Addendum 1

To Operations/Human Performance Group Factual Report

Attachment 1

DCA11IA040

Second Crew Interview

Interview:	**Ronald Lee Young, incident first officer**
Date/Time:	**October 13, 2011; 1200 EDT**
Location:	**via teleconference**
Present:	**Roger Cox – NTSB; Katherine Wilson – 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:

He resided in San Diego and drove to Los Angeles to report for duty. He wore reading glasses and he used them during the incident flight and was able to see clearly.

When he reported to the aircraft in New Orleans on the day of the incident flight he did not observe any amber cautions on the ECAM or abnormal indications on the overhead panel. There were no master caution alerts or amber status messages. He and the captain arrived at the airport about one hour prior to departure and he set up the cockpit using the "first flight of day" procedures. He did not feel rushed. He did not recall for certain who conducted the exterior preflight inspection. He did not recall having any CFDS messages displayed in the cockpit.

When he was informed that the flight data recorder showed that an avionics smoke warning was recorded from power-up until the end of the recording, he stated that there was no avionics smoke caution displayed in the cockpit. He thought the airplane was powered externally when he arrived, but he was not certain. He did not recall starting the APU and thought that the captain started it. Normally, if he arrived at an unpowered aircraft, he would check the batteries and select external power on. He could not remember if he had pressed the recall button during preflight. During taxi-out he did not press the status button because STS was not displayed and there was no reason to do so.

He was not aware of the position of the recorder ground control switch (RCDR) during preflight, but it should have been on. He did not touch the switch. He did not recall any information in the maintenance log history included in the flight paperwork. He did not do any system fault resets at any time. He knew there was an emergency cancel button on the ECAM panel but he had never pressed it. He and the captain spoke with a customer service representative (CSR) who verified their names. He saw a fueler but did not see any other ground service personnel in or around the aircraft.

He was not sure if he had ever loaded a secondary flight plan in the FMGC. He knew that some pilots did do that. He had abbreviated his departure briefing due to having flown with the captain many times. He did not recall briefing a possible emergency return to the airport at New Orleans. The company taught pilots that they should brief what to do in the event of a V1 cut, and that was what he briefed. He did not brief specific actions pertaining to what airport to go to or how it should be flown because he believed he should defer to the captain's decision in that event. He did not recall having a discussion with the captain regarding a detailed return to the airport. He explained that a "T" procedure was a special engine failure after takeoff procedure and that New Orleans did not have such a procedure for runway 19. He was not aware that runway 10 was closed at the time of their departure. He did not recall commenting on noisy conditions in the cockpit prior to engine start. He could not recall for sure whether the takeoff

had been a flex or TOGA takeoff. In the event of a TOGA takeoff, the captain should respond "TOGA" when prompted during the before takeoff checklist.

He recalled that during climb out he had retarded the thrust levers out of the climb detent, but he did not recall if there were any ECAM messages or what the ECAM indications were that resulted. He said that the FMA gave a "climb power" or "open climb" indication. He was not familiar with the master caution and chime that results from retarding the thrust lever out of the climb detent. He said if there was an "in between" setting, meaning not at TOGA and not at climb, there was a "man thrust" indication. He did not recall seeing or hearing a master caution or chime associated with retarding the thrust lever. He stated that a climb indication normally begins to flash as the airplane passes 3000 feet. He recalled that they got the avionics smoke indication between 3000 feet and 4000 feet. The captain had said "you've lost your autothrust." The FO agreed with the captain's assessment and reached up to the MCP and tried to re-select autothrust. He had not realized he had lost autothrust until the captain pointed it out.

He did not recall how the RAT was deployed. The captain did comment in flight that the RAT had deployed and the captain was not aware of why it deployed. He stated that the captain did not deploy the RAT. After he lost his instruments he was not sure what was showing on the upper ECAM. He remembered that the upper ECAM screen was present, but was not sure what was on it. He could not recall if the captain's MCDU was blank or was working. After the captain took control of the airplane he did not give the FO any specific direction to complete the ECAM. He believed that the ECAM procedures had been completed. He recalled the captain saying to himself "gen 2 off" and he looked up and observed the captain turn the gen 2 switch off. The captain said "I'm finished" and "I'll take the aircraft." They had a positive transfer of control; he assumed procedures had been completed and screens were back to normal at that point. The FO did not press any other buttons on the ECAM for the remainder of flight. He said if he needed to obtain further information on the condition of the aircraft he would hit the recall button but he did not do so.

Regarding his responsibilities as the PF during the ECAM procedure, he said that at the time the company procedure was that he would be aware of what the PM was doing "time permitting." He did not think that he had time to be aware of the captain's action while he was flying. He "took for granted" that the captain had completed the ECAM procedure. He said company procedure now required the PF to be involved in what the PM was doing. It was now required that they "go back through the steps and make sure everything was cleared." They were now required to divide their time between flying the aircraft and monitoring the checklist. During the event, he stated that he did not recall seeing any ECAM action items on the upper ECAM. He did not see anything on upper ECAM that was part of the avionics smoke procedure.

He was aware that the avionics smoke procedure does have generator 2 placed back on line prior to landing, but he did not recall ever getting to that step in the ECAM procedure. He said company procedure stated that any time an ECAM requires you to depower a system you are prohibited from putting power back on that system. To him, that would include putting gen 2 back on line. Gen 2 does power avionics systems, so to him it would make sense that you would not put it back on line. He referred to emergency procedures page 15.10.3 (smoke cabin cockpit procedures) which made the statement about not repowering a system. When asked if it is now

his understanding that if you have an avionics smoke caution whether it was appropriate to put a main generator back on line, he said the guidance was contradictory. Even though there was an avionics smoke procedure in the book which said they should re-power the airplane, other guidance said they should not re-power the airplane. The beginning of the avionics smoke procedure said the condition was "smoke is detected in the ventilation extract duct." He stated 'who are we to question a multi-million dollar airplane and a sophisticated smoke detection system?"

When he went through three days of retraining with the company following the event he asked a fleet captain when he would have known the caution was a false indication. The fleet captain said that it was when they did not smell smoke. He felt that the idea of relying on a pilot's sense of smell over the detection system was "preposterous." He mentioned the effect of delayed response to smoke and fire in the Swissair case. He could not recall the Swissair case or other guidance about the urgency of a smoke/fire response being discussed in UAL ground school, but he may have heard it at a regional airline where he worked previously. He said he had learned that UAL had had 17 to 19 prior false avionics warning events and that neither he nor the captain ever knew about that. He said "had the company ever provided crews this information this incident might never have happened." He was contacted by a person "higher up" in management at Delta who said that Delta had also had problems with false avionics smoke warnings.

Asked why the crew put the landing gear down while out over the lake, he stated that they were already in visual conditions and that he could see the shoreline and knew where the airport was. He had flown into that airport visually many times and had contact with visual landmarks. He saw the airport first. He stated when asked that during landing the engine warning display (EWD) was available. He did not recall seeing the thrust reverse indication on the screen during landing, but when asked if there was an indication, he said "I'm sure there was." He did have a brake pressure gauge but he did not observe what the pressures on the gauge were during landing. He said he was looking out the window. His duties to monitor engine and brake pressure indications were covered in ground school during retraining.

He said he heard the evacuation alarm after it was actuated. He silenced the cockpit alarm using the plain cockpit silence button, not the guarded evacuation button. This action silenced the alarm in the cockpit, and he was not sure if the alarm silenced in the cabin. The overhead panel was black and the captain pointed out the silence button. He said he thought he heard the alarm but was not 100% sure. He attempted to use the PA using the interphone, not the handset, to command the evacuation, but he did not hear feedback or side tone and did not believe that the PA was working. During the running of the evacuation checklist, he said that calling ATC was a mandatory action, but he did not make the call because he knew they had already declared an emergency and they were off the runway. ATC already had men and equipment standing by for them. He thought they were "fully briefed". However, he knew that the call to ATC was a mandatory call.

Regarding his initial qualification training on the Airbus, he did not recall being given an introduction to the airplane which explained the overall philosophy of design by the manufacturer. He did not recall any reference to "10 golden rules for flying the Airbus" or a

discussion of how the pilot, procedures and airplane were meant to interact according to the manufacturer. He said this was his first Airbus aircraft, but from his standpoint the working procedures were the same as other aircraft.

If there had been an avionics smoke ECAM when they arrived at the aircraft, he would have tried to clear it, called maintenance, and re-checked the paperwork for any prior occurrences. The captain would have called SAM[1] in San Francisco. Regarding the difference between a red and an amber LAND ASAP message, he stated that he now knows that the original message was amber but he still believed that ASAP meant ASAP and if you have smoke you should land. He thought there was a contradiction between what the ECAM said, "LAND ASAP," and what the avionics smoke procedure in the book said. The company flight manual cited several "false ECAM's" but avionics smoke was not one of them. He agreed that red was a little more urgent, but "smoke" and "ASAP" meant to him "get it on the ground."

There would never be a time when he would take off with amber lights on the overhead panel, unless it was a properly deferred item. It was pretty obvious when a light was illuminated. He was not aware of a requirement to hold the recall button three seconds under some circumstances in order for the ECAM to respond. If he pressed recall and nothing showed up in the right column there was no problem outstanding. He had used a QRH when he flew the Boeing. He said the ECAM on the Airbus was tricky and you could mess things up if not following it precisely, and the airplane was more temperamental. Sometimes changing power sources, such as going to APU power, will clear a message and you cannot recall it.

He had not received training at UAL on avionics smoke, but he did recall such training on another airplane when he was at a regional carrier. The prior training was not useful during the incident; he would have handled it the same. He had been trained on emergency electrical configuration, both initially and during recent retraining. He was not aware of UAL planning on putting a QRH on the airbus. During the incident flight he did not recall pushing a button to bring up the engine page during climb.

At the time of the incident he did not remember that the company flight manual called for generator power to be restored to the airplane prior to landing. He said he was "not part of the process" in making the decision about continuing with no generator power.

When asked if it was still his view that it was appropriate to land without main electrical generator power in the event of an avionics smoke caution, he said that it was. He said that there was company guidance that said you should not re-power any systems that had been de-powered. He provided certain pages from UAL manuals regarding handling of smoke emergencies which supported his statement.[2] He also referred to Airbus A320 emergency smoke/avionic smoke QRH pages not provided by UAL which he said did not provide for the re-powering of main electrical generators.

[1] UAL system maintenance

[2] FO Young provided copies of the UAL A319/A320 Flight Manual pages 1.30.9, 12.20.15, 14.20.41, 15.10.13, UAL Flight Operations Manual 5.10.5, and a non-UAL Airbus A320 QRH pages 1.08 and 1.09.

He went on to discuss possible ECAM software version differences on the Airbus. It was his understanding that there had been 5 different software versions of ECAM software. He did not recall seeing a line on the ECAM to turn Gen 2 back on, and he said it was possible that the ECAM on the incident airplane did not have an action item to turn generator 1 or 2 back on.

Asked what percentage of flights that he as the FO would enter flight plan set-up information (DIFREPS)[3] into the FMGC, he said it was about 30-40% of the time. He did not remember whether he made the entries on the incident flight. He always copied the primary flight plan into the secondary flight plan in the FMGC, and he believed that was UAL's procedure. When he said he would "clear it" if he found an avionics smoke caution on the ground, he meant that he would clear it through maintenance.

[3] DIFRIPS was an acronym used for programming the FMGC

Interview:	**Donley Kent Moffer, incident captain**
Date/Time:	**October 13, 2011; 1415 EDT**
Location:	**via teleconference**
Present:	**Roger Cox – NTSB; Katherine Wilson – NTSB; Mike Barnett – FAA; Marc Ghafouri – ALPA; Bradley Peterson – UAL**
Represented by:	**John Hanson – ALPA**

During the interview Captain Moffer stated the following:

He lived in Grapevine, Texas, and commuted via commercial airline to his base in Los Angeles. He wore glasses and had them on during the incident flight. He did not have any problems seeing the displays.

Prior to departing on the incident flight, he went to Operations and got the flight paperwork. He went to the airplane and did the walk around. He then did his flows and checks for the first flight of the day. There was no ECAM message when he got in his seat; everything looked like a normal airplane. On the ECAM, he would check the engine oils and other information and everything looked fine. There was not anything that popped up. Power was on the airplane when he got there and the first officer was already in the cockpit. He thought external power was on the airplane when he got there. He believed the first officer started the APU sometime prior to engine start. He did not recall when they went off external power.

He did not recall turning on the recorder ground control switch but was pretty sure he did. He could not think of a reason why it would not be turned on. He did not know if a change in power affected the recorder switch. If it was on, the light on the switch would be blue.

Regarding the maintenance log history, he looked at the maintenance paperwork for the airplane prior to the flight but did not recall what was on it. He did not remember anything about previous avionics smoke events and was not aware of any prior events on the incident airplane. He did not hear about the incident airplane's history of avionics smoke warnings until after this event took place. He had never been informed by the company that there had been false avionics smoke warning events on Airbus aircraft previously.

He did not reset any system faults prior to the flight and did not remember pushing the emergency cancel button. He could not think of any reason it would be pushed. He thought there could have been ground people on the airplane when he got to it but he did not see them. When he went to operations, it was run by United employees. He did not contact maintenance personnel prior to the flight. He had checked the ECAM status page during preflight and nothing had been displayed. When asked about a status message he had referred to during the before takeoff checklist, he did not recall that message. He said crews do see CFDS messages frequently.

The first officer loaded the flight plan. The captain always copied the active flight plan into the secondary flight plan but he did not recall if it was done on this flight. He did not recall

receiving any specific training on briefing a detailed emergency return plan or on setting up the secondary fight plan for a return to the departure airport. The "T procedure" was an escape maneuver designed for an engine failure on takeoff from a specific runway and was needed to avoid terrain or an obstacle. He would brief the "T procedure" if it was applicable or brief a standard engine out procedure. There was no "T" procedure for the departure on the incident flight.

At the time of departure he was not aware that runway 10 was closed.

Asked about his reference to noise just prior to closing the door during the departure, he did not recall what was noisy when the airplane was at the gate. There was grinding equipment around on the Southwest ramp and concrete dust blowing toward the aircraft so there was more noise than normal. They checked the cockpit windows. After the engines were started, he thought things settled down. It was humid and the air conditioning was blowing fog. He just dismissed it.

He did not remember if they made a TOGA takeoff but would guess that it was. The proper response on the before takeoff checklist was "TOGA" if you planned a TOGA takeoff.

He recalled that during climb the yellow autothrust message came on the ECAM and then almost immediately they got the avionics smoke alert. He did not notice whether the thrust levers had been retarded aft of the climb detent. During the retraining that he received there was no mention of the normal autothrust ECAM messages that he would expect to see when thrust levers are retarded to less than the climb detent.

He did not recall the order in which he moved switches during the avionics smoke ECAM procedure but he followed the list on the ECAM screen. He thought he turned generator 1 off first and then generator 2, but he could not say for certain. He said pushing the "Man ON" switch will extend the RAT and connects the RAT to the electrical system. He believed that the "Man ON" switch was a red guarded switch but he did not recall raising the guard or pushing the switch. He recalled the RAT deploying when he pushed the Gen 1 line switch. It deployed because electrical power to the airplane was lost.

He followed what was being displayed on the ECAM. He was surprised that the RAT deployed. After the RAT deployed, he went back to the ECAM screen and it was blank. The first officer was also flying cross-cockpit. He said the lower ECAM was blank and there was nothing on the upper ECAM. He told the first officer that he had the jet. He did not recall the upper ECAM coming back on.

When he flew the incident airplane on his first flight back after the incident occurred, the ECAM "locked up." He described a series of faults on that airplane including an FMGC #1 that would not respond to inputs, a GPWS fault, a cabin pressure fault and a loss of captain's airspeed indication. He briefed the FODM[4] after the flight and he filed an FSAP report. He said he would provide details of that event to the investigation.

[4] Flight operations duty manager

During the incident flight, his primary concern was getting the airplane on the ground. He told the first officer that he had the airplane but could not remember if he told the first officer that he had the ECAM. He said there was nothing displayed on the ECAM to his knowledge. He was thinking he did not want this to be the next Valujet.

He thought they put the gear down when they were about 3.5 miles from the airport and then it was just a matter of getting stabilized. He said battery power was not on his mind.

After the incident, he looked back through his old training manuals and he did not see anything on avionics smoke or emergency electrical.

He thought he added 1/3 of the headwind on to the V2 speed. He did not recall having the amber bar to show him V_{LS} or stall speed. He thought green dot was still displayed but did not remember more.

The engine display was working and was visible during landing. He did not recall seeing reverse lights or the first officer calling them out or calling out brake pressure. He was aware that this was a required part of the procedure.

He heard the EVAC alarm in the cockpit until the first officer silenced it. The FO used the plain (unguarded) horn shut off button to silence the horn. After it was silenced the light on the panel continued to flash. The first officer was having trouble finding the EVAC button and he helped him find it. He also heard the EVAC alarm in the cabin. He tried to use the interphone but could not hear anything; he then grabbed the handset and it was not working. He knew it was not working because the cockpit door was open and he could not hear the PA he was making. He was aware that notifying ATC was mandatory as a part of the EVAC procedure, but he did not recall calling them.

He did not remember any introduction to the philosophy of flying the Airbus when he first went through qualification training. He said pilot training had been cut and that might explain why this subject was not covered.

He said that he understood now that the intent of the avionics smoke procedure was to restore electrical generators before landing. He had not seen any further ECAM action items directing him to turn either generator on. If he had seen them he would have followed what it said to do.

When told that recorders showed that after the cruise page had appeared during climb that the engine page had been selected, he said he did not recall pushing the engine page button at that time.

He understood that pushing the recorder ground control switch was a part of the captain's flows and was performed during the initial part of the preflight check. He thought that he had done so but couldn't be certain.

He would only take off with lights on the overhead panel if the item was an MEL[5] deferral. If he arrived at the airplane and had an avionics smoke message, he would call dispatch and SAM (maintenance) and go through the necessary steps to get a proper deferral before departing.

To recall items on the ECAM, he would just press and release the RCL button. He did not know if holding it would do any good. He was not aware of a need to hold the button for 3 seconds and had never seen a time when there was a need to do this.

Not all emergency and irregular procedures with ECAM actions were covered during qualification and recurrent training. The avionics smoke procedure was not covered during his training on the airplane.

Prior to the incident flight, he had just completed a proficiency training event (PT) and on day 1, which was taught by a pilot instructor (EPI), they discussed fires during flight. They were told if landing was delayed by a couple of minutes, it could make the difference between a successful landing and loss of the airplane. The Swissair and Valujet accidents were discussed.

He would personally rather have a QRH than rely only on an ECAM because he would not have the ECAM "locking up." He trusted a QRH over the ECAM. He thought they should write the ECAM steps down and have the book backing it. He was not aware of discussions at United to put a QRH on the Airbus fleet but thought it was a good idea.

If he saw an avionics smoke alert when he first arrived at an airplane, he would call maintenance.

"ASAP" to him meant the same thing regardless of its color. He was familiar with the training for different colored messages, but to him "ASAP means land as soon as possible."

He was not aware of a prior history of avionics smoke false alarms on the Airbus. Had he known, he said they might not have felt as much pressure to land immediately.

His practice regarding loading the FMGC ("DIFRIPS") was that when the FO was going to fly the leg the FO loaded the FMGC. The captain would then check what was entered. It was normal procedure to copy the active flight plan into the secondary flight plan.

[5] Minimum equipment list