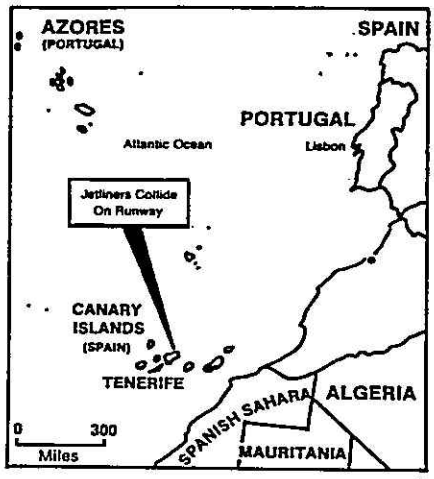
Crisis on the Island

The emergency story of the world's worst aviation disaster



By Carla A. DeDominicis

IT BEGAN as a pleasure trip and ended in a nightmarish tragedy. The control tower tapes sounded like a script from the movie "Airport," with Pan American pilot Victor Grubbs' last words before the crash, "He'll kill us all!" being all too prophetic.

The newspaper headlines the next morning shouted, "Jets Collide; 530 Perish." Eventually, the death toll rose to 581 in the world's worst commercial aviation disaster.

"The irony of it all is that it occurred on the ground," said Marion Andersen, one of the 63 survivors in the March 27 Santa Cruz de Tenerife crash of KLM Dutch Airlines' and Pan American Airways' 747s. "We were taxiing and the captain had just thanked us for being patient, suggesting we all have a drink on the house. I had about two sips of my drink when it happened."

The next thing Andersen knew, there was a shattering noise and a gaping hole on the left side of the plane. The KLM jet, traveling at a rate of 155 miles an hour, had collided with the Pan Am plane.

"I was sitting in seat 11H, the first row behind first class on the right," Andersen said. Recovering from initial thoughts of "this can't be happening," Anderson unfastened her seat belt, crawled through the debris to the hole and jumped down the side of the plane.

Then, she ran. "I ran and ran until I thought I had gone far enough, until I couldn't run anymore. Occasionally, I would look back and see explosions, balls of fire, and the engines still whirling, standing out in the black smoke," said Andersen, who had been running on a sprained ankle caused by her 15-foot leap.

"Immediately, first aid crews and volunteers arrived at the airport. It was terrible. They spoke Spanish and I spoke only English. I had bruised myself in the jump and my side looked like a piece of beefsteak.

"Those of us who had jumped were standing watching the plane burn. We saw people being dragged away from the fire, some of them burning. The farmers who had seen the explosion had come from their fields and other civilians began taking us to the hospital — those most badly injured were transported first."

At Tenerife General and Candolaria Hospitals, medical personnel and volunteers began dealing with the most extensive emergency they had ever encountered. They had not yet realized the extent of the crash which claimed the lives of all 248 Easter travelers aboard the KLM jet and 333 vacationers on the Pan Am plane.

"They were great," Andersen said about the Tenerife medical personnel. "They took those of us who weren't that badly injured and brought us tea to drink and towels to clean up with, while they tended to the more badly injured.

"Doctors and nurses would periodically check in on us to make certain that no one went into shock. They x-rayed us and gave us tetanus and gamma globin shots, all the while taking care of those who were badly injured and burned. Nurses and doctors kept pouring into the hospital. Considering their facilities are not as good as

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ISLAND CRISIS

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ours, I think they did very well," Andersen said.

Meanwhile, the C-130 Hercules aircrew from the 314th Tactical Airlift Wing at Little Rock Air Force Base, Jacksonville, Arkansas, on rotational duty at Rhein-Main Air Base, Germany, was awakened with orders to fly to Tenerife with medical supplies and evacuate the survivors.

"We were on alert in Frankfurt when we got the call. It was about 6 am, Monday, March 28, so we were all asleep," said Captain Thomas L. Koed, the pilot who flew the C-130, a 727-sized plane, into Tenerife.

Crew members who participated in the mercy mission to Tenerife are pictured inside the C-130 aircraft. From left to right: front; Lt. Col. William E. Owen, mission commander; Capt. Thomas Koed, pilot; 1st Lt. Lewis H. Evans, co-pilot; Airman 1st class Charles J. Andrews, crew chief; Airman 1st class Gregg A. Murdock, crew chief; back; Staff Sgt. James H. Nicholson, flight engineer; Capt. James N. Butts, navigator; and Sgt. Scott D. Rearich, loadmaster. (U.S. Air Force Photo)

"The first word received was to take off as soon as possible," Koed said. However, supplies from a nearby hospital had not yet arrived and some 600 body bags had to be gathered up from the Frankfurt area.

"After we received our medical supplies, we discovered that air traffic control would not give us takeoff clearance because our destination airport, Tenerife, was closed and declared a disaster area. We were finally granted clearance to the nearby Grand Canary Island."

By 9:30 am the crew of the C-130 was off to Rota Naval Air Station, Spain, where they picked up a crew of three flight surgeons and 18 nurses and medical technicians from the 2nd Aeromedical Evacuation Squadron. From there the aircrew and medical personnel, equipped with emergency medical supplies, hundreds of blankets and 140 litters, headed to Tenerife to accomplish their mercy mission.

"There were lots of diplomatic-type hold-ups," Koed said. "We arrived in the Canary Island area about 4 pm but we still had no permission to land, neither from the tower nor from the Spanish government."

So, temporarily thwarted by diplomatic problems and aware their eventual landing at Tenerife would inevitably be somewhat treacherous, the aircrew and medical personnel diverted to the international airport on the Grand Canary Island, some 20 minutes flying time from Santa Cruz, to await a go-ahead order.

For the next three hours, the crew worked by telephone, talking to Spanish and American representatives.

"You can imagine that we were a bit frustrated that we couldn't get in," said Flight Navigator Captain James Butts.

Finally, it was decided the crew would spend the night on the Grand Canary Island, awaiting clearance. It was not until 12:30 pm, Tuesday, some 45 hours after the crash occurred when Spanish officials granted permission to land.

"When Captain Koed circled the field, we saw a huge hole in the asphalt which had been severely burned out when the planes collided," Butts said.

"Other than that, all we could see was the remains of a tail from one of the planes and a wing and engine from the other. The rest was an unrecognizable mass of metal strewn everywhere," Koed said.

Koed and his mission commander, Major William R. Owen, determined that if they were to land their C-130, the only plane small enough to land on the remaining runway yet large enough to carry out the survivors, they would have to do so on the taxiway which measured only 4,000 feet long and 90 feet wide.

"Although the taxiway was half as wide as the runway, we decided it was the only place we could land," Koed said. "It was either that or cope with a wider but shorter debris-laden runway. Plus, the weather was giving us some problem. There were very strong cross winds and a cloud coverage over the island down to the thousand foot level."

After overcoming the obstacles they faced, the aircrew of the C-130 touched down their craft at 1 pm. Still, all of the political hassles had not been settled, and the medical team was refused permission to see the survivors in the hospitals.

"Although the survivors reported receiving good care at the hospitals, because of diplomatic problems, our doctors couldn't get in to check," said Sergeant L. Scott Rearich, Load Master.

"The injured were eager to go home, but Spanish medical authorities initially refused to release them," said James Slaton, a member of a team from the U.S. Embassy in Madrid, Spain, that assisted in the evacuation.

Finally, it was determined that seven severely injured Americans, all suffering from intense burns, would remain temporarily in Tenerife. Navy doctors were allowed to remain on the island to care for them. The other survivors were then brought from the hospitals to Los Rodeos Airport, one at a time via the three ambulances on the island, a process which took a little more than five hours.

"The hospital officials had refused to transport the victims until they were assured we'd be able to get in," Koed said. "Once the patients arrived, extreme care had to be taken to ascertain the victims' identities and to assess their injuries. For the most part, records of injuries or medication administered were not available. Case histories had to be obtained by questioning the patients."

According to standard procedures, the patients' wounds, most of which were burns ranging from 15 to 70 percent of their bodies, were covered with dressings to prevent infection during the airlift.

Many of the injured were sustained with bottles of plasma and glucose. The medical personnel from the C-130 assisted the 40 litter patients and 17 walk-ons onto the aircraft. Here,

each of the litters were secured into a special tiered holder in the cavernous plane and stacked in bunk-like fashion for maximum use of space.

During the trip, medical personnel treated shock and dehydration. (Dehydration is common to passengers on extended flights due to pressurized cabins. In this case, it was amplified by the severe burns.) The IVs had to be maintained during the flight and many of the patients, uneasy about having to board another plane, or writhing in pain, were sedated.

"On the whole," Co-pilot 1st Lieutenant Lou Evans said, "considering what they had gone through, the victims did quite well. They were as cheerful as one could expect. I think by the time we were able to land, they were all quite happy to get out. I even had one guy joke that he was finally getting his tax-paying dollars out of the government."

After flying what was described as a "smooth" flight to nearby Las Palmas, the survivors were transferred to a C-

Survivors were secured into a special tiered holder in the cavernous C-130 aircraft and stacked in bunk-like fashion. Sustained on bottles of plasma and glucose, they anxiously awaited takeoff. (U.S. Air Force Photo)

141 Starlifter, a larger and faster plane which was set up with specially equipped enclosures to prevent infection among the burn patients.

"High winds and blowing sand at the airport made the transportation of patients from one aircraft to the other very difficult, especially for the burn patients. Four people were required to carry each litter, with two other people holding blankets to block as much sand as possible," Koed explained.

The efforts of the medical personnel were successful in all but one case. One woman, Isabelle Lord, of Long Beach, California, died during the C-141's transatlantic flight.

Flying coast to coast depositing the victims as close to their homes as possible, the C-141, assigned to the 437th Military Airlift Wing at Charleston Air Force Base, South Carolina, assisted by many of the C-130's medical personnel, made its first stop at McGuire Air Force Base in New Jersey where 10 survivors were admitted to Walston Army Hospital.

Fourteen survivors, the most seriously burned, flew on to Kelly Air Force Base, San Antonio, Texas, and then were transported by ambuses (large buses configured to transport both walk-on and litter patients) to the Institute of Surgical Research Center at Brooke Army Medical Center in San Antonio.

According to Colonel Basil Pruitt, director of the institute, the doctors' first operations were to remove the dressings applied for the flight and to clean the wounds. Life-support therapy and infection prevention were continued as the dead tissue was debrided. The first and second degree burns would heal themselves by regeneration; however, the third degree burns had to have new skin surgically grafted over the wounds.

From Kelly Air Force Base, the aircraft flew on, stopping at El Toro Naval Station, El Toro, California, and ending its mercy flight at Travis Air Force Base, Fairfield, California. The patients were then transported from the military bases to medical facilities nearest their homes.

Meanwhile, at Tenerife, the bodies of the dead were laid out in a hangar at the edge of the Santa Cruz runway to be transported to the U.S., attesting to the magnitude of the crash. The Tenerife aviation disaster will long be remembered; however, it is the combined efforts of the American and Spanish medical personnel that are responsible for the lives of the 63 survivors.

EDITOR'S NOTE: Death tolls cited in this article were verified at press time with the Pan American Airways' and KLM Dutch Airlines' business offices in New York, New York.

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By Max Klinghoffer, MD,
William E. Burnette, MPH and
John W. Sturgeon

O'Hare International Airport in Chicago, Illinois, is a city in itself — but a city with two-dimensional traffic, and therefore, has a greater vulnerability to emergencies. O'Hare covers about 13 square miles. Thirty-one airlines use the field, of which there are 13 domestic, 13 international and five commuter lines. The airport is serviced by the Chicago Fire Department, which has one main station and two satellite stations on the airfield. Thirty thousand people work at O'Hare — there is a Department of Security, restaurants which feed thousands of people daily, shops, infirmaries, automobile rental offices and a pharmacy. Over 37 million passengers used O'Hare in 1975 (the latest statistics available). The number of people who passed through O'Hare in that year was over 93 million.

THE PLAN for a medical response to a disaster at O'Hare International Airport is based upon the premise that the care received in the first minutes following an injury may be the determining factor in the medical outcome. The airport is located at the far western edge of Chicago, and is close in proximity to excellent medical facilities. There are several factors which can cause serious delay in bringing medical teams to the scene of the accident or in transporting casualties to the medical centers. These factors are:

1) Heavy traffic conditions at all hours.
2) Severe traffic congestion at rush hour.
3) Near paralysis of traffic during severe weather conditions.
4) Interference by morbid curiosity seekers adding to already existing traffic problems.
5) Security requirements necessary to keep unauthorized personnel away from the area of the airport.
6) Use of helicopters is restricted because of the severe weather (a frequent occurrence in the Chicago area) and heavy air traffic around the airport.
7) Communication problems.

PRE-TRIAGE SYSTEM

In order to ameliorate these problems in providing emergency medical care, the O'Hare pre-triage system was established in 1972 by the Airport Authority and the Fire Department with the help of Max Klinghoffer, MD, who served as a consultant. In such a disaster program, the physical characteristics and the services offered at O'Hare Airport had to be considered.

Major components of the pre-triage program at O'Hare included personnel, supplies, communications and on-going training. Since transportation is usually a major problem in the metropolitan area, the airport administration decided that employees at the airport, well-trained in basic

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O'Hare International Airport

ONE PRE-TRIAGE PLAN FOR EMS

Photo by Robert B. Miles, Coral Gables, Florida

O'Hare International

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lifesaving procedures, would be of more value in the first hour following a disaster than the most highly trained physician who is an hour from O'Hare Field would be.

Since early 1976, well-trained paramedics have been stationed at the main Fire Department at O'Hare. With these paramedics assisting in the supervision of a larger number of employees trained in pre-triage, the initial care of the casualties can begin minutes after the accident occurs and notification is received.

TRAINING COURSE

The training course (approximately 16 hours) is conducted at O'Hare Fire Department. The trainees, recruited from all employees at the airport, represent every area of employment at O'Hare and few have had any extensive medical background. The trainees are informed at the beginning that the training will be helpful to them in everyday emergencies, at home, on vacation and along the highways, as well as at O'Hare. All material is presented in non-medical terminology and is accompanied by demonstrations and film-strips. Class is held informally and lectures may be interrupted for questions from students. At the end of the course, a multiple-choice examination is given and certificates issued to those who pass the exam.

During the first session, students are given an explanation of the purpose of the training, a definition of triage and its application at O'Hare Field. A full explanation of pre-triage and the role of the O'Hare program in the echelons of emergency medical care is included. It is emphasized that the program does not in any way compare with the care received in a hospital, but is designed to get the casualties to the hospital in the best possible condition for definitive medical care. Trainees are informed they will be told what to do in any given emergency, and more important, what not to do. Demonstrations and a brief history of the development of the procedure are added.

COURSE OUTLINE

The course outline includes examining the many aspects of shock symptoms and treatment, the control of bleeding and various types of wounds, how to splint fractures and bandage wounds, effective means of transport, as well as learning how to administer CPR.

SUPPLIES

Supplies stored at the O'Hare triage area are divided into two categories: mobile pre-triage and fixed pre-triage. Mobile pre-triage consists of 15 canvas bags weighing about 22 pounds, designed to be taken to the scene of the accident, each containing:

- 7 — Hemostats (1 Pkg. of 3; 1 Pkg. of 4)
- 2 — Field Dressings (1-18x22; 1-22x36)
- 10 — Abdominal Pads (5 Pkgs.; 2 to each Pkg.)
- 40 — 4 x 4 Gauze Pads (4 Pkgs.; 10 to each Pkg.)
- 2 — Tourniquets (2 Pkgs.; 1 per Pkg.)
- 1 — Abelson Curved Cricothyrotomy Cannula (Universal Size)
- 3 — Airways (disposable) — 1 Each, #2, 4, 5
- 1 — Bulb Syringe with 2 Catheters (#12, #14 Fr.)
- 2 — Scissors (1 per Pkg.)
- 20 — Syringes (Disposable) with #25 Ga.-5/8" Needle
- 12 — Ace Bandages (2-6", 4-4", 4-3", 2-2")
- 12 — Alcohol Sponge Packages
- 4 — Roller Gauze (2-3", 2-2")
- 2 — Adhesive Rolls (1 per Pkg.)
- 4 — Vaseline Gauze (6 x 36)
- 24 — Bandaids
- 20 — Caffeine Sod. Benzoate Amp. (7-1/2 Gr.)
- 1 — Clipboard (6-1/2 x 11")
- 6 — Pencils
- 25 — Identification Tags
- 1 — Set Inflatable Splints
- 1 — Resuscitube
- 1 — Short Spineboard
- 1 — Flashlight
- 2 — Cervical Collars
- 1 — Bite Stick-Wedge
- 1 — Plastic Sheet, 6' x 6', with Four Spikes

The first item removed from the bag should be the plastic sheet which is designed to be spread on the ground to keep the contents of the bag at least clean, if not sterile.

The second phase of pre-triage consists of equipment set-up in the bunk rooms and officers' quarters at the main fire station. Chains with shower curtain hooks are available in the bunk rooms for suspending IV containers. Should it become necessary, the apparatus room would also be used. The fixed pre-triage supplies are stored in a special area at O'Hare.

To further expedite and facilitate the care of the casualties, there are eight triage tables included with the equipment stored at O'Hare. Each of these is an aluminum folding table which, unfolded, measures six feet by three feet. Each table is marked off into five sections: 1) records; 2) resuscitation; 3) dressings; 4) IV supplies; and 5) fracture supplies. It should be emphasized that the triage tables, each accompanied by one box of equipment for that table, may be moved to any point on the field in a matter of minutes, thus bringing lifesaving care to the casualty at any point at the airport.

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The personnel who will be involved in triage at O'Hare are the following:

1) Those trained at O'Hare in this triage training program.
2) The paramedics stationed at O'Hare.
3) Physicians and nurses employed at O'Hare who happen to be on duty at the time of the incident.
4) Physicians and nurses not working at O'Hare who happen to be in the terminal at the time of the incident. (Identification required.)
5) Medical personnel from outside the airport. (These physicians and nurses are urged not to come to the field unless they receive official notification that they are needed there. This is to prevent removal of personnel from hospitals where they may be needed later. They are also asked to come only by official vehicles, such as fire department or police car.)

COMMUNICATIONS

Communications within O'Hare consist of 19 radio pages placed at key points at the field. By dialing six digits on any phone in the airport, these 19 units will simultaneously signal the disaster situation. Trained personnel will report to the main fire station. From there personnel are divided into two groups: 1) Those being sent to the scene of the accident with the mobile triage bags; and 2) Those designated to set up the stored equipment in the bunk rooms and fire station. (Fixed pre-triage.)

Outside communications are via fire department radios, by telephone or other radios. Another important factor in this type of disaster concerns the emotional trauma for the survivor and for the families of the travelers. Public relations personnel of the airlines, clergy and Red Cross personnel are urged to be present in an area adjacent to the triage rooms. By receiving immediate information from the physicians in the triage area, these personnel will be able to communicate immediately with the families of those involved in the accident and report on their condition.

Disaster plans are never static. Each rehearsal, each real disaster, shows pre-triage personnel how they can function more efficiently to give victims of a medical emergency a greater chance for survival.

**The system utilized at O'Hare to sort out the victims needing immediate care at the scene prior to transport to a triage area.*

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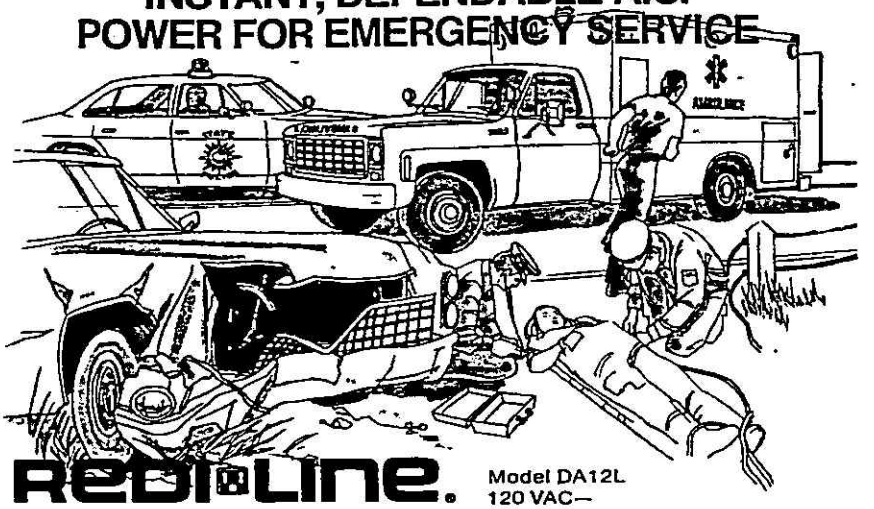

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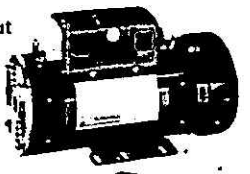

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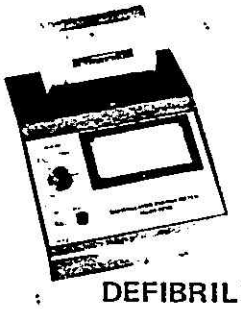

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