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Scene Investigation, Identification, and Victim Examination Following the Accident of Galaxy 203: Disaster Preplanning Does Work

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ABSTRACT: Galaxy Airlines Flight 203 crashed following takeoff from Reno-Cannon International Airport on 21 Jan. 1985. Sixty-eight persons on board the aircraft perished in the initial crash and resultant fire which followed. Two victims expired as a result of crash injuries within subsequent days and one passenger survived. A community disaster response plan was in place and had been practiced by local government agencies before this incident. The successes of this preplanned response, as well as methods of actual recovery, identification, and examination of the victims is presented.

KEYWORDS: odontology, human identification, aircraft, accidents, disaster management, aircraft crash

Disaster Planning

Difficulties in the area of management have frequently been reported as an outgrowth of prior disaster events. Chain of command has often been nonexistent. Obtaining supplies or manpower has been difficult. Multiple agency participation has caused inconsistencies. In-depth research into cause of death relative to disaster scene findings appears to be rare.

An effort to minimize the above common difficulties and to maximize available resources for conducting a postdisaster response was addressed by Washoe County, Nevada over a five-year period before the crash of Galaxy 203. Key elements of this planning process include: multiagency practice of the National Inter-agency Incident Management System (NIIMS) [1]; identification of a flexible command structure allowing command modules to fit disaster circumstances; inventory of necessary equipment, personnel, and facilities; rehearsal of agency responsibilities in the presence of supporting agencies; and establishment of an accounting and purchasing mechanism.

The actual test for effectiveness of this five-year planning process was demonstrated by: exact location charting during victim recovery, positive identification of 100% of the victims, autopsy examination of 100% of the fatally injured, uniformity of examination enabling comparisons of causes of death or injury, and recovery of over \$160 000 in personal effects.

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These tasks were completed during a five-day period following this crash without significant disruption of standard community services.

Crash Scenario

The aircraft was a Lockheed Electra, Model L188, four-engine turboprop, N 5532, operated by Galaxy Airlines. Designated Flight 203, the aircraft departed Reno-Cannon International Airport at 1:04 a.m., 21 Jan. 1985. The flight carried six crew members and sixty-five passengers upon a chartered return flight to Minneapolis, Minnesota.

Seconds following takeoff the pilot notified the control tower of severe vibration within the aircraft and requested permission to return to the airport. The aircraft descended into an open field approximately 2 miles (3 km) south of the airport. Following impact, the aircraft skidded across an open field subsequently hitting a frozen dirt embankment and catapulting into a recreational vehicle sales lot. The aircraft and recreational vehicles erupted into a massive conflagration.

Two deceased victims were ejected still buckled into their seats approximately 120 ft (36.5 m) forward of the destroyed fuselage. These were the only unburned victims. Two victims, a father and son, were ejected onto a paved street approximately 60 ft (18 m) forward of the crash site. The son became the sole survivor of the crash. The father expired in a local hospital eight days after the incident. One victim initially survived thermal burns over an estimated 80% of his body, but died in a burn center fourteen days postcrash. Sixty-eight fatalities received thermal burns and traumatic injury of varying degree rendering them visually unidentifiable.

Emergency Response

Airport crash-fire rescue units were notified immediately following the pilot's distress call and were in the activation process at the time of the crash. A Sheriff's patrol unit was operating on the street near the crash site. This officer observed the initial explosion and notified his dispatcher. Firefighters arrived on the scene 5 min postcrash with three fire companies ultimately responding. Total containment of the fire was achieved within 25 min of the initial crash. Local ground and helicopter ambulances responded and removed the three survivors from the crash site.

Command Structure

The National Inter-agency Incident Management System (NIIMS) is designed to provide flexibility of command based upon the major need at the time. Thus, the responding county fire department established the initial command at the scene. Following suppression of the fire, security and search of the scene became paramount and command was transferred to the Sheriff. The initial command itself established by fire department personnel became second in command and accomplished a supplies and personnel procurement function under the command of the Sheriff. Temporary morgue operation was under the direction of the Coroner with access to personnel, supplies procurement, and security through the two previously activated agencies. A prearranged accounting mechanism designated purchase orders to disaster costs and enabled financial record keeping to progress without loss or confusion.

Deceased Victim Recovery

A grid pattern was established with plastic tape and wooden surveyor stakes in 23-ft (7-m) squares over the entire crash site [2]. An alphanumeric number representative of recovery location was written upon a coroner's tag and attached to each victim or to articles of per-

sonal effects. The grid pattern enabled rapid measurement and recording of the exact location where each item or victim was recovered. Photographs of each recovery were made before removal. Two work teams, each consisting of a deputy coroner, a photographer, a recorder, measurement takers, and litter bearers, excavated each body from the wreckage in systematic order. Each recovery was then bagged and removed to refrigerated trucks. A prior cache of body pouches, identification tags, and survey stakes existed within the Coroner's office.

Three refrigerated vans from a local produce distribution company were used. A written agreement specified that the vans would be equipped with metal interiors and would be returned to the supplier following steam cleaning and certification of cleanliness by the county health department. Notification of the produce company and dispatch of the trucks was accomplished by a single telephone call from a Coroner's secretary. An example of the community response to this disaster was the trucking company's single question: "How many trucks do you want and where do you want them"?

Temporary Morgue

The Washoe County disaster protocol designates the Nevada State Fairgrounds as a temporary morgue site. An exhibit building at this site has 2 well-lighted rooms each 60 by 60 ft (18 by 18 m) in dimension. Over 100 formica topped folding tables, kitchen facilities, restrooms, and hot and cold water are immediately available. Also present is a loading dock matching the deck height of the refrigerated trucks. Fences and walls control access to the area insuring security. A bank of 4 telephones was installed after establishment of the temporary morgue.

Forty-six bodies were removed from the refrigerated trucks and were placed in rows within a large room. Numerical sequence by rows allowed individual examination of each body without comingling of evidence or errors in record keeping. Examination teams were designated by function and systematically approached each body in numerical order. Equipment utilized in each examination was transported along the rows upon wheeled carts.

The first examination team assigned case numbers and cross-referenced this number with the crash scene recovery number. This team initiated a case record which included sex determination when possible, an approximate physical description, and inventory of personal effects or clothing fragments associated with each body. This team was responsible for charting this preliminary information upon a wall chart.

The second team through the sequential exam process consisted of six dentists working in pairs. Since all victims were visually unrecognizable, the maxilla and mandible of each victim was removed, tagged by case number, and cleaned. A chart of dental characteristics was prepared. Each tagged maxilla and mandible with accompanying dental chart was then sequentially placed upon a long table awaiting comparison to antemortem dental records.

Third in the assembly line examination process were FBI Disaster Squad fingerprint specialists. Charred fingers were removed, cleaned, and inked [3]. Rolled fingerprint impressions were made. Frequently, charring of outer layers of skin prevented fingerprinting, however, the charred skin could be dissected away from the fingertip and impressions of underlying friction ridge detail could be obtained.

Autopsies were conducted fourth in the examination process. Three teams, each consisting of a forensic pathologist and a technician, examined the bodies in sequential order by assigned rows. Examination protocol directed the sequence in which dissections would be conducted, thus allowing for autopsy of each victim in a standard and uniform manner [4]. The original property inventory teams were reassigned to accompany the pathology teams for specimen collection and labeling as well as removal of property following description by the pathologist. During each autopsy, specimens of blood, urine, psoas muscle, and liver were collected for chemical evaluation. Specimens were frozen and were transferred to the Federal

Aviation Administration staff for analysis. Photographs of pertinent pathologic findings were made. Overall photographs and internal airway photographs of each victim were routinely taken.

Identification

The Minneapolis office of the Federal Bureau of Investigation supplied a major link in the identification process by interviewing next of kin and procurement of premortem dental records. Dental records of all but eight victims were delivered to Reno within four days. Six of the remaining records were delivered on the fifth day. Of the two victims without dental records, one was identifiable by fingerprints and the second by personal effects plus an orthopedic device.

Recognizing the potential for receipt of a large percentage of premortem dental records, no comparisons were attempted until all dentition was removed, charted, and sequentially placed upon the aforementioned long table. Six participating dentists then continued the assembly line approach by simply obtaining a single premortem dental record at the head of the table and walking along the row of removed and charted dentition until a comparison could be made. Upon detection of a matching record and specimen, those items were placed on the opposite side of the table. The dentist would then return to the head of the table and again proceed along the table with an uncomparing record. Fifty-nine positive identifications were achieved in 2 h. The remaining seven positive dental identifications were completed the following morning when six additional premortem records were received and one dental record was discovered comingled with that of a spouse. Names of all positively identified victims were released at this time. A subsequent report certifying identification was written in each case. Twenty-six positive identifications were also obtained by the FBI Disaster Squad through fingerprint comparisons.

Autopsy Findings

Autopsies revealed a wide range of traumatic injury including obviously fatal head, thoracic, and abdominal injuries. Conversely, many victims were found without significant trauma except burns. Soot deposition within the trachea ranged from nonexistent to dense. All final determinations as to cause of death were deferred until analysis for blood alcohol, carbon monoxide, and cyanide was complete. Correlation of original crash recovery positions to injury patterns was envisioned at this time.

Body Release and Shipment

Caskets and embalming supplies were delivered to the temporary morgue during the four days following the crash. This effort was coordinated jointly by five local mortuaries. Following autopsy of the forty-sixth victim (Day 4) an embalming and casketing process was begun in reverse numerical order. The first eighteen victims examined had earlier been removed from the morgue and returned to a refrigerated truck. Twenty-two identified victims with autopsies yet to be conducted remained at this time.

The victims, excluding the flight crew, were embalmed and placed within a clean body pouch. Identification numbers upon each body, each body pouch, and each casket were reconfirmed. Each body pouch was placed inside a casket which was affixed with a burial transit permit and an instruction sheet for obtaining copies of death certificates and reports. Shipments of caskets by commercial airline was begun at the rate of twenty per day. Pairs of caskets containing spouse or members of the same family were shipped simultaneously.

All certifications of identity, autopsies, embalming, casketing, and shipment documentation was completed upon the evening of the fifth day following the crash. Normal daily operation of the Sheriff, Coroner, and Fire Departments had not been interrupted.

Personal Property

Nevada law requires the Coroner to maintain receipting and accounting records of a decedent's personal effects. Over \$52 000 in cash, \$115 000 in damaged jewelry items, and the entire cargo of partially burned, fuel soaked luggage was recovered during this investigation. Inventory of burned currency with subsequent redemption by the U.S. Treasury, followed by inventory of burned luggage, became a manpower allocation for weeks following the crash. Checks for redeemed currency were mailed to survivors. Luggage was crated and shipped with external markings designating the package contents as severely burned and damaged articles. Jewelry was cleaned and appraised then returned to next of kin. Ownership of relatively few articles remains unknown.

Press and Media Coverage

A county public information officer scheduled and directed frequent news conferences. The public information officer had previously compiled a dossier regarding county officials. Much confusion was eliminated by a preface to each news conference which included spelling of names, resume review, and parameters of the conference. Subsequent news conferences were announced at the close of each completed news conference. Media representatives were provided controlled guided tours of the crash site. Air space over the crash site was closed. A working public official could thus prepare a brief statement and deliver the same in a controlled setting and return to his tasks. Telephone requests from the media for information were answered by direction to the next news conference.

One controversy was raised by visiting media representatives over refusal by the Coroner to release names of suspected victims before completion of positive identification. This procedure was predefined within the county disaster protocol. Withholding of suspected identification enables the investigation team to detect false identities upon the airline manifest as well as separate those victims for whom process of elimination is the only means to reach identity. This also enables individual queries regarding victims to be answered at one time with a more complete perspective.

Summary

In summary, all major management and command decisions necessary to complete this investigation, identification, and recovery operation were addressed before occurrence of the event. Commanders of all public agencies understood the processes which were to be completed to the degree that tasks could be initiated by telephone or in the absence of specific agency directors. Supplies, facilities, and accounting procedures were in place before their need. Personnel necessary to accomplish the professional requirements of this investigation were preidentified and trained. A quality investigation resulted in minimum time. Practice of disaster preplanning is a necessary component of public service.

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