Attachment 1

To Operations/Human Performance Group Factual Report

DCA11IA040

Interview Summaries

Interview Summary for UA 497

Incident crew

Young, Ronald Lee	First Officer	Apr. 6, 2011
Moffer, Donley Kent	Captain	Apr. 6. 2011

Management

Neugebauer, Christopher	Acting Training Manager	May 19, 2011
Maddox, Amy	A320 Standards Captain	May 19, 2011
Belcher, Kris Lee	A320 pilot instructor	May 19, 2011
Redmond, Kenneth Craig	A320 Standards Captain	May 19, 2011

FAA

Garrard, Walter Edward	A320 APM for UAL	June 9, 2011

Interview:	**Ronald Lee Young**
Date/Time:	**Apr. 6, 2011; 1210 PDT**
Location:	**UAL LAX domicile airport conference room**
Present:	**Roger Cox – NTSB; Mike Barnett – FAA; Marc Ghafouri - ALPA; Bradley Peterson – UAL**
Represented by:	**John Hanson - ALPA**

During the interview First Officer (FO) Young stated the following:

His current position was First Officer A319/A320. He was 50 years old and his date of hire at United Airlines (UAL) was April 13, 1998. He held ATP, FE, and airplane multi engine land certificates and type ratings on the A320, B757/767, BA3100, and SF340. He was limited to commercial privileges for single engine land. He had about 14,000 hours total pilot flight time, including 2000 hours PIC and 900 hours in the A320. He had been on the A320 for about one year. His most recent simulator proficiency check was in August of 2010 and he was scheduled for a proficiency training session (PT) the following week. He could not recall if he had experienced the avionics smoke procedure or the emergency electrical procedure during the last PC.

He was the pilot flying on the incident flight takeoff. Preflight and taxi were normal and they made a full (TOGA) power takeoff with flaps set to 3. Initial clearance was runway heading to 4000', but they were subsequently cleared passing 2500' to turn right to heading 250° and climb to FL 180 or FL190. Passing 4000' he heard a "ding" and saw an ECAM message "avionics smoke" and another message "land now." He said the captain thought the message was "land ASAP." The captain told him to fly the aircraft and handle the radio communications and he, the captain, would run the ECAM. Conditions were IMC. He leveled the airplane at 5000'. The captain said "you lost your autothrust." The A/T would not reengage, so he retarded the thrust levers to slow down. He then lost his flight instruments and began to fly cross cockpit using the captain's instruments for altitude, heading and airspeed. He asked the captain, "do you want me to get vectors back?" and he then declared an emergency with ATC. He said "UAL 497 declaring an emergency, roll the equipment." The captain keyed the mike and said they "had a smoke issue."

When the captain saw the FO flying cross cockpit, he said "I'll take the aircraft." They were cleared down to 4000' and then lower. The FO decided to alert the flight attendants, but he did not hear the bell when he called and the FA's did not respond. He used the pedestal handset to call the FA's, but he got no response. He opened the cockpit door and told the FA's that they were in an emergency and would be landing immediately. They descended to 2000' then to 600' or 700'. He saw the water and the shoreline and recognized their position; he had been into this airport a lot recently. He told the captain "we're on a good heading for 19." The captain held 600', configured with gear down and full flaps and used the VASI for guidance.

On touchdown the cockpit door swung open. He turned to the cabin and shouted "remain seated, remain seated." When the engines came out of reverse the captain went to the tiller but the aircraft pulled to the left. The captain said "I can't control it." The captain said "we're going

to evacuate." The FO skipped the ATC notification step because they knew what was happening. They shut down the engines and the captain said "get them out." The FO could not find the "Evac" switch; the overhead was all black. The captain set off the evacuation signal and the FO then silenced it. The 1R slide did not inflate. The FO yelled "go the other way." He went down the 1L slide, helped the passengers, and sent them away from the airplane. The passengers did a phenomenal job, he said. Two of the FA's went out 2L. The captain came out a few minutes later, bringing a megaphone. He used the megaphone to corral the passengers and he asked them about injuries. One lady was on her back, not feeling well, but a passenger who said she was a nurse assisted her.

His first indication of a problem was losing the autothrust. He pushed the AT button on the MCP which did not work. Then he saw the ECAM "avionics smoke." There was no smell or odor. His thinking at the time was about "the everglades," and that the situation was serious. He could not recall seeing a master warning or caution. He heard the captain say "generator switch," but the captain did not announce avionics smoke and he did not pull out the book. They did not don the oxygen masks because there was no smell. He lost both his screens and used the captain's screens. He planned to ask for ILS to runway 10, but ATC was pushing for runway 19.

He thought they went into the emergency electrical configuration, but he didn't know what the ECAM steps were. He was out of the loop and had no #2 radio. He did not use the QRC except after landing for evacuation. The ECAM took priority. The flight was IFR, given no gyros instructions, with the RAT down. The plane got a little squirrelly with the RAT down, but he had practiced flying with this condition.

The captain figured the approach speed, but did not discuss it. They flew final at 150 to 160 kts, keeping in mind minimum RAT speed of 140. He would normally find ref speed on a chart, but did not look up a ref speed. He knew the runway was 7000' and was not sure about stopping distance. There was no time due to the severity of the emergency they were in. During rollout he called out "remain seated," and after stopping said "evacuate" and used the checklist.

He thought that the avionics smoke ECAM was in red, and the "land now" message was red. He thought the load shedding and loss of instruments was due to the captain's actions. They came out of the overcast at 1000' and used the VASI's for landing. He believed that they ran the ECAM procedures just like in training, but he did not keep up with those actions.

He noticed the AT light on the MCP was out when he went to reset it. Generator 2 was shut off. The visibility was good, 8 to 10 miles in haze. Initially he was flying and talking on the radio. There was no discussion of urgency in the cockpit, but there was an immediate tension. He had no prior experience with this type of abnormal. He believed that they performed immediate action items just as they were taught at the training center, and that their training "kicked in." The captain did not say "ECAM complete, situation normal." He made the initial turn back toward the airport, a heading of 030. The captain took the airplane at an altitude between 5000' and 4000.' At that time his side of the radio panels was dark. He assumed only comm. #1 was working and didn't try the radios on his side. The captain said "we've lost all our instruments," but that wasn't exactly true. He wasn't sure how to tune the ILS and did not know if the FMGC's were working. He had had practice in no gyro approaches. The controller offered the no gyro

approach, and he thought it would be to runway 19. They did not tune radios or brief an approach.

They took off with fuel of 34,100 lbs, so the landing was overweight, about 148,000 to 150,000 lbs. They did not run an overweight checklist, do runway analysis or calculate V speeds. Their only pre-departure briefing regarding emergency return was to maintain runway heading after takeoff in the event of an engine failure. The landed with flaps full and had no discussion about it. He did not go "heads down" on the ECAM and did not follow up on ECAM actions. He did not recall hearing the gear horn. He did not recall if they had a clearance to descend from 2000' to 600'. He was aware of the brake pressure of 1000 psi on the accumulators. The captain maintained reverse until below 80 knots. They did not discuss his role of calling brake pressure during landing. He said reverse came out because he heard it, but they did not discuss the status of the nose wheel steering. They put the gear down just crossing the shoreline. The captain did not say "leaving 2000' or say what altitude they were going to. He called ground contact. There were no speed warnings in the cockpit.

The crew was on a four day trip. The previous day had been a "red eye" to Mexico City (MEX). They had no issues during their stay at New Orleans (MSY). On the incident flight, they started both engines at the gate. Flight analysis showed they were legal to takeoff flaps 3 and TOGA power. The FO never engaged the autopilot but AT was engaged from takeoff on. They did not review the status page for system failures. The FO did not know of a technical way to figure Vref, so they used "seat of the pants" logic with the RAT speed of 140 in mind. He heard the captain mention 147 knots plus wind additive to fly the approach, which was at 150 to 160. He didn't ask about the number. He did not address being high or low or a 1000' call, but just felt they needed to get below the bases of the clouds. They did not conduct an approach briefing. They used the PAPI on the approach.

He did not recall ever doing an avionics smoke procedure in training, but he did recall doing an emergency electrical configuration procedure in training. He did not think that "screen blanking" guidance or procedure applied in the incident situation.

The 140 knot stall speed of the RAT was a factor in his thinking. He did not set any speed bugs. They descended out of 2000' in order to get into visual conditions. He never thought they were flying a PAR.

Prior to flying the A320 he had flown the B757/767 for 6 years, and before that the B737-300/500 and he had flown B727 flight engineer before that. He had flown captain on the Jetstream B3200 approximately 1 ½ years and captain on the Saab 340 at for about 6 to 8 months at American Eagle. His original flight training was at American Flyers.

The status of nose wheel steering and antiskid during the incident did not cross his mind. He believed that in the emergency electrical configuration it was not possible to obtain ECAM information. Normally approach briefings are done at or before 18,000'. An approach briefing was not done because of the time constraints and the severity of the incident.

The report time on the day of the incident was 6 am. He arose about 5:45 and had gone to bed between 1030 and 1100 pm. He slept about 5 ½ hours, while his normal sleep is 6 or 7 hours, but he felt well rested. He did not try to eat, but had coffee. He intended to eat a crew meal during the flight.

The previous day he had arisen around 8:30 am for a 10 am departure from MEX. They flew from MEX to Dulles (IAD), cleared customs, and then flew to MSY, arriving around 6 pm. It was a long duty day. He had no dinner in New Orleans, but had eaten a first class leftover meal during flight. At the hotel in New Orleans he ate some dry cereal and drank some water, but was no hungry.

The previous overnight stop was 29 hours in MEX. After arriving in MEX he had slept 5 - 6 hours following a 6 am arrival. Conditions there were not very healthy, with lots of smog, heat and smell. He had never had a migraine, but he had a bad headache while there. He took two aleves and later went out about two hours to a museum and to eat Mexican food. He went to bed around 10 pm.

The previous duty period had been one leg from LAX to MEX, a red eye which left LA at 1159 pm Friday night.

He took no medications.

He said he was embarrassed about not being able to find the evacuation switch. Later the firemen had asked him to turn off the battery switches, which were difficult to find. He was the one who had declared the emergency in flight. They had not discussed this. The captain was not telling him to perform tasks. He had flown with the captain at least two other times, but not recently. He enjoyed flying with the captain, who had good communication and flying skills.

Interview:	**Donley Kent Moffer**
Date/Time:	**Apr. 6, 2011; 1415 PDT**
Location:	**UAL LAX domicile airport conference room**
Present:	**Roger Cox – NTSB; Mike Barnett – FAA; Marc Ghafouri - ALPA; Bradley Peterson – UAL**
Represented by:	**John Hanson - ALPA**

During the interview Captain Moffer stated the following:

His current position was A320 captain at LAX, and he was 49 years old. His certificates and rating were ATP with type ratings on Citation, HS125, H-1000, B-737, B-757/767, B-777, B-747-400 and A320. He had 16,000 total hours, of which 9000 were PIC and 2000 were in the A320. He first qualified on the A320 in 1996 as FO. He qualified as captain on the A320 in 2007.

His most recent PC was 2 months previously. He did not recall performing the avionics smoke procedure during that training, but he did recall doing the emergency electrical configuration. He did recall using the oxygen mask during training for smoke emergencies.

His date of hire at UAL was 7/17/1995. He had flown at EJA for 6 months, American Eagle for 1 ½ years, and Conoco for 4 years. He had had no accidents, incidents or violations and no letters of investigation of warning. He had had no issues in training.

The incident flight was scheduled to depart at 7 am, and the crew reported 1:10 prior to departure. The paperwork had been put on board, and the captain did the walk-around. The flight plan showed they would be 15 minutes late to SFO. He added fuel to allow higher cruise speed. The analysis showed they would do a flaps 3, TOGA takeoff. V2 was 147 knots, which is a number he "grabbed" later in the flight. After takeoff the initial heading was 250, with climb clearance to FL 180 or 190. At 4000' he noticed a yellow autothrust message on lower ECAM. The FO tried to re-engage the autothrust. At that time they got a red "land ASAP" ECAM message and the electrical page appeared along with an avionics smoke ECAM procedure. He told the FO to fly and handle the radios while he ran ECAM.

The first item on the ECAM was oxygen as required. Both pilots agreed there was no smell, so they did not don masks. He believed there was smoke in the extract duct. He could see the ECAM was setting them up for emergency electrical configuration, with generator 2 and 1 going off. He said, Ron you have no instruments," and he took control of the airplane. They were at 5000' in IMC. Ron declared the emergency. He thought they would need runway 10 if it was a "healthy" runway, and that they would be in direct law and "not a lot of brakes." There were men and equipment on the runway and he could hear this discussion about them on the radio. He heard "you haven't moved one inch." He realized he would not be able to fly the localizer; he had attitude and compass. He asked for a PAR and was told runway 19 is available now. He said the door was open and the purser was briefed.

He set 160 knots in the window. He landed on runway 19 centerline, got on the brakes and used right rudder to keep it on center. The winds were 170/15-25, off to the left which

caused the airplane to weathervane left. He stepped harder on the right brake. They were going about 10 knots when they left the runway. He was concerned about the high fuel load and wanted to evacuate. They got out the QRC to do the evacuation. The FO had difficulty finding the Evac switch. 1R did not inflate and the aft slides were not usable due to the attitude. He said he went back in the cabin to look for handicapped persons or babies, and grabbed a megaphone. He asked if anyone was injured. One elderly lady was faint, but said she was fine. The crew went into Operations at MSY and debriefed the UAL duty manager. They then were interviewed by FBI agents.

He told the FO to fly initially, and then said "I've got the jet." He said the ECAMs were done. He didn't don oxygen masks because he didn't smell smoke or odor. He said this is one of the worst ECAMs you can get besides double engine failure. He didn't want to wind up like Swissair or Valujet. His initial thought was that the red "land ASAP" was important, and it was a fly by wire airplane. Swissair had been discussed in training. They took too long to troubleshoot their problem. He knew he would lose the electrical system with both generators off. He knew what would happen when the RAT extended. He said he did not hear very well and had new bifocals. They had trouble finding generator 2. The first indication of a problem was the AT, the red land ASAP, and the electric page coming up. Turning off the generators did affect approach planning. There was a scud layer, but they expected a visual approach. They broke out of the overcast between 900 and 1000 feet, He used his own authority to go lower; he knew he was over water and okay. He did not know any way to get the ECAM back. He did not recall seeing a timer. He turned off gen 2 before gen 1. All the download of power came from moving switches.

He had attitude and compass but no localizer. He asked for a PAR, but had not flown one except in the 737 simulator 5 years before. He did not know if MSY had PAR available. He did not know the minimums for the no gyro surveillance approach. He expected to break out at 1000' and knew on the 3 degree glide slope and from his distance to the airport that he would be able to land, so he did not expect to have to go around. He knew there was no terrain or obstacle issue in the vicinity. He did not see any list of items lost due to the electrical emergency. The ECAM was lost and he did not have time to pull out the book. As long as ECAM was present, he knew the condition was still present. He did not do an overweight checklist. He knew he would be in direct law with no antiskid or nose wheel steering. He had a "man pitch trim" message. He did not recall telling this copilot this.

He was confident the airplane would stop. It pulled to the side because the wind was 30 degrees to the left. The rudder lost effect as they slowed. Normal landing distance is 3500 to 4000'. He used full reverse. The landing weight was 152,000 lbs with dry runway and full flaps. Approach speed was based on V2 rounded up 15-20 knots to 160. This did not affect landing distance. They had no green dot so they used the takeoff safety speed. He used full flaps rather than flaps 3 because of the short runway. They stopped 2000' from the end. VASI was on the left side. They landed in the touchdown zone, 1000 to 1500' down the runway.

The airplane is touchy in direct law, but pitch was firmer than he expected. He used full aft stick to hold the nose off during roll out, but it dropped harder than he expected. There were bells when the RAT deployed. Screens were lost when they stopped. He knew they would

evacuate because they were going off the runway. The cockpit door was open. Two or three people went out the back, but the over wing exits were not used.

He never smelled smoke. In training to use ECAM the captain designates who flies and talks. The pilot not flying runs the blue ECAMs. He was reading them off but not very loud. He never got to the point where he could say "ecam complete, screen normal." He had his HSI, attitude and airspeed but not the map. He did not ask the FO to read brake pressure on rollout. He used 147 plus wind additives to determine approach speed. He used one steady brake application. He thought 3 applications were available. He did not do an approach/descent checklist. He tried to keep the nose up on landing but "it quit before I wanted it to."

The "land ASAP" message was on upper ECAM. He had no prior experience with avionics smoke. The avionics ecam message was white. He did not recall the position of the galley or emergency exit switches. He asked the FO, "Ron is that right," when he moved the gen 2 switch. The screens started to fade during the approach. He did not see any conditional statements in the ECAM. He did not see countdown time. His last switch action was gen line 1. He did not see anything on upper ECAM. He did not believe that the problem was screen blanking. They did discuss using the masks. He said they would put them on if they smelled anything. He did not turn to the heading given as a vector to runway 10. He believed that he would have no navigation instruments. He thought the "land ASAP" message came about after the Swissair accident. He did not select #1 or #2 on the radio panel. He knew it would stop in 3500 to 4000'. Deceleration was okay and he used reverse. He felt the tires fail. He did not do an emergency return briefing. In the descent at 2000' he expected to see the shoreline. He thought he was cleared lower. He did not evaluate landing distance. He did not recall the gear horn going off. He put the gear down when he saw the airport. He thought if he maintained 140 to the ground the RAT would be good.

The crew was on a four day trip. The trip briefing is on a card in the front of the book. There was no "T" procedure in New Orleans. The eight minute taxi time allowed adequate engine warm-up. When asked about use of oxygen masks, he said "you only use oxygen when you need it." He thought the FO was keeping up with the ECAM actions. He did not think to turn on the intercom to communicate with the FO. They did not switch to tower frequency on landing; landing clearance was given by the approach controller. He could not hear the controller instructions while he was doing the ECAMs. He started down the glide slope 2 ½ miles out, and had gear down, flaps 3, then went to flaps full. He did not run the approach descent check because time was tight. They already had the altimeter setting, and he thought that checklist was not important. He did verbalize his concerns to the FO about the need to get on the ground immediately.

The FO moved the flap handle and gear handle on command. He did not do an approach briefing although it is standard company policy. He was aware of the use of the AC Essential switch in the event of screen blanking. He had flown with the FO before and liked flying with him. His CRM, skills and knowledge were good.

He woke up at 4:30 am the day of the incident, and the report time was 6 am. He had gone to bed at 9 pm and slept well. He got about 7 ½ hours of sleep, whereas his normal sleep

time is only about 5 hours. He did not eat breakfast, but had coffee. He expected to eat a crew meal in flight. The previous evening he ate a buffalo sandwich he purchased from a subway store in a gas station. They had arrived in the late afternoon. The previous day he awoke in Mexico City about 7 am and had a 10 am departure. He had arrived in Mexico City at 4:57 am coming from LA and slept 3 hours after arriving. He took no regular medication, but did take an aspirin in Mexico City. He cited air pollution as the reason.

He had picked up the FOM as he was leaving the cockpit in order to find the phone number for UAL Operations in Chicago. He said both FMGC's quit after he moved the gen line 1 switch.

Interview:	**Christopher Neugebauer**
Date/Time:	**May 19, 2011; 10:20 AM**
Location:	**UAL Training Center conference room**
Present:	**Roger Cox and Katherine Wilson, NTSB; Mike Barnett, FAA; Brad Peterson, United; Marc Ghafouri, ALPA; Nathalie de Ziegler, BEA; Dan Bower, NTSB, observing**

During the interview, First Officer (F/O) Neugebauer stated the following:

He was the acting training manager for the Airbus fleet at UAL and had been in this position for about 7 months. Prior to that, he had been an instructor on the Airbus. Sean McBride was the previous training manager and had been in that position beginning in 2007 or 2008. F/O Neugebauer was an instructor for about 10 years and was hired by United in September 1997.

His duties and responsibilities were to monitor the day to day training including qualification and continuing qualification. He said pilots came back every 9 months for training. He managed about 35 pilot instructors who gave the training. He worked with the Quality Control (QC) Manager, Carol Cameron, and together they were in charge of the curriculum to make sure that it supported the instructors and trainees. The QC manager was responsible for standardization and qualification of instructors and ensured the training program was in line with the training document approved by the FAA. F/O Neugebauer focused more on what information was taught. There was also a training development group that designed the curriculum so that it matched the FAA approved manual.

Describing the initial qualification course for the A320, he said the training course was about 24-25 days in length. It consisted of 4-5 days of classroom training taught by a ground school instructor (GSI). GSIs were not pilots but they had aviation experience. GSIs would present airplane systems using PowerPoint and there would be a test at the end of each day. At the end of the systems phase, there was an ESKV (electronic systems knowledge validation). After systems training, trainees moved to the fixed base simulator training phase. There were 8 fixed based simulator sessions and then on lesson 9 or 10, there was a procedures validation. The first few sessions were taught by GSIs and the last 6-8 fixed base simulator sessions were taught by a pilot instructor. The next phase was the maneuvers phase in the full flight simulator which consisted of 4 events. This phase consisted of standard high impact maneuvers such as V1 cuts with maneuvers proficiency validation (MPV) at the end. Trainees next did the LOFT (line oriented flight training) phase in the full flight simulator which consisted of 4 events. These events were typical airline flights from start to finish with emergencies inserted by the pilot instructor. The fifth event was a line oriented evaluation (LOE) which was done by a standards captain who was also an APD (aircrew program designee).

Recurrent training was done on an 18 month cycle. After 9 months, pilots come back for a proficiency check (PC). This training was a 3 day event with 3 simulator sessions. The first day was evacuation and ditching training, a 2 hour flight operations briefing, and a simulator session doing maneuvers practice and training. On day 2, they did a 2 hour systems review, a 4 hour simulator session in the full flight simulator, and a maneuvers and training validation (MTV) at the end of the day. Then pilots do special purpose training on a cycle which was defined in the

flight operations training document (FOTD). On day 3, pilots started with a 2 hour operational knowledge validation (OKV), which was an oral, and then a 4 hour LOE simulator session with a standards captain; it was a full check ride.

Nine months later, pilots would come back for proficiency training (PT) which was 2 days. The first day covered ditching, evacuation, emergency procedures, and security training. It was all ground school completed by an instructor. Day 2 was a simulator session with no checking, just training to proficiency. He said it mirrored MTV with high impact emergencies such as V1 cuts and single engine maneuvers.

They were on a 36 month training cycle, but every 18 months they would redo the scenarios. He said the scenarios were in a matrix approved by FAA and were driven by FOQA and FSAP data, as well as data from the last 18 months of training and validations. He thought they had a robust data collection system. They had quarterly data meetings and did trend analyses. LCAs (line check airmen) also had quite a bit of input. He said after a line check was completed, the LCA completed a grade sheet. The line training managers would sit in on quarterly meetings and gave input from the line.

Special purpose training in the last cycle consisted of scenarios such as AC bus 1 and AC bus 2 failure, enhanced GPWS, alpha floor recovery training, upset/unusual attitude training, windshear, cat II and III approaches, and short field landings. MTV stayed pretty much the same with a few minor adjustments. It covered scenarios such as aborted takeoffs, non-precision approaches, missed approaches, single engine V1 and V2 cuts, single engine approaches, single engine missed approaches, single engine landings, visual approaches to landing, and evacuation. He said they were all validated maneuvers which were graded without input from the instructor.

During day 3 LOE, they did a full flight where a crew would complete all checklists and all flows as in a normal revenue flight. The most recent scenario was a flight from IAD to LGA, and it was a cold weather scenario. Crews would get a TCAS on climb out, would get a reroute and have to do FMGC work, and would get a spoiler elevator (SEC) fault requiring them to run the associated checklists and ECAM. They would have an inoperative spoiler, no autobrakes, and an inoperative thrust reverser and would land on a short slippery runway. He confirmed that it was a dual SEC failure. The alternate scenario was a yellow hydraulic quantity loss. The incident captain received a yellow hydraulic quantity loss during his last check. This was given by an APD standards captain.

LOE crews were given a satisfactory or unsatisfactory grade. He said a maneuver could be graded below standards and had to be redone to standards. If an LOE event set was unsatisfactory, they would redo it at that time. He said unless an instructor told him, he would not know that a pilot had to redo a maneuver. Maneuver grading data was de-identified.

United had a remedial training program, which was called Optimum Proficiency Training (OPT). Pilots requiring more than 50% additional training during each phase of LOE to complete the course would be placed on a reduced frequency training schedule. A pilot in OPT would have to come back for training every 6 months instead of 9 months. If the next two cycles were fine, the pilot would go back to a 9 month cycle. Neither of the incident pilots had been in OPT.

The first attempt of every maneuver was graded on a 0-4 scale with a 2, 3, or 4 rating as passing. Subsequent maneuvers were graded as satisfactory or unsatisfactory. The first attempt was always graded, and that is what went into the data. The most difficult maneuvers for pilots were single engine missed approaches and non-precision approaches. Pilots were more likely to get a 2 or 3 rating on these maneuvers. Pilots also had issues with the ECAM but he could not remember if that was a validated maneuver. He thought it was a validated maneuver in LOFT and MTV.

The Avionics Smoke ECAM procedure was never trained during qualification training but there was a lot of training on ECAM SOPs (standard operating procedures). He thought the closest to avionic smoke that they trained for was the Emergency Electrical configuration, which was trained and flown in the full flight simulator. He said the cabin/cockpit smoke event was also trained in the full flight simulator and avionics smoke could be addressed in that event. He said there was a detailed checklist and one of the options was avionic smoke. Sometimes an instructor would take a pilot on that route and sometimes not. Because there were over 100 ECAM procedures, it was not possible to train for them all. They had tried to train for the worst case scenarios, and in the process train on proper use of ECAM standard operating procedures.

The emergency electrical configuration was covered thoroughly in ground school, and electrical irregular events were presented in the fixed base simulator and in the full flight simulator. Emergency electrical configuration was a SPOT (Special Purpose Operations Training) maneuver during initial qualification a couple years ago, but was not currently done.

He would observe training every once in a while and would also see the QC reports completed on instructors. He said every year a pilot instructor would get a QC by another instructor. He last observed a flight operations brief about 2 weeks prior and observed a simulator session last December. He flew the line 2-3 days per month. Instructors were required to complete a validation grade sheet with the 0-4 scale, and any grades of 0, 1, or 2 required additional information from the instructor. Training documents were destroyed within a certain amount of time after training but some information was de-identified and kept. He would determine that training was working through the QC program. Also, trainees were asked to evaluate training online at the end of each training phase. He thought a good amount of trainees completed the evaluations.

CRM (crew resource management) training was integrated throughout all of training. Line pilots received CRM training in qualification and continuing qualification. On all validations and evaluations, CRM was graded on every validation and evaluation, and they were given a lecture on CRM where they would discuss CRM related incidents.

Fatigue was covered in every PC or PT book, and these books were distributed to pilots 1-2 months prior to their training.

Since the MSY incident, there had been some discussions about changing training to include a similar scenario.

Regarding the effectiveness of AQP, he felt they got an overall "better product" out of AQP (advance qualification program) and thought pilots were more ready to work as a crew. He said CRM was integrated in AQP. He thought the downfall of AQP was that it did not spend as much time on systems training. Pilots used to have to do an oral and would have to study the systems more. He thought training was pretty scripted and the most leeway instructors had was in some of the techniques to handle a maneuver. Grades of 0 or 1 for training maneuvers were pretty infrequent. He said they had trained good pilots and thought only 1 of 7 or 8 MPVs would have to repeat a maneuver. Prior to the incident, he had not heard of the incident crew.

He estimated there were 33 active instructors and 37 instructors on the books. They used to have about 95 instructors. He thought the workload was manageable but the amount of reserve or on call days had been limited. Instructors had to fly 24 days a year and they always got that. The footprint was "pretty balanced". He would like to see another day or 2 of training but it was not required for safety. They were only training 1-2 qualification crews per month. He could not recall any negative comments received from LCA. He recalled older complaints about crews being slow time-wise to complete flows and ground operations on the line. Overall he received positive comments on training. The only comments he could think of were that training could be a day or two longer. He thought 99% of the time they could get a pilot up to speed if he was not prepared for training. Pilot instructors just had to deal with the occasional pilot who was not well prepared.

Regarding the mental involvement of the pilot flying, he should try to follow what was going on with the ECAM but his primary duty was flying the airplane and talking to ATC (air traffic control). They taught division of duties during ECAM events. A PF could be heavily involved in maintaining control in scenarios such as an "injured" auto flight system, and have his hands full. They did expect pilots running the ECAM to verbalize what he was doing; they teach "read and do" aloud. Certain switches, such as red guarded switches, had to be confirmed by both pilots before they were actuated.

There were three types of instructors. Ground School Instructors (GSI's) were not pilots but had aviation experience mostly from the military, such as flight engineers. They did systems training and review. Pilot instructors were line pilots and they picked up training from the third or fourth fixed base simulator session. They flew at least 2 days a month and were all first officers but some held a captain bid although they did not typically go out and fly that. QC instructors were the top pilot instructors who did normal instructing but also would perform a QC on pilot instructors. Standards captains were line captains and they performed day 3 LOE and LOE on the line phase.

Regarding training records, when doing retraining due to an "unsat," the training was validated and documented, but the data was de-identified and removed after a certain number of months. They used the terms "qualification" and "transition" interchangeably. He could not recall any time that United had let a pilot go because he could not fly. They complied with PRIA requests using the summarized training data and drug/alcohol testing results.

He reiterated that there were line check airmen (LCA's) and standards captains, who could be either PC qualified or APD's able to do rating rides. Because of the reduced manpower

and low turnover, all standards captains were APD's. Pilot instructors (PI's) could do qualification training, validations, and recurrent validations. PI's progressed through these levels over a period of about 1.5 years. Their QC airmen were top instructors and acted as mentors.

He reiterated that they taught captains to divide duties, read aloud, to be methodical and check the status page during irregular events. There were strict procedures for system fault resets (circuit breakers). Airbus allowed them to have ECAM only procedures, although performance data had to be found separately.

An advantage of AQP was immediate remediation of substandard maneuvers. Validation was done in AQP in a phased way rather than the "one massive check ride" done under the old appendix H training.

Interview:	**Amy Maddox**
Date/Time:	**May 19, 2011; 1305 MDT**
Location:	**UAL Denver Training Center conference room**
Present:	**Roger Cox and Katherine Wilson, NTSB; Mike Barnett, FAA; Brad Peterson, United; Marc Ghafouri, ALPA; Nathalie de Ziegler, BEA; Dan Bower, NTSB, observing**

During the interview Captain Maddox stated the following:

Her current position was A320 standards captain. She had been in this position about 3.5 years. She had been a line check airman for 5.5 years. She had been at United about 18 years and had flown the A320 about 6.5 years.

During a check ride, she had a sheet of points to cover that she tried to follow. For example, she would work from the quick reference guide. She said pilots did not have to have that information memorized but they could reference it. She also covered overwater type issues, flight plan and payload increases, takeoff alternates, takeoff weather, SMGS, information from the flight operations manual, RVSM, immediate actions on the QRC, limits from the flight manual which were memory items they needed to know, the walk around video and what a pilot would do if they saw a particular situation (for example, oxygen disk or APU thermal disk), system fault resets, procedures as to whether they log it or not, and whether to call maintenance or not before they reset a circuit breaker. She said the last proficiency check had to do with cold weather and they had a checklist in the flight bag in the cockpit. It was specific to the Airbus. She would discuss ice pellets and snow pellets.

She performed a check ride on the incident captain on January 22, 2011. She said given the date of the event, the major system malfunction would have been a loss of the yellow hydraulic system quantity. She did not recall the captain and said she gave check rides to 20-24 people a month. She said that unless she knew the pilot before the check ride, she did not recall them. She said she gave check rides about 12-14 days a month every other month. She also performed line checks. She estimated that she had given 200 to 250 check rides in the A320, and two had been unsatisfactory. In one, the captain became too focused on the PFD after a jammed stabilizer failure and in the other the crew made a bad decision and went to an airport that was below landing minimums.

She had never asked a crew to do an avionics smoke event in the simulator because it had never been a part of their profile. She had never given anyone an emergency electrical condition. She had never personally experienced an avionics smoke or emergency electrical configuration event and did not think she had looked at the checklist for avionics smoke since initial training on the Airbus.

UAL trained crews to follow the ECAM. If she smelled smoke or fumes, she would put the oxygen mask on. If there was an ECAM for the event, she would do the ECAM or pull up the QRC. She would expect a crew to do the ECAM and if time was available, to pull the flight manual. She said the ECAM was usually the most accurate way to handle a situation.

In training she would say “you have smoke” to simulate the emergency. She said perceptible smoke was not evaluated during training. To Capt. Maddox, perceptible smoke was if she saw it or smelled it. If she received an Avionics Smoke ECAM but did not perceive any smoke, she would still follow the “Land ASAP” message. She would not continue to her destination. She said she never had an ECAM for smoke that was not accurate. She would think maybe she just did not smell anything. She could not think of any general guidance from UAL regarding smoke/fire and landing. She recalled specific guidance on degraded engines or when only one redundant system remained, which required landing ASAP.

Capt. Maddox said if a crew got an ECAM, the captain would designate who would run it. She said hopefully the pilot flying (PF) would be watching what the pilot not flying (PNF) was doing. In the simulator, if the PNF did not brief the PF of what he did with the ECAM, she would make them redo the ECAM. In the simulator scenarios, she said time always permitted the crew to discuss this. She did not teach techniques for using the ECAM. In real life, she said crews did not really get ECAMs and she thought handling ECAMs was a weak area in training.

She would not do anything different if she received a red “Land ASAP” message versus an amber “Land ASAP” message. There was no training regarding this.

A pilot would have to look at the engine indications to know if only one thrust reverser deployed on landing. The PNF should be monitoring that the thrust reversers were working and ground spoilers had come up. There were no callouts on landing besides airspeeds but she thought the PNF should make an announcement if a thrust reverser did not deploy. She had not experienced screen blanking but she said there were procedures for that situation. There was no scenario given in training when a crew should not do the ECAM. The closest situation she could think of was a cargo fire on the ground. Some aircraft had a conflict between FWC1 and FWC2 in that one FWC would prompt cargo doors to be closed and the other did not.

If she received an avionics smoke message on the ECAM but did not perceive any smoke, she would still work towards “Land ASAP”. She recalled training regarding direct law during initial training. She had witnessed pilots have problems with the ECAM such as skipping lines or steps, not seeing indents, print being small, timer line going away and a crew would forget to turn an item back on, performing steps out of order, and confusing terminology. In terms of CRM in the simulator, she would make sure that one pilot did not make all of the decisions, that the captain managed the situation, and that the crew used all resources to get information when time was permitting. She said the scenarios where she gave an unsatisfactory grade, the crew was not working together.

She said they had a PowerPoint in the briefing room which reviewed current hot operations topics, and she would discuss them with crews. Recent topics had been cargo smoke, the new managed descent profile, and FOQA/FSAP trends, such as altitude deviations. ECAM handling was not an emphasis item and she he did not talk with pilots about how they were going to do the ECAM itself. Every event needed to have a satisfactory conclusion, and that included completing ECAM. On average, crews were good at keeping the PF informed.

She thought there were 10-11 standards captains for the Airbus. All standards captains could review new scenarios and she had done so recently. It was time intensive. She did not add anything to the checking events. If a crew had an unsatisfactory event, she would redo the event but would not teach them how to do the event. She would just reevaluate them doing another event. She was an APD. She said "SPOT" training allowed training on different things. With regard to emergency electric configuration training, they emphasized the importance of re-establishing a generator before putting the gear down.

Capt. Maddox thought running ECAMs in the Airbus was hard. She did not like doing them; it was a struggle. She liked the electronic checklist in Boeing aircraft.

Interview:	**Kris Lee Belcher**
Date/Time:	**May 19, 2011; 1435 PM MDT**
Location:	**UAL Denver Training Center conference room**
Present:	**Roger Cox and Katherine Wilson, NTSB; Mike Barnett, FAA; Brad Peterson, United; Marc Ghafouri, ALPA; Nathalie de Ziegler, BEA; Dan Bower, NTSB, observing**
Represented by:	**John Hanson, ALPA Legal**

During the interview F/O Belcher stated the following:

He was an A320 pilot instructor and had been one for 3 years 8 months. He had flown the A320 since February 1999 and had been with United since June 1997

He looked at the incident crew's pictures but he did not recall the incident F/O. He remembered the captain but could not recall specifics more than who he was. He remembered that they must have done well enough to pass proficiency training (PT). He did a PT with the incident F/O and PC with the incident captain. He did not recall anything regarding training of the F/O.

Since he had been at United he did not recall avionics smoke being included in the formal curriculum. He said they had dozens of ECAMs but they did not look at all of them because there was not enough time. Rather, they trained crews on how to deal with ECAMs in general. There were different levels of ECAMs – level 1, 2, and 3. He would speak to how the flight warning computer will prioritize ECAMs. The avionics smoke message was a level 2 ECAM. He would go in to a CRM scenario and ask crews what they would do in different situations. He would also discuss the need to divide the cockpit, and he mentioned the everglades accident in which three pilots were all focused on changing a light bulb. This would be part of the two hour brief before the simulator. CRM was part of ECAM actions. There were two clear buttons, one for captain and one for copilot.

The biggest problem he saw regarding the ECAM was that pilots would go too fast. They made rapid selections, (clear, clear, done) and would forget to complete the procedure all the way to system status, which was considered completion of the ECAM procedure. If he saw that happen, he would tell them to recall the ECAM and start over. Red guarded switches must be verified by both pilots. He believed there should be a "status briefing" at the completion of the ECAM performed.

He thought he trained a pilot every day that he came in and estimated that he had trained about 500 pilots as an instructor. He never had a pilot come back for another day of training.

Most pilots told him that they had never had an ECAM on the line. He had never done the avionics smoke ECAM. They did not train how to evaluate what was 'perceptible' smoke. A "Land ASAP" or "Land at nearest suitable airport" message meant to not continue to the destination. To him, this message was different from "are we ready to land?" If the ECAM said "Land ASAP", he would always land but he would need to make sure they were ready to land. To him, perceptible smoke meant he saw particles or smelled smoke. He would have to have

some indication of smoke besides a light. It was also conditional; if there was no perceptible smoke, he was going to wait 5 minutes. Since the incident, crews had been asking about the avionics smoke ECAM during training.

If only one thrust reverser deployed on landing, a pilot would feel the yaw and the pilot not flying could look at the engine stack page. There were no official callouts but if a failure of the thrust reverser to deploy was not planned, he would call it out.

He never gave a scenario in the simulator where the crew should not complete the ECAM. If he confirmed that he received an avionics smoke message on the ECAM but did not perceive any smoke, he would wait 5 minutes and if he still had no smoke, he would call SAM (System Maintenance).

Crews flew in direct law in the simulator. There was no ECAM for direct law but crews could go to the flight manual. Pilots received a direct law scenario when they trained the emergency electrical configuration and also when they had a failure of the green and yellow hydraulic systems. Flight in direct law was taught in initial/transition training.

He had witnessed pilots have problems with the ECAM such as going too fast or doing a step and hitting clear even though they were not done with the ECAM. Most crews did not see an ECAM on the line. He taught the ECAM in the fixed base trainer during initial training. He thought pilots were “pretty marginal” performing ECAMs when they got to him in initial training. He said there was an ECAM procedure pamphlet that he used when training transition crews. He thought it was a very good pamphlet but did not think it was printed anymore.

Prior to the incident, he did not recall anything about avionics smoke. They had the cargo smoke ECAM out for several months and it was in the current curriculum. In transition training during LOFT, they would go through a smoke incident during a rapid decompression. There was a scenario with dense smoke in the cockpit.

Pilots could repeat an event but on the third time, they would need additional training. He personally did not have that happen. If a pilot was less than proficient, it had to be annotated. He had never sent a pilot to another day of training but he had participated in training on the extra day for other pilots. They had a curriculum of things they had to cover in training but United would also solicit input from instructors.

He guessed that the “Land ASAP” message received during an Avionics Smoke event was orange. He did not see a red or orange message as different but said it meant different levels of criticality. He was going to land as soon as the airplane could safely land. He would not reset anything in the cockpit unless it was part of a procedure. If he ran the procedure and went to the book but still had the ECAM message, he would call SAM. When following a “Land ASAP” message, he would have to think about performance and airport issues.

He was proud of the training at United and thought they did a “pretty good job”.

Interview:	**Kenneth Craig Redmond**
Date/Time:	**May 19, 2011; 1530 MDT**
Location:	**UAL Denver Training Center conference room**
Present:	**Roger Cox and Katherine Wilson, NTSB; Mike Barnett, FAA; Brad Peterson, United; Marc Ghafouri, ALPA; Nathalie de Ziegler, BEA; Dan Bower, NTSB, observing**

During the interview Captain Redmond stated the following:

His title was Standards Captain, A320, and he had been in that position since November 2007. He was qualified as A320 captain in June 2006, and had been a line check airman (LCA) since June 2007. He was hired by UAL in April 1992. Although he had conducted the last proficiency check of F/O Young, he had no recollection of him.

He estimated that he had conducted about 240 proficiency checks of UAL pilots on the A320 and had given about a half-dozen (6) unsatisfactory grades. The root cause of these failed check rides generally was lack of proficiency. He estimated that 5% of pilots he had checked needed to repeat at least one maneuver before achieving a satisfactory overall check ride. He had recently graded a requalification pilot unsatisfactory, and one of the reasons for doing so was that the pilot had "stumbled through the ECAM." You could expect pilots to "stub their toe" once in a while, but their rule was that if three maneuvers must be repeated the ride was unsatisfactory.

Use of ECAM was a concern with some crews. A common problem was a crew rushing through or going part way through the ECAM, doing the blue "to do's," and then going to the manual to find the procedure and not finishing the ECAM steps. Some crews struggled, but the majority of crews were proficient with ECAM. He had never conducted training in the simulator on the avionics smoke procedure.

He was normally scheduled to fly three days a month. The avionics smoke ECAM procedure showed a conditional statement "if perceptible smoke," so if no smoke was perceived he would not expect a pilot to follow any of the listed steps. Both the red and amber "land asap" ECAM messages meant to find a suitable airport to land and should be treated the same. The red color of the message was tied to the emergency condition. He had never had avionics smoke or emergency electrical configuration in flight, and the only time he had landed with one thrust reverser inoperative was when one reverser was deferred. He said part of the normal pilot not flying duties was to look at the thrust reverse indications. He would look for amber and then green. If one did not deploy he would call it out, but United did not have a specific call out.

The scripted elements of proficiency checks were partly based on recent "hot items." During F/O Young's last training visit, the training scenario was a flight from IAD to LGA. Since the UAL 497 incident, crews had been expressing curiosity about the event and were making inquiries about the avionics smoke procedure. In discussions with crews he emphasized the importance of completing the ECAM and getting the aircraft generators back on line.

His background included service in the Air Force, Air National Guard and TWA. He had been a check airman at TWA and had trained on multiple airplanes over 19 years, and he felt UAL's training was "top notch." The company had a good continuing qualification program and used inputs from FSAP to identify problems, including such items as altitude deviations. He felt that a certain number of crew problems were a result of "human nature." He was currently working on improving aircraft systems training.

He reiterated that on check rides two repeated maneuvers were allowed but that three repeats resulted in an unsatisfactory grade. He conducted "facilitated debriefings" after check rides in which he asked the pilot how he thought he had done and then he would fill in the blanks. He believed that AQP worked well.

In a scenario where the F/O lost both PFD and ND screens he would expect the captain to recognize what happened after a short period of mental processing, and to take control of the aircraft. He would grade the captain's performance satisfactory in this situation if he recognized it soon enough that the aircraft remained under control. Pilots were trained to speak up. Line checks were done on a 24 month cycle.

He flew 3 days a month as a captain, did line checks 3 days a month, and would also sit in the left or right seat and do operational experience. He thought United provided a culture for pilots to speak up. He said some speak up more often than others.

Capt. Redmond believed 90% or more of crews who followed a complex ECAM did a good job on proficiency checks and on the line. All pilots were professional and focused and did a great job. He said as far as looking forward, when they had a situation like the MSY incident, they would talk about it with crews. He was a QC and when he talked with his colleagues they were talking about it. He thought they needed to get the message out. He recognized that they cannot address every single irregular but pilots needed to have the skill sets and habit patterns to address them. He said as long as crews followed procedures, they would have a safe operation.

Interview:	**Walter Edward Garrard, Jr.**
Date/Time:	**June 9, 2011; 1100 EDT**
Location:	**via teleconference**
Present:	**Roger Cox, NTSB; Katherine Wilson, NTSB; Bradley Peterson; UAL**
Represented by:	**David Wiegand, FAA**

During the interview Mr. Garrard stated the following:

His title was Aviation Safety Inspector – Operations, and his position was Aircrew Program Manager (APM) for the A320 fleet on the UAL certificate in Denver. He had been in that position since February, 2006. The full scope of his duties was described in the FAA 8900.1. He provided technical administration on the certificate, including overseeing revisions to training, providing feedback to the Principal Operations Inspector (POI), and overseeing the designees on the fleet who did the majority of certifications for type ratings. He attended quarterly data review meetings and considered training and procedure modifications as needed. He also provided surveillance of ground school instructors and was responsible for pilot checks on the airbus fleet at UAL. He was qualified to conduct line inspections. His most recent checking event was 1 ½ weeks prior, when he had monitored an Aircrew Program Designee (APD) conducting a rating ride. He had conducted 3 checking events in the last month.

He had reviewed and discussed the avionics smoke procedure with UAL personnel and did not think that the procedure needed to be specifically covered. The different kinds of smoke procedures ended up in the same place; the steps to be done were parallel. He had heard some anecdotes about avionics smoke, but he not heard reliable reports of other crews having difficulty with the procedure.

Regarding the relative importance of red and amber "LAND ASAP" messages, he said this message was an "info note" on the right side of the ECAM, and the color provided a varying degree of importance. It was not a mandatory action, but meant "consider this." It was just part of the overall situation, and must be put in context. The fleet had experienced some anomalous indications where sensors had given "LAND ASAP" without other indications, and this was mentioned in the flight manual. He said "don't panic" when you see it.

When a pilot in command (PIC) exercised his authority to deviate from a regulation in an emergency, it was a judgment call based on the situation, not a blanket authorization to do anything. The pilot must be able to justify his actions later. If a procedure called for the oxygen mask to be donned and this was not accomplished, it was "not good." There was no guidance to ignore this step. However, the avionics smoke procedure started with "if perceptible smoke," so if there was no smoke, it was okay not to don the oxygen mask. In fact, if there was no perceptible smoke, there was no reason to do any of the steps in the procedure. When asked if the crew would always be able to detect smoke from the avionics area, he was not able to say.

Regarding the overweight landing procedure, the crew was supposed to refer to the checklist in the flight manual before landing overweight, time and conditions permitting.

Regarding FAA INFO 11002 on monitoring smoke, fire and fumes incidents, released to FAA inspectors by AFS-200 in January of 2011, he had not read the bulletin and was not aware if UAL was following the guidance. Regarding CASS meetings, he said 99% of the information in those meetings pertained to maintenance.

Regarding the fact that UAL did not use a Quick Reference Handbook (QRH) in the airbus fleet, he said he knew that Airbus, the manufacturer, did provide a QRH but he was not aware of whether other airbus operators provided their crews with a QRH or not. UAL and airbus procedures were very similar, although there was carrier-specific information in the UAL flight manual. He came to the UAL Certificate Management Office (CMO) after the "ECAM only" procedures were instituted and approved. He had not heard anything from Airbus on the subject.

Regarding the strengths and weaknesses of the Advanced Qualification Program (AQP) training at UAL, he said that AQP had been in effect there for a long time and had been effective for many years. He had helped to review AQP. The company continually analyzed grading on maneuvers, tracked the data and modified or updated training to keep it viable. FSAT's and safety programs provided inputs. He said no program was perfect. Examples of modified procedures were stabilized approach criteria and instrument approach techniques. FOQA and ASAP data were used. Some training had been simplified as a result. There had been no request to change the length or frequency of training events.

Regarding pilot knowledge of aircraft systems, he said compared to the old Appendix H methods, the sequence of training and milestones were different. There was not as much of an oral exam as under appendix H, but systems knowledge was tested in shortened form on line oriented evaluations (LOE) and on proficiency checks (PC's). Systems were reviewed and a 75-100 question test was given during Continuous Qualification Testing. When asked his opinion of pilot systems knowledge, he said "I am satisfied." He felt that pilots must do their part, but in some cases it was necessary to "spoon feed" them the information.

Training success rates were provided to the POI quarterly. The overall success rate had been in the mid -90's. He was not aware of any remedial training program. UAL trained pilots to proficiency, and he did not know if there was a program which spelled out when a pilot would be identified for extra training. He did not track pilots who were receiving remedial training. He was not familiar with the term "optimum proficiency training." He said a pilot could identify himself for further training or there could be inputs from different groups including himself. If a pilot had trouble and instructor would evaluate him and a flight training captain could specify additional training. The source of this guidance was the FOTD. He said the company tracked such items but that he did not track it at all.

He had run an avionics smoke procedure in training himself and had no difficulties. He had seen pilots in training whose execution of ECAM procedures was not perfect, but it was usually caused by missing a step and was self-corrected. It was a "human factors" problem. ECAM was a priority system, and sometimes a higher priority occurred when a pilot was in the middle of an ECAM procedure. That was the way the system was built.

Her did not know the New Orleans incident crew and had not heard of any planned changes to procedures as a result of the incident. He had discussed the event and felt that training in the use of ECAM, avionics smoke and general smoke procedures was adequate. He had not planned any changes to surveillance.