OPS11IA246A

On Thursday, January 20, 2011, at approximately 2235 est, a Boeing 777-200 operating as American Airlines flight 951 (AAL951), and a flight of two US Air Force H/C-17s, operating as THUG11, was involved in a near mid-air collision (NMAC) while transiting through New York Air Traffic Control Center (ZNY) Class A airspace.

AAL951 was operating as a regularly scheduled passenger flight under 14 Code of Federal Regulations Part 121 (14 CFR part 121), and had departed from John F Kennedy International Airport (JFK) for Sao Paulo, Brazil. THUG11, a flight of two US Air Force heavy C-17s operating under 14 CFR Part 91, had departed aerial refueling track 777 (AR777) to Joint Base McGuire-Dix-Lakehurst (WRI),Wrightstown, New Jersey.

AAL951 was traveling southeast bound climbing to FL220, and THUG11 was traveling north west bound descending from FL250 to FL220. The airplanes were within the confines of ZNY Sector 86 airspace, but were under the control of two different air traffic controllers. AAL951 and THUG11 were both assigned FL220 because of a misunderstanding between the controllers.

When the airplanes were approximately 88 nautical miles east of New York City, New York, the ZNY radar data processing system generated a conflict alert (CA) to the two controllers. At about the same time, AAL951 received an initial Traffic Alert and Collision Avoidance System (TCAS) resolution advisory (RA), and THUG11 received a TCAS traffic advisory (TA). AAL951 received two additional TCAS RAs in quick succession, the last one reversing the descent instruction to a climb instruction. THUG11 was configured to receive TA alerts only, and therefore did not deviate from air traffic control (ATC) instructions. When the controllers noticed the conflict, they instructed both AAL951 and THUG11 to turn in an unsuccessful attempt to maintain separation. Radar data indicated that the airplanes passed within approximately .38 nautical miles laterally, and 0 feet vertically.

Before the incident, THUG11 had been engaged in aerial refueling operations on AR777 with TEAM48, a KC-10.

At about 2228, TEAM48 and THUG11 departed AR777 and contacted the R86 controller to request clearance back to WRI. TEAM48 reported his altitude as FL260. THUG11, a standard formation flight of two C17s, was at FL250.

The R86 controller instructed THUG11 to "…turn right fly heading 030" and issued additional instructions to TEAM48 to establish lateral separation from THUG11. TEAM48 continued to WRI without incident.

At about the same time the R86 controller was providing instructions to TEAM48 and THUG11, AAL951 checked in with the R66 controller. AAL951 was immediately instructed to proceed direct to the KINGG intersection. One minute later the R66 controller instructed AAL951 to climb and maintain FL230.

THUG11 was on a westerly heading to cross COYLE, and AA951 was on a southeasterly heading direct to KINGG. Figure 1 illustrates the KINGG and COYLE fixes and AAL951 and THUG11's routes of flight.

Around the time of the incident, the R66 controller had also been talking with Continental Airlines flight 31 (COA31). COA31 had informed the R66 controller that he had two flight plans entered into the system and he was confused about which flight plan was active. The R66 controller said in his interview that he knew the

read back of that flight plan would take some time, so he told the pilot "we'll go over it in a second."

At about 2232, the R86 controller cleared THUG11 "…to McGuire via present position, direct to COYLE direct McGuire,…descend now to 10,000."

At about 2233, the R86 controller attempted twice to contact AAL951 on his frequency. The R86 controller had already taken an automated radar handoff on the airplane, but the R66 controller had not yet instructed AAL951 to change to the R86 controller's frequency so the pilot did not respond.At 2233:55, the R66 controller informed COA31 that he was ready for him to read back the flight plan he wished to verify. The pilot immediately began the read back, which took approximately 57 seconds.

At 2234:01, the R86 controller instructed THUG11 to maintain FL210. Before the incident occurred, the controller working the R81 position noticed that the R86 controller needed assistance. He temporarily moved to the D86 position and began helping the R86 controller handle coordination calls.

At 2234:06, after instructing THUG11 to maintain FL210, the R86 controller asked the D86 controller to tell R66 to stop AAL951 at FL200. The D86 controller called the R66 controller, who immediately responded, "I will call you back." However, the D86 controller continued, saying "AAL951, we need him stopped at 20." According to the R66 controller, he was focused on listening to COA31's flight route read back, and therefore did not respond.

At 2234:38, the R86 controller instructed THUG11 to, "…turn right immediately to 020 heading for traffic." According to the R86 controller, the turn to 020 was provided to the C17's in order to establish lateral separation from the B777; however, he believed vertical separation would also exist.

At 2234:52, the R66 controller called the D86 controller and asked, "What was that about AAL951?" The D86 controller replied, "I wanted you to stop him at 20, stop him at 21."

Following that coordination with the R66 controller, the D86 controller leaned toward the R86 controller and told him to stop THUG11 at FL220. The R66 controller, who was still on the line, heard the D86 controller say FL220 and believed that the D86 controller was referring to his airplane, AAL951. According to the R66 controller, his next action was to look at AAL951's position relative to THUG11, and he decided to also give AAL951 a turn in addition to the revised altitude assignment. He immediately told the D86 controller, "I will turn him (AAL951) 30 degrees right."

At 2234:58, the R86 controller instructed THUG11 to maintain flight level 220.

At 2235:01, the R66 controller instructed AAL951 to, "turn 30 degrees right vectors traffic maintain FL220."

At 2235:14, the R66 controller transmitted to AAL951 "…traffic 12 o'clock ten northeast bound C17 leaving flight level 220 for 10 thousand." The pilot responded "Ok."

At 2235:22, the R66 controller called the D86 controller and asked, "Where are you going with that THUG?" The D86 controller responded, "He is turning back to the left. I said stop that American at 21." The R66 controller responded, "all right he stopped at 22, he went through 22."

At 2235:25, the R86 controller instructed THUG11 to say his altitude. The pilot transmitted "level 220 and in

a right hand turn to 020."

At 2235:30, AAL951 informed the R66 controller "…we are following a descend RA now." AAL951 reported this TCAS RA when the airplanes were about seven miles apart. At that time, the R66 controller stopped issuing control instructions, as required.

At 2235:35, the R66 controller instructed AAL951 "…turn left at your discretion traffic now one o'clock four miles southwest heavy C17 flight level 220."

At 2235:49, the R86 controller transmitted "THUG11, you up?' The pilot responded, "Level 220 in a right hand turn to 020."

At 2235:54, the R66 controller asked AAL951 "…do you have that traffic in sight?" The pilot transmitted "No, we do not."

At 2235:56, the R86 controller informed THUG11 "traffic right below you is a Boeing triple seven that should be leveling at flight level 210."

At 2235:58, the R66 controller informed AAL951 "… traffic is now at 12 o'clock less than one mile at flight level 220, C17."

At 2236:12, THUG11 transmitted to the R86 controller, "Yeah, THUG11 just came within approximately 2000 feet of that traffic."

At 2236:17, AAL951 transmitted to the R66 controller "that guy passed us now and that was not good."

At 2236:21, the R86 controller instructed THUG11 to "…continue right turn and then proceed to COYLE."

At 2236:24, the R66 controller responded to AAL951 statement "I understand that and I apologize, I am not working that other airplane." The R66 controller then instructed AAL951 to climb to FL230.

According to the C17 crew statements, the second airplane (THUG12) in the flight was approximately 4000 feet in trail and offset 500 feet to the right of the lead airplane at the same altitude. This profile was flown in accordance with Air Force Instruction 11-2C-17, which states:

The second and third aircraft of each element maintain a minimum of 4,000 and 8,000 feet spacing, respectively, from their element lead. Maintain spacing with reference to the element lead to reduce telescoping effects. The minimum offset distance is 500 feet right for the number 2 aircraft, and 500 feet left for the number 3 aircraft.

The two C17s were TCAS II equipped. Air Force Instruction 11-2C-17 states:

Multi-ship formation - Lead aircraft (or designated alternates) will operate TCAS in the "TA only" mode. Consideration should be given to having the last aircraft in multi-element formations operating TCAS in TA only mode….For formations utilizing SKE [station-keeping equipment] and TCAS overlay to verify formation position, all aircraft will operate TCAS.

According to the pilots of THUG11 and THUG12, both airplanes were operating TCAS in a TA only mode.

According to the pilot of AAL951, he received three consecutive TCAS RAs. The first RA, received when his airplane was approximately 7 miles from the C17 traffic, was an advisory to descend. Seconds later, a second RA was received that required the crew to increase rate of descent. Seconds after that, a third RA was received which instructed the crew to climb.

For further information, see the Air Traffic Control Group Chairman's Report in the docket for this case.

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