATCT appears to be in place; however, difficulties in securing the appropriate county building permits have caused delays in constructing it. According to ATC personnel and the airport manager, the temporary ATCT in place at OPF is to remain in place and be utilized as the operating ATCT until the new ATCT is built.

The temporary ATCT was installed after the old, 112-foot ATCT was condemned because of inadequate fire-suppression capability. The temporary ATCT is approximately 29 feet tall and consists of a trailer with a modified ATCT cab fixed to four large metal shipping/storage containers stacked two wide and two tall. (See figure 2 for a photograph showing the temporary ATCT’s design.) The ATCT cab contains a local control position and a ground control position; the ground control position also provides flight data/clearance delivery functions.

FAA Order 7110.65 prescribes ATC procedures and phraseology for use by tower controllers to provide for the safe, orderly, and expeditious movement of aircraft to and from the

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<sup>1</sup> The local controller has primary responsibility for operations conducted on the active runway(s) and must control the use of those runways. The ground controller is responsible for safe aircraft and vehicle movement on the defined airport movement areas, other than the active runway(s).



**Figure 2.** Photograph of Opa Locka Airport's temporary air traffic control tower (old tower visible in the background).

runways via movement areas.<sup>2</sup> Safe, orderly, and expeditious movement is best accomplished from an ATCT that is tall enough to give the controller an unencumbered direct line-of-sight view of the runway and airport movement areas, thus, allowing the controller to give the appropriate control instructions. Specific approval for entry onto the movement areas must be obtained from ATC; a ground controller traditionally provides this approval.

FAA Order 6480.4 establishes requirements for selecting the site location and cab height of a new or replacement ATCT for FAA use. The order applies to all federally funded ATCTs, including FAA-operated towers, FAA contract towers like the one at OPF, and non-federal towers. Visibility from the ATCT is one consideration when choosing an ATCT's location and height. Specifically, "visibility from the ATCT Cab shall allow an unobstructed view of all controlled movement areas of an airport, including all runways, taxiways, and any other landing areas, and of air traffic in the vicinity of the airport." In addition, there are operational requirements to consider, including but not limited to the ATCT's minimum height and orientation, weather, cab orientation, and visibility of non-movement areas. The Safety Board staff has not been able to determine what criteria were used to establish the temporary ATCT at OPF, the criteria used for other temporary ATCTs, or the FAA's involvement in upgrading the existing temporary ATCT at OPF, despite specific queries to the FAA.

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<sup>2</sup> According to FAA Order 7110.65, an airport movement area includes the runways, taxiways, and other areas of an airport/heliport that are utilized for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and parking areas.

Tower cab configuration and height should allow the controller to view the airfield from above the horizontal visual plane, which allows the controller to determine spatial relationships between aircraft, vehicles, and other potential hazards. The Safety Board's investigation found that the short height of OPF's temporary ATCT presented an extremely limited line-of-sight view of taxiing aircraft and vehicle movement on many areas of the airport. Because the height and location of numerous buildings blocked visibility from the temporary ATCT, controllers had no visibility of the northeast end of the airport where the majority of aircraft were based and of the final approach course to runway 27R. (See figure 3 for a view of the accident site from the temporary ATCT and figure 3a for a traditional view of the accident site from the old ATCT.) Line-of-sight view was further hindered by the air conditioning unit on the southeast side on the temporary ATCT; the air conditioning unit partially obscured runways 12/30 and 9R/27L.

Although, as mentioned earlier, the local controller failed to coordinate with the ground controller in this incident, the visibility restrictions created by the temporary ATCT's short height likely contributed to the November 6, 2007, accident because the controllers could not see N701SE and N18R. This lack of visibility did not allow the controllers to see a developing situation and, therefore, did not allow them to take preemptive action.



**Figure 3.** Northwest view of the accident site from inside Opa Locka Airport's temporary air traffic control tower (ATCT). The current location and height of the temporary ATCT prevent controllers from observing aircraft and vehicle movement on the majority of the airport surface and limit some views of aircraft on approach to the airport.



**Figure 3a.** The accident site, as seen from the old Opa Locka Airport's air traffic control tower (ATCT). This photograph provides a traditional view from an ATCT.

ATCTs usually have windows that slope at an inward angle from the ceiling toward the base of the ATCT to allow any light from inside the ATCT (such as video screens and other equipment) to be reflected onto the ceiling, which is painted black, to allow for clear, unobstructed visibility of the airport environment. Although not a factor in this accident, Safety Board investigators noted that the non-angled ATCT windows in OPF's temporary ATCT reflected interior ATCT cab equipment lighting at night, which made visually discerning aircraft on the airport challenging. Because of the ATCT's height and location, visibility at night was further hampered by vehicular traffic traveling on roadways adjacent to the airport because controllers could confuse vehicular traffic, on and off the airport, with taxiing aircraft (see figure 4).

Finally, the Safety Board notes that the temporary ATCT's short height and geographic location exposed OPF air traffic controllers to aircraft noise and exhaust. In addition, unlike the old ATCT, the temporary ATCT was not adequately climate-controlled, therefore, controllers had to deal with excessive variations in ATCT cab air temperature and humidity. These working conditions could contribute to inattention and fatigue, exacerbating the unsafe working conditions in the ATCT.



**Figure 4.** Photograph of runway 12/30 and 9R/27L from Opa Locka Airport's temporary air traffic control tower at night (southeast view). This photograph highlights the difficulties controllers encounter when trying to discern aircraft and vehicles from background clutter, as well as the restricted view created by the air conditioning unit located in the lower right hand corner of this photo. The difficulty discerning aircraft and vehicles is most predominant and dangerous at night.

An additional safety factor noted by the Safety Board was the potential effects of wind conditions at OPF; these conditions could affect controllers' ability to do their job. When winds reach 40 miles per hour/35 knots, the temporary ATCT is to be evacuated. The high-wind evacuation plan requires controllers to evacuate to a trailer located adjacent to the temporary ATCT. This adjacent trailer, as shown in figure 3, is located in an unprotected area of the airfield and does not offer protection from high winds. Because of the temporary ATCT's instability and the plan to evacuate during high winds to a trailer adjacent to the ATCT, Safety Board staff questioned the decision to use this temporary ATCT in Miami, an area of the country prone to hurricane and frequent thunderstorm activity. This safety factor could be adequately addressed with a new temporary or permanent ATCT.

Although the Safety Board recognizes that the FAA is working on a new permanent ATCT, the existing unsafe temporary ATCT at OPF has been in use for more than 2 years, and no

obvious resolution is apparent to mitigate the hazards associated with the temporary ATCT. Waiting until the new ATCT is completed in 2010 is unacceptable. Because of the safety hazards associated with the continued use of the existing temporary ATCT at OPF, the temporary ATCT's timely compliance with FAA Order 6480.4 is critical. Therefore, the Safety Board believes that, until a permanent ATCT is constructed at OPF, the FAA should ensure a temporary ATCT exists that complies with FAA Order 6480.4.

### **Use of Progressive Taxi/Ground Movement Instructions**

According to FAA Order 7110.65, Chapter 3, the controller determines the position of an aircraft before issuing taxi/ground movement instructions or takeoff clearance. Taxi/ground movement instructions are instructions that approve or disapprove the movement of aircraft, vehicles, equipment, or personnel on the movement area. Progressive taxi instructions are precise taxi instructions given to a pilot who is unfamiliar with the airport or issued in stages as the aircraft proceeds along the taxi route. The controller issues progressive taxi/ground movement instructions, including step-by-step routing directions:

- When a pilot/operator requests;
- When the specialist deems it necessary due to traffic or field conditions, for example, construction or closed taxiways; or
- During reduced visibility, if necessary, especially when the taxi route is not visible from the tower.

FAA Order 7110.65 was updated in April 1994 in response to Safety Recommendation A-91-61, which was issued as a result of a fatal accident involving two air carriers at Detroit Metropolitan/Wayne County Airport on December 3, 1990. Contributing to the cause of that accident were, in part, deficiencies in ATC services provided by the Detroit ATCT, including the failure of ground controllers to take timely action to alert local controllers to a possible runway incursion, failure to use progressive taxi instructions in low visibility conditions, and issuance of inappropriate and confusing taxi instructions. Weather conditions at the time of the accident in Detroit included dense fog. Although the visibility issue associated with OPF's temporary ATCT is often not weather-related, the ATCT's height and location limit visibility of portions of the runways, taxiways, and movement areas. Providing progressive taxi/ground movement instructions is one method of ensuring that aircraft and vehicles are properly separated until traditional ground taxi instructions can be resumed.

Until an appropriately sited replacement ATCT is constructed, the use of progressive taxi/ground movement instructions would help controllers manage traffic flow, particularly in areas they cannot see. A cautionary statement included in the taxi/ground movement instructions would advise the pilot or vehicle operator when the airplane or vehicle is not visible from the ATCT. Additionally, the pilot or vehicle operator would be advised to proceed with caution, of



other known or observed airport surface traffic, and to report a position that is not visible to the controller. For example, a controller could issue the following instructions to a taxiing airplane:

N12345, Opa Locka ground, taxi to runway 9 left, not visible from the tower, proceed with caution. A Cessna 152 just requested taxi from the ramp, report approaching taxiway C.

After the pilot or vehicle operator reports at the position that is not obstructed from the controllers' view, the ground controller issues traditional ground movement instructions.

Therefore, the Safety Board believes that the FAA should require that OPF air traffic controllers provide progressive taxi/ground movement instructions to pilots and airfield vehicle operators that are not visible from the temporary ATCT.

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

Until a permanent air traffic control tower (ATCT) is constructed at Opa Locka Airport, ensure a temporary ATCT exists that complies with Federal Aviation Administration Order 6480.4, "Air Traffic Control Tower Siting Process." (A-08-51)

Require that Opa Locka Airport air traffic controllers provide progressive taxi/ground movement instructions to pilots and airfield vehicle operators that are not visible from the temporary air traffic control tower. (A-08-52)

In response to the recommendations in this letter, please refer to Safety Recommendations A-08-51 and -52. If you would like to submit your response electronically rather than in hard copy, you may send it to the following e-mail address: [correspondence@ntsb.gov](mailto:correspondence@ntsb.gov). If your response includes attachments that exceed 5 megabytes, please e-mail us asking for instructions on how to use our Tumbleweed secure mailbox procedures. To avoid confusion, please use only one method of submission (that is, do not submit both an electronic copy and a hard copy of the same response letter).

Chairman ROSENKER, Vice Chairman SUMWALT, and Members HERSMAN, HIGGINS, and CHEALANDER concurred with these recommendations.

*[Original Signed]*

By: Mark V. Rosenker  
Chairman