



Aviation Fire Journal



The Internet Magazine Of Worldwide Aviation Fire Protection

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The Internet Magazine Of
Worldwide Aviation Fire Protection

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**Front Cover Picture - U.S. Air Force Fire
Fighter in support of 'Operation Enduring-
Freedom' removes hose line from ARFF
vehicle during training exercise. (Photo
courtesy of United States Air Force)**

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EDITORS FORUM



The big news today it is the SARS (*Severe Acute Respiratory Syndrome*) epidemic and its ramifications on the airline industry and international tourism, particularly in Asia and Canada, and the international airport fire services.

How does the SARS epidemic affect Airport Fire Services you ask? Well, it affects it in several ways. First off, reductions in flight schedules due to low passenger volume equals less revenue for the airport in landing fees, passenger airport surcharges, and gate fees. This filters down to less revenue for any improvements or equipment procurements for airport fire services. In some cases, airport operating hours are reduced, or in some cases closed, thereby reducing firefighter working hours and overtime.

There is another impact that one also has to consider operationally. Since many airport fire services provide emergency medical services as part of their duties, they could encounter a potential SARS patient who becomes sick while in the airport or on an aircraft.

While it is not my intention to downplay the SARS epidemic or its seriousness, we must put it into some sort of context so that we can understand the disease and how to prepare for it.

SARS, in a nutshell, is a more virulent infectious mutation of the corona virus microbe that is related to the common cold. However it has struck fear in the hearts and minds of air travelers worldwide. However, when looking in comparison of this new threat, we must consider the fact that Tuberculosis (TB) and Malaria kills more people around the world each year than SARS. Even the recent Henta virus deaths were small in comparison. The SARS disease is new, and this fact can obviously change. The severity of SARS cases ranges from mild illness to death. Actually, about 90 per cent of the cases recover, 10 per cent will need intensive care and 4 or so per cent will die.

Symptoms include high fever (greater than 100.4 degrees F / 38 degrees C), dry cough, shortness of breath or breathing difficulties.

Fortunately, most of the current cases of SARS have occurred in people who have had close face-to-face contact with SARS patients, such as health care personnel who treated SARS patients, and family members living in close contact with SARS patients. The disease is spread in such circumstances through direct contact with droplets from the mouth and nose of an infected person. However, other possible routes of transmission of the disease are possible, such as contact on surfaces. Only 5% of those infected die from the disease, many of these deaths due to other predisposing health factors exacerbated by SARS.

As with all infectious illnesses, the first line of defense to prevent transmission is careful hand hygiene. As a general rule, it is good practice to wash hands frequently with soap and hot water; if hands are not visibly soiled, alcohol-based hand rubs may be used as an alternative. According to principles of health-care infection control, in a health-care-related emergency, emergency personnel should wear disposable gloves for direct contact with blood or body fluids of any passenger. However, gloves are not intended to replace proper hand hygiene. Immediately after activities involving contact with body fluids, gloves should be carefully removed and discarded and hands should be cleaned thoroughly.

The next realization that we all must face is learning to live with SARS. Like any virus, they eventually will run their course, or in time a vaccine is developed. What we must understand is that SARS will not go away for a while, and life must go on in spite of it. What if everyone stopped traveling by air? The economic downturn will fuel a worldwide crisis. Airlines will fold, airports and its employees, including firefighters, will lose their jobs, and the world will come to a grinding halt.

The key to any outbreak of infectious disease is knowledge, prevention, and personal protection. Taking the basic personal infection control precautions, such as hand washing, monitoring your health while in or returning from affected regions, and early health care treatment regimens if you are becoming symptomatic will allow us all to carry on living our lives in spite of SARS.

WILLIAM MULCAHEY

HOW NOT TO RUN AN AIRPORT FIRE SERVICE

by
Donald Nelsen

A very controversial subject and doubtlessly one in which very strong feelings are kept on all sides. Even though this topic is of life and death significance to the air commuter and employee alike, it is the most overlooked aspect of the entire aviation service provision package.

To begin with, the airport administration must fully support the safety aspect of the airport fire service. When the term 'safety' is used in this context, it means not only the Aviation Rescue Fire Fighting (ARFF) mission but also hazardous materials mitigation, pre-hospital medical care, and emergency management. For purposes of this article it does not include 'security' aspects of risk management, loss prevention, police protection, customs or immigration inspections, law enforcement action, etc. An airport administration that ignores the recommendations of its safety staff will be left holding the proverbial bag of feces when an incident does occur. Notice the terminology of "when". Not one airport or community in the world is immune from an aircraft accident. Every airport and many communities in the world will have an accident, and it will occur again over time. Many airport administrators do not take into consideration that although the catastrophic event of a wide body commercial airliner crashing is remote, the general, business/corporate, and military aviation communities unfortunately experience crashes somewhere in the world on a daily basis. One only needs to subscribe to the daily Air Crash Rescue News e-mail notifications to get a front row seat as to what is happening in aviation around the globe.

Typical to close hold administrations, they frown on unbiased outside evaluation of airport disaster drills then stick their heads in the ground like an ostrich when something does happen. 'Gee, our disaster

drills always worked out so well, I can't understand why we performed so poorly in this actual incident.' 'Well, I didn't realize the Fire Chief had recommended those changes years ago.' 'Oh, the recommendations were caught up in the bureaucracy and apparently never reached my desk.' Unfortunately all too familiar sounding clichés of an airport administration trying to pass the buck. Penny pinching in the past and present will surely guarantee having to pay the piper in the future, and in huge amounts. Instead of playing political games or using the 'it wasn't invented here' mentality ... take the recommendation of those dedicated professionals whose service is committed to saving lives.



For instance, I am personally aware of an airport administration that routinely ignores the recommendations of the ARFF staff. Even when federal and state grants were available to the fire services they were denied permission to apply for the grants. Every Sunday in the state wide circulated and metropolitan area newspapers you see their advertisements in the Aviation section touting 24 hour ARFF protection as a lure to the business, corporate, and general aviation communities.

Little do those flyers and their passengers realize that the lone lime green rapid intervention vehicle is staffed by only one driver/operator and lacks key life saving equipment (*handheld and vehicle mounted thermal imaging cameras, piercing nozzles, marsh land access or rescue equipment—the airport is surrounded by wet lands-, stokes litter, and much more*) which could make all the difference in the world should your aircraft go down there as the closest help is over ten minutes away. Unbelievably, the same airport administration had a \$22,000 rock garden installed around the fire station to "pretty it up some". I am sure those aircraft crash victims will be happy the sta-

tion area looks nice.

Airport Emergency Plans (AEP) need to be realistic and objective oriented. Airport administrations need to recognize that only general strategic goals should be listed. Specific tactical tasks should not be mandated in black and white. The Incident Commander and/or Operations Section Chief must reserve different tactics for various dynamic situations. As long as we are on this issue, if the Airport Administration wants to actively partake in an emergency or disaster, they should have Incident Command System (ICS) training in addition to periodic refresher drilling. The airport administration which wants to retain "Command" yet has not a clue as to what an Incident Management System (IMS) is nor could they spell "ICS" will definitely be in the figurehead role until the situation has been mitigated and lives are no longer at risk. Oh, they will retain command all right; they can go right over there in the cold zone and command their scribe in their automobile. Once the victims are treated and transported and the property loss has stopped, then they can come out and get their pictures taken as the conquerors of societies ravages. Until that time, let's please leave it to the professional emergency servants.

Another classic example of how not to have an AEP written and utilized is the same aforementioned municipal airport. The United States' Federal Aviation Administration (FAA) Advisory Circular (AC) format for an AEP is somewhat followed. Each functional area (air traffic control, airport administration, ARFF, fire, ambulance, police, etc.) has a section in which a 'check list' type of narrative is used to respond to the more common scenarios. To begin with, the only 24-hour services are ARFF, municipal fire (a combination of career fire fighters and volunteer firemen), and municipal police. The air traffic controllers are 16 hours a day, airport operations (masquerading as administration) is usually 17 hours a day, ambulance service is volunteer, paramedic services is hospital based career and per diem personnel which do not have transport capable vehicles, emergency management is nearly all volunteer, and the actual airport administrators are Monday through Friday from around 10 or 11 AM until 3 or 4 PM – when they aren't away at conferences. Yet all of the 'activities' of each functional area are plainly written in black and white.

For instance, under Air Traffic Control the procedure for an aircraft emergency is:

1. Depress ARFF (panic) button which will activate radio and siren alerts.
2. Notify the town police dispatch via the tie line of nature and location.
3. Contact ARFF on ground frequency with nature and location.

4. Sanitize air and ground space as soon as possible.
5. Turn airfield over to ARFF as soon as possible.
6. Close airport to air traffic per airport administration upon actual accident.

Another example for ARFF is:

1. Contact ATCT on ground frequency for nature and location.
2. Ascertain if municipal emergency services are responding.
3. Notify airport operations of nature and location.
4. Obtain ATCT clearances and proceed to staging point.
5. Stay at staging point until the aircraft has come to a complete stop.
6. Notify airport administration in case of an actual incident/accident.
7. Perform Rescue and Fire Control Activities.

Nothing listed above in these actual citations takes into consideration the 1/3 of the time the Air Traffic Control Tower is closed. Nothing takes into consideration that Airport Operations isn't on site 7 hours a night. Nothing allows for transiting an uncontrolled airfield with the apparatus. Nothing allows for a 'setup' of ARFF apparatus on the airfield, dependent upon aircraft situation, to take advantage of its pump and roll capabilities. "Notification" is not detailed. Is it a telephone message? Is it a page? Is it a smoke signal? Lastly, do you really think the sole ARFF driver/operator is going to go through steps 1 through 6 when an accident occurs before performing "Rescue and Fire Control Activities"? What was that? 'Surely this can't be the truth!' you say? Unfortunately this very plan was touted throughout the general aviation community via a nationwide 'professional executives association' as being a model plan. Of course none of the membership of that organization had the courage to ask the tough questions. After all, the airport manager was the vice-president who travels to every conference. She must know it all even though he has never been on the safety or security side of aviation emergency services. 'Well why didn't her Fire or Police Chief try to correct the deficiencies?' They did. They were told the emergency plan meets the advisory circular and that no changes were needed. Of course not, then all of the model plans already disseminated would have to be updated causing some egg on her face.

Hi Chief, Mrs. Airport Manager here, the ARFF utility vehicle will need replacement in the next few months. Would you please submit a recommendation? Sure will ma'am. In fact our recommendation is to trade in the two-door sport utility vehicle for a four-door heavy-

duty pickup truck with a modular body. This new vehicle will not only allow us to better perform our nighttime airfield operations duties but we will have the capability to acquire an index A skid unit so when the sole index B rapid intervention vehicle is down for periodic maintenance or has a breakdown the airport will still have some ARFF protection. *How much will it cost?* We have priced the pickup truck at approximately \$35,000 and the skid unit at approximately \$15,000. *Well, I am a fan of GMC products so we'll get you a four door Chevrolet Blazer. You definitely don't need a pickup truck for airfield operations duties.* Oh, OK. When is airport operations getting rid of their fleet of pickup trucks in favor of Blazers? *Uh, the airport doesn't want to spend that much money on something that won't really be used.* I understand your concerns Mrs. Manager. However, the rapid intervention vehicle was low bid and designed by the municipal fire chief who had not a clue as to what was needed here. It is poorly designed. Its manufacturer went bankrupt. There has been issue after issue with it mechanically since its arrival here five years ago. We really need to look to the future for overhaul or replacement in addition to having a backup capability as we have continuously recommended for some time now. You really don't want to go from index B protection to no protection do you? *Uh, Uh, of course not. We'll get you the Blazer and talk about longer-term plans.*



Approximately four months later, the rapid intervention vehicle blows the clutch and power divider on its weekly training evolution. No, that's not a misprint, a **WEEKLY** training evolution! The RIV could not be used more than once a week because it was literally falling apart. The airport's sole rapid intervention vehicle was then relegated to only a three times per week engine start up for check out. Except, of course, for school tours and actual alerts. This continued for about six months because the airport administration was busy preparing for their annual 'overseas' trip as well as another national business association conference. Then all of a sudden the airport administration stops drinking its

bottled water and swallows some good old county provided water. *Hmmmm. Let's buy a pickup truck and a skid unit so we have some ARFF protection until the rapid intervention vehicle is fixed. Since we spent \$30,000 on the Blazer, let's buy the least expensive skid mount we can find. Chevrolet 1500 pickup truck for \$30,000. Ansul index A skid unit for \$10,000. \$40,000 total – we saved \$10,000 from what the chief recommended. We are geniuses!!!!* Yes you are ma'am, now we have an RIV which doesn't work except to squirt water for the kids, we have a 4 door Blazer for nighttime airfield operations duties, and we have a 2 door pickup truck without a modular body which can only carry a skid unit in the bed. You spent \$70,000 on vehicles and equipment which doesn't meet our actual needs. And, we only have **ONE** fire fighter on duty 24 hours a day/7 days a week but in your defense he now has three useless vehicles to choose from. Yes ma'am, you are a rocket scientist. You have more degrees than a thermometer. It is only wishful thinking that this situation never actually happened. You just can't make this stuff up.

I want our firemen to be the best. The municipal firemen are over paid and under worked. I want our firemen to be educated above and beyond the capabilities of the local firemen. I want our firemen to receive all of the best training. An Airport Fire Chief's dream comes true you say? Oh, sorry, I forgot the small print. Do not incur overtime. They must work their regular scheduled tours.

Do not be away from the station for extended periods. I want to see the same faces. I want fill in firemen to be here as often as possible, but they still must meet all of the prerequisites as full time firemen. And, they will be paid approximately \$6,000.00 less annually with significantly worse benefits and no pension even though they must meet initial qualifications of 2 years full time ARFF, Fire Fighter 2, Emergency Medical Technician, Hazardous Materials Technician, Cardiopulmonary Resuscitation, Incident Command Systems, Drivers License, High School Diploma, and at least 21 years of age. Impossible you say? Preposterous? Outlandish? You bet, but that was the actual

directive 'sent down from above'. How on God's Green Earth can you accomplish this? You can't. And then when you start sending guys out on their days off for these 'volunteer' assignments you violate labor laws and union contracts. *But, we want our guys to be the best. I don't care how you do it, just do it.* Well, I'm sorry Mrs. Airport Director. There is only one airport fire department I know of that meets your requirements. Unless you plan on transferring to **FANTASYLAND**, I would strongly suggest you lighten up somewhere on your mandates to something that is workable.

Oh, I see. Well then I want our firemen to be defibrillator trained so when somebody has a heart attack they can intervene and save their life. That would be an excellent public relations coup if we can have that happen, don't you think? Now you are talking. We already priced on site training and equipment purchases. It is workable and within current budgetary constraints, but there is one glitch. State law mandates that once a defibrillator is attached to a patient and utilized, the care provider (in this case our sole Crash Fire Rescue Driver/Operator) is 'married' to the patient until they reach the hospital and medical control is provided appropriate reports from both the automated external defibrillator and the pre-hospital care provider. If our sole driver/operator does this while on duty alone (a very good possibility 128 hours a week), the airport would be stripped of all safety-first response protection until he returns. Given the sad state of affairs with our volunteer basic life support ambulance squad and non-transport capable career advanced life support system paramedics, it is also a 50/50 chance that we wouldn't get and ambulance anytime soon and/or the paramedics would be unavailable. In either case, we couldn't transfer care to an equal or higher trained practitioner because the volunteers generally aren't emergency medical technicians and the paramedics are usually tied up on other calls which they can't clear from until some form of local medical provider shows up to relieve them and transport the patient.

If we could add a second ARFF person around the clock, this would make this problem negligible. Additionally, there are some other duties and responsibilities which we can add so the second fireman gives much more 'bang for the buck'. We can offer mutual aid services outside of the airport proper, thus making this an actual public relations coup. *Uhh, no way! We are not adding another fireman. You will not respond off of the airport. We are paying for your services and not the locals. I've got an idea. We'll train the operations coordinators in defibrillation so they can use the AED to save somebody's life this way your fireman doesn't have to leave the airport. He can assist the operations coordinator until the ambulance and*

paramedics arrive. See, I am a genius. OK, ma'am, but I just want you to know that you are sacrificing emergency medical care in an attempt to score public affairs brownie points. What happens when the AED says there is no shock indicated? What are your operations coordinators going to do then? What about if the victim has an airway obstruction and only abdominal thrusts or rescue breathing is necessary? What if the person had a syncope episode or seizure and doesn't require any CPR or rescue breathing? What are your non-first responder qualified operations coordinators going to do then? You see, ma'am, this isn't a game. Somebody's life will actually depend on our response. Exactly how much is a human life worth to you? *Oh, golly gee! Let me go hide in the ivory tower and think this over. You haven't put any of this in writing to me, have you?*

It is an unforgiving world we live, work, and play in out there. Sacrificing aviation emergency services may save a few bucks here and there, but ultimately the airport administration will be left holding the bag. 'Cover your assets' by documenting your deficiencies and recommended corrections. Be progressive and proactive even though your airport administration prefers the 'out of sight, out of mind' approach. Just remember, when provided a \$22,000 rock garden around the station you are now "High Profile" visibility wise and expected to be professional. Make the situation advantageous to you and not you subject to the situation.

ABOUT THE AUTHOR— *Donald Nelsen* currently serves as the Regional Manager of The Americas for the *International Aviation Fire Protection Association* and periodically contributes articles to the *Aviation Fire Journal*. Donald was the ARFF Chief for a privatized service (which is operated by a contractor) in New Jersey for 4 years. He currently is a per-diem Fire Instructor at the Morris County Training Academy in New Jersey and a per-diem Terrorism Instructor for Rutgers State University in the New Jersey Division of Fire Safety's semi-annual educational offerings.

NOTICE TO ALL AVIATION FIRE JOURNAL SUBSCRIBERS

The '**AFJ TRAVEL CLUB**' has been discontinued as of this date due to a lack of any active AFJ subscriber participation over the past two years. However, the "AFJ TRAVEL TIPS" column featured in each issue of AFJ will continue to offer our AFJ subscribers money-saving travel tips. It is with regret that this AFJ Subscription benefit has had to be discontinued.

IAFPA REPORT

An Official Communication Column of the
*International Aviation Fire Protection
Association (IAFPA)*

by
William Mulcahey- IAFPA Association Director

The IAFPA has reached a landmark in 2003. The founders of the IAFPA - *the five now standing Executive Directors* - as well as the interim appointed Board of Director members which comprise the IAFPA Management Group, are to undergo the first general membership election process this year.

All active IAFPA members will have the opportunity to nominate and elect all of the Executive Directors and the Board of Directors in 2003. Unlike other organizations which permit members only to vote for Board Members, and subsequently these elected Board members decide and then vote for the Chairperson / President, Vice President, etc., the IAFPA believes that these most important appointments should be decided upon by the decision of the majority vote of its general membership. We feel that this gives everyone the opportunity to decide who is to lead the IAFPA into the future.

The IAFPA has moved farther and faster than any other similar association. In its 3+ years in existence the IAFPA has been recognized by the international aviation fire protection community as the leading international aviation fire protection association. The IAFPA has just gained official appointment on the *National Fire Protection Association's (NFPA) Aircraft Rescue & Fire Fighting Technical Committee*. This prestigious organization has recognized the impact that the IAFPA has made in the international ARFF community in its short time in existence.

The IAFPA is seen throughout the world as an "international" focused association and the reason is simple – the IAFPA actual travels and conferences in different regions around the world to spread the mission of information exchange and professional interaction. This year alone the IAFPA will be hosting conferences and workshops in Europe and in Asia. In the future the IAFPA will be bringing its mission to other places around the world that strive not only for a membership, but also the opportunity to actually meet the persons involved in the organization – its

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Directors and members - who bring a personal interaction with others from around the world. If your not an IAFPA member already, don't you owe it to yourself to become professionally involved?

AFJ TRAVEL TIPS

MORE MONEY SAVING TRAVEL TIPS

The key to low-cost dining in Great Britain or Ireland is the meal-serving pub, found everywhere. In the comfy glow of a fireplace, you can down a pint of ale and dig into a hearty Shepard's pie (beef stew capped with mashed potatoes) or bangers and mash (sausages and those potatoes again) for a fraction of what even an inexpensive restaurant would charge. Alternately, you can seek out a fish and chips shop specializing in a wonderfully greasy, batter-fried cod, whitefish or skate accompanied by a pile of "chips" (fries).

Restaurant prices in many foreign countries already include a service charge, and you should avoid double tipping. If a foreign language menu has a word at the bottom looking vaguely like "service" with a figure or percentage after it, it means the tip is automatically included in the price. But you needn't be miserly; if the service has been particularly good, it's still customary to round up the bill or leave a euro (about US \$1) per person to show you noticed and appreciated the effort.

Among the services offered by almost all Public Libraries are not simply internet and computer access, but also faxing and photocopying, for which you'd pay much more at Kinko's or a hotel's business center. Internet and computer use are usually free at libraries, and laser copies can cost as little as 10¢ and photocopies only 5¢.

In cities heavily visited by tourists, shop for travel items like postcards, film, and batteries in areas that aren't frequented by tourist, and you'll save up to 50 percent. Sometimes, the cheaper shops are found simply a block away from the main "tourist strip." And meals bought in a café located far from the tourist throngs will often cost a third of what they do in such areas as Times Square in New York City or Piccadilly Circus in London.

You can find high-quality, budget-priced hotels in Paris by using tow little-known web sites. Access www.paris-travel.com for discounted rates at quality-level two star inns access: www.yourstayparis.com for low-cost apartments.

WHATS CRASHED AND WHERE

FEBRUARY 20, 2003 (KOHAT, Pakistan) -Soldiers examine the wreckage of a Pakistan Air Force Fokker-27 turboprop which was crashed in the mountains



of Taulanj, near Kohat, Pakistan killing 17 high officials including air force chief. (AP Photo/B.K. Bangash)

FEBRUARY 26, 2003 (ISRAEL) - The wreckage of an Israeli F-16 warplane lies at the edge of a reservoir in northern Israel on February 24, 2003. The air force says an engine malfunction caused the U.S.-built



plane to crash. Its pilot ejected safely. He was reported to be unhurt. REUTERS/Baz Ratner

MARCH 1, 2003 (LEESBURG, Virginia -USA) - Three people were killed on March 1st in a small plane crash near downtown Leesburg. The Socata turbo-prop plane crashed in a resident's back yard at Market and Ayr streets at 3:15 p.m., while attempting to



land at Leesburg Municipal Airport. The plane sheared the tops of several trees and came to rest six feet from a house.

MARCH 4, 2003 (JAKARTA, Indonesia) - Indonesian police officers examine the wreckage of a helicopter



after it crashed at a hotel's swimming pool in Jakarta, Tuesday, March 4, 2003. A helicopter clipped the roof of a five star hotel in the Indonesian capital on Tuesday, before crashing killing three people on board, hotel staff said. (AP Photo/Dita Alangkara)

MARCH 7, 2003 (TAMANRASET, Algeria) - Rescue workers and police officers gather around an Air Algerie passenger jet after it crashed March 6, 2003 after takeoff in Tamanrasset, 1,600 kilometers (990



miles) south of the Algerian capital. Engine trouble likely caused the fiery crash of the Boeing 737 that killed 102 people. One person survived.(AP Photo)

MARCH 20, 2003 (LEESBURG, Virginia-USA) - One person was killed in the crash of a single engine plane behind a row of houses just north of Leesburg Executive Airport shortly before 8 p.m. It is the third fatal plane crash in Leesburg in the past nine months. Witnesses said the 2-seat 2002 Mooney aircraft was coming in for a landing at the town airport when the crash occurred. Some reported hearing the engine cut out before the aircraft fell to the ground in the backyard of a home in the 300 block of Whipp Drive in the Stratford subdivision.



Executive Airport shortly before 8 p.m. It is the third fatal plane crash in Leesburg in the past nine months. Witnesses said the 2-seat 2002 Mooney aircraft was coming in for a landing at the town airport when the crash occurred. Some reported hearing the engine cut out before the aircraft fell to the ground in the backyard of a home in the 300 block of Whipp Drive in the Stratford subdivision.

MARCH 21, 2003 (QUEENS, New York - USA) - A member of the New York fire department (L), dressed in a hazardous materials suit, talks to baggage screeners from the Transportation Security Administration after an anthrax scare at LaGuardia Airport in New York City. Since the beginning of the war between America and Iraq, many false alarms have taken place around the city as citizens fear another attack on New York. (REUTERS/Chip East)



stration after an anthrax scare at LaGuardia Airport in New York City. Since the beginning of the war between America and Iraq, many false alarms have taken place around the city as citizens fear another attack on New York. (REUTERS/Chip East)

APRIL 2, 2003 (SILANG, The Philippines) - Investigators check the remains of a six-seater Piper Cherokee plane after it crashed in a golf course in Silang town in Cavite province, south of Manila on Wednesday April 2, 2003. All of the three passengers onboard



were killed as the plane exploded upon crashing, witness said.

APRIL 4, 2002 (LEOMINSTER, Massachusetts - USA) - Rescue workers and firemen respond to the wreckage from a twin-engine plane that crashed into a sheet metal plant in Leominster, Massachusetts.



The plane crashed into a sheet metal shop, igniting a huge fireball and sending its workers fleeing. Several persons aboard the plane were killed, according to officials. (AP Photo/Christopher W. Harrington).

APRIL 7, 2003 (PUNJAB, India) - An Indian Air Force official inspects the wreckage of a MiG jet after it



crashed into a milk plant in the northern Indian state of Haryana April 7, 2003. The crash, which injured seven people, was the second involving the Russian

designed plane since last week, when a MiG-23 hit houses in a village in neighboring Punjab, killing five people and injuring 24. (Ajay Verma/Reuters)

APRIL 8, 2003 (TOLEDO, Ohio -USA) - A firefighter walks past what is left of a Dassault Aviation Falcon



20 jet plane near Toledo, Ohio. The twin-engine jet went down while approaching Toledo Express Airport. All three people on board were killed. (AP Photo/J.D. Pooley)

APRIL 11, 2003 (HOUSTON, Texas - USA) - Eight vehicles were burned after a fire broke out in a parking garage at Bush Intercontinental Airport. The fire



happened at 2:30 a.m. in the second level of the old Terminal C parking garage. Houston fire officials told reporters that firefighters had a tough time battling the blaze because of construction in the area and not being able to get equipment up into the garage. No injuries were reported.

April 13, 2003 (CONESUS, New York -USA) — Three pilots aboard a single-engine Piper PA-23 plane died



when they crashed in woods near Hemlock Lake in Livingston County. The scene was accessible with help from the Department of Environmental Conservation, which had a four-wheeled all-terrain vehicle for use.

APRIL 19, 2003 (WILEY FORD, West Virginia - USA) - The Wiley Ford and Ridgeley volunteer fire departments responded to the Greater Cumberland Regional Airport after a battery exploded when it was



struck by the prop of a commuter plane. No one was injured in the incident, although debris from the explosion broke a large window of the airport terminal. The battery was being used to start the commuter plane. The Federal Aviation Administration is investigating the accident. (Photo Credit: Steve Bittner/TimeNews)



CRASH PATCH GALLERY

PHILADELPHIA INTERNATIONAL AIRPORT (Philadelphia, Pennsylvania — USA)



This issue's submission to **CRASH PATCH GALLERY** comes from **PHILADELPHIA INTERNATIONAL AIRPORT** located in Philadelphia, Pennsylvania (USA). This facility's ARFF is provided by Philadelphia Fire Department's Engine Company 78. This ARFF unit was featured in last issue's "Crash Crew Profile."

AFJ magazine welcomes your submission to **CRASH PATCH GALLERY**, but assumes no responsibility for trades between any individuals involved. You can submit your patch by sending it, or scanned as a .GIF, .JPG, or .BMP file to the **AFJ Editor**.

NOTE: Picture shown is not actual patch size.

FIREFIGHTER SAFETY TIPS CORNER

- NEVER 'TEST' AN UNKNOWN LIQUID SUBSTANCE BY TOUCHING OR SMELLING IT.
- KEEP YOUR PERSONAL PROTECTIVE EQUIPMENT CLEAN AND IN GOOD CONDITION.
- BECOME FAMILIAR WITH ANY NEW CONSTRUCTION ON THE AIRPORT RUNWAY OR AIRPORT AREA THAT MAY CAUSE A DELAY OR CHANGE OF RESPONSE PATTERN.
- KEEP UNAUTHORIZED AND NON-ESSENTIAL PERSONNEL OUT OF A FOAM BLANKETED AREA.
- TEST AND FLUSH ALL FIRE HYDRANTS BEFORE HOOKING UP.
- WHEN ENTERING OR LEAVING AN AIRCRAFT, KEEP YOUR HEAD DOWN. TAKE MOMENT TO BE SURE NOTHING IS FALLING.

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FIRE IN THE SKY: SWISSAIR 111 REPORT

CANADIAN TRANSPORTATION SAFETY BOARD FOCUSES ON IN-FLIGHT FIRES

BY
MICHAEL MURPHY

On March 27, 2003, the Canadian Transportation Safety Board (TSB) released its long-awaited report into the event on September 2nd, 1998 that claimed SwissAir Flight 111 (SR 111), a McDonnell-Douglas-11 which crashed near Peggy's Cove, Nova Scotia, killing all 229 people on board. TSB's investigation focused on in-flight fires, which may overcome an aircraft and its crew before there is time to take advantage of ground-based ARFF. Ironically, the aircraft was only 66 miles and 20 minutes from Halifax when the tragic events began. This only underlines the dangers faced many times each day by airliners venturing over water or inhospitable terrain, hundreds of miles and hours away from suitably-equipped recovery airports.

This article is organized into five parts, the first four mirror and summarize the TSB report; the fifth is an exclusive interpretation of the report for AFJ readers.

1. Factual Information

Shortly after the aircraft reached its initial cruising altitude of 33,000 feet on its way from New York's JFK airport to Geneva, the crew detected an unusual odor in the cockpit. At first, the pilots believed it was probably an air conditioning anomaly, but within 4 minutes, the crew had declared a "Pan-Pan-Pan" and requested an immediate return to the nearest airport.

Air Traffic Control in Moncton, New Brunswick cleared the aircraft to Halifax, Nova Scotia and down to 31,000 feet, later clearing it down to 3,000 feet, in anticipation of a landing on runway 06 at Halifax. The crew was pre-occupied with checklists for descent and dealing with air conditioning smoke and smoke/fumes of unknown origin. Unable to make a stabilized approach directly into Halifax, carrying fuel for a Trans-Atlantic flight and on the wrong side of Halifax for the 06 approach, the crew requested and was granted time to lose altitude and to dump fuel.

Thirteen minutes after first detecting the odor, the autopilot and other electrical systems began to fail; a minute later, the crew declared an emergency. The last communication heard from the aircraft was 20

seconds later. Half a minute after that, the cockpit voice and flight data recorders stopped working. The crew shut the number 2 engine down while still in-flight, possibly because fire-damaged systems gave a false indication that the tail-mounted engine was on fire. Five minutes later, the doomed aircraft hit the water in a spiral dive (bank angle estimated between 60 and 110°) at approximately 300 knots, subjecting all 14 crew and 215 passengers on board to an unsurvivable force of "in the order of at least 350 g." The aircraft broke up into more than 2 million pieces, and then sank into water 90 metres deep.

Rescue efforts by local fishermen, the Canadian Coast Guard and the Canadian Navy soon proved futile. The operation then shifted into the recovery mode, which turned out to be a staggering challenge. Five major attempts over 13 months were made to recover underwater debris, including by Canadian Navy divers, the salvage ship *USS Grapple*, heavy lift barges, scallop dragger operations and a suction hopper dredge. Remotely operated submersibles were used during all phases of the recovery. Ultimately, TSB was able to recover almost 98% of the aircraft by weight, much of it in tiny pieces.



Determining the precise location of the two data recorders, located by a Canadian Navy submarine, and recovered by Navy divers on the 4th and 9th day of the investigation, was made more difficult by both transmitting on the same frequency. Although recovered largely intact, TSB was frustrated to find that electrical power to both units had been cut five minutes before the impact, causing the loss of a significant amount of critical data.

Although a major setback, this provided clues about the crash: both data recorders were powered from the same source: the Generator 3 (i.e. right engine) bus. During the emergency checklist dealing with smoke/fumes of unknown origin, each of the three engine-driven generators buses is deactivated in sequence to isolate a possible source of smoke/fumes. When the FDR failed, the aircraft was still in a clean configura-

tion - flaps, slats and wheels up. The fact that the aircraft crashed, wheels up, with the hydraulically actuated flaps set to 15° but the electrically actuated slats retracted, contrary to their normal extended position for that flap setting, was yet another indication that the aircraft was experiencing serious electrical difficulties.

Heat and Fire Damage

Although there was evidence of a fierce fire in the headliner above and behind the flight crew seats, back to the cockpit bulkhead and first class cabin, the fire did not penetrate the aircraft skin, nor was there any discoloration of the aircraft's white exterior paint. The inside of the aircraft's skin in this area was, however, heavily sooted. The fiberglass insulation blankets in the attic, as it is known, seemed to protect the aircraft skin from the fire. However, the metalized covering of these blankets was damaged or destroyed, as were the maze of wiring and ducting that fills the attic. Part of the first class ceiling area had been exposed to temperatures as high as 593°C/1100°F for 10 minutes.

Floor carpets as far forward as the cockpit and seats as far aft as business class also showed hot material dripping down from the ceiling. Parts of the cockpit were found to be heavily sooted, discolored dark brown and black, blistered and bubbled, suggesting temperatures of at least this magnitude, if not more.



Potential Ignition Sources

TSB paid considerable attention to the area of the attic between the cockpit and the first class area of the cabin. The most likely ignition source was electrical energy. Four bundled power supply cables for the In-Flight Entertainment Network (IFEN) were found with melted copper, an indication of an arcing event. These cables, found on the ceiling on the right hand side of the cockpit bulkhead, had been exposed to temperatures in the range of 500°C / 932°F for 10 minutes

Also of great interest were the materials used, notably wire insulation and the thermal/acoustical blankets used in aircraft, in this case, metalized polyethylene

terephthalate (MPET) known by its trade-name as metalized Mylar®.

Although MPET had earlier passed the FAA's vertical Bunsen burner test, the Civil Aviation Administration of China (CAAC) discovered, following three incidents, that once it began to burn, MPET could be completely consumed by fire. The CAAC brought this to the FAA's attention in 1996; the latter agency said that while they would investigate, the tests used by the CAAC were not required for FAA certification. Less than six weeks after the SR 111 crash, the FAA announced it would develop new specifications for aircraft insulation materials. It was not before 2000 that the FAA mandated the removal of MPET covered insulation blankets.

One area of concern to TSB was the need to fire-harden aircraft systems. It was noted that the aluminum lines in the flight crew oxygen system could leak at temperatures as low as 427°C / 801°F. At higher

temperatures, the oxygen lines had a tendency to rupture, sometimes in as little as three minutes, introducing pure oxygen into a fire environment, greatly exacerbating the situation. Similarly, fiberglass ducting and end-caps showed little tolerance to high heat, again providing fire with a fresh air supply and a means of propagation.

The TSB conducted airflow tests to determine how smoke and fumes would be influ-

enced by various ventilation fans being turned on and off during the various emergency checklists. It was found that some switch selections caused airflow reversal between the cockpit and the cabin.

On Board Fire-Fighting Capability

In terms of the aircraft's own fire-protection and fire-fighting system, it was noted that in keeping with FAA regulations, there were fire detection and fire suppression systems in the designated cargo areas in the belly and in the engines and Auxiliary Power Unit (APU) as well as in the lavatories. The cockpit and cabin were not required to have detection or suppression systems; instead there were 8 portable fire extinguishers, five of which were 2.5 pound Halon 1211

and two five pound monoammonium phosphate (dry chemical) extinguishers. The remaining portable extinguisher was a single 2.5 pound Halon 1211 unit in the cockpit, mounted on the rear wall, out of immediate reach from the pilots.

The report noted that, in accordance with Joint (European) Aviation Requirements, the cabin crew had received initial and recurrent training on fire-fighting, including the importance of identifying the source of the fire, the location, handling of fire fighting equipment, communicating with the cockpit and fire-fighting responsibilities. As was consistent throughout the industry at the time, there was no training on how to deal with fires in the cockpit or in the inaccessible areas, such as the attic.

TSB also took great note of the aircraft's electrical supply system, including the power fed to the IFEN as they began to focus on electrical arcing events above the cockpit and over the bulkhead that separates the cockpit from the first class cabin. This arcing could be caused by metal-to-metal contact between an exposed and energized wire and a source of an electrical ground. Arcing events can generate extremely high temperatures by the arc (up to 5000°C/9,000°F or more), the vaporization of molten conductor and local gases. If flammable materials are nearby, arcing can be the ignition source for a fire.

TSB found a total of 21 wires that showed melted copper - an indication of an arcing event. One wire was insulated with irradiated ethylene-tetrafluoroethylene (known as XL-EFTE or its trade name, Cross-Linked Tefzel®); the others were insulated either by polyimide (known as PI or its trade-name, Kapton®) or ethylene-tetrafluoroethylene (known as EFTE or its trade-name, Tefzel®).

The general purpose wire in the HB-IWF was polyimide wire, which, while light in weight, a good insulator, resistant to abrasion and producing little smoke when burned, was susceptible to arc tracking, a process where the insulation, when charred, turns into a conductor, and can, over time, cause a massive arc. The insulation on the IFEN wiring was EFTE, with the exception of the power supply cables which were PTFE (polytetrafluoroethylene, known by its trade name, Teflon®)

Owing to differing resistance to abrasion, wires with differing insulation should not be installed in close proximity to one another, as the tougher insulation can, under circumstances of heat and vibration, cut through insulation of a wire with softer insulation. PI is the most resistant to abrasion, EFTE is less resistant to abrasion and cutting than PI; PTFE is the least resistant to abrasion and cutting.

The report indicates that, as certified and installed on HB-IWF, the original IFEN system design did not incorporate an ON/OFF master switch. The ability to turn the system *on* or *off* was achieved by pulling a circuit breaker. TSB addressed the negative implications of aircraft circuit breakers being used in this manner, including the wear and tear on the circuit breakers, and the subtle suggestion that circuit breakers are merely a switch of convenience, rather than a thermal protection device whose tripping should be interpreted as a serious safety event.

Of particular interest to TSB was the IFEN that was certified and installed in the aircraft in 1997 in accordance with an FAA Supplemental Type Certificate (STC). When SwissAir ordered a suite of IFENs for its fleet, its technical services organization, SR Technics, engaged the services of the IFEN designer, Interactive Flight Technologies (IFT). However, IFT had to engage the services of Hollingshead International (HI) to integrate the IFEN into the aircraft system. The work would all have to be done in accordance with a FAA Supplemental Type Certificate (STC), which had been granted by the FAA to Santa Barbara Aerospace (SBA). The Swiss Federal Office of Civil Aviation (FOCA) was willing to accept the FAA-approval, as delegated to SBA. Although FOCA did not assume any direct responsibility for authorizing or overseeing the IFEN installation, roles and responsibilities were spread between five companies and two regulatory authorities.

The TSB report identifies several irregularities with the installation and documentation of the IFEN, some of it likely caused by the lack of familiarity of HI and SBA staff with the MD-11 and its electrical design philosophy. FAA monitoring of SBA was also deemed to be lax: a special FAA review done after the crash showed shortcomings in both SBA's certification procedures and the FAA's monitoring of the project. SBA subsequently went out of business.

There were several in-flight problems reported with SwissAir's IFEN prior to the crash – overheating and short circuits were noted in several cases. Inspection of other SwissAir IFEN installations showed installation anomalies.

2 . A n a l y s i s

The 38 pages comprising this section of the TSB report allow the investigators to marshal their evidence in many of the areas enumerated above. This is required if the Board is to support the conclusions, and more to the point, to gain the Board's support for recommendations that might impose significant financial burdens on carriers, regulators, and by extension, travelers and taxpayers.

This section identified that neither fatigue, nor incompetence on the part of the flight crew or air traffic controllers nor criminal activity directed at the aircraft were involved. However, it did note that all six aircraft power bus feed cables are routed together near the overhead switch, creating a risk that all services provided by these cables could be lost by a single point failure.

Development of Fire

What is particularly interesting about this section is the degree to which TSB, normally disciplined to comment only on facts that can be ascertained, delved into speculation. As much out of necessity, the words such as *likely*, *could reasonably be linked to*, *possible* appear with unprecedented regularity. The most likely source of ignition for the fire, which spread throughout the attic in the cockpit, was *“an electrical arcing event involving breached wire insulation that ignited nearby MPET-covered insulation material.”* This event likely took place above the cockpit bulkhead. TSB believes the fire developed and propagated aft, out of the cockpit ceiling area, and into the ceiling over the galley area. The hot temperatures likely melted the insulation on Tefzel® wiring, which caused arcing, damaging other wires and the tripping various circuit breakers, de-energizing other aircraft systems.

IFEN Design, Installation and Certification

The original design had the IFEN wired to the Cabin Bus, which would be the first to be isolated during any emergency load shedding. However, because the Cabin Bus could not provide sufficient electrical power to the original IFEN installation (a full 257 seat configuration) the 115 volt AC Bus was used instead. This change was not signaled to the pilots, who did not know that the IFEN was powered when they may have believed it was not.

The investigation looked at the convoluted manner in which the task of installing the IFEN was managed by SwissAir and regulated by the FAA. The contracting and subcontracting between SwissAir, SR Technics, IFD, HI and SBA almost ensured that responsibilities and accountabilities were diffused. The report stated that, along with the hands-off roles played by the FAA and FOCA, *“the overall result was the IFEN STC project management structure did not ensure that all the required elements were in place to design, install and certify a system that would be compatible with the MD - 11 Type Certificate.”*

3 . C o n c l u s i o n s

This is a summarization of the most relevant findings:

1. Aircraft standards for material flammability are inadequate. This allowed fire to spread and intensify which ultimately led to the loss of control of the aircraft.
2. MPET insulation blankets, duct end caps, fasteners, foams, adhesives are flammable.
3. Current circuit breaker design does not afford sufficient protection
4. The fire most likely originated in the cockpit bulkhead area, near a power supply cable for the IFEN. This area lacked a fire detection and suppression system.
5. Aircrew were expected to use sight and smell to detect smoke.
6. The lack of an integrated fire-fighting plan led to more effort being given to landing the aircraft than locating and dealing with the fire.
7. Certification standards lack consideration of fire as a failure mode.
8. The lack of access to certain areas in the cabin (i.e. attic) made it difficult, if not impossible to fight fires in those areas.
9. Checklists for dealing with smoke and fumes were so lengthy (20-30 minutes) that they allowed other ignition sources to develop.
10. Emergency checklists did not emphasize the need to land the aircraft.
11. Shortfalls in aviation industry installation, maintenance and inspection of wire were noted.
12. The fire hazard of contamination (lint, debris, etc) is not fully understood by the aviation community.
13. High intensity map lights were a potential source of fire risk, especially if contamination were present.
14. Aluminum oxygen lines were susceptible to leaking and rupturing, exacerbating any fire situation.
15. Best practices with respect to the use of circuit breakers are not yet universal.
16. Both Cockpit Voice and Flight Data recorders

should be powered by separate sources, and also from a source independent of the aircraft system.

17. The FAA STC process was flawed.

18. Databases for capturing wiring anomalies were inadequate.

4. Safety Action

The report identifies the safety action that has taken place since the crash, the safety action required and concerns that TSB has about safety.

Safety Action Taken

Some of the safety actions taken include:

MD-11 and aircraft wiring:

The investigative and regulatory bodies of three countries (Canada, US and Switzerland), the manufacturer (Boeing) and the airline (then SwissAir) have taken action to deal with wiring issues in the MD-11 and wiring in general.

Data Recorders:

TSB and NTSB have urged their respective regulatory bodies to require 2 hours of data recordings (vs. the current 30 minutes) and to ensure sources of power that are both independent of each other, and under emergency conditions, independent of the aircraft.

Insulation Materials:

TSB recommended that regulatory authorities take urgent action to reduce or eliminate the risk caused by MPET insulation blankets and to validate all insulation materials against more rigorous standards than currently exist.

In-Flight Firefighting:

TSB made five recommendations to ensure a more aggressive approach to fighting in-flight fires within the accessible and inaccessible areas of the fuselage.

In-Flight Entertainment Systems:

TSB recommended a review of the STC process that approved

the system in question. This was followed up by the FAA, FOCA and SwissAir, the result being the system in question is no longer approved and is no longer in service.

Circuit Breaker Reset Philosophy: TSB noted that a single philosophy on the use of circuit breakers has yet to emerge.

Standby Instrumentation: TSB issued two advisories addressing inadequacies in the requirements for standby instruments, noted the lack of requirements for standby communication and navigation equipment, and observed on the lack adequate training in their use under simulated emergency conditions.

Material Flammability Standards:

TSB recommended revision of standards to preclude any on board materials that would sustain or propagate fire. TSB also recommended more rigorous testing of wiring for failure mode as a potential ignition source or which could exacerbate a fire already in progress.

Safety Action Required

TSB is still calling for safety actions in five areas:

Thermal Acoustic Insulation

Materials: Regulatory authorities should develop a more rigorous test regime to prevent the certification of any materials that could sustain or propagate fire.

Interpretation of Materials

Flammability Test Results:

The TSB recommended that regulatory authorities take action to ensure accurate and consistent interpretation of requirements for flammability.

IFEN STC:

TSB recommends that every IFEN system installed under STC should be reviewed for emergency load shedding.

Circuit Breaker Reset Philosophy:

TSB recommends that regulatory authorities establish standards for resetting circuit breakers.

Accident Investigation Issues:

TSB recommends regulatory authorities take measures to improve the



intelligibility of Cockpit Voice Recorders, implying that pilot boom microphones would provide more useful data than Cockpit Area Microphones. The Board also recommended that Quick Access Recorders, used by many airlines to maintain quality standards, and which often capture many additional parameters not captured by the FDR, be fed to the FDR, where they are more likely to survive a catastrophic event. Finally, the board recommended that regulatory authorities develop harmonized requirements for cockpit image recording that could help investigators actually see what was happening in the cockpit, rather than attempting to reconstruct it from FDR and CVR data.

S a f e t y C o n c e r n s

TSB identified 10 areas of continuing safety concern. Those not covered here in the interest of space have been mentioned elsewhere in this article. TSB's frustration at the slow pace of progress on remedial action is evident.

In-Flight Firefighting Measures: The TSB is concerned that *"there was a lack of awareness in the industry about the potential seriousness of odor and smoke events."* Similarly, the Board *"remains concerned with the pace of progress in mandating that all aircraft crews have a comprehensive firefighting plan that starts with the assumption that any smoke situation must be considered to be an out of control fire until proven otherwise, and that an immediate response based on that assumption is required."*

Aircraft Fire-Hardening: The TSB would like to see a more timely response to the need to rid aircraft of flammable materials and *"disagrees that the eventual reduction or elimination of flammable materials and anticipated technological advances adequately deal with the near-term risk. Therefore, the Board is concerned that regulatory authorities have not taken sufficient action to mitigate the risks identified in the TSB's [previous recommendations in this area.]"*

Aircraft Wiring: TSB remains concerned about the inadequacy of flammability testing requirements for aircraft wire and the limitation of the current Federal Aviation Regulation, FAR 25.1353(b), concerning the installation of wire, which in the Board's opinion, needs to be resolved. The TSB remains concerned that, the in-service performance of EFTE wire (Tefzel®) may not be fully known.

Contamination: The TSB is concerned that the role of contamination (dust, lint, etc.) in propagating fires is not well enough understood.

Arc-Fault Circuit Breakers: Although the TSB felt such devices would provide major improvements over

existing circuit breaker technology, they felt that they would not trip the circuit prior to the ignition of nearby flammable material.

Role of FAA: The TSB was concerned that some of the FAA's authority to approve modifications installed after manufacture had been delegated without sufficient controls being put in place. It found that 10% of In Flight Entertainment systems had been designed, installed and certified without a means for the flight crew to isolate the IFE without interfering with essential aircraft systems.

Checklist Modifications: The TSB was concerned that *"given a lack of checklist modification and approval standardization within the airline industry, airline operators may unknowingly introduce latent unsafe conditions particularly to emergency checklists."*

5. Interpretation

The report was the culmination of a staggering task. It represents an investigative challenge of enormous proportion. The investigative team, headed by former RCAF pilot Vic Gerden, broke new ground in investigating the accident.

The many ironies of this crash (newish aircraft, reputable operator, competent crew, aircraft bought down, in part by an IFEN that included a gambling channel) were exceeded only by the sheer tragedy of the event. With 229 lives cut short, and the loss felt by families, friends and businesses, this was a catastrophe. It is perhaps appropriate the TSB engaged so liberally in speculation on this investigation – to do otherwise would have dishonored the dead, and insulted the living. The report makes sweeping recommendations for the manner in which aircraft are designed, built, maintained, operated and regulated. And rightly so, as there are still weaknesses in the aviation safety structure, and as readers of this journal appreciate more than any, weaknesses in the safety net that come into action when the primary safety devices fail.

However, it remains to be seen, indeed, it already seems to be all too evident that the full remedial force of this investigation will be treated like so many of its predecessors – given nodding acknowledgement, but insufficient action. TSB's frustration in the safety concern section is palpable. It is doubly ironic in Canada, where there have been four commissions of inquiry into aviation safety. The SR 111 crash continues a trend in Canada that there is major crash every 10 years. It began in 1963 with the crash of an Air Canada DC-8 near Montreal, the 1970 crash of another Air Canada DC-8 near Toronto, a series of crashes

that lead to the Dubin Commission of Inquiry in 1980 and the crash of an Air Ontario F28 at Dryden in 1989. Sadly, the recommendations of the previous crashes wax and wane, such that we still find ourselves dealing with issues that were supposed to be addressed, once and for all, as the result of tragedies past. ARFF has been a case in point in Canada.

Without being too critical of an otherwise impressive report, it is noted that passenger oxygen was never deployed: this would only have lasted for 15 minutes, and in any event, because it mixed oxygen with cabin air, would not have saved passengers from the toxic effects of smoke. Even the flight crew oxygen system, which allowed the pilots to select between normal diluted flow, 100% oxygen or emergency pressure would only have lasted 119 minutes - less time than may be required for an emergency diversion under the worst possible circumstances. This only underlines the need for fire-hardened aircraft.

AFJ readers may find it interesting that the report makes only passing reference (two sentences) to the Halifax airport response team. The report states that *"Aircraft Firefighting Services at Halifax International Airport met the availability and equipment requirements of the CARs."* (Canadian Aviation Regulations), without citing what category the airport was operating at

(Category 8), or observing on the fact that the CARs do not meet ICAO SARPs for a number of criteria, including rescue and response time, even though the Halifax Airport is an internationally listed airport with significant international traffic. Readers will note from previous articles in AFJ that Canadian regulations do not require any more than one Fire-Fighter per vehicle. The report did give the Halifax ERS unit full credit for its response time, saying *"The Aircraft Firefighting Services were activated at 0120 and, within one minute, the response vehicles were in place adjacent to the runway of intended landing."*

While the report openly and legitimately engages in considerable speculation about the origins and effects of the in-flight fire, it does not speculate what might have happened had the aircraft been able to make it to the runway. This was admittedly improbable, and

would, in any case, have probably gone off the end of the runway, under circumstances of passengers and fuel that would have severely tested Halifax's limited emergency response services.

TSB found that industry standards for reporting of fleet-wide electrical anomalies lacked the level of detail that could have helped the investigation. This deficiency in the Service Difficulty Reporting System has subsequently been addressed, at least in part, by the FAA and the airline industry. The point here is that lack of evidence is not proof of a lack of a problem. It has similarly hobbled the investigation of ARFF related incidents.

Talking on television, one of the TSB investigators opined that they felt lucky the aircraft hit the water – instantly extinguishing the fire. Aside from the catastrophic impact damage, this at least prevented further loss of evidence from fire. Any fire event, be it pre- or post-crash, has the potential to destroy evidence. It suggests that once all has been done to save the people affected, the fire fighter's response – and that of regulators and engineers, needs to be focused on saving the evidence from damage.

Let's hope the regulators will not again succumb to the same illusion as did the blameless victims of this

flight: "Out of sight; out of mind." This report, dealing with fire in the sky, and its predecessors, dealing with fire on the ground, ought never to be set aside by the passage of time. To do so, is to fail to learn from our mistakes; surely there could be no more certain proof of stupidity. The full report can be seen at: http://www.tsb.gc.ca/en/reports/air/1998/a98h0003/eReport/sr111_200303.pdf



ABOUT THE AUTHOR— MICHAEL MURPHY is a renowned Canadian authority on ARFF and Aviation Safety in Canada. He is a prolific writer and contributing editor to AVIATION FIRE JOURNAL. He is a member of the International Aviation Fire Protection Association (IAFPA).

MILITARY FIREFIGHTERS USE OF WHAT'S ON HAND IN IRAQ

OPERATION IRAQI FREEDOM - Airman 1st Class Jett Reidy hotwires the 2,300 gallon Iraqi fire truck, and the monstrous vehicle begins to lumber down the airfield. Today's mission, to fill the truck's water tank. So the team drives past bombed out vehicles, heaves over dipping dirt fields and pulls up to a massive man-made pond circling one of Saddam Hussein's main p a l a c e s .

"Just like a straw, we'll draw into the truck," said Tech Sgt. Jeff Felty, as the team puts a coiled hose into the canals and starts pulling in water. "Because of the water system at the airfield, this is the only way we c a n g e t w a t e r . "

The six firefighters arrived at the Baghdad airport April 14, to be on hand to respond to the many military flights now landing here. So far, the team has responded to a Chinook making an emergency landing



with just one engine working and other emergencies. Just like on base, the team races out ready to r e s p o n d .

"All our fire knowledge, the medical support, pretty much everything they teach you, you keep a hold of, because you never know when you are going to need it," said Airman 1st Class Justin Rockhold. A lot of what they've had to apply has come in the form of making do with what tools are there for them.

"A lot of the time we're flown in with regular fire trucks," Rockhold said. This time, though, because of space, they didn't have their trucks so they have made use of what they found scattered around the former battlefield. "Here's how we found a lot of our trucks right here," Rockhold says, as the team passes an abandoned fire truck on the side of one of the highways circling the airport. "We came in with mechanics and repaired what we could see, got it up and running. We've got three good trucks now."

The team is working with the Iraqi airport fire chief, who stayed here until the ground war began. He has returned, and the team is working with him to get operations returned to normal.

On April 18, the airport's fire chief came back to the facility to work with the Air Force team that's getting operations moving again. Between the civilian looting and the military swath cut by the Army's 3rd Infantry Division, he lost everything. His former office was destroyed, his pet birds are dead. Six of his fire trucks are gone, his runway sweepers demolished. His personal cars are gone. He left his office just before the ground war in Baghdad began. This was his first day b a c k .

Now he's working with the U.S. Air Force fire team to get things back to normal. "Fire service is a universal language," said Tech Sgt. Jeff Felty. "Getting to work with the Iraqi firefighters is great. "The firefighter relationship is working out well - the Iraqi fire chief is even bringing the team pizzas from downtown.

Tech Sgt. Ken Joy stands guard (Left) as firefighters Airman 1st Class Brandon Olsen and Senior Airman Dwight Moses (below) pump water from a stream near Bashur Airfield in northern Iraq to fill their P-19 fire truck. They make several trips a week to the stream to get water for the airfield. (U.S. Air Force photos by Master Sgt. Keith Reed)





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WORLDWIDE CRASH TRUCK DELIVERIES



Royal Netherlands Air Force, Netherlands Airforce Navy and Amsterdam Airport Schiphol Take Delivery of E-One Vehicles

A group of international and domestic dignitaries were on hand April 17 at Woensdrecht Air Force Base in the Netherlands when Emergency One delivered three new fire fighting vehicles. One vehicle each was received by representatives of the Royal Netherlands Air Force (RNLAf), the Amsterdam Airport Schiphol and Royal Netherlands Navy (RNLN). In all, E-One will manufacture and deliver 35 8x8 Aircraft Rescue and Fire Fighting (ARFF) vehicles.

"This is a great day for E-One, Kenbri Fire Fighting, Amsterdam Airport Schiphol, Royal Netherlands Navy and the Royal Netherlands Air Force," said E-One Vice President of International Operations Peter Trampe. "Today does not signal the culmination of our service to the people of the Netherlands, but it does represent an important step. The dreams of so many people are coming to fruition today. We are proud to deliver a new generation of Crash Tenders that meets the increasing demands of fast intervention in aircraft crash rescue."

Military leaders, political officials and members of the Amsterdam Airport Schiphol were joined by media members and other invited guests as the first vehicles were officially delivered.

"I am proud to accept delivery of these beautiful



ARFF vehicles," said General Major P.M.A. Vorderman, Director Material, Royal Netherlands Air Force. "We are very pleased about the excellent cooperation between the project groups of the Royal Dutch Airforce, Amsterdam Airport Schiphol, Kenbri Valves and E-One Europe throughout the entire development and purchasing process of the new crash tenders."

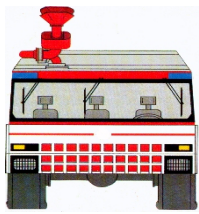
The revolutionary E-One ARFF vehicles are powered by 1005 horsepower MTU engines and are outfitted with dual coil spring independent suspension axles that allow the vehicle to travel faster than its competitors and traverse the most difficult terrain. The new ARFF cabs and bodies are constructed of glass fiber reinforced polyester (GRP).

Emergency One, Inc. is a subsidiary of Federal Signal Corporation. Headquartered in Ocala, Fla., USA, Emergency One, Inc. is a leading ISO 9001 certified manufacturer of fire fighting and rescue vehicles with over 23,000 vehicles in service worldwide. E-One

Europe, a fully-owned subsidiary of Emergency One, Inc., is manufacturing complete fire trucks and crash tenders in close co-operation with Kenbri Fire Fighting in Stellendam, The Netherlands.



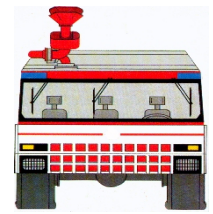
(PHOTO TOP) - New E-One delivered to Amsterdam Schiphol Airport. (PHOTO BOTTOM) - New E-One delivered to Royal Netherlands Air Force.



BACK TO BASICS

SMOKE IN THE COCKPIT / CABIN EMERGENCIES

by
Dan Pierce
Airport Public Safety Officer
Los Angeles World Airports / Ontario Int'l Airport



One type of call that will get an Aircraft Rescue Fire Fighter's adrenaline flowing is that of smoke in the cockpit or cabin of an aircraft. Shades of the 1983 Air Canada DC-9 fire in Covington, Kentucky pop into our heads. Smoke in the cockpit/cabin emergencies are calls that can present a very wide spectrum of operational concerns.

WHAT'S BURNING?

Let's take a look at some of the more common reasons for this emergency. It is important for the Incident Commander (I/C) to quickly identify what is burning. It is helpful if the crew has identified what is burning and communicated this information to the I/C.

ENGINES

Aircraft ventilation systems use bleed air from the engines to provide fresh air for cabin occupants. Sometimes burning engine oil or hydraulic fluid will get into the bleed air and cause a haze of smoke in the cabin. Once identified by the crew, the engine that is causing the problem can be isolated and the cabin can be cleared in a few minutes.

ELECTRICAL ARCING

There are miles of wiring used on many of today's modern commercial cargo and passenger aircraft. Some of this wiring can be compromised by age and chaffing which may result in exposed sections of wiring that find a ground source causing arcing. This arcing can burn wiring insulation and cause smoldering of other combustible materials around it. Most circuits are protected by circuit breakers that are located in the cockpit or galley areas. Once these smoldering fires get going, they may be very difficult to locate and

isolate due to the many concealed spaces found in aircraft construction. The use of a forward-looking infrared (FLIR) device or infrared/laser pyrometer (digital surface thermometer) may be useful for attempting to locate the source of smoke being generated. Electrical arcing of an installed entertainment system has been determined as the cause, which brought down the SwissAir flight 111 over Peggy's Cove in 1998.

Cockpit/Cabin Electrical Devices



Electronic Instruments, communications equipment, batteries or other electrical devices that have failed in the cockpit or in the avionics bay may cause smoke to be generated. Sometimes a cabin electrical device like a coffee pot heater, anti-collision light or fluorescent light ballast will fail causing smoke to be generated into the cabin air. These problems are usually short lived

and do not result in serious fires yet any small amount of smoke in the cockpit or cabin areas is of grave concern.

BAGGAGE COMPARTMENTS

Contents in baggage compartments have ignited causing smoke to enter the cabin environment. Does Value Jet ring a bell? Since 2001 U.S. registered passenger aircraft have installed smoke detectors and halon fire suppression systems to mitigate this type of problem. Overhead storage compartments are also a possible location for something burning. These are easily accessible.

AIR PACKS

The air conditioners used to cool the hot bleed air from the engines have been known to generate



smoke from overheated bearings. This is generally in older aircraft since newer ones do not use liquid lubrication in the air-pack bearings.

AUXILIARY POWER UNIT (APU)

An overheated APU can cause smoke in the cabin. These emergencies usually occur on the ground since the APU is generally turned off once the engines are up and running.

CONCLUSION

Aircraft fires that originate in the cockpit/cabin histor-

ically have resulted in serious loss of life. Fatalities from these fires are rare due to good fire prevention in aircraft system design, maintenance and inspection, the use of fire retardant materials and rapid egress systems. Crew emergency training that utilizes emergency checklists that isolate and deactivate aircraft systems is also essential for rapid mitigation. If accessible, the use of handheld extinguishers and automatic fire suppression systems will extinguish a fire onboard. Aircraft crews are very concerned when this type of emergency occurs. There is a potential for loss of life if the situation is not quickly attended to. Statistics indicate that when loss of life does occur due to an interior fire developing, over ninety percent of all those on board usually will perish! Some other cabin fires can be found online at [AirlineSafety.com](http://www.airlinesafety.com) at their web site:

<http://www.airlinesafety.com/faq/faq8.htm>

Good training for aircraft and ARFF crews, early identification, isolation and suppression are all important elements for successful mitigation of this type of aircraft emergency.

ABOUT THE AUTHOR—DAN PIERCE is a 23 year veteran of ARFF and is an Airport Public Safety Officer (PSO) at Ontario Int'l Airport (California). He is a member of the IAFFA, NFPA and ARFFWG. He is a Contributing Editor to AVIATION FIRE JOURNAL.

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PATTON'S MAXIMS FOR LEADERSHIP



General Patton always believed on being seen up close and personal by his men, to let them see who was leading them into battle. He despised "rear echelon" types who never went out among their troops to learn about the problems they faced or to listen to their "gripes." In this photo General Patton is seen addressing officers and men just before the D-Day invasion in June, 1944.

"IF A MAN HAS DONE HIS BEST, WHAT ELSE IS THERE?"
General George S. Patton Jr.
(1885-1945)



Always do your best no matter what job you have to do. Never do less than you can with the skills, tools, and abilities you have at your disposal. After all is said and done, let history be your judge. Above all, never criticize yourself-you'll find there are always more than enough people who will gladly do it for you. Unless you do your best, the day will come when, tired and hungry, you will halt just short of the goal you were ordered to reach, and by halting, you will make useless the efforts and deaths of thousands.



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WHAT'S YOUR OPINION?

Last edition of AFJ's "WHAT'S YOUR OPINION?" question came from **BOB R.** of **Altoona, Pennsylvania** who asks: "There have been many ARFF vehicle rollovers recorded throughout the years. It seems that the FAA and the ARFF vehicle industry is taking a "Band-Aid" approach to solving the problem with the use of electronic devices that measure the vehicle angle on turns. It seems to me that the ARFF vehicle operator has a lot more to concentrate on then watching these meters. The easy answer when an operator rolls a vehicle is that it was "driver error". Can anyone out there in 'AFJ Land' comment on the effectiveness of these electronic rollover meters and /or how your operators are training on ARFF vehicle driving techniques to prevent the possibility of a rollover? Also, can you comment on what manufacturers can do in there design of ARFF vehicles that can prevent or minimize these rollovers in the first place?"

Opinion presented by JOHN L. of Des Moines, Iowa (USA) - "While the anti-roll alerting device that monitors and alerts an ARFF vehicle operator to the possibility of roll-over is now seen on some trucks, the majority of those out there do not have them. While I do not have personal experience with this 'new toy', I do know that a driver has enough to concentrate on while responding to an aircraft emergency- Watching the AOA, movements of other aircraft, using handheld radios and other activities—which can divert attention from these anti-rollover devices. It seems to me that the basic problem of many ARFF vehicles is the suspension / stabilization system and vehicle design itself. Almost all ARFF vehicles seen today on the market will roll. However, a rather "low-key" ARFF vehicle maker – COLET SVD - designs high performance ARFF vehicles that can out-manuever and perform high speed turns that other manufacturers vehicles can't without rolling over. I am sure that within certain parameters even COLET vehicles will roll. From what has been reported by military and civilian users, the COLET trucks are much better performing vehicles all round – in speed, turning at high speeds (without rolling), pumping and overall safety to the crew if it should roll over. Maybe I am off-base here, but it seems that another "do-dad device" compensate for an overall design that will reduce the possibility of rollover in the first place. This is just my opinion. Note: I am happy to see COLET SVD advertises in AFJ – Nice touch."

Send your questions and / or opinions to
"WHAT'S YOUR OPINION" via e-mail to:

THE CAPTION CORNER

Welcome to this issues edition of **THE CAPTION CORNER** and our latest pic for you to "fill in the blank". Last editions photo for captioning is shown below. The winner of the last issue's caption for the picture is **CATO MORTENSON (NORWAY)** with the following caption:

**"NEVER MESS AROUND WITH A WOMAN
WHOS HUSBAND OWNS A CHAIN SAW"**



You can win the **FIRST PRIZE** of a **CRASH TRUCK LETTER OPENER**, compliments of **COLET SVD** (www.coletsvd.com)
So send in those captions today!!



See the next issues picture above for captioning. Use your noodle and caption the picture!

Send your caption to 'Caption Corner' at
AVIFIREJNL@aol.com

AVIATION NEWS BITS

AIRPORT NOW SCREENS FOR CONCEALED CHEMICALS

Airline passengers are accustomed to being searched from head to toe for concealed weapons. Now their bags are being searched for concealed chemicals.

Fort Wayne International Airport travelers are facing a new wrinkle in the already extensive baggage-screening process - a wipe-down with a chemically sensitive swab. "From everything that we've seen, if we go to war, there will be a real high risk of terrorism," said Aaron Batt, federal security director at the airport. "What we're attempting to provide is enhanced security."

The process is part of an increasing number of security checks air travelers are now required to undergo. Since September 2002, all checked bags are opened and searched by one of 20 employees of the Transportation Security Administration, a branch of the Department of Homeland Security. Now the search includes the swabbing, which checks for unspecified (for security reasons) chemical residue. Friday afternoon, baggage screener Dan Burch watched as a co-worker performed the process in front of the passenger, who stood next to the bag as it was opened. The gray tennis shoes were inspected, as were the clothes.

And then the swab - a piece of paper with a chemically sensitive membrane in the middle - was run through the interior of the black suitcase, then inserted into a machine that analyzes the membrane. After passing, the bag was sent on its way. The passenger's eyebrows raised at the sight, but he didn't complain. "We have very few problems," Burch said. "Most of the people respect what we are doing and they appreciate it. False alarms do happen. Screeners have gone so far as to keep a bag off a plane after they couldn't figure out what was setting off an alarm. Most of the time, though, a more detailed search reveals the bag is safe. "We really look into the bag when we don't know what the substance is," Burch said.

The machines are set up near the ticket counters and passengers are welcome to watch the inspection. The inspectors themselves were taught customer relations by Marriott Hotel personnel. "Most people are very willing to cooperate. There are times when they come in frustrated," Burch said. "We try to say something nice. The majority are very accepting. Some people you know not to say a lot to. And then they are out of

there quickly."

After having checked bags examined, passengers go through a physical search along with their carry-on bags. Carry-on luggage is still examined by the X-ray, commonplace in airports for years. Metal-detector searches lead some passengers to have to remove their shoes and belts for inspections before being admitted to their gate. Terry Cross, 39, of Fort Wayne, was flying to Washington, D.C., Friday for a business conference. He arrived early, but didn't mind the extra bag check. "I feel a lot safer," he said. "I don't think it's a problem. It doesn't make me upset."

Batt, who worked at the Minneapolis-St. Paul International Airport before Sept. 11, has top security clearance to Federal Bureau of Investigation information regarding airport security. He makes weekly trips to South Bend to be briefed on any suspicious activity in the area. Security has beefed up, he said, but screeners don't want to scare passengers. A pilot program in Denver is experimenting with a separate screening area for families and children.

Batt wants passengers to be inspected, not interrogated. "Screeners are the first line of defense, not the last," he said. (By Dan Cortez of The News-Sentinel (3/16/03))

AVIATION ACCIDENT STATISTICS SHOW NO FATAL ACCIDENTS FOR U.S. AIRLINES OR COMMUTERS IN 2002

Washington, D.C. (USA) - The National Transportation Safety Board released preliminary aviation accident statistics for 2002 showing no fatal accidents involving airlines or commuters.

Thirty-four accidents were recorded for scheduled airlines in 2002, all non-fatal. Additionally, there were no fatalities to persons on the ground during the year. In 2001 there were 531 fatalities involving U.S. airlines. It should be noted that half of these fatalities resulted from the September 11 hijackings.

The 2002 statistics also show a decline in the accident rate on U.S. scheduled airlines. The 34 accidents involving scheduled airlines resulted in a preliminary accident rate of .337 per 100,000 departures (or 3.37 per million). This represents an 11 percent decrease from the 2001 rate of .379 accidents per 100,000 departures.

While departures decreased for U.S. scheduled airlines in 2002, nonscheduled 14 CFR 121 and scheduled 14 CFR 135 (fewer than 10 seats) operations increased. The nonscheduled Part 121 operations

accident rate increased from 1.248 accidents per 100,000 departures in 2001 to 2.333 in 2002. The accident rate for scheduled Part 135 operators increased from 1.251 per 100,000 departures in 2001 to 1.575 in 2002.

Air taxis reported 58 accidents in 2002, down from 72 in 2001. The accident rate decreased from 2.27 per 100,000 flight hours in 2001 to 1.90 in 2002, and total fatalities decreased from 60 to 33.

The number of general aviation accidents decreased slightly from 1,726 in 2001 to 1,714 in 2002. Fatal accidents increased in 2002 to 343 compared with 325 in 2001. Despite reporting fewer accidents in 2002, the accident rate for general aviation aircraft increased slightly from 6.28 per 100,000 flight hours in 2001 to 6.56 in 2002.

Tables 1-12 providing additional statistics are available at <http://www.nts.gov/Aviation/stats.htm>.

REPORT OF FLIGHT 587 DELAYED

NEW YORK (USA) - A final report pinpointing the cause of the crash of American Flight 587 likely won't be ready until November, the second anniversary of the crash in Belle Harbor, Queens, that killed 265 people.

Carol Carmody, a member of the National Transportation Safety Board who chaired the NTSB's hearing on the crash last fall, told reporters last week that the agency has loaned investigators to the probe into the loss of the space shuttle Columbia, taking resources from the Flight 587 probe.

Robert Benzon, the investigator in charge of the Flight 587 probe, was summoned to Shreveport, La., on the day the shuttle crashed and has worked nearly non-stop on the shuttle investigation, and dozens of other NTSB investigators have been assigned to the shuttle probe as well. The NTSB told NASA it would assist as long as necessary.

A hearing was held on Flight 587 last fall, but the cause has not been determined. Investigators have long known that the tail snapped off the Airbus 300-600 headed for Santo Domingo shortly after the plane took off from Kennedy Airport, sending the aircraft into a dive. Investigators believe the tail came off as a result of the actions of one of the pilots, who moved the rudder from side to side in response to a wake turbulence encounter. But the NTSB is still looking into issues involving possible mechanical malfunctions that might have made the rudder move on its own. "We haven't found anything," said NTSB

spokesman Ted Lopatkiewicz. "But there are more ongoing tests."

Investigators are preparing to tear down and CAT-scan part of the autopilot and part of the yaw damper, a device that creates slight rudder movements to counter the natural tendency of the plane to move back and forth. The NTSB also plans a test this spring, using another A300-600, on the attachment point of the tail that investigators believe broke first. The test will show how the structure responds when subjected to pressure and loads the tail of Flight 587 had been exposed to.

Investigators are also still interested in how the pilots were trained to use the rudder, and recently interviewed the simulator instructors who trained the first officer of Flight 587 who was flying the plane.

Another issue may be why pilots and airlines weren't adequately warned that the Federal Aviation Administration does not require aircraft to be certified to withstand the rudder moving all the way from side to side.

Although a rudder-limiter system prevents the rudder from moving so far at high speeds that it would damage the airplane, it does not prevent the back and forth movements that can overstress the tail and break it off.

SWISSAIR REPORT UNLIKELY TO PINPOINT CAUSE

HALIFAX, Canada—Investigators who have pored over the wreckage of Swissair Flight 111 for more than four years aren't expected to produce a definitive cause of the crash, but will likely zero in on critical flaws that set off a devastating chain of events, experts say.

Among them is a controversial in-flight entertainment system said to be a part of findings by the Transportation Safety Board, which will release its final report into the 1998 crash on Thursday.

Aviation experts who have followed the lengthy investigation say they'll be surprised if the program is not found to be a main contributor to the massive electrical failure that brought the jetliner down off Peggy's Cove, killing all 229 people on board. "The entertainment system, from an engineering background, was a power-hungry monster and it gobbled up a lot of energy, creating so much heat that they required a rebalancing of the air conditioners," Gerry Einarsson, a former Transport Canada engineer who specializes in avionics, said from Ottawa.

"I can't with any degree of evidence say it caused it, but there's a great deal of reason to suspect it." Investigators know a fire that raced along wires crippled the jetliner by disabling its electrical system, but they have yet to clearly state its source and likely won't.

Einarsson, who has lobbied Ottawa to improve aviation safety, believes the entertainment unit is key to the fire. He says the system was so hastily installed on the MD-11 that the proper inspections weren't done to ensure it could operate safely in the air.

He and others blame the powerful American Federal Aviation Administration in part for allegedly shirking its duties in certifying the system — something they say the safety board should address in its report.

"I seriously doubt that the Canadians will go as far as I think they should, because of political reasons," says Bernard Loeb, the former head of the U.S. National Transportation Safety Board. "If I was the Canadians, I'd be a little cautious about suggesting an FAA process has significant holes in it."

Critics allege the agency didn't pay close enough attention to the devices, the installers and the manufacturers even though concerns had been expressed about them. The system, which allowed passengers to gamble, play video games and watch movies, was found on test flights to raise cabin temperatures and cause hard drives in the seats to fail.

Despite that, Swissair ordered the system to be installed on 21 of its planes — including the jetliner that would plunge into waters off Peggy's Cove just more than an hour after leaving New York. The system came into sharp focus in the days after the crash, when investigators recovered 21 short-circuited electrical wires, including at least seven that came from the system. A wire that shorts can cause a spark or fire that could ignite other materials.

Swissair, now bankrupt, voluntarily disconnected the system three weeks after the crash as a "precautionary measure." Myles Gerety, who lost his brother in the accident, said he doesn't expect the report to produce a single cause, but hopes it isn't linked to the gaming unit. "If it started with that entertainment system, I'm going to be really upset, because it just seems like such a frivolous thing to bring down a plane," he said from Connecticut before heading to Halifax for the report's release.

The report is also expected to mention Kapton wiring, a disputed insulation that has been banned in some U.S. military aircraft because of its propensity to chafe, crack or break down.

The safety board, which has spent more than \$60 mil-

lion on the investigation, recovered pieces of the charred wire near where the fire was thought to have started just behind the pilots in the ceiling. The Kapton wire had arced, a phenomenon in which the outer insulation is cracked or chafed and the wire is exposed to another surface.

Electrical sparks can escape and set off a chain reaction, burning along the wire almost like a fuse. Even though the discovery helped narrow the possibilities, the difficulty for investigators was trying to determine which came first. Ed Block, a wiring expert, is convinced it was the source. "I have seen this wiring-cancer attack the military, the commercial fleet and the general aviation fleet," Block, a former U.S. Department of Defence employee, said Friday. "I am hoping the TSB sends a clear message to the world about this hidden danger."

Others are hoping the safety board demands changes to the cumbersome checklist pilots go through when they encounter smoke in the cockpit. The Swissair pilots spent close to 10 minutes going through a 208-step checklist after they detected smoke, eating up valuable time some say should have been spent in diverting the plane to the nearest airport.

The TSB issued a recommendation in 2000 that planes land quickly in the event of smoke and that checklists be streamlined. Einarsson doesn't think the report will find a sole cause because of the complexity of the investigation and the devastation to the plane, most of which was recovered from the ocean floor.

"I would love a smoking gun, but I don't think that will happen," he said.

PLANE FIRES LINKED TO VIDEO SYSTEMS

CALGARY, Canada—A video-entertainment system caught fire aboard an Air Canada Airbus passenger jet parked at Vancouver International Airport last year, drawing a frightening parallel to a Swissair disaster off Nova Scotia that killed all 229 people on board in 1998.

The Vancouver fire, which occurred 40 minutes before passengers were set to board, has spurred a series of safety directives related to the replacement of faulty components and the installation of special switches to cut electrical power to entertainment systems. The in-charge flight attendant aboard the Airbus A330-300 on Jan. 17, 2002, shut off the power switch to the forward-galley entertainment system at the first sign of trouble. But two internal six-volt batteries continued to power the system while completing a systematic shutdown, giving new life to the smouldering

fire.

Details of the fire are contained in a federal transportation safety board report concluded in January, but seen for the first time this week. "It powers itself for two minutes even after it's shut down," said regional safety board manager Bill Yearwood. "That's the concern. The crew wasn't aware of the intricacies of the system."

Fortunately, the Vancouver incident occurred on the ground and the flight attendant managed to put out the blaze using a halon fire extinguisher.

However, the circumstances are hauntingly reminiscent of the crash of a Swissair MD-11 aircraft off Peggy's Cove. A federal report being released today into that crash is expected to point to a fire in the wiring of the entertainment system as a possible cause. "There are a lot of concerns about flight entertainment systems," said Yearwood. "The issue is that these systems may not be as stringently scrutinized as normal aircraft components."

The Passport entertainment system that caught fire aboard the Airbus in Vancouver had been repaired by manufacturer Rockwell Collins Inc. of Pomona, California, three times over the preceding three months. The U-18 component is used in 539 processing boards in Passport systems aboard 27 aircraft worldwide.

As a direct result of the Airbus fire, Rockwell Collins issued a number of service bulletins requiring airlines to replace defective U-18 components built before July 2000. Airbus is also issuing its own service bulletins ordering the installation of a main power switch for all Passport systems aboard A330 and A340 aircraft.

Air Canada is complying with the bulletins, said the safety board report. *(By Larry Pynn, The Calgary Herald—March 27, 2003)*

BIRDS AND PLANES ARE ON A COLLISION COURSE

SYDNEY, Australia - Feathers are flying in Australian skies as airlines report a massive jump in the number of potentially "catastrophic" collisions with birds.

Pink and grey galahs, hawks, ibis, ducks and bats are among Australian creatures most commonly hit by planes and all punch well above their weight, the Australian Transport Safety Authority (ATSB) said in a report recently released.

A flock of birds can severely dent a plane's fuselage or cause a loss of power if sucked into a jet engine,

said the ATSB, citing figures showing close encounters of a feathered kind cost the world's civil aviation industry \$3-billion (about R20-billion) each year.

Tiny starlings can exert up to 4,6 tons of force on a plane travelling at high speed, while a hefty eagle has an impact force of almost 14 tons.

'Bird strikes with catastrophic outcomes are likely to continue'

"If the trends of increasing bird populations and increasing aircraft numbers continue, the occurrence of bird strikes with catastrophic outcomes are likely to continue to rise," the ATSB said.

The ATSB said the number of reported bird strikes leapt 80,5 percent from 1991/92 to 2000/01 in Australia. It was not clear whether the increase was simply due to larger flocks of birds and growing numbers of planes, or also to better reporting systems.

The ATSB said hand-held laser devices used to frighten birds away from airports and United States-developed bird warning systems were proving a success around the world. Meanwhile, new engine

CONCORDE RETIREMENT ENDS GLAMOROUS ERA OF SUPERSONIC TRAVEL

LONDON, England - The supersonic jet-set has been bumped. Concorde, the needle-nosed aircraft for the super-rich and super-rushed, is retiring after a quarter-century of ostentatiously expensive service, its British and French operators announced Thursday.

"Never has such a beautiful object been designed and built by man," Air France President Jean-Cyril Spinetta said as he announced his company's five supersonic jets were being grounded for good. Concorde thus goes the way of the gilded carriage, the Orient Express and the Bugatti Royale as emblems of the rich and mobile.

A commercial failure and a strategic disaster for European aviation, Concorde nonetheless conferred unmatched prestige on operators British Airways and Air France, and the glamour of a glitzy passenger lists which included Elizabeth Taylor, Michael Jackson, Madonna and Queen Elizabeth II.

For a quarter century, business executives and stars asserted their status by boarding the delta-winged marvel, a product of 1960s technology and optimism, happily spending thousands more dollars to save a few hours. "Flying at twice the speed of sound gives you a buzz," rock star Sting, a regular flyer for two

decades, once said. "I'm still excited about going on Concorde even after all these years."

Celebrity antics on the supersonic jets were guaranteed to make headlines. Motown diva Diana Ross was led off a Concorde by police at London's Heathrow Airport in 1999 after an altercation with a security guard. That same year, Hollywood power broker Harvey Weinstein was fined 200 pounds (dls 320) after being caught smoking in a Concorde toilet. In a letter to the court, Weinstein said he was "an extremely nervous traveler."

Filling the 100 seats on a Concorde has become increasingly difficult because of the global economic downturn, the impact of the Sept. 11 attacks on trans-Atlantic travel, and a horrific crash on July 25, 2000 that severely tarnished Concorde's safety record.

An Air France jet, spewing flames, slammed into a hotel minutes after takeoff from Charles de Gaulle airport, killing all 100 passengers - mostly German tourists - along with the nine crew and four people on the ground.

Investigators concluded that a stray bit of metal on the runway punctured one of Concorde's tires, propelling pieces of rubber into the fuel tank and igniting a fire. Air France and British Airways grounded their fleets for more than a year, reinforced the fuel tanks and installed improved tires before resuming service in November 2001.

Since then, there have been several small but well-publicized mishaps, both with Concordes owned by British Airways and Air France. Spinetta said Concorde was filling 60-70 percent of its seats right after flights resumed, but that has since dropped to 20 percent.

BA said its seven Concordes would stop flying from the end of October, but didn't give a date for the last scheduled flight. Air France announced its supersonic flights would end by May 31. "With its going, we must lose some of the romance from aviation," said BA's chief executive, Rod Eddington. "Concorde looked fantastic. You cannot lose such an aircraft without shedding a tear."

Concorde was a spectacular wrong turn for Europe's aerospace industry. It aspired to be the future of the aviation industry - but it was the Boeing 707 that shaped modern air travel, and American manufacturers all but monopolized the lucrative market for the big subsonic jets that made flying a mass phenomenon. U.S. authorities, repelled by sonic booms, effectively killed Concorde's viability by refusing to allow it to exceed the speed of sound over land.

Beverly Shenstone, technical director of British Overseas Airways Corp., predecessor of British Airways, called Concorde "the largest, most expensive and most dubious project ever undertaken in the development of civil aircraft."

Options for 74 Concordes were sold by 1967, but the only firm orders were five for BOAC and four for Air France. In all, 20 Concordes were built, including four prototypes which were quickly retired. The two airlines took the unsold planes in 1979.

"I have no doubt there will be, at some point in time, the son of Concorde," Eddington said. "I don't know when it will be."

AIRCRAFT COLLISIONS WITH BIRDS SHARPLY ON RISE IN SWEDEN

STOCKHOLM, Sweden - The number of aircraft collisions with birds in Swedish airspace is growing rapidly, forcing airports to step up preventive measures, the daily Svenska Dagbladet reported.

In 2002, there were 205 mid-air collisions between planes and birds, more than twice as many as two years previously.

Only last week, an Airbus 320 charter plane flying in from Cyprus had to make an emergency landing after slamming into a goose, or maybe a flamingo, whose feathers were sucked into the engine, causing the smell of smoke to spread through the cabin, the paper reported.

Paradoxically, the number of accidents is on the rise at the same time as there is less air traffic in Sweden due to the weak economic environment.

But a zoologist quoted in the paper said that as the noise levels at airports drop, bird breeding in surrounding woodland goes up, increasing the danger of collisions.

Airports already apply a mix of methods to scare birds away, including light signals, the firing of hailstones in the air, and even controlled gas explosions at irregular intervals.

Planned extra measures include the clearing up of rubbish tips near airports, a favourite gathering ground for birds, the paper said.

IS YOUR SPECIFICATION UP TO SCRATCH?

By
TONY CASH
Civil Aviation Authority (U.K.)



The detailed specification of Aerodrome Rescue and Firefighting (ARFF) vehicles for use at international aerodromes may include some unique features peculiar to that aerodrome. However, certain common features are desirable whatever the location; and for this reason standardized guidelines on appliance design are set out in the ICAO Airport Services Manual Part 1 - Rescue and Fire Fighting (3rd Edition 1990). More recent guidance is available in UK CAA CAP 168 (Licensing of Aerodromes) and NFPA 414 (Standard for Aircraft Rescue and Fire Fighting Vehicles 2001 Edition). There are various criteria, which influence what might be included in a specification:

- The amount and types of extinguishing equipment
- Equipment and Personnel to be carried
- Response time objectives
- Local weather and terrain
- Types of aircraft using the aerodrome
- Tactics necessary to deal with the hazards arising from aircraft operations.

As a regulator, the UK CAA are primarily interested in the current and future intended role of the vehicle and that it is capable of being operated over all types of terrain likely to be encountered at that aerodrome at a speed commensurate with safety. Each vehicle must have sufficient performance to meet the fire protection levels appropriate to the scale of flying activity occurring at the aerodrome. Reliability is of paramount importance during the service life of ARFF vehicles because when called upon, they must work first time every time.

Some of the essential elements of the equipment specification for an ARFF vehicle include:

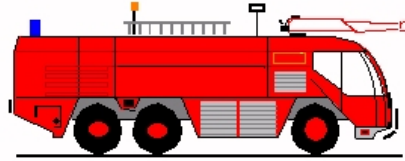
- The ability to operate in all weather conditions and carry enough extinguishing agents and rescue equipment
- A crew compartment large enough to allow fire fighting crew to don protective equipment and breathing apparatus
- Foam cannons having a range suitable for the length of the largest aircraft scheduled to use the aerodrome. Additionally, they should have the capability of spraying foam in a dispersed pattern, as this is one of the most effective ways of using film-forming foams

The Rapid Intervention Vehicle (RIV) can be operated in conjunction with major foam tenders, and in some circumstances the RIV might be the first vehicle to reach an accident site. The purpose of an RIV can be to transport the officer-in-charge and a rapid intervention crew to assess the situation and initiate rescue action whilst suppressing any fire until the major foam tenders arrive.

In addition to carrying fire fighting media appropriate to the aerodrome's ARFF category/index, the RIV may also carry rescue, lighting and ancillary equipment. The specification for an RIV should combine acceleration, top speed, flotation, traction and maneuverability (depending on the local terrain) but speed and acceleration are considered to have greatest importance.

Whatever choices are made, it is vital that a programme of regular inspection and maintenance is followed for all ARFF appliances to maintain full functionality.

CRASH CREW SPOTLIGHT



SOUTHERN CALIFORNIA LOGISTICS AIRPORT (Victorville, California - USA)

by
John Becker
Fire Chief
Victorville Fire Department

In 1992, the U. S. Air Force closed George Air Force Base in Victorville, California, which had been the home of the 35th Tactical Fighter Wing. The local cities joined together and began the re-development of the facility and conversion to a civilian airport and industrial park named "Southern California International Airport." Because the Airport is approximately 110 miles from Los Angeles International Airport and 45 miles from Ontario International Airport, emphasis



was placed on air logistics, not passenger operations, and the name subsequently changed to Southern California Logistics Airport. SCLA provides a facility dedicated to such operations as cargo, flight-testing, aircraft design and development, full service airframe and power plant repair, and limited military support operations, as opposed to passenger service.

SCLA is the primary airhead for the U. S. Army National Training Center at Fort Irwin and constantly moves troops and related cargo in and out in support of the Desert Warfare Training Center. The Airport complex consists of some 5,000 acres, including Runway 17/35 at 13,050 feet, presently being extended to 15,050 feet, and Runway 21/03 at 9,050 feet. Field elevation is 2,875 feet and enjoys about 360 days of excellent visibility each year. The primary runway in-

cludes full Category "1" ILS capability.

SCLA is a "port of entry" and features 24-hour customs in support of its air logistics roll, and is a foreign free trade zone. Presently, many major aircraft companies, such as Boeing, Pratt & Whitney, Southern California Aviation, and G. E. Aircraft Engines, have chosen S.C.L.A. for location of support and maintenance facilities.

The City of Victorville Fire Department began providing ARFF services at SCLA in 1996. The Air Force left behind a 12,000 square foot fire station, situated to allow access to either runway within the F.A.A. required 3-minute response time. The station contains excellent living quarters, office areas, and a full-service vehicle maintenance bay where all ARFF equipment is maintained and repaired.

Apparatus at the SCLA Airport Fire Department includes the following major pieces:

RED 2 is a 2001 Dodge F-450, 4 x 4 rescue unit.,



which carries 500 lb. PKP, 100 gallon pre-mix A.F.F. F., Jaws of Life, air bags, and related equipment

RED 4 is a 1974 Oshkosh P-41500 gallons water,



and 180 gallons of AFFF, It was rebuilt and modified "in house" in 1997.

RED 5 is a 1981 Oshkosh M-4000 which carries 4000 gallons water and 500 gallons AFFF. It was refurb-



bished in 1999 by Crash Rescue Equipment Services.

RED 6 is a 1973 Oshkosh P-4 which carries 1500 gallons water, 180 gallons AFFF, 300 lb. Halon 1211. It



was rebuilt and modified "in house" in 1997

In addition to these units, the station also houses a foam re-supply trailer and mass casualty/medical trailer to support Airport operations. Because SCLA is a logistics center, there are no

regularly scheduled passenger operations; hence, the Airport operates under an F.A.A. limited Index "C" certificate. The soldiers traveling to and from Fort Irwin arrive by commercial carrier, such as Northwest Airlines, and for all such operations, A.R.F.F. services function at Index "D" levels, with all major ARFF equipment staffed.

Staffing varies and is dictated by the demands of the particular carrier or contractor. A minimum staff of three personnel is on duty at all times when no scheduled flying is occurring. Personnel work a 56-hour work schedule with three platoons. Staffing is increased for large aircraft or military passenger operations as needed. All personnel involved in SCLA ARFF services meet the standards of California State Fire Marshal "Firefighter I," "Emergency Medical Technician-Defibrillator," "Haz-Mat 1st Responder & Decon," and California State Fire Marshal "Aircraft Rescue Fire Fighter" in addition to maintaining all Federal Aviation Administration (FAA) Part 139 requirements.

All SCLA firefighters are employees of the City of Victorville Fire Department, which presently has over 50 aircraft fire-fighting-certified personnel from which to draw. As part of the City of Victorville Fire Department, S.C.L.A. Fire is supported by a large mutual and automatic aid structure that can provide engine companies, water tenders, ambulances, and other equipment to support any large-scale incident. The fire station is also home to Mercy Air Rescue, a fully staffed air ambulance and crew, on duty 24/7.

At the present time, in conjunction with the runway extension program, the Fire Department will be receiving an additional A.R.F.F. vehicle and is also reviewing the possible need to construct and staff a satellite fire station.

While the aircraft operations at S.C.L.A. are somewhat different than those at most airports, A.R.F.F. services are very similar to many others throughout the United States.

JOHN BECKER is a 30 year fire service veteran with about 12 years involving ARFF. He is the Fire Chief of the City of Victorville Fire Dept and SCLA Fire Services. He is a member of the International Aviation Fire Protection Association (IAFPA).

OAKLAND INTERNATIONAL AIRPORT TAKES DELIVERY OF RETIRED FEDEX 727 FOR TRAINING EXERCISES

Oakland International Airport (Oakland, California – USA) took delivery on March 14th, 2003 of a retired Boeing 727-100 freighter donated by FedEx Express at a special ceremony at the airport's Aircraft Rescue and Fire-Fighting (ARFF) facility.

Also, FedEx Express donated to the aviation maintenance technology program at the College of Alameda an engine, miscellaneous avionics equipment and an auxiliary power unit (APU) at the ceremony. This program instructs students in airframe and power plant maintenance, fiber optic and avionics maintenance, and aviation operations (includes pilot ground school for fixed-wing aircraft and helicopters).

The airport's Air-side Operations department, Aircraft Rescue and Fire-Fighting (ARFF) unit, and local

law enforcement agencies will use the donated aircraft for hands-on safety training. Additionally, Oakland International Airport will use the aircraft for its mandated tri-annual full-scale exercise.

"We appreciate FedEx Express' generous donation of the 727 freighter to Oakland International Airport," said Steve Grossman, director of aviation for the Port of Oakland, the owner/operator of Oakland International Airport. "The donation will provide airport personnel with the opportunity to continuously hone their skills to ensure traveler safety and security. FedEx Express is not only a leader in the express package industry, but a leader in Oakland through its efforts to create jobs and opportunities for the local community." Before making its final flight to Oakland, the aircraft (N135FE) provided nearly 23 years of service to

FedEx transporting packages to destinations throughout the U.S.

"FedEx Express is proud of its commitment to the communities we serve and in which our employees live and work. The donation of this retired FedEx 727 is just one example of the many ways FedEx supports training and educational endeavors," said David Sutton, assistant general manager, FedEx Aircraft Acqui-

Oakland Airport ARFF Firefighters inspect its new 727 training aircraft donated by Federal Express



sitions and Sales. "We are happy to work with Oakland International Airport, to provide training and educational tools for airport safety staff and students at College of Alameda, that is producing outstanding graduates who will soon become the aviation work force of tomorrow."

FedEx Express, the world's largest express transportation company, operates a regional Hub at Oakland International Airport. It designated as its Pacific gateway in 1995.

MULTIMEDIA REVIEW

ARFF

Aircraft Rescue and Fire Fighting Computer Based Training (CBT)

Version 1.0

By
Dan Pierce

The 3-CD ROM set recently released by the United States Federal Aviation Administration (FAA) to airport ARFF departments in the U.S. is a comprehensive learning tool developed by Les Omans and C2 Technologies. The curriculum presented by this CD-ROM set covers a lot of information in fourteen lessons that have four to fifteen sub-sections for each lesson.

The ARFF CD states that "The goal of the training program is to give airport fire personnel trained to NFPA 1003 - Professional Qualifications for Airport Rescue Fire Fighters Standards trained to FFII and NFPA 472 Hazardous Materials Operational Standards training in

- Nature of aircraft emergency response.
- Airport & incident scene safety considerations.
- Aircraft construction, stabilization and access.
- Effective use of ARFF apparatus, tools and equipment.
- Aircraft incident tactics, strategies and command.
- Other response agencies and organizations."

The CD set does a very good job at presenting visual information in pictures provided by Les Omans' library and text that is accompanied by an audio narrative on each page of each lesson section. The narrators voice does get somewhat monotonous after awhile with predictable changes in his voice pitch. Each page is advanced with a mouse click. If the trainee plans to listen to many of the lessons in one sitting, he/she may want to turn down the volume and read the text alone. A short 3 question quiz pops up during the lesson to let the trainee know if he/she is absorbing some of the key points during the presentation. There are also short imbedded movies that supplement some of the lesson sections.

The CD set does an effective job at providing additional technical information that would be supplemented with hands on (manipulative) training on the eleven categories for ARFF recurrency training required by the FAA in FAR 139.

One of the problems I had with this CD set was that

some of the information presented was conflicting with other ARFF information already established by IFSTA in the new Fourth Edition of *Aircraft Rescue and Fire Fighting*. For example, the CD lesson on wheel fires (Lesson 4-7 and in Lesson 13) states that the agent of choice for aircraft wheel fires is mass application of water while the IFSTA text states on page 173 that dry chemical is best agent. "A dry-chemical fire extinguisher is recommended for controlling tire fires on all aircraft because it is less likely to create localized cooling of the metal in the wheel parts. Serious accidents have resulted when ARFF personnel have used CO2 or an improperly applied stream of water on a wheel fire. As long as one or more tires remain inflated, the use of a dry chemical extinguisher is the preferred method of extinguishment." (IFSTA ARFF-Fourth Edition, p. 173)"

The CD states that aircraft are categorized as commercial, general aviation and business aircraft when in fact, they are all sometimes used for the same purpose. Because an aircraft is a jet doesn't make it a business aircraft. The things that differentiate aircraft are the type of propulsion system (i.e. prop, jet, turbo-prop), weight and what Federal Aviation Regulation (FAR) they are operating under. i.e. FAR part 135, 121 or 91 etc. How would a Boeing 737, Embraer Brazilia or Beechcraft King Air best be categorized? These aircraft may be used for GA, Business, and Commercial transport.

The CD does a great job of explaining the Incident Command System (ICS) in Lesson 12 yet there are several examples in lessons 13 and 14 of confusing use of Incident Command System (ICS) terminology. The lesson indicates that the Incident Commander should use "Anywhere Command". "Anywhere" is usually a geographical reference to the incident location. This works well for structural departments off of the airport. However, the lesson fails to mention that FAA Advisory Circular 150/5210-7C states that the airport identifier should be used in conjunction with the word "Command" to identify the Incident Commander. i.e. "LAX Command". The lesson also states that individual teams should be known as a location "Division" or functional "Division" rather than being identified by their actual resource call signs. For example, the lesson states that an interior fire attack team would be known as an "Interior Division." Is this the callsign that would be used on the radio? "Interior Division to Operations...?" or "Interior Division to Interior Division Supervisor...?" In reality, the unit should be using its regular call sign such as "Operations (Chief of Operations) from Engine 20 Interior ..." or "Suppression (ARFF Suppression Branch/Division Director/Supervisor) from Attack Team 1" (a mixture of personnel from different ARFF units). The ICS starts from the bottom up for individual teams and top down

for command. The interior attack team would indeed be operationally placed in the ICS in the ARFF Suppression Branch, Interior Division reporting to the Incident Commander, Operations Section Chief, ARFF Suppression Branch Director or Interior Division Supervisor once those assignments have been made yet they should be known as their unit call sign for accountability. Would it be appropriate to advocate identifying each handline entering the aircraft interior by door identifier Division? i.e. L1 Forward Left-side Division, R1 Forward Right-side Division etc? I think not. I have a hard time understanding why an individual resource like a water tender used for ARFF vehicle re-supply would be known as "Re-supply Division" versus its regular call sign like "Water Tender 150" reporting directly to the Operations Section Chief. Even if there were more than one Re-Supply unit, they would be reporting to the Re-Supply Group Supervisor using their regular call signs. I apologize for this lengthy discussion of ICS but the CD set devotes an entire 2 lessons (13 and 14) to tactical operations incorrectly using ICS terminology.

The boiling liquid evaporative vapor explosion (BLEVE) movie in lesson 6-3 p.29 wouldn't run for me. The narrator's pronunciation of several terms like not-am instead of no-tam for the word notam was annoying. Some pictures used were inappropriate for the text that was describing their purpose. I have no knowledge of any Oshkosh P-4 that uses a central inflation/deflation tire pressure system.

New terms were constantly appearing like "High Mobility Suspension System", "High Performance Turret". These are very subjective terms and I don't know that they have been universally accepted. How about using "Independent Suspension" and "High-flow Bumper Turret"? I think these are more common terms that don't use the manufacturers patented product name. In lesson 7-8 p.131, a skin piercing agent applicator tool (SPAAT) is referred to as a "pneumatic air driven drill". There are references and examples of many ARFF specialty items used for agent application produced by one manufacturer while other manufacturers items are not included in the whole CD set. This may be interpreted as a biased opinion by the curriculum developer as the best equipment to use for ARFF suppression. I didn't see an extendible boom turret nozzle that rotates 360 degrees or an ARFF vehicle built with monocoque construction technology.

In lesson 13-4 the CD states that "tactics similar to a structure fire" should be used. Tactics similar to a structure fire are identified as

- Access
- Fire attack.
- Search
- Ventilation

- Other tactics used in structure fires.

I disagree with this statement because aircraft are in no way constructed like buildings. The lightweight aircraft construction and confined space present enormous problems for interior crews. There are some common methods for fire extinguishment that are used but ARFF is apples and oranges when compared to structural fire fighting. Time factors for all operations are significantly reduced. How do you conduct a primary search with a twenty inch aisle obstructed by victims and overhead debris in zero visibility while advancing the nozzle to the fire? Climb over the seats? Why would you cut a hole in the top of the plane when you can cross ventilate with all of the doors opened? Has cutting a hole in the top of an aircraft actually saved anyone's life? I have yet to witness a significant fire in an aircraft that hasn't already vented itself through the top of the fuselage. Positive/Negative pressure ventilation would probably prove more effective although it must be understood that you are not pressurizing/depressurizing the aircraft with all of the doors open. You are simply directing air flow.

Lesson 7-6 p.96 states that turret use is not effective for interior cargo. I would like to see the study on this. I have no doubt that an extendible boom turret placed into the open door of a passenger aircraft or cargo door access of a cargo aircraft, directed 90 degrees towards the fire will have a positive effect on cooling and extinguishment. It is much quicker to place into operation than handlines as well. Piercing nozzles and firefighters with handlines may not be able to access igloo containers on cargo aircraft.

Most of the curriculum in this multi-media CD set is good information. The reviewers for the curriculum in this CD set are well respected by the ARFF community for their accomplishments and contributions to the industry. It surprised me how many discrepancies were overlooked. Seeing that this CD set is being distributed to ARFF stations throughout the country by the FAA, this production should have been presented to the *IAFPA, ARFFWG, NFPA, IFSTA and AAAE ARFF Committees* for review prior to it's release. It may have taken longer to get it all ironed out, but I think it would have benefited the curriculum content quality.

Although I felt there was a lot of subjective misinformation, overall, the CD set is a very useful tool for ARFF training. The CD does state in the first lesson that *"There may be other alternative and acceptable procedures not addressed by this training program to accomplish aircraft rescue and fire fighting."* With this in mind the CD set is a great supplemental medium for training new ARFF personnel and being used for recurrent ARFF training.

MANUFACTURERS NEWS

Birmingham International Airport Embraces Simulation Technology for Training Fire Crews

Birmingham International Airport (BIA) has become the first Airport Fire Service in the UK to purchase VectorCommand Aviation, a state of the art interactive computer simulator that runs a number of complex aviation and structural fire scenarios.

Over 60 civil and aviation fire services in the UK, Australasia and North America use the VectorCommand simulator for training and assessing their incident commanders in the critical skills needed to deal with emergency operations.

Birmingham International Airport will use the simulator to supplement existing fire crew training, and enhance specific skills such as command, control, tactics and risk assessments, which would all be crucial in the event of an aircraft incident. The new equipment will be particularly useful for the airport fire service, as it demonstrates realistic scenarios, incorporating time constraints, manpower and environmental issues, which often restrict realistic exercises.

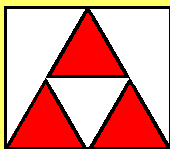
Paul MacDonald, BIA's Fire Service Manager, said, "VectorCommand will fully prepare our officers for the

fire ground experience. The system will enable us to concentrate on specific issues, in safe and suitable surroundings, without affecting the operational status of the airport. It also offers a safe and challenging method of evaluating an individual's problem solving skills in a dynamic environment".

Birmingham International Airport is the second largest UK airport outside London. It handles over eight million passengers a year with around 300 aircraft movements each day. Birmingham serves as the Midlands' premier gateway to North America, mainland Europe, Scandinavia and the Indian sub-continent. Nearly 60 airlines operate to over 100 destinations world-wide, including direct daily scheduled services to New York and Dubai.

If you would like to find out more about VectorCommand Aviation Solutions, contact:

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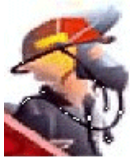
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The trainers in use at the DFW Airport's Department of Public Safety are designed and built to scale and represent actual conditions encountered on commercial aircraft. Propane is used as the fuel for operating the trainers. Contact Jeff Giraud at Tel: 972 - 574-4454 or by e-mail: JGiraud@dfwairport.com or visit our web site: http://www.dfwairport.com/TRAINING/ff_aircraft.htm

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Kellogg Community College, 450 North Avenue, Battle Creek, Michigan USA 49017. Phone: 616-965-3931 Ext.2226. Fax: 616-968-9020. Training dates through October. ARFF Hot Drill Course using ARFF Mobile Fire Trainer. Training on sight at airports. Michigan airports call about training grant when using the ARFF Mobile Fire Trainer.

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- For further information, contact Nick Palmer at LSU_ARFF@yahoo.com, or visit our web site at: http://feti.lsu.edu/specialized_training/ARFF/index.html

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Rochester, New York - Contact Jim Harrington at: JHarrington@MonroeCC.edu or 585-279-4015, Website: www.monroecc.edu/depts/pstc/nftc.htm

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Captain Brian Pugh, P.O. Box 22107, Salt Lake City, Utah, 84122 (USA) Phone: 801-5314521, Fax: 801-531-4521. FAR Part 139 Annual Live Fire Training is scheduled every month. E-mail: Brian.pugh@ci.slc.ut.us. Web Page: www.ci.slc.ut.us/services/airport/ARFF/index.html

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SINGAPORE AVIATION ACADEMY

Singapore, - Advanced Airport Fire Fighter 1 September—26 September, 2003; Airport Fire Officer 7 April—2 May, 2003; Senior Fire Officer 5-30 May 2003; Foam Tender Operations Refresher 22 September—26 September, 2003; Incident Command & Control Workshop 16-20 June, 2003; Rescue Fire Fighting Refresher 14 July—August 1, 2003; Bulk Fuels Installation Fire Management Workshop 23-27 June, 2003; Breathing Apparatus Operations 28 September - October 2; Helicopter & Military Aircraft Emergency Management November 5-8. For more information on training programmes, call the Course Administrator at Tel: (65)540-6216 or fax (65)542-9890 / 543-2778. E-mail: saanet@pacific.net.sg Web Site: www.saa.com.sg

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643-8437; Fax:709-643-1293; E-mail: fire.chief@cyjt.com; Visit our web page at: <http://www.cyjt.com/fireindex1.htm>

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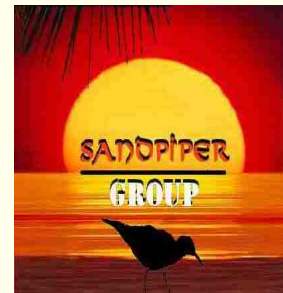


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