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NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

EMERGENCY MANAGEMENT SPECIALIST'S FACTUAL
REPORT

By: Lawrence Roman
(8 pages)

**NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety
Washington, D.C. 20594**

**AIRPORT/EMERGENCY MANAGEMENT SPECIALIST'S
FACTUAL REPORT OF INVESTIGATION**

A. ACCIDENT: DCA-97-MA-058

Operator: Korean Air Lines Co., Ltd.

Aircraft Boeing 747-300, Serial No. 22487

Location: Antonio B. Won Pat, Guam International Airport, Agana,
Guam

Date: August 6, 1997

Time: 0142 Local Time

B. INVESTIGATOR

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C. SUMMARY

On August 6, 1997, at approximately 0142 Guam Local Time, a Boeing 747-300 (3B5B), operated by Korean Air Co. Ltd. as Korean Air flight 801, en route from Seoul, Korea (RKSS) to Agana Guam, crashed on approach to runway 6 Left at the Guam International Airport (PGUM).

At the time of the accident the glide slope associated with the instrument landing system (ILS) to runway 6L was out of service and the crew was conducting a "localizer only" approach to the runway when the airplane contacted high terrain approximately 3 nautical miles southwest of the airport.

The 0132 reported weather at Guam International indicated that the wind was from 090° at 6 knots; visibility was 7 statute miles with showers and there was a scattered layer of clouds at 1,600 feet, a broken layer at 2,500 feet and an overcast cloud layer at 5,000 feet.

The flight was operated as a scheduled 14 Code of Federal Regulations (CFR) Part 129 passenger flight. There were two pilots, one flight engineer, one purser, thirteen flight attendants and 231 passengers (including six deadheading flight attendants) on board the airplane at the time of the accident. The airplane was destroyed by impact forces and a post-accident fire. Of the 254 occupants on board, 225 were fatally injured; and 25 passengers and 4 flight attendants survived the accident with minor to serious injuries. However, during the 30 days following the accident, two passengers and one deadheading flight attendant succumbed to their injuries.

D. DETAILS OF THE INVESTIGATION

1. Airport Information

PGUM, has an elevation of 297 feet msl and is located approximately 3 miles northeast of Agana, Guam. The airport is owned by the U. S. Navy, and is operated by the Guam International Airport Authority (GIAA) under a lease agreement. PGUM has two asphalt/concrete precision instrument runways: 6R-24L, which is, grooved, 8,001 feet long and 150 feet wide, and 6L-24R, which is grooved asphalt/concrete, and is 10,015 feet long and 150 feet wide. Runway 6L, with a touchdown elevation of 256 feet, is equipped with an instrument landing system (ILS), with a 3 degree glide path angle, although the glide slope was out of service at the time of the accident. PGUM is also equipped with a 1400 foot medium intensity approach lighting system with runway alignment indicator lights (MALSR), a 4-box visual approach slope indicator (VASI), and high-intensity runway edge lights (HIRL).

PGUM is certificated by the Federal Aviation Administration (FAA) at aircraft rescue and fire fighting (ARFF) index D¹ in accordance with the applicable provisions of Title 14 CFR Part 139.

¹ 14 CFR 139 requires, for scheduled air carrier service with aircraft at least 159 , but less than 200 feet in length, that at a minimum, the airport is equipped with a minimum of three ARFF vehicles with a total quantity of water for foam production of at least 4000 gallons.

2. Emergency Response

2.1 INITIAL NOTIFICATION AND EMERGENCY RESPONSE

The Guam Federal Control Tower (FCT) received its last radio transmission from KAL 801 at 0141. At 0145 the FCT local controller attempted to query KAL 801, but received no response. At 0147 the local controller began conversing with PGUM ramp control, the Federal Aviation Administration (FAA) Guam Combined Enroute/Radar Approach Control (CERAP), and Andersen Air Force Base, attempting to locate KAL 801. According to PGUM ramp control logs, at 0155 the FCT reported that KAL 801 might have crashed. At 0158 the FCT alerted PGUM ramp control, which began emergency notifications at 0202.

The Guam Fire Department (GFD) Communications Center (GCC) recorded receiving a 911 incoming call from a local resident at 0150, who reported a sudden fire high in the sky towards the Agana Heights area. At 0207 the GCC logs showed that they received notification of a downed aircraft from GUM ramp control, although GUM records show that notification occurred at 0202. GCC immediately dispatched GFD Engine Company No. 7, which was stationed about 3 ½ miles from the crash site, and Rescue Units 2 and 3; the first arriving fire fighting unit, Engine Company No. 7 arrived at the scene at 0234.

On October 4 and 5, 1997 the Airport/Emergency Management Specialist interviewed the GFD 911 and the Island (Federal) dispatchers who were on duty at the time of the accident, and who according to logs made and received notifications of the accident. The GFD dispatcher did not recall when he notified the Island Dispatcher, nor could he recall the specifics of the conversation, due to the excessive workload at the time. The Island Dispatcher recalled that he received the first notification of the accident from the GFD 911 dispatcher at 0234, and he believed that the entry on the GFD 911 log indicating that Island dispatch had been contacted at 0207 was incorrect.

The first Guam Fire Department (GFD) unit, located at the Piti Fire Station, Engine No. 7, was notified at 0207, however according to the GFD Fire Chief, Engine No. 7 was delayed to allow the engine to warm up, and due to a necessary procedure which requires that brake systems be drained overnight to avoid excessive buildup of condensation in the brake lines in fire trucks equipped with air brakes. The result was that Engine No. 7 did not depart the Piti Station, which is about 3 miles from the accident site, until 0219. Engine No. 7, the first fire truck on the scene, arrived at 0234 at the gate to the road that led to the accident site about a mile away. The Guam Fire Chief stated that the delayed response by Engine No. 7 was still under investigation.

The Guam Civil Defense Director stated that he arrived at the pipeline gate at 0235, at which time the Fire Chief transferred incident command to the Director. The Director then assigned two police officers to prevent access of persons and equipment, except for what was requested and needed at the site, as determined by the On-Scene

Commander (OSC), who was a GFD Deputy Fire Chief. The Chief stated that he remained with the Director at the command post area, which was located at the pipeline gate, during the emergency response. The Chief stated that they attempted to remove the section of broken pipe which was blocking the pipeline road, by hand, and by small vehicle, but they were unsuccessful until they used a truck mounted winch. Engine No. 7 which had become stuck while attempting to negotiate around the pipe was removed with a wrecker. In response to some observations by witnesses who were interviewed by the Survival Factors Group (See Exhibit 16D), parked police cars blocked the road to the accident site. In response, the Chief stated that although a number of police cars were left along the pipeline road, none of them were parked in a manner that blocked access, once the broken pipe and Engine No. 7 were removed.

The Chief stated that they did not use a hose relay system to extinguish the fires, because, the U. S. Air Force Fire Chief had assessed the accident scene, and advised the Chief that the remaining fires were not threatening the lives of rescuers or survivors. The Chief also reject the use of helicopter borne fire extinguishing tanks, because the downdraft and water drops from the helicopters would adversely effect the ongoing rescue and triage activities.

The Director stated that although Guam Civil Defense owned a command post vehicle, it was not utilized because it was outdated and out of service for a number of years, and they had no funds to repair and update it. The Director stated that following the accident, the Regional Federal Emergency Management Agency (FEMA) Representative advised him that FEMA would provide funding to update the command post vehicle.

On October 3, 1997, the Airport/Emergency Management Specialist interviewed the Fire Chief of the Federal Fire Department at Guam Naval Activities (naval station). The Chief recalled that he was notified of the accident at about 0200. The first federal fire station, Engine Company 5, located on Nimitz Hill, about a mile from the pipeline gate, was notified, and responded at 0234, and arrived at the pipeline gate at 0239.

The Chief arrived at the command post area (at the pipeline gate) at about 0230, and reported to the GFD Fire Chief, who told him that incident command had been given to the Guam Civil Defense (GCD) Director. The Chief then reported to the GCD Director seeking instructions, to provide resources for fire suppression and rescue activities but the GCD Director gave no reply, and "seemingly dismissed him".

The Chief expressed concerns that although he was ready to provide federal resources he was given no direction; the Chief believed that incident command should not have been transferred to the GCD Director because he lacked the training, resources, and technical expertise to conduct tactical command. The Chief also expressed concern that no attempts were made to initiate fire suppression at the accident site.

When the Federal Fire Chief was asked if the Federal Fire Department drained air brake systems of air, to avoid condensation buildup in fire trucks, he stated that this was only done periodically by maintenance personnel, and when done a truck was taken out of service, and response coverage was assumed by another unit.

On October 3, 1997, the Airport/Emergency Management Specialist interviewed the Base Fire Chief at Andersen Air Force Base (AAFB), Guam. The Chief stated that he was notified by his personnel of the accident at 0245, and GFD had requested fire fighting aqueous film-forming foam (AFFF). The Chief instructed his personnel to dispatch a 550 gallon foam trailer, and a tanker truck, however when his personnel called back to report that they were unable to build-up adequate air pressure in the tanker truck, he instructed them to send a P-19 ARFF truck, which contained 300 gallons of AFFF and 1500 gallons of water. At 0329, the Chief left AAFB with a convoy consisting of the P-19 truck, a pumper, a rescue truck and 10 fire fighters.

The Chief estimated that the convoy arrived at the area at the bottom of the hill between 0400 and 0430. When he saw that the area was totally congested he proceeded to the pipeline command post area on foot. When he arrived at the gate he reported to the GFD fire chief who referred him to the GCD Director. When the Chief sought direction from the Director, the Director ignored him and was non-responsive. The Chief waited near the command post until 0612, when he dispatched a rescue truck with rescue personnel to the scene to help with rescue activities. At about 0700 or 0730 the Chief proceeded on his own initiative to the scene. At about 0800 the Chief observed smoke emanating from the scene, and upon further examination, determined that it was a small fire near a wing which was not threatening survivors or rescuers. He reported his evaluation to the command post. The Chief stated that prior to that he had made no evaluations of the fire or the accident, in fact he had not even viewed the accident site until 0800. At about 0800 he gave consideration to bringing in a pumper, but determined that it would only block the pipeline road and hamper rescue and shuttle vehicles.

The Chief expressed serious concern that there was no incident command and he believed that a technically competent, and experienced fire fighter senior officer should have been in incident command.

On October 6, 1997, the Airport/Emergency Management Specialist interviewed the Incident Commander - On Scene (OSC). The OSC was notified of a possible accident in the Nimitz Hill area at about 0205, and he responded from his home in Dededo, arriving at the pipeline gate at 0234. U. S. Navy security personnel, and his Northern District Commander were already there, and the pipeline gate was open. He stated that he saw flames, but as yet, had no confirmation that it was an airplane crash, but Engine Company 7 arrived with units Rescue 1 and Rescue 2, and proceeded down the pipeline road. The OSC then proceeded down the pipeline road in his vehicle with the Governor of Guam. At a distance about 75 to 100 yards prior to the main body of wreckage an approximately 75 foot section of the pipeline was damaged and laying

across the road blocking further access by the emergency units. He instructed Engine Company 7 personnel to continue trying to remove the obstructing pipe, and Rescue 1 and 2 personnel to proceed with him to the airplane on foot.

As they approached the area, he could here people yelling, and he could see small areas of flame, although he saw no large fires. He described the approach from the pipeline road into the crash site (about 100 yards) as very difficult due to the rough terrain, sword grass, 6 to 8 feet high, and darkness. He placed himself east of the fuselage and established incident command at the site. He had only a portable radio, and did not have direct communication with the command post at the gate, because they had no radio, so he radioed his requests for resources to the GFD dispatcher, who in turn relayed them to the Response Activity Coordination Team (RAC), at Civil Defense headquarters.

After one or two hours the OSC thought he had adequate personnel to continue rescue activities, so additional personnel were held at the gate until relief personnel were needed. He recalled that the first survivors were transported to hospitals at about 0300-0330. He had no contact with fire chiefs from other departments. At about 0600 or 0700 he proposed a plan to extinguish the small remaining fires, but the command post declined, because the fires were not posing a threat. (Note - individual actions and requests are found in more detail in the attached GFD "After Action Report")

2.2 MEDICAL RESPONSE

On October 2, 1997, the Airport/Emergency Management Specialist interviewed a U. S. Navy Petty Officer (PO), an Emergency Medical Technician-Basic, who was assigned to the Guam Naval Hospital, and who responded from the COMNAVMAR Branch Clinic, located on Guam Naval Activities, (naval station), approximately 8 miles from the accident site. The PO stated that although his recollection of times was imprecise, he recalled being notified of the accident between 0200 and 0230, and he estimated that it took about 10 minutes for him in the ambulance to arrive at the gate at the entrance to the pipeline road, where his ambulance was directed to the side of the road and parked. From that point, the PO Mueller proceeded on foot to the accident site on foot via the pipeline road. After attempting to cut through to the accident site from a point near where the broken pipe lay, he returned to the road, because the terrain was too difficult to traverse, so he proceeded further down the pipeline road to a point about even with the airplane fuselage and proceeded toward the accident area. He estimated that he arrived between 0245 and 0300, and recalled observing that the fuselage was engulfed in bright blue flames with the interior heavily involved with fire. As he proceeded to within about 150 feet of the burning fuselage, he observed about 14 survivors with various degrees of injury, but mostly burns. He noted that most of those survivors had clustered together, apparently after fleeing the airplane.

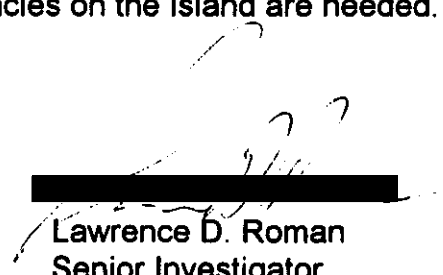
The PO proceeded to treat victims and best as possible, but noted that conditions very extremely difficult due to intermittent rain, soft ground, grass which was taller than the average person, and extremely rugged terrain. In addition he noted that the darkness and tall grass prevented seeing beyond 10 feet, even with flashlights. He treated about 20 persons, and communicated directly with the Guam Naval Hospital, via radio. For the most part, he received no direction or coordination from any on scene supervisors, until some time later when a nurse arrived and asserted some control at one of the triage areas. He attributed the lack of coordination to the darkness and inability to see, locate, and/or otherwise communicate with supervisory personnel. He recalled that there were two triage areas; one near the nose section of the airplane, and the other between the main portion of the fuselage and the pipeline road. He stated that all of the survivors were checked by medical personnel numerous times. He believed that the last survivor was found at about 0430, and the first survivors began to be transported to hospitals between 0400 and 0500. He recalled that he worked for about 3 hours without relief, and was quite tired. He did not recall any observing any extricating of persons from wreckage, until a woman and a child were extricated from the nose section at about 0730. He believed that the extrication took 30 or 40 minutes

The PO believed that the rescue, triage and transportation went as well as could be expected due to the extremely difficult circumstances. The Guam Naval Hospital Executive Officer, who was present at this interview believed that Guam was in need of a single territorial disaster plan to include all emergency response agencies on the island.

On October 6, 1997, the Airport/Emergency Management Specialist interviewed Dr. Andrea Eberly, with the Guam Department of Public Health, who directed triage activities at the crash site. Dr. Eberly stated that she was notified of the accident at about 0245, and after stopping at GCD Headquarters for a briefing, she arrived at the accident site at about 0315. Overall she said she was impressed with patient care, triage and transportation at the site, but much of it was due to extraordinary individual effort and improvising rather than structural organization. She felt that coordination was lacking. She thought that the amount of time taken to treat and transport the injured survivors was appropriate because of the difficult circumstances. She said that the terrain, the tall grass which blocked almost all light and cut rescuers hands, the rain and mud, and the almost total darkness made rescue and triage extremely difficult. When she arrived she saw two pre-triage areas; one near the airplane's nose, and the other near the tail. Military personnel appeared to be coordinating activities at the nose area, and were beginning to transport those patients via helicopter, so she assumed control of the pre-triage area near the tail. After assigning personnel to patients to monitor vital signs, she established a triage area at the VOR, because the terrain was more favorable for litter bearers to proceed in that direction. Initially there was a shortage of litters, but military personnel began bringing litters later. After patients were carried to the VOR, they were treated and triage tags were used. Transport was done by ambulance, but because of the narrow width of the pipeline road, and the lack of turn-around areas, only one ambulance could be permitted down the pipeline road

from the gate about 1.5 miles away. Most patients' injuries were burns, so she placed emphasis on transporting them quickly, since treatment options at the scene were limited.

She believed that improved communications, interagency drills, and a coordinated plan for all emergency response agencies on the Island are needed.


[Redacted]
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