**Docket No. SA-532**

**Exhibit No. 2-B**

# NATIONAL TRANSPORTATION SAFETY BOARD

**Washington, D.C.**

Operations/Human Performance Group Chairmen
Interview summaries – Flight crew

(31 Pages)

# Attachment 1

**to Operations / Human Performance Group Factual Report**

# DCA09MA026

# FLIGHT CREW INTERVIEWS

# FLIGHT CREW INTERVIEWS

**Interview: Jeffrey B. Skiles, First Officer (FO) - US Airways**
**Interview date: January 17, 2009**
**Time: 0955**
**Location: Marriott Downtown NYC, NY**

Present were: David Helson, David Tew, Katherine Wilson, Malcolm Brenner - National Transportation Safety Board (NTSB); Lori Cline – US Airways; Larry Rooney – US Airline Pilots Association (USAPA); Ricky Daniel – Federal Aviation Administration (FAA)

First Officer Skiles was represented by Peter Lambrou, M.D. - (USAPA)

In the interview FO Skiles stated the following:

He was 49 years old. He was hired by US Airways 22 years ago and was now based at CLT. He came from a civilian aviation background. He learned to fly at age 15 or 16. He flew for a cargo company, then a commuter airline, and then was hired by US Airways in April 1986. He was a B-727 engineer when hired, upgraded to copilot until the airline parked the B-727. He then went to the DC-9 until the airline parked it, the Fokker until the airline parked it, then the B-737. His decision to move to the Airbus was voluntary, his only voluntary move, although it came just ahead of the company parking the B-737s. He had always served as a line pilot, never a check airman or instructor.

He said before he worked at US Airways, he had previously worked for Combs Air Freight and a commuter airline called Mid States in Wisconsin. He logged about 5,000 hours pilot in command time. He was a captain on the Fokker 100 at US Airways for about 1 ½ years. FO Skiles said he had a type rating in the F100, the B737, and the A320 and he had flown all three airbuses, the A319, A320, and A321.

The accident flight began as just a standard flight. He did everything he had just learned to do as FO in Airbus. They taxied out. They were late. They were assigned Runway 4 for takeoff, to fly 360 heading after takeoff. He was hand flying the airplane, still getting used to the sidestick controller. The aircraft was cleaned up.

Between 3,000 to 5,000 feet he looked out and saw a line of birds, a line perfectly spaced. While he was not an ornithologist, he would guess they were Canada geese. The Airbus was climbing and he saw the birds go down below the windscreen and thought they would miss the birds. Then he heard birds hit: "BOOM, BOOM, BOOM". He then heard compressor stalls and the engines quit.

The Captain ("Sully") said "my aircraft" and directed the FO to perform the dual engine failure procedures in the QRH. They turned south. The captain declared an emergency with ATC. Mr. Skiles got out the checklist. It was an exception and, on the back, the QRH told what page to go to. He flipped through, found the page, and began executing the QRH procedures. There was some talk about returning to LGA but it was far away at that point they were coming down fast. TEB did not look viable to Mr. Skiles and the

only other option was straight ahead down river. To him personally he could not believe they were going to land in the river. Birds did not take out engines. They landed in the river. He had his shoulder harnesses on, never took them off. He said it was surprising how smooth the landing was. It was a soft touchdown, the nose went down, and he saw water go over the top. Then they popped up and just floated. It was not so bad. The captain told him to execute the evacuation checklist and he began it. The flight attendants immediately started evacuation. He completed the checklist and the captain told him to come back to the passenger compartment. The passengers were off. They were enthusiastic to get off, but the captain worried because none took life vests. At the captain's direction, Mr. Skiles got life vests and threw them out through the overwing exits with the assistance of two passengers. Water was now knee deep at the overwing exits. People up front had inflatable slides. The airplane was sinking lower and lower. It was now less than 5 minutes since touchdown. The captain said they needed to get off. Mr. Skiles came forward and he and the captain hopped in the 1L door raft. He hopped into the raft but sat on the edge because it was full. Rescue boats were already there. The captain directed them to take people off the wings first. But there were so many boats and other boats were arriving as well. For some reason, a really big boat picked up Mr. Skiles and the captain. They had quite a climb to get aboard it. He was holding the rope to keep the raft steady while passengers got up there. The passengers all climbed up in the boat and the captain told him that it was time to get out of there. Their hands were frozen and the captain said that if he waited any longer he would be unable to climb the rescue ladder.

When he first saw the birds, he heard booming and the power came right back. That was the aircraft reaction.

Asked whether they lost power on both engines simultaneously, he indicated that he did not know.

Just after the birds hit, he heard a sound like a compressor stall. It sounded pretty much the same as the sound of the birds hitting but the birds were gone. He used to experience compressor stalls when they put the DC-9 in reverse so he was familiar with the sound.

Asked whether there were ECAM messages after the bird strike, he indicated that he was not sure. Dual engine failure was an exception to the ECAM so he went to the QRH and never read the ECAM. There were procedures in which they did not follow the ECAM. Dual engine failure follows the checklist. The shock happened so fast and he did not have much time.

Concerning the N1 engine gauges, the left engine was producing a little power while the right one produced none. The left one was in the idle range, or, if not in the idle range, at least had more power than the right which had none.

"This was my second trip on the airplane; I'm not all that familiar with it."

They reached acceleration altitude in a clean configuration. They used flaps for takeoff, a flex takeoff.

The captain took control immediately after the birdstrike by stating "my aircraft." He asked Mr. Skiles to execute the checklist.

The tower cleared them to land at LGA, it sounded like Runway 31. He suggested Runway 13 instead, but the captain said they could not make it. The airport was on the captain's side and the FO could not see it. They turned south and were descending. The captain asked the controller about TEB. He pointed it out in the distance. It appeared too far. They were already at green dot speed, and "if the image is rising in the windshield you aren't landing there". The captain was making these decisions while Mr. Skiles ran the checklist trying to figure out what was going on. The checklist items included recycling the FAC computer. The ignition was on relight. The captain turned it on right when they hit the birds. However, it had no effect. There was no engine surging.

The dual engine failure checklist was very long, several pages long. He did not have time to get off the first page.

The captain made one PA announcement when it was obvious they were ditching. Mr. Skiles asked whether he should hit the emergency switch on the overhead panel (to notify the flight attendants) and the captain said yes. The captain called for flaps 2 and they landed with flaps 2. When it was obvious they were landing, Mr. Skiles asked the captain if he wanted more flaps and he said no.

After landing, he performed the evacuation checklist. The recall items: shut down engines, fire buttons, notify ATC except that in this situation nobody would hear them.

The Airbus had a ditching button, but he did not push it.

Concerning training, he was recently trained on the Airbus. He just finished OE on the Thursday before the accident (one week before). He said it was very good training. His last training was 8 years ago. The Airbus was dramatically different than other planes because of automation. He was transitioning from the B-737 and said he did not have any problems. "Í never enjoy training and only do it when they park airplanes under me." The OE went smooth, and he had a very nice OE instructor.

One of the training spots was dual engine failure, but it was performed at altitude with plenty of time to do procedures. This training did not really have an effect on the accident, which happened extremely fast. The newspaper said it was only 3 minutes from the time the birds hit until they touched down. They did not have much time and were already quite slow. They were not in the relight envelope. The current training philosophy was to take your time to try to assess the situation. It did not apply in the actual accident.

The only training for ditching was given in ground school, covering switches and so forth. They learned about the ditch button. There was no training in the simulator. From what he recalled, the training covered everything on the panel and you had to know what the ditching push button did. All guidance he received for ditching implied that they had time, so the training did not help in the actual emergency.

He said his total flight time was about 20,000 hours and that he may have been the most experienced first officer in history.

Asked about CRM and his coordination with the captain, he stated that there was not a lot involved or necessary in the actual emergency. He ran the checklist while the captain was deciding on landing. US Airways was very interested in crew coordination and there was a strong emphasis in training. In the accident, however, there was no time to do anything.

Before they left the gate, they were late because of ATC delays into LGA. It had been snowing earlier in the day. They did not need to de-ice. The weather cleared up and it was sunny when they arrived at LGA.

When he first saw the birds, they were not straight ahead but off to the right in front of the airplane at an angle. He did not know which direction the birds were heading. The birds were more or less straight ahead. He thought: "Boy, they evenly space themselves out." They were dark birds, looking black, but he did not know the actual color. He had no memory of the sun location.

His time in type was about 35 hours. He flew the leg into LGA.

He did not recall the maintenance log but believed there were no write-ups. He did not experience any indications/malfunctions with the aircraft. There were no problems during the takeoff roll, takeoff, or initial climb and there were no warnings or lights before the birdstrike. He had no difficulty hearing radio communications and they made no mention of birds. He had no problems with visibility/layout of instruments, signals, or controls.

There were good outside visual references as it was a very nice day

After the birdstrike, he did not recall the warning lights. There was the shock of hitting and he could hear the "engines dying".

He said workload was normal on the day of the accident.

FO Skiles was asked about his activities in the 72 hours prior to the accident. On January 15, 2009, he awoke at 0640. He left the hotel at 0730. The flight was scheduled to leave at 0900. He felt rested. The quality of his sleep was good. He did not eat breakfast which was typical for him.

The accident crew switched aircraft in CLT. He got a slice of pizza in the airport.

He thought the flight from CLT to LGA left on time but he was not sure. He said he thought the aircraft showed up late.

He got off the plane in LGA to do the walk around. He said it was a quick turn because they were late. There were no discrepancies during the walk around.

On January 14, 2009, he awoke at 0510 for a 0600 van. The accident crew flew to LGA.

They had a long layover in PIT and stayed downtown. He walked to see a movie and saw Grand Tourino which he said was very good. He walked back to the hotel.

On January 13, 2009, he did not recall when he awoke but said he felt rested. He said he got up and walked 5-6 miles. He came back and spent some time in the hotel room before going to the airport. He said they flew to PIT for a short layover. They stayed at a hotel and had less than 8 hours in PIT.

He did not recall when he went to bed.

On January 12, 2009, the accident crew flew from CLT to SFO. He said they got in to SFO fairly late. He said he was not tired so he went out and walked for an hour. He came back and went to bed. He estimated that he was walking around 2200 and went to bed around 2300 but was not sure.

When asked how much sleep per night he needed to feel rested when not working, he said 7 hours.

When asked if he was a morning or an evening person, he said he was definitely a morning person.

He said the four day pairing he had was a much nicer schedule than he would normally fly. He said they had a lot longer legs in the 737. Prior to this pairing he had three days off.

He said he had not been involved in any previous accidents, incidents or violations. He said he had no past failures in training events. He had not been disciplined for his performance. He received a commendation letter from the director of operations years ago for making great PA announcements.

FO Skiles said he had experienced a bird strike before but never to this degree. He had experienced previous bird strikes which required maintenance to clean blood off the nose cone. This had probably happened several times and involved seagulls. He said he did not smell bird but also that he did not have a great sense of smell. He had never experienced an engine failure. He had a compressor stall on the 737. He said if a pilot did not get it out of reverse quick enough he would hear “boom boom boom”.

FO Skiles had not had any major changes to his health, financial situation or personal life, good or bad, in the last year.

FO Skiles said he had a first class medical with a limitation requiring that he wear corrective lenses and wore contacts. He said he was wearing them at the time of the accident. He stated he did not have any problems with color vision. He stated his hearing was good. He did not take any prescription medicines. He stated he last had a drink about 10 years ago. He did not smoke. He did not take any drugs, prescription or nonprescription, that might have affected his performance in the 72 hours prior to the accident.

He said he did not give a blood sample at the hospital but he did a drug test when he went back to the hotel after the hospital.

When asked how he liked working for the company, he said “no one likes working with the company”. He said given the alternatives it was “not so bad”.

He said he felt no external pressures from the company or his personal life. He said his mood before the accident was the same as it was today, good. He said he felt alert.

He had not flown with the captain before. He flew with him on the four day pairing but not before that.

He said the mood of the captain before and during the flight was good. He said nothing was bothering him. He said the captain was alert.

He said he got along personally with the captain but they did not know each other socially. He said the captain’s interactions with the flight attendants were fine.

When asked to compare the captain’s proficiency to other pilots he had flown with, he said it was extremely high. He said the captain’s greatest strength was that he was still “blown away” by his professionalism. He could not think of an area in which the captain could improve. When asked if he heard anyone ever complain about flying with the captain, he said he never read the captain’s name on the “bathroom wall”.

He did not fly outside of work

When asked how familiar he was with flying in and out of LGA, he said in the 737 he never went there. He said in recent years, hardly at all.

He said the CRM training received was done very well. It was embedded in all training. He said US Airways set the standard so it was already there.

He said the captain was very professional. The FO said his own role in the accident was small but the captain and flight attendants did an incredible job. Personally, the captain was a very nice man. He talked about general things and his children.

He did not have problems with insomnia or sleep disorders. In fact, he could fall asleep virtually anywhere and anytime. He had never seen a doctor because of sleep issues.

The accident probably involved Canada geese because of the tight formation. The impact sounds were multiple "thunks." The engines died almost right away. He knew they died because he could hear them. The captain said "the engines are rolling back." Asked about the handling of the airplane, he said that he did not notice any yawing and that the captain took over control in about 3 to 4 seconds.

Asked how he liked the Airbus, he said that he liked it right up until the accident. It had obvious differences from the B-737. It had a much larger cockpit and better creature comforts. The controls were entirely different, with the control stick and glass cockpit.

He said prior to the flight he did the final taxi checklist. He said he was the pilot flying and the captain did the after takeoff checklist.

He did not recall if he looked at the engine instruments and had no recollection of the engine indications after the bird strike.

He said prior to the bird strike, the engine ignition was off and that the captain turned it on immediately after. He said it seemed like the left engine was producing some power so he cycled the right one first.

He said he did not move the thrust levers up or back and did not know if the captain did. He said the captain made the decision about the ditching. He said they were at green dot speed which was about 200 knots or a little over 200 knots. He said the relight speed was 300 knots or greater.

He did not recall if ATIS mentioned birds.

He said the police made them all go to the hospital. He said none of them wanted to go to the hospital. The Flight Attendant, Doreen needed to go because she had a gash on her leg. He said they did not do much at the hospital; they had their blood pressure taken. He said he did not have blood taken or take a drug test at the hospital. He said they did that later at the hotel. He said at the hotel he did a breathalyzer test and a urine test but he did not recall who set that up.

He said he and the captain had discussed landing at LGA briefly but LGA was on the captain's side and he could not see it from his seat so he does not know if they could have made it. He said he thought maybe ATC mentioned TEB but said they could not have made it.

FO Skiles could not recall how many compressor stalls he heard and the captain said he smelled burned birds.

He said he did not shut down any engines, he just recycled the master switch and he did not see the captain shut engines down. He did not recall the captain doing any other items beyond flying except turning on ignition and making a PA announcement.

He did not recall bringing thrust levers to idle and did not recall what position the thrust levers were in. He said the thrust levers were at idle and they did not go through any kind of confirmation. He said when he went to the checklist he did the checklist for fuel remaining and he said he did not get to the ditching push button on the check list.

He said the captain had called for the checklist and they did not have time to get to the ditching push button. When asked if the checklist was confusing, he said in this type of situation any checklist seemed confusing.

He said he did not look at the ECAM to see if the ram air turbine (RAT) was deployed. They verified that the emergency AC bus light was out.

He said they did not have a total loss of electrical power; the captain's screens were still powered. He did not recall if his screens were because he was busy doing the checklist.

He said they did a flex takeoff and he thought flaps were config 2 for takeoff.

He said he remembered cycling the FAC and he did push the engine fire push buttons during the evac checklist but he did not push the APU fire push button.

He said he cycled the engine master switch. He said he did engine number 2 first and waited a while. He did not know if he waited 30 seconds. By the time he got to number 1, they did not have much time left but he put it back up. He said it was either going to come back or not.

He said he had gone through training as a paired crew, a captain and a FO.

He did not recall any problems during engine start. He said they started both engines to taxi out. There were no delays on taxi and takeoff. He said there were no problems on takeoff. He said it was engine bleeds on, APU bleed off and APU not running for takeoff. He said he hand flew the airplane for a while after takeoff but could not recall if the auto pilot was on when the birds impacted. It was not a NAV departure; they were flying an assigned heading.

He heard a noise, and the captain said "engines rolling back". He said he would not describe it as a vibration or explosion. He said it seemed like it was a simultaneous power loss. He said the captain called out to take control and "I am the FO so that is what I did". He did not recall what was on the ECAM; he looked in the back of the QRH and saw that dual engine failure was an ECAM exception.

He said he started the checklist and went to the fuel remaining section. He said the captain had already turned on the ignition. He did not recall touching the thrust levers and did not recall confirming them. He said he was not making callouts from the checklist because the captain was busy flying the airplane and talking with ATC. He said they were very time compressed.

He said he did recall that the captain looked up to check that the AC bus was still powered. He said he did not need to select the switch. He said the captain made a "mayday, mayday" call.

FO Skiles said they landed flaps 2 and gear up. They did not do any VAPP speed determination. Did not select galley switch, GPWS, or GPWS TERR. He did not select the ditching push button. He said the engine master switches were on when they landed. He thought the APU master was on and thought that the captain had done that. He did not recall hearing a transfer of power when the captain started the APU.

He said the company had no specific rules about when to show for a flight. On the first day of a trip pilots needed to be at the airport 1 hour prior to flight but there was no requirement on overnights.

He said he did the evacuation checklist. He did not discharge the agents. He did not set the parking brake.

He said "this thing happened so fast" he did not think there was any procedure that could be devised for it.

The interview ended at 1213.

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**Interview: Chesley ("Sully") B. Sullenberger III, Captain - US Airways**
**Interview date: January 17, 2009**
**Time: 1245**
**Location: Marriott Downtown NYC, NY**

Present were: David Helson, David Tew, Katherine Wilson, Malcolm Brenner - National Transportation Safety Board (NTSB); Lori Cline – US Airways; Larry Rooney – US Airline Pilots Association (USAPA), Ricky Daniel – Federal Aviation Administration (FAA).

Captain Sullenberger was represented by Peter J. Lambrou - (USAPA).

In the interview Captain Sullenberger stated the following:

He was 57 years old. He was a captain with US Airways and was based in Charlotte, NC. He had been with US Airways for 28 years; it would be 29 years next month. He learned to fly in 1967, and had a private, commercial, instrument, and CFI all before he finished college. He was active duty US Air Force and he flew the F-4. After that he went to US Air. He had approximately 19,500 total time. He held an ATP (Airline Transport Pilot), and airplane single and multiengine land certificates. He clarified that he first went to PSA (Pacific Southwest Airlines) which merged with US Air. He flew the B-727 as a second officer, a MD-80 as a first officer, a BAE 146 as a captain, a B-737 as a captain, a MD-80 as a captain, and A319/320/321 as a captain. He had type ratings in all of those aircraft but the B-727. He also had a type rating in the Lear jet 24 E. Captain Sullenberger said he had about 3800 hours in the Airbus.

Captain Sullenberger was asked to describe the events of the accident. He said they departed LGA on runway 4. The FO was the pilot flying. The initial heading was 360 and they were assigned 5000'. He said everything was normal prior to reaching 5,000 feet. He noticed a large flock of large birds filling the windscreen and there was no time to react. He felt and heard birds colliding with the aircraft. He heard and felt vibration. The engines had stalls. He felt yaw. He smelled cooked bird and the smell came through the cockpit and cabin. He felt an immediate and dramatic loss of thrust simultaneously. There was some yawing as thrust reduction was not even. He said "my aircraft" and assumed pilot flying duties. He said the he lowered the nose to obtain green dot speed. He moved the ignition mode to ignition and transmitted "mayday, mayday Cactus 1549, bird strike loss of thrust both engines" on the departure frequency. He told the FO to do the QRH for dual engine flameout. ATC mentioned that they divert to LGA. Because of the low speed and altitude and the fact that they were heading away, he told tower that LGA was no longer an option. He looked up ahead and asked about TEB and quickly realized they could not make it. They were too far away as altitude was decreasing rapidly due to loss of thrust. The FO was quickly going through the checklist, and he was complying with his requests.

He said both engines were heavily damaged and they were unable to maintain altitude at all. There was no relight; they were out of the envelope and were sinking rapidly. He saw the river, started APU and said they were "going to land in the Hudson". His focus became on outside and the speed tape. He was intent on maintaining wings level. He made a PA, "brace for impact". He planned a touchdown next to a vessel. He called for flaps 2, and there was no time for anything else. He began to flare and maintained full aft stick through touchdown. He said the touchdown was not too bad. The nose went down and the water came up over the windshield. The aircraft came suddenly to a stop.

He said the FO began the evacuation checklist. Captain Sullenberger got out of his seat and opened the cockpit door to command the evacuation. He said he saw it was already in progress. He said the 1L and R rafts were open and in use. He said much of the forward cabin was evacuated. He said the over wing exits were open. He moved to the back part of the cabin. He noticed passengers in the back and told them to move forward. He said the evacuation was expeditious and orderly, and occurred rapidly. He said the

flight attendants did a fantastic job. He said he was able to get all passengers off of the airplane. He said some "able bodies" male passengers came in through the over wing exits to get life vests, coats and blankets. He checked the aircraft for passengers. He was instructed by the flight attendants to get life vests and coats. He went forward gathering more vests, coats, and blankets and gave them to passengers in the 1L and 1R rafts. He gave them to a person in the 1L raft. He went from front to back calling for anyone. He said there was no one. He went back to the front. He said there was a problem detaching the raft from the 1L door. He detached it, and put his life vest on. He and the FO were at the 1L door. They boarded the 1L slide raft together.

He said that nothing was remarkable about the flight before they hit the birds. He said everything was how it should be except the birds.

He said they started both engines during the pushback. He said they taxied to runway 4 and were in config 2. He clarified that config 2 meant flaps 2 in the airbus. He said they did a flex takeoff.

When asked about delays in the taxi, he said they were told to hold short to allow a Northwest airplane to taxi by them.

He said they did not have to deice as the weather was VFR at that point.

He said the FO was the pilot flying. He said the FO was hand flying but did not recall if the autopilot was turned on.

When asked if they were above the acceleration height, he said yes and they had already cleaned up and were in the clean configuration.

When asked about the first sighting of the birds, he said he thought the FO first saw them but he did not know. He said he saw the birds as they were filling the windscreen, left and right. He said they were big birds and there were lots of them. He said it was too late to react. When asked if the FO was still flying, he said yes.

He said he did not sense any reaction in terms of aircraft movement prior to hitting the birds. He said the image he saw in his head was large and dark birds, like a black and white photo. He said he just saw large dark birds, from stern and aft. He said he saw them like a "wings-body" profile. He said there were many of them and they were large. He said they had a big wing span. They were "large, massive, big birds". When asked if they were dark, he said his impression was that they were dark. He said they were not light colored that he recalled. He said the sun was not in his eyes. He said the sun would not have been in his eyes because they were heading north westerly and it was winter.

He said at the initial impact he heard many birds hit. He said it sounded like it was "raining birds". He said he grew up in Texas and when a squall came through to multiply the rain drops by 100 and that was what it sounded like.

He said the first thing he was aware of was simultaneous, what he felt, heard and smelled. He said immediately, a second after that, there was a huge loss of thrust. He said it was a total sinking feeling and the nose dropped. He said they lost every "umph" and "forward motion" they had. He was surprised at how symmetrical the loss of thrust was. He said they did not yaw much and were at climb thrust so the loss had to be symmetrical.

When asked if he noted the engine instruments, he said it was so shocking and he was so focused on maintaining aircraft control. He said he looked at the upper ECAM and saw very low N1s, perhaps even sub-idle. He said he felt and heard bangs. He felt vibration and smelled smoke.

When asked about taking over the controls, he said he said "my aircraft" and FO Skiles said "your aircraft". Captain Sullenberger took control of the airplane and dropped the nose to obtain green dot speed because they had slowed below it. He said he then turned on the ignition.

He said he called for the checklist but the FO already had it out. He said he was not sure if he even got all of the words out of his mouth. He said he called for the dual engine flameout checklist.

When asked if he followed the FO's callouts, he said he moved the thrust levers to idle when the FO called for them. He said when the FO called for the start switch he went to the start switch.

He said the normal procedure was to confirm certain items like start levers and generators, and critical things like fire switches.

He said he was not sure if he moved the throttles and if he confirmed them, or vice versa. He said he knew they got moved but now not sure who did what. He said he was trying to fly and manage the landing at the same time. He said the altitude and airspeed were decreasing.

He said he did not recall anything that jumped out at him about the switches. He said at that time he had not been able to restart engines and it was clear they were not going to. He said the FO continued to try until touchdown. He said the engine speed was too slow to restart. He said the lower they got, the more he had to focus on outside the aircraft. He said if they had more altitude they could have gotten through the checklist. He said it all happened so fast and they ran out of time.

When asked about the initial decrease in thrust and if there was any fluctuation after that, he said there was never a recovery of any thrust. He said it never got any better. He said if anything it got worse. He said the rapid thrust decrease was the worst they had and they never got any additional thrust back after that.

He said on short final the aircraft was configured for flaps 2. He said he did not recall any other configuration changes. He said the lower they got the more he had to focus

outside and on the speed tape. He did not remember the airspeed he was trying to hold when he lowered the nose.

He said he had initial airbus training in July 2002. He said his last recurrent was CQT a year ago. He said his base month is February so he was due again next month.

He said they received training for engine failures in the simulator. He said CQT is one day of ground school and two days in the simulator. He said the engine failure training that he received was to maintain aircraft control and try to get the airplane in the proper configuration, return to the airport and make a single engine landing.

He said they received training for a dual engine failure when reviewing QRH procedures. He said he did not recall ever practicing it in the simulator. He said it is possible that they did but he did not remember.

When asked about training for ditching, he said they got familiarization with the QRH. He said he thought that was something that was difficult to practice and he did not recall it in simulator.

When asked about guidance for ditching in company manuals, he said there were things in the manuals about that. He said it was a dichotomy between planned and unplanned landings. He said if it was timed and they could prepare, there was guidance. He said notification, prepare the cabin, direction of landing, wind and sea states, airplane configuration, and land near vessels. He said yes, there was guidance in the manuals about that.

When asked if anything from training was helpful in the current situation, he said "absolutely training has helped". He said he was trained on fundamental values to maintain aircraft control, manage the situation, and land as soon as the situation permits. He said training on CRM, clear definition of duties, and clear communications of plan and to where headed. He also said the basic rules of airmanship and CRM helped. He said what they learned in training and procedures on aircraft from airbus. He said all they learned in some way contributed to this.

When asked to describe the crew coordination, he said it was amazingly good considering how suddenly it occurred, how severe it was, and the little time they had. He said FO Skiles was a good pilot and it was amazing how he handled it. He said if he had not been told it was the FO's first trip after OE he would not have known. He did not have to verbalize every part of it. He did not have time to exchange words but through observations of the event and hearing him say things, the FO knew what he had to do. He said he was immediately aware that the FO was on the same page and was doing his part.

He said the birds did not hit the windscreen. He said the FO did not make a call out regarding the birds.

When asked why he took control of the airplane from the FO, he said that it was clear immediately that it was a dire situation. He said he was the experienced crew member and it was his responsibility as the captain. He said it was an extreme emergency.

He said he had experience flying in and out of LGA. When asked how often he flew in and out of LGA, he said "many times". He said there were no problems with the aircraft on the way in to LGA. When they received the accident aircraft in CLT, there were no discrepancies in the maintenance logbook.

Captain Sullenberger was asked about his activities in the 72 hours prior to the accident.

On January 15, 2009, he awoke at 0640 AM for a 0730 van departure from downtown Pittsburgh. The accident crew had a 0900 departure. He said his sleep was good and he was fortunate to be a good sleeper. He was a sound sleeper and said he felt rested. He said he got a cinnamon raison bagel and cream cheese and a banana at the airport.

The accident crew flew PIT-CLT. They were excited because they flew the newest A321. The airplane was deiced in PIT which put them behind schedule. He said, otherwise the flight was unremarkable.

The accident crew changed planes in CLT. They picked up the accident aircraft, aircraft 106. Captain Sullenberger did not eat in CLT. There was an ATC delay out of CLT to LGA. The delay was extensive because it was snowing in LGA. There were ground delays in effect from ATC. They had an hour and 15 minutes delay due to ATC delays.

At LGA, Captain Sullenberger got a sandwich which he did not eat and said was still on the airplane. He said LGA was a quick turn. He did not recall the time they left but he recalled it was not as late as he thought it would be. He said it was not as late as he had thought given the previous delay.

On January 14, 2009, he awoke at 0510 for a 0600 departure from the hotel. He had a 0705 EST flight departure from PIT to LGA. He ate breakfast at the hotel.

He said they had a long layover that night at a downtown hotel in Pittsburgh. He said it was snowing. He went for a walk around town. He went to dinner and answered some emails. He went to bed fairly early, probably about 2200 EST.

He said his quality of sleep on the previous night was good, average. He said it was a short night and could not get 8 hours of sleep but that that was ok. He said it felt normal.

On January 13, 2009, he awoke at 0700 PST. He had breakfast with his children, after which he got ready for work. He left his house at 1100 for a 1220 show time at the airport.

He said they were close to their schedule arriving in PIT. They got to the hotel fairly quickly. It was a short night. The total layover time was 9:58 but that did not include check in and check out. He did not recall when he got to bed.

On January 12, 2009, the accident crew flew to SFO. He said he went home that evening because they had a long layover. He stayed home the rest of the evening and went to bed around 2300 PST.

When asked how much sleep he needed to feel rested when not working, he said he and his wife were on the same schedule and went to bed at 2300. He said when not working he awoke at 0700.

When asked if he was a morning or an evening person, he said neither. He said he was "11 to 7" and did not like to go away from that. He said if he had to choose he would rather stay up later.

Captain Sullenberger was asked if the schedule of the trip was normal, he said it was typical and "not bad". When asked how many days he had off prior to the trip, he said he had been off more than usual. He had a trip scheduled for the week before with FO Skiles, but because the FO had OE, a check airman took his trip. Captain Sullenberger had off from December 31, 2008, until this four day trip.

Captain Sullenberger said he had not been involved in any previous accidents, incidents or violations. He said he had not had any failures in training and had not been disciplined for his performance. He received a commendation as an instructor on the MD-80. He was a line instructor in the late 1990s/early 2000s and was commended for his performance as a check airman. The commendation noted he was a "tireless pilot advocate" and was "someone who tried to uphold the highest standards". Captain Sullenberger was thanked for his service to the pilot group.

Captain Sullenberger stated he had been involved in a few bird strike incidents but that they were nothing major. The incidents never resulted in damage to the airplane or radome. He said there was only blood and feathers on the wing. He had never experienced an engine failure and stated he hoped he never would.

Captain Sullenberger had not had any major changes to his health, financial situation or personal life, good or bad, in the last year.

Captain Sullenberger stated he was in excellent health. His vision was good and he did not wear glasses. He stated his hearing was good. He did not take any prescription medicines. He stated he last had one beer a week and a half ago. He did not smoke. He did not take any drugs, prescription or nonprescription, that might have affected his performance in the 72 hours prior to the accident.

Captain Sullenberger said the workload on the day of the accident was normal. He said the weather had improved and it was nice. He stated that the workload on the takeoff and initial climb of the accident flight was normal.

Captain Sullenberger stated that there were no problems with radio communications with ATC. He stated there were no problems with the visibility or layout of instruments and controls in the cockpit. He said there was nothing that hindered his view outside the cockpit.

When asked how he liked working for US Airways, he said it was a "good company". When asked if there were any external pressures from the company, he said "I'm not sure". When asked if there were any pressures from his personal life on the day of the accident, he said no. He said his mood before the accident was good and he felt alert.

When asked about the mood of the FO before the flight, he said the FO was good, happy, and normal. He said the FO was alert. He said he had not flown with the FO before the four day pairing. He said they got along great but they did not know each other socially outside of work. He said the FO's interactions with the flight attendants were normal and congenial. He did not see him interact with any passengers.

When asked about the FO's proficiency compared to other FOs he had flown with he said "good, very good". He said the FO's greatest strength as a pilot was he was very gifted, very skilled and very smooth. He could not think of an area that the FO needed to improve on. He had not heard anyone complain of flying with the FO.

He said he flew occasionally outside of work. He said he had two friends with access to small airplanes that he would fly. He said it was a Cessna and a Bonanza. He last flew outside of work several months ago.

Captain Sullenberger said that CRM training was a part of regular training. It was transparent. When asked about the quality of training, he said there was always more that could be done but it was good given the amount of time they had.

When asked if there were any differences between flying different airbus aircraft, he said it was a seamless transition. He said it depended on how nuanced a pilot wanted to make it. When asked if changing planes mid-day on the accident day influenced the accident flight at all, he said no.

When asked if he had ever been a Check Airman he said there were two categories of check airman and he had been a line instructor, but not a simulator check airman. He said he had been an MD 80 Line Instructor for about 2 – 2.5 years but had not been one on any other aircraft, and had not been a simulator instructor.

After the engines quit he decided they could not get back to LGA. He said they were "too low, too slow", were pointed the wrong direction and it was too far over densely populated area. He said the runways at LGA were 7000 ft long with water off the ends.

His first thought was LGA but he quickly ruled it out. He said TEB did not have the disadvantage of water but he had never been there, it was also too far away. He said that due to the surrounding area, there would have been "catastrophic" consequences if they did not make it.

Captain Sullenberger recalled the birds filling the windshield but he could not recall how close they were. He said he might have been looking down and when he looked up the birds were close. He recalled that there was no mention of birds by ATIS, ATC or other pilots on frequency. He said he did not recall if it was on the written or printed ATIS.

He said the FO was desperately trying to restore thrust by doing the procedure while the captain was flying; he was doing dual engine failure procedures. He said the FO was trying to keep us from landing in the water by reestablishing some usable thrust. He said that green dot speed was the best lift over drag. He said he had a compressor stall before on an Airbus at cruise altitude, did not believe it to be an A321, thought possibly an A319 or A320. He said at the time he was west bound to SAN from CLT, at cruise altitude. He said ATC had asked them to descend about 1000 feet; he thought the altitude was in the low 30 thousands. He said when the FO reduced thrust to descend, they experienced a compressor stall. He said it was around dusk and US Air pilots traveling in the cabin and other passengers reported seeing flames shoot out of the engine about the same time we heard the noises.

He said he was not sure if he heard a compressor stall when the birds hit, he suspected so but was not certain. He said he had felt some yaw but not much. He said there was no other movement that he felt just the huge loss of thrust that was abrupt and shocking.

He said he looked at the top numbers on the upper ECAM, which was N1. He said the digital readout for both engines was so low that his impression was that they were at idle or less. He said he did not notice them ever recover above that.

He said that he was not certain if he or the FO shut down an engine. He said the FO was trying to get useable thrust all the way to touchdown and he was not sure at what point that effort may have ceased before they ran out of time. He said the FO was trying desperately to save them from landing in the water. He said the FO kept going through the procedure to get a relight all the way down. He said they never said they were going to shut them down and stop. He said it happened so fast, he knew the thrust levers were moved back but forget exactly who did what. He said he watched it being done; he said they may have helped each other. He said he knew they did the procedure.

He said he got the ELT as he was stepping off the airplane and people were being rescued. The airplane had not sunk yet but he thought it would so he decided to grab the maintenance logbook. He said he also got some piece of paper that he thought might be useful.

He did not remember if they had time to push the ditching push button. At that point they were very low and he was focused outside and on the airspeed.

Captain Sullenberger said his children were age 16 and 14 and that in June he will have been married for 20 years. He said he drank coffee and drank some that day in the morning with breakfast and probably right before he left for LGA for that last flight.

He said he had flown the flight into LGA. He said he usually alternated legs with the FO but because this FO was new, he could not land on special or contaminated runways. He said the FO was gifted and skilled; if he had not been told the FO was new, he never would have known it and that he had abilities and knowledge that made him believe the FO had been on the aircraft longer than he had. He stated the FO was particularly good on procedures, callouts, duties, and flawless on checklists.

Captain Sullenberger said he was a certified commercial glider pilot and glider instructor but had not flown a glider in many years. He did not think his glider experience helped him in this event because it was too many years ago. He said he thought what helped him in this incident was that he understood the concept of management of energy.

He said there was no particular reason why he did not do a single engine taxi in LGA. He did not know how long the taxi would be and he wanted to make sure they would have sufficient engine warm up time.

He said he observed the digital readouts of N1 on the upper ECAM and his impression was that they were idle or less than idle after the bird strike. He said they were very low numbers. He said the needle positions were not where they should have been. He said that, along with the tremendous thrust loss indicated to him that they had catastrophic failure of both engines.

He said the fact that they were at a high thrust setting, climb thrust, and there were no big yawing motions indicated that it was a major thrust reduction that was nearly symmetrical.

He did not recall if the FO ever stated that he finished the checklist. He said they were very time compressed and automated aural warning “too low gear, too low gear, too low gear” and radio traffic, background noise, his intense singular focus on maintaining a successful flight path made his attention narrowed. He said he doubted the FO had time to complete the dual engine failure checklist, under the circumstances. The captain thought the FO was exemplary on how much he did during the descent. He said he felt the FO’s previous Captain experience was helpful.

Captain Sullenberger stated he attempted to start APU and believed he heard an electrical transfer but was not aware if RAT deployed. He said they selected flaps to 2 for landing, he thought he felt the flaps but did not recall if he checked the ECAM to confirm if flaps got to 2.

He was not sure if they lost AC power but the captain instruments appeared to function normally until they lost power in the water. He said the Upper ECAM worked for some time but did not recall looking at it at a lower altitude.

He said he did not recall the exact numerical airspeed but looking at the speed tape he said he was "right where I wanted to be" just above $V_{LS}$. He could not recall what their weight was or how much fuel was on board.

He said he did not talk to Flight Attendants on the handset, he said he only had time to make the "brace" call.

He did not recall how far they got in the dual engine failure checklist. He said he did not think they finished but they just ran out of time, they were too low. He said they were at a low airspeed; they never got to 250 knots so they could not accelerate to 300 knots which was what the relight envelope was. He said they were below the envelope, due to the thrust loss and damage, and he thought they could not have gotten them started again.

He thought the speed when they had the bird strike was 220 knots or more, maybe approaching 250 but the thrust loss was so dramatic, he had to immediately lower the nose to maintain speed. He did not recall what the airspeed was prior to impact.

Captain Sullenberger said it was clear to him that the FO had started the checklist at the appropriate point which was "fuel remaining". He was happy that it was clear that they understood each other and worked well together without the need for a lot of words.

He did not look to verify if the RAT deployed and did not recall if they had pushed the ditching switch, he thought they had run out of time.

Just before the impact with birds, he said his head was down but he was not doing anything on the MCDU. He did not recall exactly what he was doing but said he was engaged in some pilot monitoring duty. He thought they may have received a heading or altitude change.

He said he was "not sure" if the auto pilot was ever on. When he took control of the airplane, he said he was "not sure" if he had to click off the autopilot.

He said he had called for the dual engine failure checklist but not the ditching checklist. He said he did not take part in the EVAC checklist; that he got right up and went to the back. He did not recall if he saw the FO push the fire push buttons or if he had touched any switches before he got up and went back.

He thought the radio transmission he had made was "Mayday, Mayday, Mayday; Cactus 1549, bird strike, loss of thrust both engines" on the departure frequency which he thought was 120.4.

Captain Sullenberger said there were no performance limiting factors for takeoff. He said they did a flex takeoff with the APU off.

He stated that he did not think there was any way to avoid the birds. He thought later he should have ducked below the glareshield because they were so huge. He said he did not know what a 20 pound bird would do to a windshield at about 230 knots.

He said he did not see what might have been displayed on the ECAM but he assumed there were ECAM messages.

Captain Sullenberger stated because of the circumstances he exercised his emergency authority and took over the airplane because LGA and the Hudson were on his side. He said it was more expeditious for him to do things and for the FO to hear and see his actions than for the Captain to tell him.

The engine mode selector was first on the checklist which the captain accomplished.

He said he was not certain if he moved the thrust levers. He remembered them being moved but did not recall who did it.

He thought that they were so busy that they were not confirming items. He said "Jeff was saying and doing" and he was watching and doing when he had a chance.

He said he definitely did not change the ATC code and was not certain if they had time to do the FAC 1 OFF then ON item on the checklist.

He said he remembered that they had done the "engine master" because at this point they were "trying anything possible to get the engines back". He did not remember if they did the EMER ELEC MAN ON switch. He did not remember if they got to the GPWS or the GPWS TERR switches, he thought they had run out of time. He did remember hearing the "too low gear" which made him think they did not do that. He did not recall what altitude or airspeed he heard that aural warning. He used the speed tape for the reference to his speed. He did not remember selecting the GALLEY switch, and said he thinks due to the time constraints they did not do that. He said the cabin signs were still on since they had not reached 10,000 feet, and the EMER LTS were armed. He said the CABIN PRESS AUTO remained in auto as it had been all day.

He said he had turned on the APU but did not remember if they got to the engine bleeds on the check list. He said he thought they ran out of time.

He said he commanded the evacuation by opening the door and yelled "Evacuate, Evacuate". He said he asked the FO if he finished the checklist and the FO said he finished the FO duties on EVAC duty.

Captain Sullenberger said he did not turn on the autopilot after he took control.

He said the company had debriefed them just prior to this interview. He said after the accident, he had done a breathalyzer test and a urine test at the hotel.

Captain Sullenberger said he "could not be more happy and pleased and gratified that we got 155 people off the airplane and it was due to the professionalism of my crew; Jeff, Donna, Sheila, and Doreen".

He said it was too early for him to think of any recommendations for training procedures, he had not processed this enough yet. He said every accident was different and it was important to make sure that everyone had the core values and knowledge. He said he felt it was important to train people in the process not the details of past accidents.

The interview ended at 1500.

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**Interview: Jeffrey B. Skiles, US Airways First Officer**
**Date: March 27, 2009**
**Time: 0905 EDT**
**Location: Phone interview**

Present were: David Helson, Katherine Wilson - National Transportation Safety Board (NTSB); Lori Cline – US Airways; Larry Rooney – US Airline Pilots Association (USAPA), Ricky Daniel – Federal Aviation Administration (FAA), Terry Lutz - Airbus

First Officer Skiles was represented by Captain Tom Kubik – USAPA, who joined the call after the interview was in progress at 0925.

In the interview, FO Skiles stated the following information:

The flight crew received a TPF from the company prior to each flight. The TPF included the anticipated loads and planned runways and a preliminary weight and balance was calculated about 3 hours prior to the flight. He said the actual weight and balance was received via ACARS just after pushback. He said sometimes it arrived prior to pushback but usually it arrived just after since the station agents had to enter bag and passenger loads into the system before the weight and balance could be calculated.

Mr. Skiles said for the accident flight, dispatch had not sent the final weight and balance. He said crews were not permitted to use the preliminary numbers for takeoff so captain Sullenberger had to call the Central Load Planner (CLP) during the taxi out to provide the passenger count, and complete the final weight and balance before takeoff.

He recalled a slight delay on taxi out. He said they had to hold on the taxiway opposite the American gates but he did not recall the reason for the delay.

Mr. Skiles did not recall any vehicle traffic on the runway just prior to the takeoff, and he did not recall seeing any snow, ice, or debris on the runway during the takeoff roll.

Asked what the company's procedure was when an emergency occurs, he said the captain called for the dual engine failure checklist so he went straight to the QRH. He said he had recently been through training and remembered that it was an ECAM exception which was listed on the back cover of the QRH along with the page number for the procedure. He went to the QRH because the captain called for that checklist.

While he was carrying out the procedure, he thought the left engine might be producing some power. He said the left engine N1 was higher than the other; it appeared to be in the idle range while the other one was definitely lower. He said when he got to the "throttles to idle" part of the procedure he thought the left engine was still running and he did not want to shut it down so he started working on the right one.

He selected only the right engine master to off. He did not recall if he moved the left engine thrust lever to see if there was a change. The thrust lever was at idle. When he started the procedure, the thrust levers were in the climb detent and they moved them to idle during the checklist procedure. He said the captain had his hand on the thrust levers; the captain was the one who moved them.

Mr. Skiles said during the procedure, he was looking for normal indications on the gauges to determine if the engine power was restored. He said the right engine N1 was down to about 10-15%. He said he would look at N1 to determine if the engines restarted.

Mr. Skiles said that during the event, he did not discuss with the captain, and he did not consider, using a different checklist or procedure.

He said he did not have visual contact with LGA as it was on the captain's side of the airplane. He said he heard ATC discussing landing at LGA he paused and looked up from the checklist and he thought he may have mentioned runway 13 at LGA even though he could not see it but the captain said they could not make it. He said he did see TEB but thought it was too high a risk to try to land there. Mr. Skiles said he had received some glider training a long time ago and one thing that had been instilled in him was that if you had a landing point, you did not head off to a different one unless you were sure you could make it. He said he felt that the river was the best thing they saw there. He said when the captain said they would land in the river he was "just as happy" because when he looked out there, he thought it was too high a risk to try to maneuver and line up with the runway even if they could make it. He said TEB was a little off to their right at the time and he thought it was too far away.

Mr. Skiles said he did not recall any discussion they had about the landing configuration, and he did not recall what flap setting the captain initially asked for. He said they were at flaps 2 and he asked the captain if he wanted more than flaps 2 and the captain said "no".

He said the flap handle was in position 2 but he did not recall seeing the actual flap setting on the ECAM.

Mr. Skiles said they picked up the airplane that day in CLT for the flight up to LGA. He did not recall any issues or problems with the airplane on the previous flight or on the accident flight prior to the birdstrike. He did not recall any discrepancy with the airplane they planned on documenting when they arrived back in CLT.

He said that during the event, he did not find the ATC communications to be a distraction.

Mr. Skiles did not recall if they reached the "brace" call on the checklist and thought that the captain had made that call on his own. He did not recall if they used the emergency Call button to notify the cabin. He did not recall if they had turned off the GPWS during the procedure.

Mr. Skiles did not recall if the river was calm at the time of the landing.

Mr. Skiles said he did not know if his instrument displays were functioning because he was busy looking at the checklist.

Mr. Skiles did not know what the vertical speed was supposed to be for ditching but he remembered that the pitch was supposed to be 11 degrees. He said he remembered that because he had been through training recently. He said he could not recall ever hearing that the airplane should touch down at a -0.5 degree gradient for a ditching.

Mr. Skiles said the flight deck crewmembers did not have a passenger manifest. He said that according to the FAA, the flight crew did not have to know how many people were on board and that they were given that information as a courtesy.

After the airplane ditched, he said he was on the flight deck doing the emergency evacuation checklist and had no recollection of how much time passed before he went back to the cabin. He said he never went farther aft than the over wing exits where he said the water was about knee deep.

He started collecting life vests from under the cabin passenger seats and was throwing them out through the exit doors to people outside. He said he threw most of the vests out through the over wing exits but he did take some to the people outside the 1L door. He could not recall how many vests he handed out.

He said he did not hand out any crew life vests. He said the captain told him it was time to get out of the airplane and the captain went up front to grab some coats and told him to grab his vest. That was when he put on his life vest.

Mr. Skiles said when he went back to the cabin, the life rafts were inflated and working. He said after he was on the raft at the 1L door, he released the raft from the airplane. He

said there was a pouch attached to the raft which held a cutting tool to release the raft. He said he was perched on the side of the raft and due to his position and the number of people; he had trouble finding the pouch with the cutting tool so he tried unsuccessfully to release the Girt Bar. He said Captain Sullenberger asked a crewman on one of the rescue boats for a knife. The crewman tossed down a knife which Mr. Skiles used to cut the line which attached the raft to the airplane.

Mr. Skiles said he had talked to captain Sullenberger since the accident but they had not talked specifically about the accident.

Regarding the selection of flaps, Mr. Skiles said they were at flaps 2 and realizing that they had the option of using more flaps, he queried the captain to see if he wanted additional flaps.

Mr. Skiles was asked how CRM and Threat and Error Management helped the flight crew in this accident. He said that Threat and Error Management was more procedural for example; they all point at the altitude alerter to confirm an altitude change. He said that CRM was helpful as they each had specific roles and knew what each other was doing and they interacted when they needed to.

He said he had not had any training since the accident; he was scheduled to go back to training about two weeks after this interview.

When asked if he thought there was anything that could be improved in training for this event he said he did not think so as a birdstrike like this was such an "out of the blue" situation, he did not think it would ever happen again.

When asked if he thought there was anything that could be improved in terms of checklists and procedures, Mr. Skiles said that other airplanes he flew used a QRH and followed a procedure. He said he thought the Airbus procedures were so "convoluted" between the use of a QRH, an ECAM, ECAM exceptions, and memory items. He said he did not think the QRH on this airplane was as useful as the QRH on other airplanes he flew.

When asked if he would do anything different, Mr. Skiles said he would not, he thought that landing in the river was the best option.

Mr. Skiles said that when there was a problem on the airplane, the procedure was to look at the ECAM to see what the title of the message was and to check the back of the QRH to see if it was an exception. He said if it was an exception, you would use the QRH and if it was not, you would follow the ECAM procedure.

Mr. Skiles said that in the past the weight and balance was calculated at each station but the company had changed the procedure so that it was calculated in a central location called CLP (Central Load Planning). During the taxi out on the accident flight, the captain called CLP to complete the weight and balance.

Mr. Skiles said that after the birdstrike, the thrust levers were in the climb position for a while until the checklist procedure called for them to be brought back to idle, which was five or six items down on the checklist. During that time, the engine N1 indicated idle or sub idle and he knew this based on the needle position.

Mr. Skiles said making a visual landing on the river was deceiving compared to landing on an asphalt runway. The water was just a flat surface and it was hard to judge the airplane height. He said he did not know what their height was when they deployed the flaps. He said they did not get to the "brace" call on the checklist because he did not get off of page one of the checklist.

Mr. Skiles said his life vest was an orange crew vest that he got from the flight deck. He said he only passed out the vests from under the passenger seats. He said he obtained his vest from the back of his seat. He said Capt. Sullenberger got his own vest. He did not know what color life vest the captain or the flight attendant (Donna) was wearing.

Mr. Skiles said he could not recall if they had tried to call the LGA station to obtain the weight and balance before they called the CLP. He said with all the cutbacks lately, it seemed that when you called the stations you only had a 50% chance of getting a hold of someone.

Regarding the descent toward the Hudson River, Mr. Skiles said he could not recall if it was a constant descent or if they had leveled off at anytime. He said the engine N1 was indicating idle or sub idle and he did not recall hearing any engine sounds. He added that when the Airbus comes out of climb power, he did not normally hear much in the cockpit.

Mr. Skiles said the thrust reduction altitude was 1000' above the airport elevation and that is what they set on the PERF page in the FMC.

He did not recall any discussion about the speed to be flown during the descent.

Mr. Skiles said when accomplishing the checklist procedure, he did not get past the master switches. He said he did the number 2 engine first and then they were running out of time so he set the number 1 master switch to off then on and there was only a few hundred feet left. He said there was no time to consider using another checklist such as the Ditching checklist.

He had no recollection of cycling the engine 2 master switch prior to the point when he selected it off then on in the checklist procedure. He said Capt. Sullenberger had the "presence of mind" to start the APU but he was not sure if it was up and running when he cycled the master switches. He did not recall if they had selected the APU bleed to on.

Mr. Skiles said he did not have anything additional to add.

Interview ended at 1005.

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**Interview: Chesley ("Sully") B. Sullenberger III, US Airways Captain**
**Interview date: March 27, 2009**
**Time: 1035 EDT**
**Location: via telephone**

Present were: David Helson, Katherine Wilson - National Transportation Safety Board (NTSB); Lori Cline – US Airways; Larry Rooney – US Airways Pilots Association (USAPA), Ricky Daniel – Federal Aviation Administration (FAA), Terry Lutz – Airbus. Represented by: Tom Kubik (USAPA)

In the interview Captain Sullenberger stated the following:

Captain Sullenberger was asked if there were any problems with the preflight procedures with respect to calculating and/or receiving the final weight and balance from dispatch. He did not have any recollection about that.

Asked if there were any delays prior to takeoff, Captain Sullenberger said the flight had to hold at a taxiway on the way to the runway from the gate area. He recalled a Northwest Airbus behind them in the taxi sequence who went around their flight, but he did not remember more than that. He said the delays on the runway when in "position and hold" were not significant. He did not recall being told to immediately takeoff but also did not recall a long wait and thought it was somewhere in between. He said there was no vehicle traffic on the runway. He also stated that the runway was not contaminated with snow and he recalled that the weather had cleared significantly since landing earlier at LGA.

Asked to describe the procedure for configuration of the EFIS screens, PFD and ND, for the pilot flying and the pilot not flying for takeoff, Captain Sullenberger said they normally would have them selected to the lowest range. He said the ND would be selected to the closest range. He said the ND would not be VOR mode but in its typical configuration which he thought was labeled Arc. He said it was the one that they normally used. Asked whether he or the first officer had TCAS up, he said it was normal in this airplane for the traffic to be displayed all of the time and it was not something that needed to be selected. He recalled from previous airplanes that he flew that it had to be selected.

Captain Sullenberger was asked if his PFD and ND were still functioning when he took control of the airplane. He said it was his impression that his worked after the birdstrike, "certainly the PFD seemed to". He did not recall if the FO's PFD and ND were working because they were outside his scan.

Captain Sullenberger was asked if he recalled seeing the energy circle displayed on the ND. He said there was a dashed arc that appeared in certain conditions as approaching an

airport but he did not recall if it was visible on the accident flight seeing as they were taking off.

When asked if he had a visual contact with LGA after the birdstrike, Captain Sullenberger stated that he had contact with major landmarks between them and the airport but he did not recall if he could see it over his left shoulder. He knew his general area in relation to the airport but had to focus on lowering the nose to maintain airspeed. Captain Sullenberger did not have a visual of TEB but saw major landmarks on the ground. He knew the general direction of TEB but he did not think he ever saw the airport.

Captain Sullenberger previously stated that he thought the left engine might still have some power and was asked to describe what made him think that. He clarified that his initial thought was that there was a loss of thrust that was very sudden, complete, and bilaterally symmetrical. If there had been any yawing, he would have thought that some power remained on one engine. He said he looked at the upper ECAM and saw sub-idle conditions, but the indications on the left may have been slightly higher than on the right. He said the airplane was flying in such a way that it told him that there was a loss of thrust on both engines and also the rate of descent confirmed that. He felt that if there were any usable thrust, the rate of descent would not have been so great.

Captain Sullenberger said he did not recall considering the use of another checklist and said it seemed clear to him that the dual engine failure checklist was the priority.

Asked about the flap setting selected prior to landing, Captain Sullenberger said that he called for flaps 2 and believed that they achieved that because he saw FO Skiles move the flap handle, felt the flap extension begin and the aircraft made the movement and sound that the flap extension usually made, and he observed on his PFD on the speed tape that a lower speed was possible. Asked why he made the decision to continue the landing with Flaps 2, Captain Sullenberger stated that there were operational advantages to using Flaps 2 that became obvious to him. He knew that going to Flaps 3 would not give him much more of an advantage in terms of lowering the stall speed and drag would have increased. He said he was concerned about having enough energy remaining to successfully flare the airplane and reduce the rate of descent sufficiently for landing. From his experience, Flaps 2 would give him a slightly higher nose attitude when landing. He said he felt that in the accident situation, Flaps 2 was the optimum setting.

Captain Sullenberger was asked whether the evacuation call he made from the cockpit was immediately after the ditching. He said it occurred very quickly after they stopped. The first thing that happened was that FO Skiles got out his QRH and did his duties for the evacuation. Captain Sullenberger considered completing his checklist but realized that the items on his would not help the situation and he thought evacuating was better than waiting. He said the evacuation call happened a few seconds after they stopped. Captain Sullenberger did not recall water in the cabin when he made the call but stated that he could only see the forward portion of the cabin.

Captain Sullenberger did not recall any discrepancies in the preflight or items that needed to be written up on the aircraft if the flight had arrived in CLT.

Captain Sullenberger stated that the communications with ATC were helpful, were not a distraction and were not too much. He said it was appropriate for the situation.

Asked if he was prompted based on callouts by FO Skiles to make the brace call, he said no and that he just knew it was necessary. He did not ring the cabin bell prior to that to alert the cabin crew of the emergency.

Asked if he had all of his flight instruments after the birdstrike, he said he had all of them that were in his scan, which was essentially his PFD.

Captain Sullenberger did not recall turning off the GPWS and did not think that it was turned off.

Captain Sullenberger stated that the river looked calm as they were approaching it for landing.

Asked if he was aware of what the optimum pitch was and vertical speed for landing, he said he would have to refer to the written guidance. He stated he was looking for 10 degrees of nose up or less. He did not recall any training on flying a -0.5 degree gradient when ditching.

When asked if the approach to landing appeared to be normal under the circumstances, Captain Sullenberger said the airplane seemed to be flying well but he did not recall.

Captain Sullenberger stated that the Airbus training he received was at US Airways in Charlotte, NC.

In the previous interview with Captain Sullenberger, he stated that what helped him during this situation was that he “understood the concept of management of energy”. He was asked to further explain what he meant. He said he was not specifically referring to ditching but about the entire incident. He said since the situation was so time critical, at such a low speed and altitude over populated area, with so few options, he was able to fairly quickly consider all of the alternatives he was aware of and pick the one that would lead to the best outcome. There was not a lot of time to review the options. Asked where he learned about energy management, he stated the difference between flying a smaller and larger airplane is the energy involved and the total energy was the sum of two terms – height, which represents potential energy, and kinetic energy. He said raising the nose would decrease kinetic and increase potential, and vice versa. He said it was those sorts of things that were required to successfully fly a jet because there are higher speeds and altitudes involved. He thought it was something that was gained through experience.

Asked if there were any visual challenges when landing on the river versus a runway, he said it was harder than on land. He said there was a much more uniform visual field, less contrast and fewer landmarks.

Asked how he felt the descent rate was, he stated it was as good as it could be in the circumstances.

Captain Sullenberger stated that in annual recurrent training at US Airways they are taught to land near vessels when ditching because a rescue might be sooner.

He stated after the birdstrike, he lowered the nose to obtain green dot airspeed, which was displayed on the speed tape of the PFD.

When asked whether he relayed to anyone at US Airways the passenger and crew manifest, he said he did not recall all of the notifications that he made. After his safety duties of making sure that all passengers were rescued and off of the airplane, that the injured were being treated and his crew assembled, he made several calls to US Airways to let them know how many people they were accounting for. He said he did not know for certainty that everyone was rescued because some passengers were taken to New Jersey and others to NY/Manhattan. He said he made sure that everyone he could see was rescued from the wings and the rafts, but he did not know for certainty until hours later when he heard all passengers were accounted for.

Captain Sullenberger did not recall the amount of time that passed until the water reached "knee deep" around the overwing exits. He thought it was minutes.

Captain Sullenberger assisted in retrieving life vests for passengers from under the seats in the main passenger cabin, but did not recall how many he got. He passed life vests to passengers on the wings but did not recall if he gave any life vests to passengers in the rafts. He did not see any passengers with crew life vests on. He got his life vest from behind the captain's seat and put it on as he was exiting the aircraft.

Asked if there were any problems with the life rafts, he said not with the rafts per se. He said the 1R door raft could not be detached by the flight attendant but he was able to free it. He said he pulled up the Velcro covering the attachment on the floor and was able to detach the 1R raft that way. After that he exited and got in the 1L raft which was still tethered. Neither he nor FO Skiles could detach it so they asked for a knife from a crew member on one of the rescue boats so they could cut the lanyard. He stated that the raft was so full with people that they could not find the knife on the raft and it was more expedient to borrow a knife.

Captain Sullenberger was asked to describe how CRM helped during the accident flight. He said he was a big believer in it and had been involved in CRM at US Airways since its inception. He said it was not uncommon at a large airline for people to have not flown together or have met and crews had to be interchangeable. He said at US Airways they were, and their CRM gave them the skills and tools that they needed to build a team

quickly and open lines of communication, share common goals and work together. He thought that because FO Skiles had previously been a captain, it was easy for them to do it. He said due to the time pressure, they could not discuss every part of the decision process, so they had to listen to each other and observe each other to understand that they were on the same page without having to verbalize every part of it.

Captain Sullenberger had not received any training since the accident. Asked if he had any recommendations for improving the training at US Airways if a crew were to be faced with a similar situation again, he said "no, not really". He said they got good training at US Airways, but in this situation he thought the flight crew was about as well prepared as they could have been for a situation that was so unexpected and so unanticipated. He said he would leave it to others to make those determinations.

Asked if he had any recommendations for improving the QRH, he felt that there needed to be a low level altitude, imminent landing checklist that could be done quicker with a couple of memory items. He recalled that he and FO Skiles did a few memory items that helped them because they did not get to them on the checklist. He also recalled that they used to have a tabbed QRH in which the page numbers were located on the tabs making it easy to find a procedure, but for the last several years the numbers have been printed on the pages and are not as easy and quick to find.

Captain Sullenberger was asked, now that he had time to think about the accident, if there was anything that he would have done differently. He said the "short answer was no". He said they were faced with an immediate and immense challenge and they were fortunate to have the outcome they did. For that reason, he was hesitant to venture out there. However, he felt that how procedures or training might be done was a totally separate thought that was needed.

Captain Sullenberger did not recall the color of the life vests on other crew members.

Captain Sullenberger did not recall calling CLP to receive their weight and balance.

Captain Sullenberger stated that the power loss was drastic and there was no yawing. This occurred when the thrust levers were set to climb detent.

Asked why he felt that the river was a superior landing choice, Captain Sullenberger stated that choosing to return to LGA was an irrevocable choice, and if he had made a turn toward LGA then realized he could not make it, he would have had no other options or enough altitude to return to the river. He was told that he cleared the George Washington Bridge by 900 feet. He stated before he would make the decision to land on a runway, he would need to be sure that he could make it without landing short or long, he could line up the flight path with the runway, he could stay on the runway, and that he would have a sink rate that was survivable and would not collapse the landing gear and create a post crash fire. He thought that being a little short could have been catastrophic for those on the airplane or those on the ground. He could not afford to make the wrong decision and he was confident that he could make a successful water landing.

Asked if he felt the ECAM and QRH were cumbersome, Captain Sullenberger said yes. He stated he always felt that it was not an optimum situation to have ECAM exceptions and different categories of when to use ECAM, when they should not use ECAM and when they should refer to the QRH.

Thoughts on choosing river or LGA into the context of Threat and Error Management: it was clear to me based on our position, altitude and airspeed and heading away from airport and time it required me to maintain control of airplane and analyze situation that a return to LGA was not possible. We were too far away, too low and too slow for TEB. Only other option that was long enough, smooth enough, wide enough was the river.

Captain Sullenberger stated that after the birdstrike he obtained green dot speed and thought the speed was just over 200 knots. He thought he was able to hold that speed until about the time they were configured for landing.

Capt. Sullenberger stated that his decision to start the APU was something he felt like he had to do, but was not something he had been trained.

Captain Sullenberger was asked if it was standard procedure at US Airways when starting the APU to select the start button immediately after selecting the APU master switch to on. Captain Sullenberger said he thought the procedure at US Airways was to wait for the flap to open before selecting the APU start button.

Captain Sullenberger said that FO Skiles was completing the checklist and the masters on/off were done using the QRH procedure.

Asked what his target speed was when using Flaps 2, Captain Sullenberger said that he was referencing the speed tape and keeping it safely above $V_{LS}$ but he did not remember what the speed was. Captain Sullenberger did not recall the differences in reference speeds for Flaps 2 versus Flaps 3.

When asked if he listened to the auto callouts when landing in general, Captain Sullenberger said he used a combination of the visual picture and the auto callouts. On the accident flight, he did not recall hearing the auto callouts.

There was nothing else that Captain Sullenberger wanted to state or wished he had been asked.

Interview ended at 1145.