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

December 8, 2008

Addendum 2 to Operational Factors/Human Performance Group Chairmans' Factual Report

OPERATIONAL FACTORS / HUMAN PERFORMANCE

DCA07MA310

A. ACCIDENT

Operator:	American Airlines, Inc.
Location:	Lambert – Saint Louis International Airport (STL), Saint Louis, Missouri
Date:	September 28, 2007
Time:	1313 Central Daylight Time
Airplane:	McDonnell Douglas MD-82, N454AA Serial Number 49559

E. Addendum

Attachment 1 to Operational / Human Factors group Report

- Add the following additional four interviews to Attachment 1

Interview: Joseph Kohn, Md-80 Fleet Training Manager
Date: August 11, 2008
Location: phone interview
Time: 1300 EDT

Operations Group members present were Dave Tew, Evan Byrne (NTSB); Kevin Elmore (APA); Mark Maestas (AAL)

During the interview, Captain Kohn stated the following information:

His date-of-hire with American was July 13, 1987. He had been the MD-80 fleet training manager since January 2000. He had about 12,000 hours of total flight time including about 2,000 hours in the MD-80. The 2,000 hours in the MD-80 was mostly as a check airman or captain.

From 2000-2003 he was the MD-80 fleet supervisor. He worked for Eric Lewis, who was the fleet manager. Captain Hetterman reorganized the department in 2003 into flight ops and flight training. Since then he has been just doing the training side. He said the overhaul of the organization was a good thing because everyone then knew what their roles and jobs were and it worked good.

He said a crew would see an engine fire every time they came through training. When pilots first transition onto the airplane, they received 10 days of simulator training. The first 5 days were with a simulator pilot. Day 1 was normal day. Day 2 was engine starts and they started briefing normal and non-normal starts. Day 3 they were introduced to engine malfunctions and this continued through Day 5. The engine malfunctions increased in difficulty as the days went on. Each pilot would see at least 6 engine fires. Day 5 was high altitude engine failure like in RNO or DEN. On training days 6-7-8, a check airman was the instructor. Day 6 was the takeoff and landing day and it had been that for the 22 years he had been at American. Day 6 included basic x-wind takeoffs and landings, wind shear microbursts, etc. Then days 7 and 8 they start honing the skills that they learned in days 1-5. Day 9 was maneuvers evaluation day and they would get an engine fire there. Then a pilot may or may not actually get an engine fire during his rating ride. There were 3 scenarios for the rating ride and they were all different. Engine out training and engine malfunction training occurred at least 6 days of the 10 days a pilot was in initial simulator training.

During initial training a pilot saw an engine fire at least 6 of the 10 days. They taught that a during engine fire on takeoff, the engine would still have thrust so a pilot should keep climbing to a safe altitude and then do what he needed to do. Then go back and push button to stop engine rotation or kill the engine. Each pilot would see an engine failure about 6 times so the crew together would see an engine failure about 10-12 times or more. Some could see it a lot more than that. He said that was a minimum and a pilot could see it a bunch more - up to 25 times or so.

In requalification training they had 3 requalification courses – short, medium, and long. The accident captain would have gotten the long transition course which was a full 10 day course since he was away from the airplane for more than 3 years.

It should be determined before takeoff what the individual roles would be in managing emergency situations. Captain would conduct a takeoff briefing that would address who does what during a problem in a two pilot airplane. He had seen situations where the F/O would perform the take off and the captain would take control of the airplane when there was a problem. It depended on the situation. Generally it was predetermined that the pilot flying would continue to fly and talk to ATC while the other pilot handled the emergency. The captain decided what checklist was needed and would call for the checklist. The pilot monitoring will get the QRH out, find the checklist, be ready to read the checklist and accomplish the item.

Once a F/O started the engine fire checklist, he was expected to announce the checklist was for an engine fire /damage / separation, normally read everything including the preface and notes and get verification from the other pilot. The pilot monitoring would say the first items then the pilot flying would do the procedures, and the pilot monitoring would then verify and call it out. Once the throttle had been reduced to idle, the pilot flying would be doing flying skills. The pilot monitoring would then go down a “tree” of yes or no on the checklist. If the crew was going to come back and land immediately, they would basically go to the one engine landing procedure. If it was not an immediate landing, the crew would continue down the next portion of the checklist. The pilot flying would have his finger on the fuel lever waiting for the pilot monitoring to call it out and verify the correct engine. The checklist was done as a crew event. The pilot flying and pilot monitoring should work together.

He said the first two items on the engine fire checklist were not red box items. They just put out a new checklist for engine start valve open which put first 3 items on the checklist into a red box. First was auto throttle disconnect, then fuel lever off, and the third item was pneumatic cross feed lever off and closed.

Generally interrupting a checklist was not acceptable in training. They do tell pilots that if there was a complex situation where they need to get gear down and land, do it. They did not teach that in training though. They did expect them to complete the checklist. He was asked to comment on the captain briefing the F/As before finishing the engine fire checklist. He said that was not what was taught. Pilots were taught to get the airplane under control before getting the F/As into the loop.

Their training on a single engine go-around was limited. Most of their training had two engine go-arounds. Both the captain and the F/O would perform a single engine go around during training. They would probably see a single engine go-around 2 or 3 times during the simulator portion, then again during the check airman portion, and it was a required maneuver during the maneuvers validation.

He was asked about immediate landings. He replied that if you can land then do it. There were some items to be done before an immediate landing. If there was not going to be an immediate landing, then there was a "bunch of other things to do".

The MD-80 engine fire checklist pretty much follows the other engine fire checklists in the other fleets at AAL.

He was asked why American had an immediate landing portion in their checklist when Boeing did not. He said if you were going to immediately land, he did not think that some things were necessary to do. The immediate landing portion of the checklist was less time consuming and you could attend to the emergency instead. During an incident at Chicago 4 or 5 years ago, - that captain only did a few items on the checklist before deciding to get the airplane on the ground due to severe vibration and engine failure. Every situation was different.

He was asked what he expecting a pilot to do and say when he came to the hydraulic item on the engine fire checklist. He said that most of the time, the pilot would look at system integrity. If there were no problems with integrity or quantity, they would shut off the engine driven pump for the failed pump. There was nothing to be done with the aux or transfer pumps at that time. The aux and transfer pumps should be on. The failed engine pump should be put to the off position and all others turned on. That was how they trained it. He said he was not sure where "as required" was put down or defined.

He was asked what should be done when the engine fire checklist was completed. He said if there was to be an immediate landing, he go over to the one engine landing checklist. During training, if there was an engine fire, they expected, at a minimum, the engine fire checklist to be done, the one engine landing checklist to be done, and the mechanical before landing checklist to be done. The ground evacuation checklist should be done as needed. These 3 checklists should be done. When there was time, they should do all the checklists. He said it could be tight as far as timing goes during an emergency.

This event was the first time he had heard of anyone having difficulty shutting off the fuel lever. He said in all the simulators it was pretty easy to operate the fuel lever. The issue of the airplane fire handle being harder to pull than the fire handle in the simulator has come up before. He had a check airman tell him that it was more difficult to pull in the airplane than in the simulator. He said it makes sense to him that it was harder to pull based on the length of the aircraft fuselage. He said they now have a slide now in training showing the fire handle in the actual airplane and say do not be alarmed if the handle is harder to pull than in the simulator. The slide show is presented now in the recurrent program he started in June - under managing the unusual. They talk about the fire handle there. They did check the simulator and the simulators were not the same pull as the airplane. They have now modified the simulators so the handles have more realistic pull to them. They did not have a start valve open event previously. He said he had also added an in-flight start valve open event in the simulator training. An in-flight start valve open item is now a being trained during recurrent training and any transitions training. Every pilot though since June has seen that on recurrent.

Check airman giving a "hot item" briefing about the start valve open checklist and showing about how our checklist is not perfect but it is all they have. During simulator training, pilots now get start valve open on takeoff roll. If the pilots do recognize the open start valve, that is great. If the pilots do not recognize the start valve is open, the check airman may give them a "nudge" by turning it into an engine fire. They are doing a start valve event at LGA with diversion to JFK. When the light fails to extinguish, they have to divert to JFK. They are trying to duplicate the accident as they much as they can and simulate urgency to put airplane on the ground.

He said the start valve open condition currently produced no aural or master caution light. A start valve open condition just produced a visual warning with an amber light on the overhead annunciator panel. . Captain Johnson had an initiative going to tie it to master caution light. It has been approved at the senior VP level for a start valve open condition to trigger a master caution light. Captain Kohn said he thought it was a great idea. He said every pilot does not notice the start valve open annunciator light in the simulator because it was hard to see. A start valve open condition was an abnormal event but now it would now be an emergency item. A start valve open condition was now a red box emergency item. They were trying to educate their crews by briefing the QRH start valve open pink page to all the crews in recurrent during the managing the unusual segment.

He said he was aware the nose gear did not extend because they did not have the hydraulic pressure they needed. He said crews were trained in the emergency extension of the gear. He said they now include additional information during training to cover the event. There is also additional information in their Volume two manual. They have a power point slide show that is used to discuss what happened and why. He has every intention of adding this into a new loft scenario for the airline. He could not add it to the LOFT at that time because he needed FAA approval first. Eventually it will be there.

He said the MD-80 airplane never ceases to amaze him. He had been around it all his life and he was still learning.

He said crews were now seeing more emergency gear extension training that in the past.

He was asked what did he thought about the captain's decision to perform a go-around with an engine fire indication still present. Captain Kohn said he probably would have pulled emergency gear handle and landed. He said he would not have wanted to take the airplane into the air again. He said that was his personal opinion. He said he had never been in that situation so you wonder what's going on and what you would do. Every situation was different. He would give careful consideration before performing go around with that condition. He said that was a very subjective thing to talk about and there was a lot of discussion going around. They talking about the go-around in training and it was amazing what answers were given. Some pilots thought nothing of doing the go-around and others would press on and land gear up. They were dealing with it in training. Captain Kohn said it would take about 2 seconds for the gear to extend when you pulled the emergency gear extension handle. It would take longer to get handle door open than it took for the gear to release or freefall. The emphasis in training then was to pull handle. He said he did not know what the accident captain was thinking about. You do not have to go around and you do not have to land gear up. Just pull the emergency extension handle first. He said he was trying to address everything that had happened during training and said he was working hard to incorporate it as fast as he could..

He was asked what would did he expect to see during a single engine go-around. He said the procedure was pretty much the same as a two engine go-around. He would not clean up the airplane until 1000 feet. He was asked what commands he expected to hear a flying pilot to say during a single engine go-around procedure. He said he expected a pilot to say "go-around" first. Then push the toga button, call for flaps to 11, make sure engine power came up as he was not relying on autothrottles. Then the pilot should just fly the airplane up to 1000 feet to clean up again. When level and accelerating, he should retract the flaps on schedule, and get back into the game again.

He was asked about the captain briefing the flight attendants during engine fire checklist and stating he did not expect to do an emergency evacuation. Captain Kohn said they train pilots to tell F/As whether they do or do not expect an evacuation. They should go through the 4 TEST items. They are trained to do that in the simulator and brief the check airman as they would brief the passengers

If on fire, pilot should say we are planning an evacuation. During the first call to the F/A, he said they expected a pilot to say this is your TEST briefing. We want to hear that verbatim. Captain has to tell F/A whether they are expecting an evacuation or not. The F/As need to hear the 4 TEST items as that was what they emphasize in training.

During training now, he has taken it on to have the captain get a frequency and set up ahead of time to talk with ARFF when they land. He said it seems like forever they have been injuring people in evacuations. He said what better way to get info than to get the person outside the airplane looking at it to get input and advice on what the situation is. A pilot should take that input and make a sound decision accordingly.

He said he thought they should have performed an after landing checklist. The emergency evacuation checklist was on the yoke if needed. He said at that point in time, they should expect ARFF to follow them in. If they sit there and wait on tow bar or tug, just like a normal landing at that point, the pilots should perform the after landing checklist and any abnormal checklist that would follow the problem. He said you can prepare for and stop an evacuation up to the point you command it. During training, they were using the Delta Airlines event in Pensacola, FL to highlight cockpit/cabin

communications. You should start the evacuation checklist, lower the flaps, and shut engines down. You were then in a position and ready to evacuate if something were to change.

He said a pilot should know that pulling the pneumatic crossfeed handle up will suck the engine fire handle back in. There was a mechanical linkage between the two. They had a scenario about the linkage in training. They showed it both ways- that pulling the fire handle closes the crossfeed lever and that opening the crossfeed lever would pull the fire handle back in. They trained both ways. In 10 years on the airplane he had never seen the pneumatic crossfeed lever be an issue on the airplane. The crossfeed linkage training he talked about was the same training they were doing in 1986-87. He said he felt the crossfeed lever/ fire handle issue in STL was not a training deficiency but the crew was in a ground mode with the APU running and was not thinking about it when they opened the crossfeed lever pushing the fire handle in. The training on the crossfeed lever / fire handle linkage was all done during in-flight scenarios.

He did not know crew. He trained about 400 pilots per months. He recognized familiar faces but not as many names.

For an engine fire, he said he would brief the E on the TEST briefing saying they may need to evacuate rather than saying that they would not evacuate. The manuals discuss anticipating the need for evacuation. You should lean towards the fact that you may need to. He thought in this case they did not run the evacuation checklist because after getting information from ARFF they did not believe there was a need to evacuate.

He said he thought crews fly like they are trained and they don't have a problem on the line with managing emergency situations. He said one issue he thought did apply was getting in a hurry.

He said the STL event was not a systemic problem and described it instead as an isolated event.

He said that years ago they did not put as much emphasis into getting information from ARFF to support decision making when on the ground.

He said if you do not think you going to evacuate, you do not have shut the engine down. The after landing checklist doesn't call for engine shutdown; but if you're anticipating evacuation you should shutdown both engines.

Interview: Robert David (RD) Johnson, MD-80 Fleet Captain
Date: August 11, 2008
Location: phone interview
Time: 1430 EDT

Operations Group member present was David Tew, Evan Byrne (NTSB); Kevin Elmore (APA); Mark Maestas (AAL)

During the interview, Captain Johnson stated the following information:

His date-of-hire with American Airlines was October 1984. He had about 13,000 total flight hours from military and civilian flying. His flight time included about 6,800 flight hours as captain on the MD-80 and about 2,500 flight hours as F/O on the MD-80. His current position was MD-80 Fleet Captain. He had held that position since September 6, 2005. He was previously an x-type check airman from May 1999 to September 2005.

His primary responsibilities as Fleet Captain were policies and procedures. He was responsible for incident and accident investigations also. He was aware of anything that concerning the operations side of the MD-80 fleet. The training side of the fleet was the responsibility of Captain Joe Kohn. He said Captain Kohn had gotten a great training program together.

He had not previously met the accident crew of the STL event. After the event they brought crew to headquarters. Captain Johnson said he used to be involved in Human Factors (HF) and approached the debriefing of the crew from a HF manner using HF skills and recreating the event so the airline would know what was there. He did not think they gave the captain a check ride or not. He said he thought the captain only flew a few trips before retiring. Captain Johnson said he recommended that someone needed to fly with the accident captain. He had Captain Jirschle fly with the captain. We work through ASAP and we work through a fleet program. All he recommended for that crew was extra simulator training to refresh them and to talk to them about the systems. Captain Johnson said that they would occasionally put a check airman with a pilot out on the line to either calm them or to ensure that if we needed a behavior change it was accomplished. They did not do that “officially” but “unofficially”, they did it for the captain's comfort.

The decision of what to do with a crew post incident would be normally be Captain Johnson’s call, but Captain Kohn or the chief pilot could also make the decision.

He said he tried to fly about 200 hours per year. This year he had flown about 148 hours to date.

Captain Johnson was asked about the event crew interrupting the engine fire checklist to talk to the F/As and he responded “that's not the way we train”. He said he would expect the checklist to be run to through the immediate landing section and then go to the notes section if he had determined that it would be an immediate landing. He said that would be what he would expect to see for a fire that did not extinguish.

He has not had time to review the CVR.

He was asked what he thought about the event captain electing to perform a go-around with an engine fire condition. He said he wasn’t there, so he could not say. He said he did not know if he would have done anything different. He said if there was a good reason, it was safer to go around than to land.

He was asked if American trained multiple events like this. He said we have not really trained to that in the past, but because of this event, we have been discussing it. We included the union in decisions. We asked the union “what do you think about us training something similar to this where you have to prioritize”. Captain Kohn was working with the union on that. The company was considering doing multiple events during Recurrent training under additional events which would be optional. He said he

would envision it would be done in the future during both recurrent and initial. They would need to meet with FAA for approval. They had a quarterly meeting with the FAA for AQP.

He was asked what changes have been done since the event. He said they had put some supplemental information in and had published red box items for a start valve open light on August 15, 2008. They had added additional information on the hydraulic system to volume 2. They added items to the Preface in the next QRH revision. They had added supplemental ground evacuation information.

No past history in training difficulties for crew. If there had been a recent history of training problems he would have chosen a different post-event course of action.

He said American deals with the concept of checking to make sure the crews are able to handle emergencies on the line the same way they are able to in training as a collective effort. Everyone was involved on a daily basis during training or checking. He said American had a good training program and that pilots are doing the right thing on the line.

He said the STL event was a singular event. The company did not see any evidence that it was reflective of a systemic problem at the airline. He considers it a "one off" event. He did not know why the crew performed the way they did.

He was asked about the captain briefing the FA's that he didn't think an evacuation would be needed while at the same time there was an engine fire indication in cockpit. He said perhaps the captain thought the fire was extinguished. Captain Johnson said he would have told the F/As what type of emergency they had, and said he may not have the answer on whether evacuation was necessary but would tell them to be ready for an evacuation as part of his TEST briefing.

Captain Johnson was asked once the airplane had landed and came to a stop and established communications with ARFF, what checklists would he expect to be performed. He said, at some point, he would have expected them to do an after landing check. The crew should ascertain if they would evacuate or not. He said he thought the captain should say give me the ground evacuation checklist, which was on the yoke, and then make determination whether to evacuate or not.

Captain Johnson was asked if, before the event, he aware the pneumatic cross-feed lever would retract the fire handle. He responded "absolutely" and said he was sure he had seen that information a lot. He said he did not recall specifically where he first heard that information. He said where they see the mistake most often made was during initial or recurrent training when you go to a single engine and then enter icing conditions. A pilot would forget and turn on icing and open the pneumatic crossfeed valve and that was a graphic explanation and picture that the pneumatic crossfeed lever and the fire handle were mechanically linked. He said every pilot has seen that scenario. He was asked why American did not have a statement in their manual stating that opening the crossfeed lever would retract the fire handle as the Boeing manual had that statement. He said American has that statement in their manual now.

He was asked about American planning to tie the start valve open light to the master caution. Captain Johnson said he and F/O Maestas went to Mr. Redding's office and we presented a briefing for 45 minutes requesting that change. He said they ready for a "no" but because of the preparation that F/O

Maestas had done, Mr. Redding said "unequivocally it was be the right thing to do". He said an email was sent last night to go forward with this. He said the cost would be about 3,000 per copy [airplane] and a million dollars per fleet. He said it would be done very soon.

He was asked was there any concern about master caution coming on and distracting crew during takeoff. He said no and that he wanted them distracted. He discussed how the alert light would appear in a different place on a TWA airplane. He said we have not told pilots to abort before V1. He said in the change we have in the preface, we were allowing a captain to use his judgment and make a decision whether it would be unsafe or unable to fly. His decision would depend on conditions. He said it would be a whole lot different with a short runway versus a long runway situation. American had very extensive training program on rejected takeoffs during both initial and recurrent training. American training really reinforced why we abort, how we abort, how it was different on a TWA airplane versus a native [original American] airplane.

He said American had all sorts of associated alerts that could cause a master caution light to come on during takeoff. He said, for example, air temp supply light will come on and will trigger the master caution on a hot day. Most every pilot had seen that. He said with FAR 25, it was "a little more congruent in actuality" especially talking about an alert on the ground versus. In-flight. He said they had set up the start valve open alert to be armed at the 22 percent position on the throttle because we did not want the light to come on every time that they had a normal engine start. He said American had a bulletin on the change and said they had been training to that bulletin. He said they had instructed their check airmen on how we want them to train the change. He said we do want the guys to reject the takeoff if they can abort before V1. They were instructing flight crews to not do the procedure until they reach the engine out obstacle clearance altitude. They preferred crews not do it until 600' which was the normal obstacle clearance altitude.

Interview: FAA POI Robert Talmadge
Date: August 14, 2008
Location: Phone interview
Time: 0900 EDT

Present were: David Tew, Evan Byrne - National Transportation Safety Board (NTSB); Mark Maestas - American Airlines; Kevin Elmore – Air Line Pilots Association (ALPA).

During the interview, Mr. Talmadge stated the following information:

He was previously a Director of Operations for two large helicopter operations involved in EMS operations.

His position was FAA principal operations inspector (POI) on the American Airlines certificate. He had been the POI for about eight months. He had a previous tour of duty as the POI for American and that tour lasted from June 2000 to January 2003. He left the position when he was called to active duty with the military. He was primary interface with the carrier for regulatory and operational safety issues worldwide.

He usually did not get involved personally with oversight of MD-80 fleet. The aircrew program manager (APM) Dave Smith handles oversight for the MD-80 fleet. He reviewed bulletins and occasionally observed the APM performing oversight of American designees in the simulator. He does perform some air transportation oversight system (ATOS) inspections occasionally.

He is assigned other reviews in accordance with the "condor for financial distress" which was a branch effort for all major carriers due to the fuel issue.

He performed oversight of APM. The APM was the technical expert on the MD-80. The POI observed APM's manner in how he deals with the carrier.

He was not qualified on the MD-80 airplane. He was type rated on EMB 110, BE1900, DC-8, and B-727.

Concerning the STL event, he was familiar with what he read in the papers and what the carrier had shared with them. He knew the crew was faced with multiple emergencies, worked through the most urgent ones in their mind, prepared airplane to land, had additional information with the gear, performed a go-around, came back and landed. They secured the airplane and disembarked passengers.

He said that based on what American and AAI-100 shared. He had reviewed operation of the pneumatic cross feed. American had reviewed its existing manuals and revised information guidance about using pneumatic cross feed after you've had an engine problem. The APM and American's fleet manager had looked into the pneumatic crossfeed guidance and determined that the information had been there but they revitalized it. The revitalized information had been incorporated into simulator training and was a "hot" item in training. The company had added information to their Volume 2 and QRH manuals. He said the company had done a pretty good job of responding to the event. Mr. Talmadge said he had forwarded the recent SAFO 08018 to the company and he expected a quick response because the FAA was already aware of what the company had done in response to the event.

During advanced qualification program (AQP) maneuvers validation, a crew would get scenarios in where they got an engine failure and had to use anti-ice. This was done so the crew would have to use proper pneumatic crossfeed method. A "hot item" in training was to advise the crews that if you were on the ground and had an engine fire handle pulled and for whatever reason, you open the cross feed, you would undo the 4 or 5 things that occurred when the handle was originally pulled.

He was asked if he was aware of any more changes at American as a result of the STL event. He said he would have to talk to the APM about that as he was the main person in communication with the company about changes in the MD-80 program. He said he had talked with Captain RD Jonson and Captain Joe Kohn. He felt like American has changed and has adequately addressed any problems. He said American had surveyed other airlines and learned some were not aware of or teaching the problems that occurred with the pneumatic crossfeed valve. POI feels the SAFO will be effective too.

He said he did not meet with the APM daily because his schedule was that they worked early mornings, late at night, weekends, etc., to do their surveillance. He said he probably met with the

APM three times per week. He said he sometimes was with the APM during simulator warm-ups for his own training.

He said the APM wanted to know if the NTSB knew something he did not about the event. The APM had said that if there were areas that needed to be stressed, he wanted to get on them as soon as possible. The POI said if we can do something better we are all about doing that. The APM said 300 airplanes represented a lot of risk.

There has been no lip service. Every commitment has been followed by action and the action was followed by evidence.

The APM reviewed any revisions to manuals such as Volume 1 and Volume 2, the QRH, any immediate action checklists, and the portion of the AQP footprint that dealt with the MD-80. The APM takes care of all the technical evaluations as he is the expert.

POI signs the manual per the FAA Order. He said he did not do a cursory review of any change. He reviewed and read the changes before signing. If he did not understand something, he asked questions about it.

He was asked if the FAA compared any changes to a manual with the manufacturer's manuals. He said they did and that, as a matter of fact, any changes usually reference the manufacturer's manual so they can compare. He said there were times when the FAA would suggest changes. He said Boeing was a "pretty good outfit" but it was hard to get heads-up information on impending manual changes so the FAA can get in front of the changes. Most changes to American manuals are prompted by changes the Boeing manuals or some safety issue that Boeing perceived. The FAA usually got a "heads-up" about changes from the airline.

They had provided changes concerning the pneumatic crossfeed lever to the FAA AAI-100 department. AAI 100 had asked them for background information when they were preparing the SAFO. The APM worked with American and looked at systems description, went into the simulator, and provided information to AAI-100 for the SAFO.

The APM does not have any assistant. Everyone in the FSDO helped him on things like IOE and because he has been sick. Others with DC-9 type ratings are helping everywhere they can. The APM carried a heavy load so everybody tried to help as much as possible.

He said he had about 13 operations inspectors in his office working on the American certificate. He also had four remotely sited inspectors who did surveillance but no certification work.

He was asked if he or the APM had any concerns about American's emergency evacuation training and the decisions made during this event. He said he had a Cabin Safety (CS) inspector who was the expert on that. The APM focused mostly on crew performance. The CS inspector felt that the crew had assessed the situation and the action they took to wait for deplaning. The F/A agreed with the decisions and had opportunity to do an emergency evacuation if she believed it was a dangerous situation. The CS inspector said the crew did what they were trained to do. The CS inspector and the

APM both felt like the crew made sensible decisions and it worked out. He said there were no concerns relayed to him from the APM or CS inspector and that he did not have any concerns.

He was asked any FAA concerns about the go-around that was performed during the event. He said the APM and American looked into it and also worked through the ASAP program as well. He said he was not sitting in the seat dealing with multiple emergencies. He was pretty sure the captain wanted to get the airplane on the ground as soon as possible. With no nose gear, the captain was faced with a couple options he did not like and took the one he felt was safest. He was asked if the FAA was satisfied with the captain's decision. He said it was an emergency situation and was "shallow water to be wading around in when he wasn't in the pool". He thought the captain did what he thought was best. ASAP discussions after the event showed the crew was trying to do the right thing. Normally a crew would pull out one page during an emergency and then be done, but this crew did not have a situation like that. The crew did not have as much info then as we have now.

He said he was not aware of an interruption of the engine fire checklist.

He was asked if he was aware of any systemic problem with crew performance or checklist usage during abnormal or emergency events. He said they had just finished performing a 3-1-3 inspection. The 3-1-3 inspection was an ATOS area review of airman's duties and flight deck procedures. They did not see anything during the inspection that would indicate any concerns. They look at the AQP quarterly reports and had not seen anything of concern. He said the 3-1-3 inspection was similar to the old FAA 1624 inspection which was an enroute inspection of a crew.

Interview: Captain Richard Throp Knight, (instructor – Human Factors safety training, check airman)
Date: May 1, 2008
Location: Phone interview
Time: 1430 edt

Operations Group members present were David Tew, Evan Byrne, NTSB; Mark Maestas, American Airlines; Kevin Elmore, Allied Pilots Association.
Captain Garbe was represented by Ray Duke

During the interview, Captain Knight stated the following information:

His date of hire at American Airlines was May, 1979. He was part of the Human Factors program development team and taught Human Factors and Safety Training at American. Every nine months they need to produce a new Human Factors class for the pilots and that consisted of a two hour and forty-five minute class. He was part of the team that developed those programs.

He had about 20,000 or more total flight hours. He had about 9,000 flight hours as a pilot-in-command (PIC) and about 2,500 flight hours as F/O on the MD-80 airplane.

He had been a check airman on the MD-80 airplane on and off since July 2000. He estimated that he had been a check airman on the airplane for about five and a half years during that time period. He

was an X type check airman. He worked in the simulator conducting training or checkrides and also worked in the airplane. He did initial training or transition training for the MD-80.

There were different types of check airmen at American. It depended on what type training you performed. He was not an FAA designee.

In initial training, he was involved in instructing days six, seven, and eight in the simulator. They also had pilots coming for recurrent training and he would be an evaluator on those events.

He covered all areas of training when he was doing training.

He was asked what he would expect during engine fire training, specifically what he expected the captain to say and do when there was a fire indication and what did he expect the F/O to say and do. He said that first of all he expected to see the identification of the problem announced by whoever saw it and that person state what had happened. After that, the captain instructs who will be the person that will be flying the aircraft and who will be the person working the checklist. Then the checklist is run to a conclusion as determined by the captain.

He was asked how they trained to fly, operate the radios, and run the checklists. He said that normally the PF flew the airplane and talked on the radio because of his awareness of the situation with regards to ATC. The pilot monitoring (PM) normally ran the checklist. He said there were certain situations where the crew could deviate from those procedures such as controllability issues.

He was asked if he would expect the Engine Fire / Damage checklist to be done completely once started or if not done completely then at what point should the checklist be interrupted. He said that, 95 percent of the time, he expected that if he gave an engine fire that the checklist would be run through to completion without stopping. He said there were some times in training that they would inject a situation where the F/A informed the captain that there was a lot of smoke on the airplane and people were having trouble breathing. At times like that, he would expect to see the captain put the checklist down and put the airplane on the ground. He said that he introduced situations like that but that he was not in a position to say that other instructors also did that. He did not oversee other instructors. Instructors have standardization days which were two days of observation during the year that they watched someone else instruct. He may not be observing engine fire events all the time so he was not qualified to answer about other instructors. He said about three or four years ago, they became aware that F/As were a valuable resource and we started obtaining info as best we could. They tried to get information from them when they had these types of events.

He was asked was there a portion of the checklist that should be completed first if a crew had an engine fire and a situation occurred that would indicate to the crew that they needed to get the airplane on the ground now. He replied that if there was an engine fire, it would make sense that “you would at least close the fuel control lever, pull the fire handle, and shoot a bottle at a minimum”.

Since he had been associated with human factors training, they had always asked captains to use all available resources to make a decision on whether to evacuate or not. He said human factors provided training guidance to pilots and F/As. He was asked if American used various scenarios during training on whether to evacuate or not. He said a basic scenario would be the Little Rock, AR accident, which

of course would require an evacuation. He then said they have other scenarios where the captain might be incapacitated or some similar problem. He said if an event occurred in another country and AARF type of support was not available, the captain again had to assess every piece of information available to make an educated decision. He said, short of a "Little Rock" type accident, an evacuation decision was not absolutely black and white as to "we will absolutely evacuate for this and not for this".

Captain Knight was given information concerning the event including the conversation between the captain and AARF, and was asked what kind of guidance he would present to other pilots in training to help them in making an evacuation decision if faced with similar conditions. He said that he would tell them to be sure to obtain information from flight attendants if possible to assess situation in cabin. He said the crew would have been fully aware of the exterior of the aircraft and its condition. He said the only piece of the puzzle missing during the event was what was going on in inside of aircraft. Captain Knight was then given additional information that the cockpit door was open and a captain riding the jumpseat was communicating with the F/As. He then responded that in his opinion the captain was doing everything he had been trained to do at American Airlines.

He was asked about American training that indicated that during an evacuation, some people were likely to get hurt during an evacuation. He replied that they had used an NTSB study that he thought came out in 2002 as part of the human factors class describing in great detail that sort of thing exactly. They also talked about the fact that if you were flying to Rochester, MN, where the Mayo clinic was located, you could expect that as high as 30-40 percent of the passengers might be wheel chair people. He said the NTSB study showed, of the 46 evacuations studied, 92 percent of the occupants had no injuries, 6 percent had minor injuries, and 2 percent had major injuries.

He said the main philosophy at American Airlines was "assess the situation and decide whether you are safer inside or outside the aircraft". This decision should be based on the information from all your available sources about the situation. He said as far back as February, 1997, they issued Flight Operations Technical Information Bulletins frequently, and there was a paragraph in one that was dated February, 1997 that said it was not feasible for the flight department to establish a rigid set of rules because there are so many variables. He said it appears they had spent a lot of time training captains to do just that since 1997. The February, 1997 was still applicable and could be retrieved by American pilots on their website. He said a pilot would have to retrieve the bulletin from the website because it was no longer being actively trained

He said they were no longer using the NTSB 2002 study in training. The NTSB study was part of a package of evaluations and training in 2002. The NTSB study was used for about nine months to a year. The study was used to give pilots information on what happened in an evacuation. It was used in one of their evacuation modules. At the time, they discussed a variety of events. One event discussed was their Phoenix, AZ evacuation. During that evacuation, there was a tremendous fuel leak.

He said, time permitting in perfect world, he would recommend the pilots assess outside the airplane and call all the F/As. The F/As would let know the pilots know what the status was within the cabin of the aircraft. On a large airplane, such as a B-777, what was happening in the front of the airplane might be different that what was occurring in the back of the airplane. The captain should use all that information to make the appropriate decision.

He was asked if no information was provided from the F/As, should pilots assume everything was okay. He responded that they did not ever make that assumption. He said they were looking for information from F/As especially if there were a life threatening situation.

He said that pilots and F/As were given separate training on evacuations. He said, prior to 2000, they were trained together. He did not know why they were trained separately now. He said the decision to conduct separate training was made "beyond his pay grade".

He said they were within 30 days of beginning a new human factors class for pilots. On March 1st, they began a new human factors class for F/As. The pilots class runs for nine months and the F/As class lasts for 12 months. That compares with their training cycles so no sees the same class twice.

He was asked what were the major themes for the F/A's program and he responded that they used a video and provided dialogue of American flight 84 that arrived in Frankfort, Germany and had very unusual situation occur as they were approaching the gate. The apu was started and was coming on line when loads of smoke appeared at row 25. They reproduced this event in the flight simulator and in the cabin simulator. They provided the story to F/As and make it an interactive situation. They would stop the video and ask what they were thinking. The event was fascinating in that it could have been an evacuation, but ended up not being an evacuation. He said the Frankfort event was one of three modules that were discussed during the training. Another module concerned lithium ion batteries. They showed videos concerning the batteries and discussed a B-777 flight that had an explosion in flight. The last module concerned "are you ready to come to work and fly" and was from an emotional state and stress management perspective.

He said the human factors group did not always have to cover evacuations during training. Flight 84 was such an unusual situation that they thought it was something they should share.

He was asked what would be covered in the upcoming pilots' human factors module. He replied that the new module would start on June 1 and that the topics to be covered were a dynamic situation. There would be a discussion of flight 84. They would cover the ASAP[1] program and data from that program. They would highlight areas from the FOQA[2] program including information about flap overspeeds. There would be Flight scope videos and discussions about unstablized approaches. They had a video on medical diversions. They would cover "pinc" [procedural intentional non compliance] with two different scenarios. There would be a pilot monitoring segment. He said that covered about 90 percent of what would be in the class.

He was asked how American trained to deal with cockpit interruptions and he replied that the captain set the tone. The captain was the one that determined what the prioritization would be to ensure that distractions would not lead to missed checklists or any other problems.

He said American did not train multiple systems failures. He said they would never give a check ride with events similar to what occurred on flight 1400. Why American did not train multiple system failures was a decision that was "beyond my pay grade".

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[1] ASAP – Aviation Safety Action Programs
[2] FOQA – Flight Operational Quality Assurance

He said that because American was under AQP[3], almost everything they did was scripted. When he was instructing a day 6 module with a new captain or F/O, there was a script and he followed it to a "t". There were limited opportunities during training to do things to create situation with multiple system failures. It was well within their training abilities to have the crew call the F/As and ask what the situation was in the back.

Submitted by

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Operations Group Chairman

[3] AQP – Advanced Qualification Program