Docket No. SA-531

Exhibit No. 2-B

NATIONAL TRANSPORTATION SAFETY BOARD

Washington, D.C.

Operations Group Chairman
Interview Summaries during Field Investigation - Buffalo

(51 Pages)

Interview:	**Philip Garrett Huff Comparetto, First Officer**
Date/time:	**17 February 2009, 1810 est**
Location:	**Marriott Buffalo-Niagara, Amherst, NY**
Present:	**Cox, Byrne, NTSB; Dittmar, Colgan; Wickboldt, ALPA; Conway, FAA; Simpkins, Bombardier; Webster, TSB-C**
Represented by:	**Dane Jaques**

Age 23. Date of hire with Colgan March 28, 2008. Has commercial multi engine land SIC in Dash 8. CFI as well. Total flying time 1000-1200 hours. Of that about 475-500 hours in the Dash 8 at Colgan.

He flew with Captain Renslow. He was a very confident in his abilities. Told Comparetto he was new to the Dash 8. Said he welcomed any comments and concerns over anything – if Comparetto didn't feel comfortable to speak up, and whether Comparetto was right or wrong Renslow wouldn't look down or reprimand him. Seemed very competent in his ability to fly in the airplane.

Renslow was on par with a captain who had the amount of time in the airplane. Knew how to fly very well. Very competent in the airplane. Knew systems very well. Things that were a little bit rougher was programming the FMS. Didn't have the lightning quick fingers that people have now. Renslow would always double check Comparetto's work – and was constantly trying to learn as much as he could. Renslow was laid back, in the sense he welcomed comments or concerns from him and the entire crew. Could be aggressive if he wanted to but Comparetto never saw it. Always had a smile on his face. Renslow did everything to make sure he got everything done correctly but it was enjoyable at the same time.

Renslow mentioned previously working for a NASCAR race team doing promotion events. Comparetto thought he had been in an aviation department for a NASCAR team but he wasn't sure.

The captain resided in FL. On the last day of the trip he was ready to go home. After 2 or 3 days at home he wasn't ready to go back to flying – there never is enough time at home Comparetto said.

Comparetto said he occasionally flew in icing conditions. Comparetto said he couldn't recall ever having had the occasion to fly in icing conditions on approach and landing.

He was asked about speed control in the airplane. Comparetto remembered descending a few times and looking up and it was not to the point of an overspeed, but he pointed it out to Renslow who corrected it and said thanks. Comparetto said the airplane has a lot of power and it can overspeed if you're not careful.

He said it was a quiet airplane in the cockpit. A lot quieter than he thought it would be – he came from light piston airplanes previously.

He said that cues he uses to help with power management when descending is that 1000 feet away from their target altitude the airplane has a warning tone. That beeps at the pilots and both will look at that. From there you can set your power at whatever it is you need.

He estimated the throw on thrust lever and said it has a decent amount of throw. From flight idle to 240 or 250 it's about half the throw. If he had to guess he'd say between 4 and 6 inches – normally it is just feel so he doesn't know for sure. You can see the other pilot moving the thrust levers in your peripheral vision if you're looking forward.

He has noticed people not putting in full power during climb after looking at the engine display and pointed it out to them. He did not notice Renslow, or others, not bringing the power up during level off.

On their engine display there is bug indicating the desired power setting for a particular phase of flight. He said you put the needles into the bug.

You select cruise power by putting it into the one detent available. The FADEC can determine climb power or cruise power. If that cruise setting is increasing speed you've got to obviously pull it back to maintain the speed you want.

Descent clean and 200 knots he thinks torque would be between 30-40 percent torque. Flaps 5 using 180 knots torque setting of 18-25 percent. He could be wrong there – more like 25-30 percent. Thrust lever is pretty far aft then. Gear down, flaps 15 to maintain level flight you're probably talking about 30-40 percent torque. The intercept glide slope and start descent target would be between 15-18 percent.

He really doesn't know what friends Renslow had at EWR. He was relatively new there. Wasn't sure about his seniority either. When they flew together Comparetto was holding a line – he assumed that Renslow was too.

He said if he's looking away from the power levers he can't see the captain moving them. But he can see it if looking forward. In cruise flight it is fairly noticeable he said.

He described moving the flaps from Flaps 5 to 15. The flap lever has trigger mechanism. You have to lift and drop at the 10 deg gate. Then lift and drop one more notch to flap 15. You only need to wait long enough to release your finger and pull trigger again.

He was paired with Renslow out of chance – it was not a buddy bid.

When he flew with Renslow, when they were done Renslow caught the first flight available to return home to FL. Comparetto thought it was a Continental airplane.

As far as he knows Renslow didn't have a crash pad. Remembers Renslow saying that he wanted to get one. Thought Renslow would get a hotel for a day, or use the crew room. Comparetto wouldn't want to spend the night there. He said it can get quite busy during shift change. When morning crews are getting done and afternoon crews are coming in it can get kind of loud. Comparetto said some can sleep better than others in those conditions.

Low speed awareness. Comparetto said it can be tough when you get busy. Running checklists or talking on the radio. There is a sound that helps him. He's so used to hearing the wind noise that it catches his attention when the aircraft slows down. He can usually notice it around 200 knots. After you've flown the airplane you can tell between 280 and 190. He said it is very quiet when the power is pulled back and you start getting slow. There is also an airspeed tape on the left hand side which has a red mark when you get close to a stall. It's a red visual tape creeping up from the bottom of the airspeed tape.

He has never experienced the stick pusher in the airplane. In the simulator he did it once. Simulator/training partner asked if they could let it go to the pusher.

He's on probation for the first year. Recently they put out a FO evaluation program. It's a means for checking performance and measure how they do. Program just came into effect when he was flying with Renslow. It is the FO's duty to ask the captain to fill out the form. He is unsure whether the FO has to provide the form or just remind the captain to fill one out.

He liked the way Renslow set the tone in the cockpit. Renslow told everybody if there was something anyone had a problem with to let him know. He told the crew to feel free to speak up and he would do everything he could to take care of the problem. Renslow made him understand they were equals on the flight deck. Encouraged Comparetto to speak up if there was a problem and vice versa. Renslow welcomed comments and criticism. Comparetto said Renslow liked to have fun, but added that wasn't really the way to describe it. The better way to describe it was that Renslow liked it to be an enjoyable workplace Comparetto said.

He said on the ground they worked well together. Because he was new to the aircraft Renslow asked for his help with ground taxi instructions. They went through the checklists. Once at cruise and had chance to relax they would chat along the way. Then it was back to business.

Comparetto said there was not a whole lot of conversation at cruise. Described it as mostly just idle chat, making conversation. About 5 or 10 minutes before they started to descend they'd pick up ATIS and start talking weather and approach briefings and get back to flying the airplane. During the descent there was maybe a little bit of conversation as they were starting the descent. However, mostly it was just checklists and getting ready to land. Comparetto said that for the descent the FO would be off on the radio talking to ground controls, making passenger briefings, etc.

Comparetto described Renslow's greatest strength as being competent. He was competent in both his ability to fly the airplane and his authority as a captain. Renslow knew his and others' jobs. Renslow made sure he did what he needed to do to get everyone on and off the airplane safely and on time. Made him feel like equals in the cockpit.

He doesn't know Renslow's reputation around the base.

Comparetto talked to FO Shaw a few times in passing in the crew room. Last time he talked to her was the day of the accident. He got in around 1000-1200 and somewhere about then saw her sitting on the couch watching TV. She said she wasn't sitting on hot reserve but her first 2 flights had been canceled. She was waiting for her flight to Buffalo. That was extent of the conversation. Really can't comment on her appearance. Previously had just talked a few times in passing. Knew her first name from someone else. She was not sitting with anyone at the time. Comparetto had just come in from his crash pad and it was sometime in the early afternoon. He said it usually takes him 10-15 minutes to drive from the crash pad to the airport and he normally leaves the pad about an hour before showtime.

He saw Renslow the morning of the accident when he walked into crew room and checked in. Normal conversation of just hello etc. Renslow was doing something in the office. He thought it was 1300-1400. Renslow was updating manuals in the aircraft. When Comparetto left to go to the plane Renslow went out and stood and talked to him for a few minutes – just idle chitchat. He appeared fine. He was joking with FA's.

Comparetto saw Shaw around 1000-1100 when he walked into the crew room. Then he went to go get some food. He then went back to go to the airplane around 1300-1400 and that's when Renslow walked up.

Comparetto flew the majority of January 2009 with Renslow.

Renslow told Comparetto he was trying to get around paying for a crash pad. To do that he was bidding lines that had overnights or had commutable both ends. A few times he'd say he stayed in the crew room. Another time he may have gotten a hotel room.

He was asked about Colgan's fatigue policy. He was aware of it. He had not used it. Had not heard of anyone using it.

He said the plane will overspeed in cruise flight if you have the thrust too high. He clarified and then said it is common in level cruise flight to have the power levers aft of the detent.

When he saw Shaw she said she commuted in that morning from Seattle. When she got there she found out her flight was canceled. Comparetto said that sometimes you get notified before you arrive for your flight, and sometimes you don't.

Comparetto said that Colgan Air adheres to sterile cockpit procedures.

Comparetto said captain's are standardized and that he knows if he flies with different captains the standardization is there.

Comparetto said his last simulator training would probably be end of April or beginning of May. He did his simulator in Seattle and his checkride in St. Louis. They covered approach to stalls and recovery. In the sim for the approach to stall training maneuver they would turn AP and FD off, pull power back, and slowly pitch nose up and add flaps until they got the shaker. Then they'd go full power, flaps 35 to flaps 15, and then when got to flap retraction speed lower the nose and keep flying. He described the pitch attitude during the recovery as fairly high nose up pitch but to lower the nose to keep airplane flying. They're targeting 4 deg nose up in the recovery and trying to lose no altitude - which after some practice they were able to do.

He described the pusher demonstration. They had mentioned to their sim instructor they'd like to see what the pusher did. The pusher pushed the yoke forward and then they took it and recovered.

When they allowed the pusher to activate in sim training it was aggressive. He can't remember if it completely recovered the stall or gave you a pretty good starting point to recover from.

Stall recovery pitch attitude – he said hold 4 deg or possibly just at the horizon to prevent altitude loss.

He elaborated on his comment that Renslow was different from other captains he flies with – He said Renslow was happy and told him to speak up – he pointed out he was new to the aircraft. For most captains it's in their briefing to speak up and vice versa. Renslow's was a bit longer. Renslow told him that he felt confident in his training but he is still learning to speak up.

He said describing Renslow as laid back wasn't the best way to describe him. Calm may be a better way to do so. When they were close to being late and Comparetto would start getting in a hurry Renslow would say there's no point to missing something by rushing. If they go out 2 minutes late then they go out 2 minutes late.

He said Renslow did not ask him to specifically turn off the pitot heats after landing. He noticed a few times on landing that Renslow hadn't done it and Comparetto asked if Renslow wanted him to switch it off and Renslow said yes.

How did delays affect Renslow? Nobody likes sitting on the ground for 4 or 5 hours. Wasn't the kind of guy who let little things bother him. On the ground for a little while. At the end of the pairing was there any hurrying to get back? Normally it was 15-20

minutes at the most and his flight didn't leave until 10-11 when they'd get in about 0830. Comparetto never saw him agitated or bothered by anything.

Conditions at EWR on the 12th? Windy, very windy, out of the west as they were landing on 29, and allowing a few aircraft to depart off runway 22. Long delays. His crew got in plane and left and it was 45 min before they got off the ground. They got back close to midnight.

Comparetto wears a noise canceling headset. Does not remember if Renslow's was noise canceling or not. He thought it was a David Clark headset though.

Comparetto has turned in an ASAP report at the company.

He has never moved flaps in flight without telling the other pilot without being asked.

Comparetto likes the stand-ups, but they do get tiring. He didn't feel unsafe to fly when he awoke. He was never more tired on a stand-up than he would have been on any morning flight.

Comparetto has had scheduling call and tell him his flights were canceled. If they show up and they're canceled duty time begins at showtime. If enroute, it depends when duty time is calculated.

He can't remember who initiated the suggestion of the pusher demonstration. The instructor was describing something about the pusher, an done of them requested a demo.

Interview ended about 1915.

Interview:	**Timothy Richard Dittmar, Captain / APD / Checkairman**
Date/time:	**17 February 2009, 0822 est**
Location:	**Marriott Buffalo-Niagara, Amherst, NY**
Present:	**Cox, Byrne, NTSB; Dittmar, Colgan;**
	Wickboldt, ALPA; Conway, FAA;
	Simpkins, Bombardier; Webster, TSB-C
Represented by:	**Dane Jaques**

During the interview Timothy Richard Dittmar stated the following information:

He is 29 years old. He holds an ATP with SF-340, Dash 8, and 737 type rating. Currently APD on Q400, checkairman on the SF-340 and the Q400. He does not have a CFI. ATP is multiengine, commercial is single engine. He's also got an advanced ground instructor rating. He has about 6,000 hours total flying time, including about 500 hours in the Q400 (all PIC), 3,000 hours in turbine airplanes. His date of hire was 3/17/2005. Before Colgan he was a flight instructor at Farmingdale State University. He currently lives in NY. When he came to Colgan he had about 2,800-3,000 hours.

He gave Captain Renslow his initial type rating on the Q400 on November 18, 2008. This was done in St. Louis. No training or checking of the Captain before. This was the first time he met Captain Renslow. No failures or items on the checkride that needed to be repeated. No areas where Renslow wasn't as proficient as Dittmar had expected from a captain. Doesn't recall any areas where Renslow was especially proficient.

Dittmar became a checkairman on the Q400 in February last year. He did training on the Q400 in Toronto and Seattle. Did ground school at Flight Safety and simulator work in Seattle. Dittmar's type ride was done by Bill Honan who is now the chief pilot at Colgan (at the time he was not).

Dittmar does not know how many check rides he's conducted at Colgan. He estimated that he's done about 10-15 initial type ratings. PC's he doesn't know and line checks he estimated to be more than 25. He also does IOE. Has done a lot of IOE's. He does not recall giving an unsat on any initial type rides, PC's, or line checks. He has had people who needed more IOE. He's not sure if any of those pilots were terminated later.

He's doing both first officer and captain's checks. New first officers at Colgan get an SIC check and Dittmar does those too. A year after first officers get on the line they get a PC.

They have had new hires in the last year. Doesn't know how many. He described the average flight experience for the Q400 new hires as over 1000 hours. Some people are hired directly into the SF-340. He's not sure about the hours or criteria for that fleet – it may depend on the results of the initial simulator screening.

Minimum IOE for new hires is 30 hours reducible by 5 percent – for example, if someone has 28.7 hours and can be signed off. There is a new policy that if it appears more than 30 hours will be needed for IOE to contact the flight standards office and check with them. He knows people have gone beyond 30 hours but does not know how far beyond and whom.

He was asked to describe Renslow's check ride. When Renslow showed up they did the oral. Dittmar remembers him doing really well in the oral portion of it. Renslow was doing a PIC check and the FO he was with was doing an SIC check. No portions of the oral was unsat. Dittmar described Renslow as well above average in the sim – top 75 percent. At the end of the checkride Renslow was extremely happy he passed. He was very excited and tired for sitting a 6 hour checkride which was the total time for both the PIC's and SIC's checks. Dittmar does not recall who the SIC was during the checkride.

Sam Omair was with Tim during the checkride observing. Tim discussed the captain's performance with Sam during the check. Talked with Sam about things to look for in checkrides and how it was good.

Dittmar said anything outside PTS standards is something he will not allow to be passed in a checkride.

At the time Dittmar was hired, his hours were slightly higher than some in the class. Most everyone in his class had 1400 to 2000 hours or more. They included airline pilots, x-military, etc. He thinks it is lower than that now but he wasn't certain – estimating that perhaps now it's 1000-1500 hours as a normal.

They have turnover in pilots at Colgan. Most go to Continental, NW, Airtran, Delta. Couple guys with USAir. Moving on to larger operators and aircraft. Some people do stay however.

He characterized the deicing system on the airplane and said it wasn't any more complex than any other system he's seen. It was reliable. Only problem's he's seen is a deice pressure light once and a MEL another time but overall it's been reliable. There have been no bulletins about the deice system on the airplane issued by Colgan outside the manuals.

He described the ice protection check first flight of the day. He said it actually wasn't a first flight of a day check but a 24 hour check. Included in the check is switching the system from fast to slow to manual to make sure the boots are cycling properly and they get the associated indicator lights associated. Also, opening and closing the inlet doors, and using the prop on test function, checking the increased ref speed switch, and windshield heat is also checked. He said the test takes about 5 minutes. The ice protection check is done in the air. The other 24 hour checks are done on the ground. The ice protection check is recorded in the maintenance log – unless it is icing conditions because you can't test the system by recycling the inlet doors etc. The CFM outlines the check and contains information on the check that is almost a section of the AFM.

He has never used the ice protection system in manual outside of the check purposes. He has used it in slow cycle – for light icing. He turns the increased ref switch on when the rest of the deicing system is turned on.

He said that if taking off in icing conditions engine inlets, props, and windshield heat will be turned on before takeoff; and the boots and props will be turned on when airborne. On landing you can leave the pitot on until you get to the gate. It is pilots discretion whether to turn it off on the after landing checklist or at the gate. The parking checklist states ice protection. The expanded checklist includes flows. Part of the flows says to set the ice protection as needed.

Use of the autopilot system is prohibited in severe icing. He said severe ice is freezing rain, or you have excessive ice build up on the wingtips or side windows and airspeed decreasing. He has not experienced severe icing in this airplane but has experienced moderate icing. He said in icing he has not experienced any unusual handling characteristics in the Q400. He has observed ice build up on the airplane by visual inspection of the left wing. He can see the whole wing from the engine outboard. You see the cycles functioning and the ice flying off the wing. He doesn't see any protected areas where the ice doesn't break off.

You can't do an autoland in the airplane. The lowest point to leave AP connected is 200 feet. He said it was not common for pilots to make coupled approaches to 200 feet. Most pilots disconnect the autopilot on approach around 1000 feet, unless you're in bad weather below 1000 feet where most pilots would keep the AP connected. It's not prohibited for a Colgan captain to fly a raw data approach to minimums.

He described stabilized approach criteria as needing to be on speed, configured, and in a position to make a normal descent to the runway. In IMC minimum altitude is 1000 feet and VMC is 500 feet. The flap setting should be briefed.

He noted that if you're getting ice on the airplane on the ground you can take off with the deice system on.

He was not familiar with the term 'bleeding speed approach.'

He'd be 180 knots or more up to 5 miles at EWR if being sequenced. Keeping the speed up is a tighter option. Under IMC maneuvering max 180 knots. He said it was not customary to go 210 until the last minute. Has never seen that on an approach. 99 percent of the time it's 180 at EWR. There is a strict profile for IMC. Must be configured before final profile.

He said to slow the airplane in hurry you dirty it up, power to idle, flaps, put down the gear. Max speed on the gear is 200 knots. Flaps 5 also at 200.

What happens to the props when you're maintaining a constant altitude with the thrust levers pulled back? He said they're at whatever RPM you've set them at – would be at 850 RPM if that's where you've set them. Propeller pitch decreases as the airplane slows down.

Dittmar started in March 2005 and finished IOE in May. Originally based in HEF on SF-340. 10 months to year later he upgraded to CA in March 2006 on SF-340. Was in Binghamton for a couple months, then Maine, and then LGA. Became Check airman in Saab in 2007 and also a sim instructor. In January 2008 he began training on Q400. Was made a check airman right away -- PC check airman, sim instructor. In October 2008 he became an APD.
He received training for the APD. Went to ground school with company for 5 hours. Also FAA ground school. Observed 2 actual checkrides. Then had to go for a simulator evaluation with FAA observing him giving checkride.

He said the director of flight standards selects the APD's. They look at the pilot resumes and discuss with the FAA who they think would make a good candidate.

When he is giving checkrides he fills out the PC check forms, 8710's and stuff like that. Only fills out the boxes for sat/unsat/trained to proficiency. No qualitative or descriptive comments are entered on the forms.

He said you use slow or fast on the boot cycle depending on what you need. He said there wasn't specific guidance about that in the CFM and doesn't recall that from training. Use visual cues – what type of ice and how much. If it isn't shedding on slow use fast. He said he didn't know if the use of slow for light icing like he does is standardized or not, or who else uses slow.

He did not recall who his instructors were in SEA.

He turns the system on in the following order: boots, prop, windshield heat, and increased ref speed. No guidance on which switch comes first in the flow.

The aircraft can dispatch with AP inop.

Regarding the use of the AP for passenger comfort he said perhaps it reduces oscillations. However, the company doesn't teach it that way. It is for safety. The use of automation, if available, is encouraged but not required.

He last saw captain Renslow on the day of the accident. He saw him a couple times that day in the crew room. The last time was sometime around 1930-2000 in crew room. Renslow was just sitting and talking to other crews. Talking to the flight attendants and another captain. He didn't know who the other pilots were. Dittmar has been based in EWR, since last January. He said Renslow was in the room that had a kitchen area, fridge, a TV, and table chairs. They also have another area with a TV, couches and more comfortable chairs. It is not a quiet area.

He was asked about activities observed earlier in the day. He wasn't sure what. He did see Renslow asking the administration assistant, Kristin Gray, a question. He didn't see him sleeping or resting or napping in other areas.

When he saw Renslow the last time he appeared normal, fine. Sounded normal as he always does.

He was asked about Renslow's reputation at EWR and said that he hadn't heard anyone speak about Renslow.

He said Renslow was putting updates on the airplane. Not unusual if someone is on reserve and flights get canceled. The get extra pay to do the revisions.

He was asked what he looks for during a check regarding pilot monitoring. He said follow SOP's and standardization. Making sure they're doing proper procedures. Speed awareness, stabilized app criteria, etc. Speed call outs if not on speed. Speed off by 10 knots needs to be called out but Vref is a hard limit and he would expect to hear a callout if speed dropped below that.

He last went through recurrent training the 3rd week in January in HEF. He attended the winter ops module. He described it as covering current procedures, usage of APU during icing, weather videos, and current issues were a factor. Regarding current issues he said that Colgan had an APU incident. They also covered the deice procedures for every airport, procedures for alternating engines deicing, operating the equipment, and the proper way to use the ice protection – not waiting for the ice detect message. He said the detect message is a fail safe not your guidance. The videos they watched talked about speed degradation, how an increase in icing on wing will decrease lift. The videos go in depth – start by showing different types of ice, and the performance effects on the airplane. They were two NASA videos. The aircraft in the video was a twin otter. Tailplane stall briefly discussed in one of the videos and requires recovery procedures opposite those used for a regular stall. Not every airplane is susceptible to this type of stall. The instructor discussed that the taiplane stall wasn't a case for Q400, but was there for informational purposes. Dittmar thought the videos were shown primarily for showing the possibilities for different types of ice.

Colgan had a new chapter 7 and revision to the appendix for winter operations. They put out a winter operations quiz to all the pilots. It included procedures, holdover times, takeoff contamination check. He doesn't recall if it addressed in-flight procedures.

He sees FAA inspectors fairly often on his jumpseat. 7 or 8 times this year. Two were Fed rides for Captains. A couple were checking operations. He hasn't seen Colgan management personnel on his jumpseat.

He has 3 or 4 FO evaluation forms in his mail box that he needs to fill out.

If he has a concern about a FO he talks to flight standards or the chief pilot. Has not done that with any FO he's flown with – outside of IOE.

Dittmar knew FO Shaw on a limited basis. Early on in the operation he was doing a line check on a captain and she was the FO. He didn't remember the CA's name. He remembered Shaw because she was the only female first officer they had at the time. Nothing stands out from that flight about her performance. He hasn't heard much about Shaw. He said she was based in ORF. He didn't recall the last time he saw her – but knows he had not seen her on February 12.

Windshield heat works very good. It works fine. After the windshield heat is on he's never had an issue of ice continuing to adhere to the windshield. Has not experienced any frosting over with the windshield heat on. He said normally in clear weather you aren't using windshield heat – it is related to de-ice function not bird proofing.

In the AOM it discusses side window and airplane wing tip as being possibilities of severe icing. He has not seen side window ice in this airplane. He said he fly's in icing all the time. The side window ice is not the only indication – you can look out and see a large amount of ice on the airplane wing and wing tip, severe ice builds up on the spinner, windshield, airspeed starts to go down. You use all cues not just ice on the side window. If it is severe you get out and go to another airport.

Use of flaps – same criteria and same profile for flaps 35 or flaps 15. In VMC follow the visual approach criteria. If flaps 15 you can go to a greater flap setting at a later time.

The NASA video described the tailplane stall and the procedure for recovering from it. The Colgan instructor did explain that it was not typical for a Q400 aircraft. The recovery was flaps back to previous setting, gear up, power off and pull back. They explained why you do that on the video is because of the opposite effect on the elevator vs. the wings. The instructor explained it was a portion of the video that didn't pertain to the Q400. At one point he explained to the class it wasn't a typical scenario for the Q400.

He described stall recovery procedures during his initial training on the Q400. Stall recovery procedure training was: if doing a takeoff stall, stall with 20 deg bank in it, say 'stall' at first indication of stall, check power, positive rate, gear up, Vfri, flaps up, accelerate to 160 knots, while maintaining altitude. Landing stalls were in flaps 35 configuration. Stall check power flaps 15, positive rate gear up, …. Clean stall, no flaps, fly out…. PTS standards are the only standards for performance on those maneuvers. They are accomplished at 5000 feet.

In training he has seen some issues with pilots maintaining plus/minus 100 feet. Has never come close to failing anybody on a stall procedure in a checking event. Has had to train to proficiency in a stall one time – they'd lost 200 feet. Retrained them for it. Did it again fine.

The hard limits on the checkride have to be 100 percent. If they go outside the limits that it is a failure and obviously they bust the checkride.

Captain would be checked in 6 months and a first officer for 1 year.

Can't remember the stall procedures in the Saab because he has tried to get that out of his head since transitioning to the Q400. Stall recovery is similar to a Q400.

Differences between the two aircraft? More glass in the Q400 than the SF-340. Pilot monitoring vs. pilot not flying. V1 cut in Saab.

There is no difference in the Q400 training syllabus for CA and FO.

The syllabus touches on incorporating icing into a minimum of one lesson, maybe more. He brings it in on checkrides too. He uses an icing scenario for both pilots. It could be during departure – depends on scenario, whether it is a use of the system or failure of the system. There is a PC form at the end of the type ride and there is a section there for icing. For the PTS type ride an icing scenario is not required.

He was asked whether the Saab 340 is susceptible to tailplane stall and answered, yes. Any other training taught or checked addressing tailplane stalls on the 340. Nothing on the Q400.

There's only been one person he's seen that has had some sort of training event after a checkride. He said that for an IOE you don't get an unsat, you get more time. He hasn't had any of his students be terminated for not finishing IOE. Has had some who were not ready and needed more time. If someone is close to the hours that are set they're in constant contact with flight standards. They'll either give them more time or put them with another instructor. They have criteria they use to make those determinations.

Approach briefing. Documented in the manual of what's required. Transfer controls during the approach briefing. Brief the actual instrument approach, if visual approach back it up with glide slope. Brief full approach including frequencies, altitudes, minimum altitudes, msa's, missed approach procedures, visibility, lighting, airport lighting, use of automation on the missed approach procedure, runway environment, runway length, turnoffs, required distances, airspeeds, flap setting, and any abnormalities if there's something wrong or something special that needs to be discussed.

Vref speeds would be bugged when they come back from ACARS anywhere from 20-30 minutes out.

In icing conditions you discuss the possibility of icing, what your determination is if you'll turn off the deicing equipment, if you do, speeds from ACARS. You get your vref speed in icing conditions from the ACARS. It affects where you bug your vref. It doesn't change how you bug them it changes the number. The procedure is written.

The 24 hour system check for icing is always done in the air. He wasn't sure if there was specific guidance on using the ice protection system on takeoff in icing conditions of 200' cig and light snow, and have already been deiced.

He is aware of a different level off altitude of 1000 feet. Note minimum clean-up on takeoff is 400 feet but usual company SOP is 1000 feet.

The CFM has a profile for precision and nonprecision approaches.

He was asked if you start slowing the aircraft will the RPM will go below the commanded setting, for example 850 RPM? -- No. At 1020 rpm? -- He had not seen the RPM drop below the set value.

Regarding CRM and operating together, when pilot flying requests a flap or gear setting change, the pilot not flying would not say "speed checks" before making the selection. The pilot not flying confirms the airspeed and sets the flaps but does not make a call out. Dittmar has seen in training a pilot not flying set the flaps at a speed beyond the limitation. He discusses that with them to correct.

Dittmar didn't recall seeing any corners of the windshield not covered by windshield heat.

He said he'd have both the clean ref and the ice ref speeds if he knew he'd break out 200' if he was in icing conditions at 1000.' If he knows he's landing in icing conditions he'd bug ice speeds. If he anticipates the fact he's not landing in ice, meaning the temperature and ceilings are above he'd bug the clean. He'd bug clean because he's not in IMC. Icing conditions exist when the temp is less than 5 deg and there's visible moisture. If ceiling was lower he'd set ice ref speed. What that specific altitude is depends on the situation.

He said you turn off ice protection in general when you exit the conditions – and confirm ice is gone through visual inspection. Don't turn off deicing if you've got a wing full of ice.

He said there are written procedures on who programs FMS. The pilot monitoring does that below 10000 feet. Use of the flight guidance control panel – if hand flying, the pilot monitoring operates it. If the AP is engaged the pilot flying operates the FGCP. They have a sterile cockpit below 10000 feet.

They use PTS standards for checking stall recovery procedures -- plus/minus 100 feet 10 knots 10 deg heading. Recognition of stall is buffet or stick shaker – whatever the first indication is. Clean stall it is buffet. Most of time he addresses problems he sees through repetition. Most pilots understand the basic aerodynamics. He's showing them how to do stalls in this airplane. A big issue is the power difference in this airplane. Most of the time people gain or loose altitude at the end of the recovery not the beginning as they begin to power out of it.

The approach checklist verifies the bugs are set. The approach checklist can be done ahead of time.

Stabilized approach criteria are in the FOPPM ECAPS section. Crew awareness procedures. Criteria is at 1000 feet for IFR and 500 feet for VFR. If ceiling was 2000 feet he thought there was some wiggle room whether to use the IFR or VFR criteria.

24 hour ice protection test – that's the official name. That is not a first flight of the day check. Pilots look at logbook to see if it has been done.

He has never seen anyone inadvertently enter stall when doing his checking or evaluations.

IOE was changed to 30 hours a while ago.

If he encountered severe icing he'd consider it to be localized and said he has some options to get away from it.

A go-around requires a report to the company. Usually if it is an ATC go-around there's no communication from the company. If it is something else they may call company just to get information.

At present, if he thought a FO had performance issues he'd go to the CP right away – not use the FO evaluation form which is meant to document how the FO is progressing.

He has demonstrated the pusher and pusher recovery in the simulator. He described how they get pusher demonstration in the simulator -- power settings idle, flaps 35, and if shaker they need to ignore that. Then when they try to recover by overriding the pusher he will stop the sim and they discuss. 2000' is the altitude they do the training at. He said 75 percent of pilots he sees do recover by pulling back against the pusher. At some point he stops the demonstration. He's not sure if the sim ever crashes. No syllabus for this demonstration and he doesn't recall it in the Colgan procedures. He is not aware if there is guidance from the manufacturer.

When he tests the stall protection system on the ground he gets the stick shaker, stick pusher, and lights. He said his hands are on the column when he is doing the test.

Interview ended at 1036.

Interview:	**John Dowd, Q400 Captain**
Date/time:	**17 February 2009, 1440 est**
Location:	**Marriott Buffalo-Niagara, Amherst, NY**
Present:	**Cox, Byrne: NTSB; Dittmar: Colgan; Wickboldt: ALPA; Conway: FAA; Simpkins: Bombardier; Webster: TSB-C**
Represented by:	**Dane Jaques**

During the interview John Dowd stated the following information:

Age 49. Date of hire at Colgan September 1999. Holds a commercial pilot, CFII, ATP. BE-1900, SF-340, and Q400 type ratings. He has about 10,000 total flight hours. Currently qualified on Q400 and has about 900 hours on the airplane since about January 30, 2008. He was working as a flight instructor in Norwood. MA before coming to Colgan at ADS Flight Center flying light general aviation piston aircraft. He is based in ORF.

He has flown with FO Shaw. He found her to be competent. She did her job well. Was punctual. Followed procedures. Asked questions. Thought she did her job well and to company standards.

She was not meek and mild and she performed her duties and handled herself well. Was assertive and spoke up. For the time she had in the plane she did a good job. Flew with her about 6 or 7 times. No need for corrective comments during those flights. Nothing apparent to him stood out as especially bad.

Doesn't recall anything specifically about her pilot monitoring duties (pilot not flying). Doesn't have any specific details about that. She would be assertive if she needed to be. Didn't encounter anything like that. Maybe if he overlooked a checklist item she'd bring it to his attention.

Last flew with her over Christmas – December 25 and 26. Also on the 19th. There was some weather in EWR that required ground operations deicing. They did the normal deice procedures pilot and co-pilot that involved her as FO.

He said the autopilot would have been used for the approaches -- standard operating procedure. Nothing really sticks out in his mind. He uses the AP in icing conditions. It may require concern and caution. It depends on the conditions you're in. Hand flying the airplane in icing conditions may be prudent if it warrants it at times. He has not been in severe icing in this airplane.

He defined severe icing as: freezing rain, temperatures minus 20. Indications on the airplane perhaps, the side windows – excessive ice there might be an indication. Spinners too. Also, icing that the deicing system can't keep up.

He's only experienced traces to light icing in this airplane, the Q400.

He has flown in and out of BUF about 6 or 8 times in this airplane; and not in other airplanes. He said the weather in BUF can get pretty nasty and ugly – snow ice rain and sleet. He hasn't had too many weather situations in BUF. The weather has been pretty good the few times he'd been in there.

He would consider it normal to do a coupled approach in wintery conditions.

He is familiar with a raw data approach. It would be something that he could do – but the company doesn't encourage it. He is not sure if he would be criticized by the company if he did it or not.

He would use the autopilot when flying an approach down to minimums – 200' and half mile visibility.

Last time he saw or spoke with FO Shaw was December 26.

General impression of FO Shaw, she did a good job. She was punctual, did her job to company standards. Right where she should be with her professional progress at this stage in her career.

FO Shaw was not the only woman pilot at Colgan.

When he flew with her she lived in ORF with her husband. Knew she was in the process of moving out to SEA where she was originally from. They were going to be driving a car there. He didn't recall when they were going to be doing the move – may have been January.

When flew with her it was mostly out and backs – but maybe one overnight.

She didn't smoke. She and her husband had gotten a new dog too. He knew she was going to move. The reason for the move was to go home close to parents. Transferring to EWR was for an easier commute from there as compared to getting to the ORF base.

She had a good reputation among captains. All thought she did a good job. Performed as expected. Right there in the group as far as where you'd expect. She compared well with other FO's of her experience. She would have gone on to become a captain. The reason was her job performance – she was a bright girl, motivated.

He described how she carried herself in the cockpit as even keeled and assertive. Not overly talkative or chatty. She didn't have an attitude. She was easy to get along with and fly with. Did what was expected. During the flights they had idle chat. It was back and forth and evenly distributed between them. He wouldn't call her overly talkative or chatty. She had a sense of humor.

She ran the checklists like they're called for – normal and like everyone else. Not rapid or slow. Her pacing and tempo of checklist reading was nominal.

He said she was not meek and mild. He never heard complaints from colleagues about her.

No problems adhering to sterile cockpit when he flew with her. Not a lot of chit chat going on. No complaints.

Don't have to turn windshield heat on except for icing conditions. He uses as necessary or sometimes when it is clear. He uses the windshield heat even through it is not required because it is on the after start checklist. Windshield heat works well.

Profiles for ILS are published and trained to and used on the line. He said that it is established on localizer below 200 knots, flaps 5, and gear down. Required to be configured usually by the outer marker. Typically be calling for the FO to put the gear down typically at the 180-170 range. They'd be flaps 5 prior to that. Typically would be at ref speed crossing the runway threshold. Vref+20, airspeed inside the marker.

He was asked what the increased ref speed switch does. He said when switch on the stall protection system gives you a margin for stall. He doesn't know how it comes up with its calculation but it will give you a margin for stall. He said you see it on your airspeed indicator you get the red on the tape. They get their bugs, their actual ice-adjusted ref speeds, out of their ACARS system. They plug that in when in icing conditions and it spits out adjusted speeds. He said the switch also resets the stick shaker and pusher speeds. If the stick shaker went off it would disconnect the autopilot. If you come down and you're in VMC and you've got no more ice you can go back to your original speeds -- and there's no reason for increased ref speed.

Severe icing to him it'd be real cold temperatures, freezing rain, side window ice, icing probe, spinner is a good indication. Anything that's loading up the system and you can't get rid of it would probably be severe icing.

In the BE1900 and SF-340 he was made aware that a tailplane stall could happen in training. The tailplane stall you have to pull up and undo what you did. He would differentiate that with light controls in pitch. It would be hard in an icing condition to tell quickly what kind of stall you had.

Last training he had was in December and the last ground recurrent training was in December. It covered stall recovery procedures. He believes it was takeoff stalls. Takeoffs and approach to landing stalls. He described stall recovery procedures: increase power, pitch, flaps up/gear up. Pitch to maintain altitude. Don't want to be excessive but it is 4 or 5 deg and add power. Goal to keep it in certain limits altitude wise is to maintain altitude. Does stall recovery in check ride.

Does not recall having the pusher demonstrated in the simulator – perhaps during initial. If did get a pusher his reaction would be to recover from the situation. Expect that a stall took place or close to it. And initiate recovery techniques. If the AP was connected he would disconnect it and add power and pitch up.

Most of the icing he's experienced has been enroute or various phases in the descent. Never had to land with the increased ref speed switch on. The switch doesn't move the bugs.

He was asked whether maintaining a 4 to 5 deg pitch attitude in a stall something that is taught? He said typically to take it to the stall you're against the stick shaker, initially you relax the stick, then initiate power and maintain 4 to 5 deg. Typically we'd come back off the stick shaker.

As far as he knows she lived in ORF the whole time. Doesn't know how she commuted back to SEA back then. Her and her husband had their own place in ORF. He doesn't think she was constantly commuting back and forth. It was intermittent. They stayed in the ORF area quite a bit.

Never called out sick when she was flying with him.

He described her FGCP (flight guidance control panel) procedures and interactions with it as being "right there".

He believes the Shaw's were renting a place in ORF.

Configuring for ILS approach – what is used to determine when to configure. The company has profiles. They like us configured everything done, checklist done, at least a mile outside the marker. Nonprecision is the same.

Tail stalls – ground school. A lot of that was covered in videos they were watching on tailplane stalls. Not covered in the simulator.

PTS standards for stall recovery – plus/minus 50-100 feet plus/minus 10 deg heading and airspeed plus/minus 5-10 knots.

His initial training on the Q400 was in Toronto. Flight Safety ground school and instructors.

ACARS – they have icing input in the system. They have more than one option. Have an ice option and E ice option and enroute. E ice is for root icing. That affects approach speed.

Never saw her tired or visibly fatigued when she came to work. Nothing more than anyone he flies with sees when flying 3 or 4 days at a time.

Never discussed hobbies, just a bit about her family and the dog.

Doesn't know what she did in her off time. She was friendly with everyone, everybody liked her.

She mentioned that she commuted from SEA.

Has never experienced the stick pusher in the airplane - no other pilots he knows of have either.

He said that light control forces is one of the cues of a tail plane stall but if the autopilot is on it can mask all that. In a tail stall the nose would pitch down. Recovery techniques different than normal stall. That's the tough part deciding what is stalling the wing or the tail. If nose doesn't pitch down he said you still could be experiencing one if you had light control forces. It would be hard to tell between the wing and a tail stall with the stick shaker going.

He said turning on and off the increased ref speed switch is associated with a call out. He calls out icing panel switches when activating them.

He knew Captain Renslow only in passing. Last saw a couple weeks ago. Crew room. She was just sitting. No real conversation other than hello.

Dowd specifically states each item on the panel when he's turning on the ice protection system.

Interview ended at 1600.

Interview:	**Robert Lantz Masters, First Officer**
Date/time:	**18 February 2009, 1217 est**
Location:	**Marriott Buffalo-Niagara, Amherst, NY**
Present:	**Cox, Byrne, NTSB; Dittmor, Colgan; Wickboldt, ALPA; Conway, FAA; Simpkins, Bombardier; Webster, TSB-C**
Represented by:	**Dane Jaques**

Age 31. Date of hire February 5, 2007. Has Commercial certificate with Dash 8 SIC. Commercial SEL/MEL. CFI but expired. He has about 1700 hours total flight time. He previously flew the SF-340. He has about 200 hours, maybe less on the Q400. He recently transitioned. He has about 960 hours on the SF-340 making for about 1100 hours total time at Colgan. He has no other duties at Colgan other than flying as FO. Before Colgan he was flight instructing at SMO for American Flyers. Before that he was working on his CFI-MEI in SMO.

He had flown previously with Captain Renslow. His managerial style was very open communication in the cockpit. He encouraged any advice or experience Masters had with the airplane, the route, or the destination to speak up and let him know any tips or hints he could learn from. Very eager to expand his knowledge on the airplane as he was also a fairly new transition. His personality was very warm and put you right at ease but you knew who was in charge – he was definitely the leader in the cockpit but was not a dictator or had an ego. Very nice to work with.

Flew with him in early and mid January. Two standup overnights. He was very open to conversation when the situation allowed and very business like otherwise. They talked about IAH as both had been based there but never flew together. Talked about people they both knew. Telling jokes. He recalls Renslow being very affable. Courtney Thompson was a flight attendant in IAH who they both knew well. They also knew quite a few of the same people there but he doesn't remember conversations about them.

At the EWR base he wasn't aware of anyone who Renslow would have been associating with.

During the flights he doesn't recall any specific conditions in which they flew in icing conditions. Pretty much they were deicing every morning coming out of ROC. Had gone through that with Renslow and Renslow was just as adamant as other captains about deicing and clearing any trace of ice. Masters doesn't know for sure what the company policy is regarding "wings and tail" only and complete fuselage deicing.

He said they used the autopilot quite commonly in cruise flight and for the approaches for workload. He can't recall specifically if Renslow used it to fly the ILS but thinks he probably did. Generally Renslow used the autopilot as a tool more than he would take over and hand fly. He was comfortable with Renslow's use of the autopilot and

described it as very standard. He didn't know when Renslow typically would disconnect the autopilot on the approach.

Masters completed his simulator portion of the ground school in October. Completed IOE during the rest of the month (and had some time off). His first full schedule was in November.

He remembered specifically asking him if he was "high mins" and he was not. High minimums (100 hours in type) restrict some of what we can do as far as visibility on ILS approaches and tailwinds they can land with. Both of them were unrestricted when they flew together. He doesn't remember if he had asked the question the first or second time they flew together.

He doesn't recall flying with any other new captains since he got out on the airplane. Most of the other guys in November and December were pretty senior guys – having a quite a bit of experience.

Greatest strength was the cockpit CRM. The eagerness to learn about the airplane. The eagerness to fly he noticed – Renslow would trip trade with other captains to fly as much as possible to increase experience. Very open and looking for anything that Robert understood better than him about the root destination or avionics. Made it clear he wanted Masters to give him a point out on anything he was doing incorrectly.

He had a point out opportunity – flying into ROC. He had flown there previously. Gave him an overview of the local area environment – approaches and airport. Renslow was specifically looking for anything unusual or anything Masters was aware of.

Masters didn't recall any systems knowledge point outs, or point outs as far as handling was concerned.

Still needed to work on areas like any one coming out of training. Still probably trying to fit all the pieces together, systems knowledge, automation, FMS autopilot. He'd take his time with programming the FMS, take time with the checklists, make sure he was thorough.

Did not eat meals together on the standup overnights.

He had the impression that Renslow was a family man. Not interested in hanging out with FA's and going out to the bar. Was most interested in getting rest and performing at best, and to learn as quickly as possible.

No recall of activities outside of flying when not working. Masters thought that his family was a priority for him.

Renslow would try to schedule trip trades and manage his schedule so he did not require a hotel or crashpad in the area. So he'd be trying to get home on the last day of the

standup. He'd commute back as soon as he could when he got back. Some captains commuting are anxious to get back to EWR and he didn't see that with Renslow.

Renslow had no crash pad in the EWR area.

Last saw captain Renslow later in January. In crew room. Fairly late one evening. Probably attempting to commute home. Never saw him doing office work. Masters never did office work himself.

How captain Renslow set the tone in the cockpit was that he gave a little speech about being new to airplane. Renslow mentioned he was willing to defer to Masters because of his increased familiarity on the airplane. Masters said just by Renslow's personality you understood you were free to speak your mind and communicate on an easy going basis.

In cruise flight they'd start having conversations. Renslow was more business like than most captains for the critical phase of flight below 10000 feet. Because he was a little more conscientious and trying to learn the airplane and focus on that. Masters can't recall who initiated the conversations. They would end at 10000 feet he would assume but didn't specifically recall. Renslow was very aware of the sterile cockpit concept and noted his altitude. Masters said everybody sees the importance of the sterile cockpit rule but there is a variation in captains with how strictly they adhere to it. Renslow was one who didn't blatantly disregard the rule. Masters said there the letter of the law – and intent of the law regarding the sterile cockpit rule. Captains he flies with very seldom violate the intent of the rule. But if they do, he has spoken up in the past. He doesn't say they're breaking the sterile cockpit but he directs them to the business at hand. He says something like how about the descent check or brief the app, to guide them that way, and let them know he's interested in becoming sterile. The intent of the rule in his words is that below 10000 you are to be focused on the app phase of the flight, the critical phase, and to not be discussing extraneous subjects, and just to be real focused on the safety of flight at that time. It's a very critical phase of flight, closer to terrain, in weather, preparing for a possible approach in low visibility -- and you need to be well prepared and plan, and be fully focused on the job at hand. Whereas in cruise flight there is more opportunity to talk and chat when things are pretty quiet.

During his training in October he doesn't know if they got real in depth with the sterile cockpit rule at the time. During his initial training they focused on it. But it was assumed to be adhered to in his previous experience. Recurrent ground school it was covered – when he was on the SF-340 fleet. He said the rule wasn't tested or evaluated on the LOFT as part of any scenario to his knowledge.

He said in his experience adherence to the sterile cockpit is improved on the Q400 fleet compared to the SF-340 fleet. He said this was probably due to the environment – busier airspace the Q400 operates in. The Q400 is also a little more complex. Everybody is also somewhat new to the airplane which may be a factor. Masters said there's a little more serious attitude in EWR compared to Houston.

Masters doesn't know FO Shaw. Knew name before accident. Saw on a seniority list or heard through other people. Not positive or negative context, just that she was there.

He said they talked in cruise and had good conversations. Renslow was definitely not a silent pilot.

Renslow was conscientious, engaged, warm, humble, eager to learn, eager to gain experience, and hard working. Masters didn't see any character flaws with respect to him. Masters is willing to engage in conversation as much as any captain is but hopefully we all understand when it is time to be serious and why.

Masters' training was in STL. Flight Safety simulator instructors. All sim periods was a flight safety instructor who wasn't very aware of Colgan. The instructor was doing Colgan and another airline (foreign). During training he used the Colgan procedures. The instructor was a brand new instructor. There were 4 or 5 groups of them he was the only new instructor. The instructor had studied the Colgan procedures thoroughly and seemed to teach well. Mike Young gave the checkride – a flight safety captain not associated with Colgan. Mike was very thorough and Masters had a lot of respect for him. Obvious he had years and years of experience on the Dash 8 perhaps through Piedmont. Very thorough oral and checkride that was difficult to pass – it was not an easy ride. They had 2 days of introductory ground school by Colgan in HEF, and they covered the ACARS a bit, FMS, and avionics in the Q400 -- but they're more relying on Flight Safety on covering that in depth. The most obvious winterization training that stands out in his mind was in recurrent and initial on the Saab. Where they talked about icing issues and watched NASA videos on tail stalls so that's where he received that training. The recurrent was in March 2008. The initial was in February of 2007.

The tailplane stall subjects they covered stuck out to him. Because it is such an unusual recovery compared to a regular stall. Something he hasn't paid a lot of attention to in the past. It was a serious subject. More academic and more interesting. He hasn't been able to implement the training. He wanted to come up to the Q400 to gain experience in winter operations. His impression on the training was that it was equally applicable to both the SF-340 and Q400. He's now starting to see that there are differences based on their systems that may cause them to react differently to a tail stall.

He has a vague recollection that with one captain that they had asked to deice just the wings and tail once.

Green on green pilots is a term used to describe the concept of two pilots below 100 hours. Colgan does not allow green on green.

Did not go through indoc when he transitioned to the Q400. Recurrent training is every year he believes.

On the LOFT he was required to make standard callouts to 10,000 feet and past. He said that the sterile cockpit rule is such a basic concept that it wasn't really focused on.

During the LOFT he said he probably had conversation with the captain he was flying with below 10,000 feet.

During the simulator training at Flight Safety they were using Colgan profiles and maneuvers and the instructor was familiar with them.

Outside the NASA video he has not been trained on tail stalls in the Q400.

He was familiar with the term "Get it clean, keep it clean. " It means that the aircraft surfaces are to be completely clean of the accreted snow and ice – you just don't play around with that he said. That's the opinion of every captain – you make sure it's clean before takeoff.

Renslow didn't mention where he was going to go during the day after the stand-ups.

Renslow didn't mention having done office time.

The first time he's been aware of the difference between powered flight controls and a tail would stall and a cable powered tail would stall. It's a new subject to him he would like to research.

In STL they covered approach to stall. Covered as pilot flying and nonflying duties covered assisting the pilot flying – being ready to adjust the power or being used as a resource for the pilot flying. Configuration was 0 flaps, approach configuration, and departure configuration. You'd complete the stall to full stick shaker. He cannot remember the altitude – perhaps 5000 to 6000 feet. Pitch angle for entry he didn't really remember but doesn't think there was one. Recovery – horn, stick shaker, full power, nose to the horizon to minimize altitude loss. That wouldn't preclude lowering the nose to break the stall, but minimum altitude loss was focused on. The only guidance was nose to the horizon with respect to pitch. He thinks the limits were 50 feet altitude loss. He did have an opportunity to observe the pusher. On the Q400 during simulator training they activated the pusher as a demonstration. The simulator broke at the point they did it. The control column almost knocked them out coming back towards the pilots in the sim. The instructor initiated the demonstration.

Fair likelihood they had a cabin jumpseater on his flights with Renslow but no cockpit jumpseater.

Nothing stood out about Renslow's power management so he can't comment.

Masters described his transition training on the Q400 as especially thorough. The ground school was excellent. The systems on the airplane were very straight forward. Being that he had experience before it was easier for him to pick up on the concepts on the Q400. Initially he had to get up to speed like anyone on IOE. Didn't cover ACARS very much in training so that was kind of a focus on IOE. Everything straight forward and he caught up quickly.

Throw on power levers on Q400 compared to SF-340 -- The actual distance is similar. They both have friction knobs so that's variable. Obviously the power levers are very touchy on the Q400. He said you can hardly think about moving them at a low power setting and it can increase power by a number of percent very quickly. So in that particular way the Q400 is rather unique. Position of the power levers is similar within the cockpit as compared to the SF-340.

Renslow likely made geographic point outs below 10000 feet going into ROC but he can't remember.

They did not land in icing conditions in ROC.

Masters has landed in snowfall. He has had an opportunity to use increased ref switch during landing. He said of course you come in at a higher airspeed, but no obvious handling differences, things just move a bit quicker. Need to be more aware of differential braking and differential reverse thrust. The increased ref speed switch will increase the cue tape to a higher margin above stall, and then when we put their data into the ACARS. Masters said they set bugs based on what comes back from the ACARS landing data. The ACARS always comes back with the 4 speeds: Vfri, Vclean, Vref, Vapp. In the ROC scenario they anticipated icing so they requested those speeds.

He described speed management on the Q400. It is difficult when the high speed cue is changing rapidly and in the descent the cue starts heading down and it is difficult to keep from pushing up against it. Doesn't recall any specific event where he had or approached an overspeed with Renslow. With other captains he has had the overspeed horn go off. It is taken vary seriously when the overspeed occurs and you need to reduce power, descent rate, etc.

Renslow turned off the pitot heat on the ground after landing when they flew together.

Masters uses a Bose noise canceling headset on every flight. Can't say whether Renslow had one with noise cancellation. Some pilots fly with just the plug in the ear headset. Renslow had a normal headset but he doesn't know if it was noise cancelling. Everybody has their own headsets. There is a backup headset in the airplane, a David Clark regular headset. You can hear the engines when the power is back at idle when wearing the noise canceling headset. Certainly you don't get the real loud prop vibration and noise. Mostly wind noise. You are definitely aware of your power setting when wearing a noise canceling headset.

When power is back at idle it is a very obvious lack of wind noise, lack of engine noise, and vibration. It is very obvious aurally Masters said.

Blue needles is when they switch from FMS guidance to ground-based navigational aids. It is a common term.

Commuters at EWR – there are a good number of them because of the high price of living in the area and low wages. Most people do commute. He estimates 75-80 percent.

Crew room at EWR. Has been there in the last few days. He did not observe messages there looking for crews who may have been in contact with the accident crew.

Trained to do both pilot flying and pilot monitoring duties on stall recoveries.

Jumpseat means non-revenue, most likely in the back of the airplane. Not always physically in the flight deck jumpseat.

Interview ended about 1333.

Interview:	**Shawn Mercer, Q400 First Officer**
Date/time:	**17 February 2009, 1633 EST**
Location:	**Marriott Buffalo-Niagara, Amherst, NY**
Present:	**Cox, Byrne, NTSB; Weston, Dittmar, Colgan; Wickboldt, ALPA; Conway, FAA; Simpkins, Bombardier; Webster, TSB-C**
Represented by:	**Dane Jacques**

During the interview First Officer Mercer stated the following information:

Age 27. Hired by Colgan Nov 7, 2007. Was CFI at Exec Aviation in Bedford, MA. He flew small single and small twins. Holds CFI certificate with MEI and Instrument endorsements. Also holds Commercial certificate, multiengine and single engine with SIC type on Q400. He has about 2200 hour total time and 900 hours in the Q400. Last recurrent in December, 2008 with recurrent ground school in January 2009. Had winter recurrent training. He watched the NASA video with the tailplane stall video.

General impression of Capt Renslow was that he was no better or worse than any other newly experienced type captain. One thing was that he was a bit weak in was the FMS. Example: entering a quick holding instruction which can be very tricky. Not behind in the airplane so much as not knowing the short cuts for the FMS.

Renslow told Mercer that he was new. Renslow was generally cautious and wanting to be sure. He didn't make any errors. Anything in particular that he remembers? The weather was pretty poor. We had to deice in the morning (it was a stand-up overnight and pretty icy. They de-iced and the brakes froze. What if anything have you heard from other FOs? Before flying he had not known or heard of Captain Renslow. They talked about family, background, general sharing. He was a commuter from FL, Tampa area.

Do a lot of the pilots commute? He would estimate at least 50%, but probably more like 60/70 percent. Do most have rental apartments? Yes most have crash pads or shared apartments. Has he observed that some pilots would stay in the crew room overnight when coming in last from home for a trip the next day? He is unaware of any company policy regarding sleeping in the crew room. He stated that most people get suitable accommodations.

Operations in severe icing? Yes. Example: coming into EWR. Side window became completely covered by clear ice. We requested lower and came out of the ice. Is that the criterion for severe ice? That part of it. Also significant rime build up side window clear ice, spinner ice, or when the boots can't keep up. Do you have concerns with the aircraft's ability to deal with icing? No, not at all. I feel very comfortable with it. Never had a situation where boots couldn't keep up with the icing

Do the captains you fly with generally use the auto-pilot? Says its 50/50 -- personal preference. Are there limitations on auto-pilot use? Yes, single engine, flaps 35, and

below 200 ft AGL are limitations. Captains are 60/40 in using AP for some phase of ILS operation. He has not recently flown or landed in icing conditions.

Asked if he is familiar with increase ref switch? Yes. When used? When ice conditions are present. Does the ice detect message come on? Yes the message comes on amber blinking until you move the increase ref speed switch, and then it stops blinking and, I believe, turns white.

Renslow told Mercer that he did like flying and mentioned some things. Didn't know where Renslow learned to fly. He mentioned wanting to go to HOU as a base and to move there for a better life for him and his family. When did you last see him? It was the morning of the 30th Jan. Who did he stay with? He said it was a typical pilot crash pad with many people. He said he did not like that part of it and wanted to move to a more private setting. He was interested in where Mercer was staying.

How do Captains set the tone in the cockpit? Very many ways, and it varies. Some say what they want and others get it from how the Captains operate the aircraft. Where did Renslow fit on that spectrum? He was very open and solicited the FOs input. He was very mellow, not a dictatorship, open, Renslow was in charge but Mercer felt like he was in charge during his leg. It was a shared responsibility, but he was in command and control he gave the impression that he was certainly in command in a nice way. He offered the first leg to Mercer knowing that Mercer had slept all day and was well rested. How would you characterize the amount of conversation enroute? Probably a lot. Renslow talked more than average. He said they talked through all of cruise. It's easy when you're on the first day together. Who initiated the conversation? I did (Mercer) I talk a lot, When? Sometime clear of the terminal area, talked though all of cruise "barber shop talk".

On the next day was it similar? Yes. What usually stops the conversation is getting to or below 10000 ft. Did it continue below 10000 on either leg. Don't really recall but it would be just smaller comments of just a few words. This is standard with all the captains. Have you ever had occasion to remind the captain of when to break off the conversation? No .

Did you know FO Shaw? Yes. How? From crew room and ground school in Manassas. Did she drink? Yes, 5 of us had dinner in a bar had two drinks at happy hour -- it was beer. I did not see her smoke. She and husband had bought or were about to buy there in WA or OR. Had a family member that worked for a good corporate outfit and she hoped maybe to work there at some time. Mercer remembered that in ground school she was a bit more able than the average FO. She was not shy about asking a question or giving an answer. She was talkative, friendly, She was more experienced than the average FO with technical knowledge. She was very vocal and would say what she wanted. Anything he'd mention about the airplane wouldn't be new to her. She'd speak up in class. She knew what she should.

Did you get deice training? Yes from Andy Nagle. What was covered? I specifically remember the NASA video – it was absolutely about tailplane stall and about what could

cause it; aerodynamically what was happening; symptoms and how to recover from it. Nose might go down and the aircraft is unstable. Mercer believes this was mostly just from the video. Mercer states he does not remember much or any other discussion about this. FO Shaw commented about the electrical system. Re the winter ops module, can't recall any other questions or comments from Shaw.

When last time you had a JS rider? Within last two days we had an ExpressJet pilot. We had a management type guy in for an airspeed awareness observation, mostly for overspeed issues. This is a new aircraft for us and it is fast. Never was an issue in the low speed regime. Outside of that awareness program, when did you see any management or check airmen? Not since that time period except about that time I had one FAA mechanic do a leg with us.

Did Shaw do any exercise? Did not see. She did have morning coffee? Yes. Regarding health, she looked like she was healthy. She looked healthy, glowing and happy.

Can you clear up the information you gave about two FAA inspectors who flew the JS on your flights? Yes, the two FAA inspectors around the time mentioned were monitoring us. Several months later there was a FAA maintenance person who was just going from point A to B. He did not recall any management check airman on his jump seat – he tends to be paired with more senior guys who happen to be check airmen.

Early December 08 and before that in December 07 received initial training. Did he have stall training? Yes. How was the training done? Recover at shaker, max power, go around button, pitch up 10 degrees, Vfri, flaps up, and recover the airspeed. The recurrent training was conducted the same as the initial. Never did the pusher demo. My initial training was In Toronto. My instructor was Plamen Iavonov for sim training. During follow up: Use flight director for stall recovery? That's hazy, maybe not with GA button, can't remember what pitch up to. Is there a PTS standard? Yes but not sure what it is.
PC was done with Tim Dittmar.

Asks about the Express pilot and how he was allowed to come on: Mercer explained the reciprocal agreements for pilots. Did he know about sterile cockpit? Yes. He was very professional. You mentioned that you studied a lot of material about tail plane stalls since the accident? Yes. What did you learn? I have come to believe that there is not a problem on the D-8 with tail plane stall and my experience is that there is not a problem on this. Colgan gave us information regarding tail plane recovery in general.

Regarding Vref, did you land with the increase ref switch on? No, the weather had improved so that we had no ice detected and we turned it off. They decided and briefed that if ice resumed while on final approach that they would just mentally add 20 kts and fly it like that.

When you have a JS rider do you give them a briefing including sterile cockpit? Yes, I give them the briefing card and that's how we usually handle that. He said among airspeed, altitude, heading, the most important during recovery was airspeed. He was not

sure whether there was a memo regarding not using the crew room for overnight sleeping – but he remembers it as a policy.

Where do you find the guidance on icing procedures? Chapter 7 FOPPM aircraft specific, also AOM. AOM is located in locker in the aircraft and Bill Honan's office. Guidance in the interim CFM as well. Mercer answers and elicits that most of this is in the AOM, but also points out that it is also in the company pilot manual as well. Have you ever been extended off a standup? Yes.

What is the normal pitch attitude in the aircraft - 1 deg nose up, at flaps 5 at 180 it's probably -1 to +1 deg above horizon.

Characterize the noise level in the cockpit? It is quiet, not like a 737 but still it is quiet. When you pull back for a descent can you tell that difference? Well it is not night and day but you can tell the difference. The ambient noise is quiet normally, it is noticeably quiet with the power back. When you level off after a descent, is there a cue for you to remember to come back in with power? Instrument scan and piloting ability.

End time 1755

Interview:	**Jonathan David Miller, Q400 Captain**
Date/time:	**18 February 2009, 1407**
Location:	**Marriott Buffalo-Niagara, Amherst, NY**
Present:	**Cox, Byrne, NTSB; Weston, Dittmar, Colgan; Wickboldt, ALPA; Conway, FAA; Simpkins, Bombardier; Webster, TSB-C**
Represented by:	**Dane Jaques**

During the interview Captain Miller stated the following information:

Age 31. DOH Colgan 7/16/2004. Holds an ATP, MEL with type ratings on the CE-500, DHC-8 and the SF-340. Holds Commercial Privileges, Airplane Single Engine Land, and Rotorcraft. Also has CFI, ME and II.

Has approx 600 hours on Q400. Total time is 6000 hours. Started on the Q400 in Jan, 2008 and transitioned from the SF-340. Flying time at Colgan about 3000 hours, about 2000 PIC in the SF-340. No other duties at Colgan.

Prior Colgan I was a Captain on a CE-200 and FO on CE-300 Eastern Air Charter in Trenton, NJ. I'm based in ORF (Norfolk, VA)

He had flown with FO Shaw. She was professional, always business like. She was average to above average for her level of pilot time. She was always professional and on time. Fully proficient in her duties. She had a very friendly style.

They did fly in icing conditions together. Once when flying from EWR to PIT they were in icing for about 20 minutes of flight in cruise and descent. They operated the deicing equipment and it included the increase ref switch. In general, once clear of icing, they would then secure the increase ref and anti-icing equipment. He couldn't remember when it was turned off on that flight. In general, when they pull clear of the runway the initiation of the after landing checklist is when they turn it off. If in icing conditions Miller leaves it on until he lands.

You set your bugs to whatever performance data comes back to you from the ACARS. Increased speed reference switch on. Then enter data into ACARS. Before entering icing conditions you turn the vref switch on. As far as inputting bug speeds they don't do that until they enter the performance data into ACARS. How do you insure that the bugs get reset? They do the reset later when they set up for the landing briefing. At the time they actually activate deice systems, its not always the time to send to ACARS to get your landing data.

Usually he lands with flaps 15 or sometimes flaps 35, depending on conditions.

He can't remember anything remarkable in particular FO Shaw except that she did not need any coaxing or prompting. She was very professional and knowledgeable. She resided in the Norfolk area but was in the process of moving back to Seattle. January she was relocating. She was originally from SEA and got her base changed from ORF to EWR. He never observed any issues with fatigue in Shaw.

He wears a David Clark headset – not active noise canceling. He said Shaw wore a muff type headset. He described the Q400 as quiet compared to other turboprops. It is definitely a quiet aircraft. You can hear the power changes easily. It is quiet compared to the Saab, but you can still hear the engines and other systems.

He thought Shaw was moving from ORF to EWR in January. She lived locally when he flew with her and was not commuting from SEA.

He described her greatest strength as being her energy and assertiveness. She was polite, alert, communicative and professional. She wasn't complacent. There are quieter FO's but she was not one of them. Everything she did was set and cross checked. She'd verbally confirm a lot of things. Cockpit flows were fully proficient when she flew with him. Usually can tell when someone is new and he didn't get that impression flying with her. He said as a pilot monitoring she was always ahead of the aircraft. If in cruise she was thinking about descents and the approach, earlier than other first officers. He can't recall any time where she would have made a configuration change without his prompting.

He didn't know much about activities she was involved in outside of flying. He knew she lived in the ORF area, was married and had dogs. She did not smoke, or drink to his knowledge. He remembered seeing her drink coffee once. He never did an overnight trip with her.

Among captains at ORF she was well liked. She was known as a good First Officer.

He last saw her February 12, the accident day. Saw her in the crew room in EWR. Recalls only that she was standing in the long hallway with two other crewmembers (the flight attendants on the accident flight). He couldn't remember the time. He just said hello.

When flying with Shaw, if they did have conversation it was enroute. Miller said he was not much of a talker. It was very light conversation. He said that his not being much of a talker was not frustrating to her.

He never had an occasion to correct her when he was flying with her. He said her handling of the aircraft and systems was very good.

He said with respect to sterile cockpit discipline, clearly she knew the protocols. Outside of the strict and narrow rule of the communication she was one to adhere to cockpit discipline. She knew when to talk and when to stop talking. He wouldn't say she was chatty but she was very personable. A very nice person. Always a pleasure to fly with.

Colgan does not have any non-verbal commands (hand signals) such as when busy on the radio and requesting flaps. He has not seen overspeeding issues during climb or descent. He has had to prompt FO's to slow down when he sees the speed tape increasing. That's his job. He hasn't had a FO challenge him about speed. He said for passenger comfort they never yank the throttles around because it would get very uncomfortable back there.

She was very knowledgeable about programming the FMS. Fully familiar with all the functions of the automated systems/autopilot.

They weren't very good friends. His girlfriend was friendly with FO Shaw and they went out to dinner twice.

He had flown in icing conditions with Shaw. Doesn't recall the METAR but it was ½ mile visibility on landing. Used ice protection and the increased ref switch on. We landed with the increase ref switch ON. No issues.

His last simulator training was about 5 months ago. His initial training was with flight safety instructors at Toronto and the recurrent was at STL. He practiced stall recovery procedures. Approach stalls were gear down, flaps 15. Also did it fully configured flaps 35 as well. Recovery procedures first indication of stall, add power, release back pressure, and as you regain airspeed to a certain value clean up the aircraft. Doesn't recall a specific attitude to target but the hard altitude limit was plus/minus 100 feet. No opportunity to see the pusher.

He only said hello to Shaw in passing on the accident day She did not mention how long she had been there. Most of the flights out of ORF for him are out and backs; and typical 4 day on and 3 day off.

If you have icing at 9000, but the airport is clear of icing and good visibility, would you turn off the increased ref switch? If the weather was completely improved then I would turn the switch off.

He thought she mentioned after moving she would be using hotels in the EWR area first. No idea about a crash pad. He overnighted in BUF on the night of the accident. He was mostly in his room but said the weather was unremarkable – light snow. The next day they departed on time and were the first flight out of BUF.

Severe icing – has never been in it in the Q400. Can't use autopilot when in severe icing. As a matter of pilot technique they are accreting any kind of ice he turns the autopilot off.

He has seen the NASA tail stall video. Can't recall when but it would have been during his last recurrent training. What he recalls from the video is the reason we watch it is that it is a different recovery procedure than a normal stall and how to recognize it. He applies it to his daily flying conditions as he's been trained to. Anything in Q400 procedures that specifically addresses the tail stall phenomenon? Nothing more than

what was shown in the video. If he were subject to that and he recognized it as such as that type of stall, then yes, he'd use the procedure. He said you recognize it by a lightening of the stick before the buffet as opposed to the normal feel of flow separation in the wings. You'd feel it with your hands. If under autopilot he can't say he would know that.

No first officer has ever moved the flap handle without being commanded. Doesn't know Renslow. He was aware of the accident that evening in BUF. End time 1457

Interview:	**Bill Morency, Regional Chief Pilot, EWR**
Date/time:	**17 February 2009, 1113 EST**
Location:	**Marriott Buffalo-Niagara, Amherst, NY**
Present:	**Cox, Byrne, NTSB; Dittmar, Colgan; Wickboldt, ALPA; Conway, FAA; Simpkins, Bombardier; Webster, TSB-C**
Represented by:	**Dane Jaques**

During the interview Captain Morency stated the following information:
Age 29. Holds an ATP with multiengine and commercial single engine, and type ratings on the BE-1900 and the SF-340.Holds a CFI, single, multi engine and instrument. Date of hire September 6, 2002. Total flying about 4500 hrs. Hired with approx 2000 hrs. Before that he worked flying a Baron and Navajo and flying corporate and also did flight instructing in Raleigh NC. At Colgan he served as a BE-1900 FO first. FO for 2 yrs, He then upgraded to captain on 1900 for 1.5 yrs. Went to the training department for about 2 years and then became a Saab captain. January 31, 2008 became base Chief Pilot at EWR. Morency lives in Raleigh, NC and commutes.

Duties as Regional CP, since not typed on Q400, are mostly administrative (attendance, uniform, administration, etc). Not current on Saab 340. This was his first management position at the company.

He is familiar with captain Renslow. As an employee he's had limited contact with him. He's done some office work for Morency. In total less than a half-dozen hours he's been around Renslow. In the limited time he's been around him his impression is that he was a well mannered, company-oriented kind of guy. He was a commuter and he believes he lived in FL. Never had any performance issues that came to his attention as chief pilot. He would perform duties in the office which included revisions – insert the new revision into the AOM on the airplane. He got paid for that. It was on Voluntary basis. Most recently he did it on the day of the accident. His first round trip was canceled and Renslow came into the office and asked if there was any office work he could do. Morency assigned him task of the inserting the revisions. He did it until he said had to go flying. Between 1200-1400 is when he came in.

Several other trips and crews had trips cancelled that day because Continental will ask Colgan to reduce flights based on demand at EWR. ATC sets quotas for the day and asks for adjustments. Any other conditions affecting this cut back? Don't know. Morency didn't not know the weather conditions that day but said Continental will ask for cutbacks even on beautiful days. Morency gets these requests often, constantly. Renslow completed his tasks, about 6 or 8 books. He started about 12-2 pm but continued to work during the PM. Morency did not see FO Shaw. Morency was not familiar with her. He remembered one meeting with her when she first arrived in EWR for some administrative reason. She came from ORF which was also a Q400 base. No issues with her performance.

Re: crew room. It is down the hall from Morency's office. Morency's office is part of three room complex including another office, and a crew room with couches, recliners, TVs and a place to relax. Nearby are crew info computers for crew members. Morency did not know how many commuters there were at EWR.

Does anyone ever stay in crew rest area overnight? Not to Morencys knowledge but it is accessible 24 hours per day. Have you ever seen members late in eve in crew room? Yes.

Anything else that Morency can comment on re either crew member of accident aircraft? No.

Re duties and responsibilities: Characterize "Admin duties"; who do you report to? Bill Honan the chief pilot. I talk with him daily for basic ops info. Performance issues re delays. When CON requests cutbacks who do they talk with? SOC, not to me. I meet briefly with them weekly. What are they about? They are internal to CON ops. We only go there just briefly once per week but these meeting occur daily. How are you involved with pilot terminations? I document their attendance and I would work with HR and Capt Honan(regarding termination). When was last time someone was terminated? December. How many terminations? It varies. How were you selected for this position? I applied and interviewed with chief pilot and HR. How were you trained? I worked with another CP and also the another regional chief pilot in IAH. How many other Regional CPs are there? There are 2 regional chief pilots himself and the IAH regional chief pilot. Who reports to you? All Q400 pilots and administrative assistant. Offices: My office, in-flight and base manager. Morency is not current on the Q400. Any aircraft training within the last 12 months? No. Have you done any winter ops training? Not recently except to hand out and collect quizzes on winter ops. 100% of pilots have done this.

How does info from company get to pilots? CrewTrack which is computerized company mail is one way and also a book with info in it. Each pilot must read this when they check in. They also have mail boxes to receive revisions etc. Where do pilots get weather and other related? Weather and other comes on the release. There are 3 computers to check other weather and information. There is no other internet access. There are limited lockers available. There is a shower but it's not very usable. What is Morencys norm shift? It varies quite a lot. Early, late or weekends. On the accident day, what time? I was there by 9 am, maybe even 8:30. Do you have a crash pad? He rents a room. I was there until 8 pm on that Thursday. I had dinner, then got a phone call and returned to the office. Describe what happened: I came to the crew room and met with 4 managers; went to the CON command center and was there until 4-5 am. The station manager was sent out on the GO team with CON people. What did Morency collect or retain? Morency said he had no instructions but he did remove crewmembers files as he did not want other crew members to see their files. What are those files: revisions, transmittals, and notes from other crew members? Its primary purpose is to use as a mail box for revisions. Morency keeps crewmember files on his laptop. It includes disciplinary actions, notes. It includes sick call outs and the captain had 2. Are there any security cameras in that area? No. He

also backs up info on his computer and zip drive and sends original transmittal sheets to HR.

How can a pilot communicate a safety concern to his/her CP? Morency refers them to Colgan safety dept Colganairsafety.com or that they can tell him. Give a recent example? Morency thinks there were a few but cannot remember any. There is a confidential safety hotline. It goes directly to safety department.
When a pilot transfers in, does anything come with that, such as FO Shaw? I do ORF, ALB and EWR, so there was not anything new to come in since she was coming from ORF. The lead captains report to me from each base outside of EWR, namely ALB and ORF. Morency did not send in the report of Renslow's work on Thursday, the accident day due to accident work pressures. Morency is responsible for delays from Colgan flights as to checking, when necessary, with crews as to the delay codes. Why else would you call Captains? Administrative issues, SOC has a duty officer who would do follow-ups on go-around. Re sick calls, there is no follow up unless it is repetitive. Repetitive is more than 4 instances within 12 months. Fatigue report question: Made with CP. It is a paper report. Morency not involved with the process. What if a pilot is fatigued prior to the trip, what can they do? They can call out sick; talk with me and ask for a personal day off. When was the last time you got one? Morency did not remember when but remembers one fairly recently. You can use your sick balance, then vacation time and then another process. There is a company criteria Hr policy. They can fill out a fatigue report and may take a PDU. They get ½ day off per month, then can use vacation or go unpaid.

How do you interact with the FAA? Inspector Michael Jessie from Teteboro, who was Colgan trained on the Q400 and serves as the Colgan CMU APM (Aircrew Program Manager) comes by the office sometimes. Morency says that the inspector reports to the Colgan POI to his knowledge. He brings issues to me and I bring this issue to the Chief Pilot. How often do you jumpseat on the Q400? About once per week; to home. I usually JS in the cabin. The last time I went in cockpit was about 2-3 weeks ago when going to ALB.

Re: crew room: Do you deem it as adequate for rest prior to a trip? No. How close do you have to live for reserve call up? 1.5 hours call out. Colgan not involved with rest except the FAA regs that require pilots and crewmembers to be properly rested. A fatigued pilot can call into crew scheduling if tired, or for sick, and do this as a sick event. They wouldn't call me; they call crew scheduling.

Does Colgan hire direct entry Captains? Yes
Who can occupy the JS? It depends. Does the PIC have to approve? Yes. The most recent hiring requirements were 1000 hours 100 multi engine. He is not familiar with Colgan SOP's.

What is Colgan's read and sign process? It's the process to get info out. Pilots are responsible? Yes. Are there more than in the past? Yes. Is on-time process a high priority? Safety is our highest priority but performance is also important. As to delays, I

normally only call crews just to get a bit more info. Do office duties count toward on-duty time? Yes. On GA reports, it is usually SOC or Duty Officer who is involved with SOC. Pilots do not report to SOC nor are they disciplined by SOC .

Have you ever called a pilot regarding an operational error relating to the Q400? Do you see pilots coming in early for a show time? Yes. They never require anyone to come in to do office work. When crews volunteer to do office work, do you verify that they are legal? I ask them and make sure that way that they are legal. Aside from discipline actions, how much to you have interactions with crews? Only when they stop by the office. How many pilots does Morency know on a personal level? Mostly only the Beech guys. Colgan does have stand-up overnights. Regarding the crew room, is there a policy that crew members can't use it to sleep overnight. Yes there is a policy that you can't use it to sleep overnight. Standup overnights are trips that begin in the evening spend 4-5 hours in a hotel and return on the morning within the 16 hours total.

Is there an ASAP program? Yes. Can Morency identify other crew crewmembers who may have been around on the accident day? To confirm, you were around all day and can you remember who else you may have seen and who may have talked to Renslow or Rebecca? No. Have you made any attempts to call anyone? No. Has the company put up a sign in the crew room requesting cooperation from any crew members who have had any interaction with the Q400 crew? Morency answers that he does not know.

Are there any restrictions where crews can live or are they simply required to be available according to their schedule requirements. Example: Reserve and standby. Crews only have to meet schedule requirements Colgan does not restrict where they live. Do crews get a bonus incentive for on time performance? No. Are crews reprimanded for delays? No.

Ended at 1304.

Interview:	**Brent Skillings, Q400 First Officer**
Date/time:	**14 February 2009, 1710 est**
Location:	**Marriott Buffalo-Niagara, Amherst, NY**
Present:	**Cox, Byrne, NTSB; Weston, Dittmar, Colgan; Wickboldt, ALPA; Conway, FAA; Simpkins, Bombardier; Webster, TSB-C**
Represented by:	**Mark Dombroff**

During the interview Mr. Skillings stated the following information:

He has been a first officer on the Q400 for 1 year and 1 month. He has about 800 hours total time.

Skillings met Captain Renslow about 3 weeks ago. He said Renslow was a new face in the crew room. During his introduction Skillings learned that Renslow had flown 3 years on the SF-340.

The first time he flew with Captain Renslow was on February 10. It was flight 3301 departing EWR about 0640 and going to YYZ. Renslow called him on the cell phone because Skilling was running a bit late. Renslow contacted him before calling crew scheduling. It was about 0545 when Skillings received the call.

The legs flown that day were EWR-YYZ, YYZ-EWR, and EWR-BUF. He described Renslow as an outstanding gentleman and nice guy with a laid back nature. He had a sense of professionalism and airmanship was never in doubt. It was clear he was comfortable flying the airplane. The captain told him that he was new on the airplane. He covered it thoroughly in his briefing before departure saying that he was a new transition in the airplane, knew the systems well, but if Skillings saw him doing anything wrong to point it out, and vice versa. Skillings said the Captain was approachable and forthcoming.

When they departed EWR on the first leg the weather was good. On both the flight to YYZ and EWR they encountered icing conditions. He didn't have a specific altitude but estimated it to be 5000-6000 feet. They flew through a cloud layer. He said the Captain was well aware of icing protection systems. They were turned on before entering clouds. The ice shed off shortly afterwards. He said they were only in those atmospheric conditions for 3 or 4 minutes. Skillings described the airplane as a fast aircraft.

On the third leg, they arrived BUF on time and were at the gate at 1259. On arrival they descended through clouds but were actually able to pick up the airport at 1000 feet. They flew the ILS-23 approach at BUF. Speed bugs were set, the approach was well briefed, and they were on task with the checklists. They landed with flaps 15. It was an uneventful touchdown and they turned off about ¾ of the way down the runway.

Skillings had no complaints about the captain's piloting skills and he said it was obvious he had the abilities to be captain. The captain did a tremendous job flying the Q400. Skillings has flown with a bunch of captains before and seen a range of performance from rusty to good. Renslow demonstrated he was a good captain.

The captain was flying the leg into BUF and had also flown the first flight of the day from EWR-YYZ. Skillings flew from YYZ-EWR.

On the ground in BUF they called for the hotel. They went to the Days Hotel in Buffalo. They went down the street to Max's to get something to eat. They returned to the hotel about an hour after that. They then went swimming in the pool and hung out with the rest of the crew. On Tuesday night he last saw the captain about 2100-2130 as they were leaving the pool-community room area to return to their rooms.

The next morning he saw the captain downstairs at breakfast "bright and early." He wasn't sure of the time but said the report time at the airport was 0530, which meant they had to take the 0515 bus, so it was about 0500 when he first saw the captain in the breakfast area.

At the airport they went through security and reported to the airplane to begin security checks on it. When they got to the gate they learned that another airplane, Express Jet, had a maintenance discrepancy and as a result they'd be taking more passengers that day. They were told at the gate they'd be taking more passengers than the usual 8-10 on that leg. They got into the airplane and Skillings then did his walk around.

Skillings flew the BUF-EWR leg. Captain Renslow flew the next leg from EWR-RDU. The final leg RDU-EWR was flown by Skillings. Skilling described those legs as unremarkable.

Skillings said Captain Renslow's airmanship was never in doubt. There was nothing he had to question during the flights. Occasionally on descent he'd prompt the captain to give him the landing speed. He said there was no extraneous conversation below the 10,000 feet sterile cockpit altitude. Skillings said his prompting for the landing speed was because of his type A personality which means he likes to get things done prior to the airport. The captain was laid back.

He last saw the captain on the day before the accident. Skillings was flying with his original captain and Captain Renslow was helping out around the office. Renslow was bringing AFM updates to the aircraft, doing busy work helping the chief pilot.

The ice detected light did come on a couple occasions during their flights. He said Renslow turned on the icing protection systems before entering visible moisture or clouds. Skillings would look over to make sure they were on before they entered.

He characterized Renslow's health as very good and said he was well rested and alert. He was ready to go each morning with release in hand. Never showed any characteristics of being fatigued. He didn't show any evidence of having a cold or anything like that.

He had no knowledge of whether Renslow exercised. In RDU they had a lengthy delay and they got food and ate together. It was BBQ or something like that. He observed that Renslow was a good sized guy and probably did some kind of exercise to stay in good health.

Renslow's CRM was very on par, on task. He did not do anything out of the ordinary that was concerning. They worked together really well and backed each other up normally. Renslow communicated with the passengers very well with announcements and updating destination weather. They were uneventful flights.

Skillings said Renslow's greatest strength was that he was just a very approachable person. He was a people person. The captain's CRM would be a the top of the list. He was very understandable and made things easier in the airplane.

Skillings said Renslow handled the airplane very well. He said that the Q400 can be a tricky airplane to have a nice soft touchdown. Renslow executed 3 good landings. All were configured flaps 15. Renslow flew the airplane very safely.

Describing the captain's systems knowledge, Skillings said that the captain was very comfortable in the airplane. He transitioned from the SF-340 to this airplane. There are a lot of automatic flight controls. He knew those well. The captain never really showed any hesitation to make inputs on the controls or change anything. He always ran checklists at a consistent rate.

When asked what areas the captain could have improved in, Skillings said there was really no answer to that – that the captain kept on task and there was nothing out of the ordinary. He said the captain had low hours on the aircraft but they never encountered any gusty winds that would have presented a challenge for him to observe any potential weak areas.

He did not have any opportunity or need to challenge the captain during the flight. He described his statement about asking for the numbers as something that he (Skillings) likes to do – to get the numbers way in advance. The captain did not have any occasion to challenge Skillings during the flights either.

He said that the captain did request Skillings to shut off the pitot system heat. It was something he thought was in the CFM but not on the after landing checklist. The captain said something about wishing that the checklist would change so he could concentrate on the taxi. Skillings shut off the 3 pitot tube heat selection switches. The issue the captain had was wanting to remain focused on taxing the airplane versus putting his head up into the controls on the overhead.

Skillings thought the captain was a nonsmoker. He said they did not have any alcohol when they went out to eat during the trip. The captain did drink coffee during the morning. Skillings did not observe him drinking coffee during the afternoon.

Skillings was not aware of any life changes in the captain's personal life. He said the captain talked about his kids and wife. He knew the captain had commuted to EWR from TPA on Jet Blue. The captain never showed anything out of the ordinary or any indication of conflict in his personal life.

Skillings did not see the captain using any medications. He said the captain wore glasses when he was flying and used them during the whole day. He said the captain showed no indications of any hearing difficulties.

The captain arrived EWR the night before their trip. He said the captain had gotten in pretty late. Wasn't sure how late the flight came in. He ended up spending the night in the Colgan Air crew room for about 5 or 6 hours. Skillings said the captain had a crash pad in the EWR area but the short time was not worth getting a hotel.

Skillings said the captain told him he flew a lot in Albany just after IOE. The captain mentioned names of pilots there but Skillings didn't recall who they were.

The captain was actually quite enthused to fly the Q400 after flying the Saab. He liked new technology and the fact it was a new airplane. He said the workload was sufficiently less after working 3 years with other systems in a different airplane.

Skillings didn't remember the captain mentioning any future plans. He did say something along the lines that if the Q400 went to Houston in the future he might change bases because he didn't like the EWR area or the cold climate.

Skillings did not have any knowledge of the captain's activities when he was not flying.

Skillings knew first officer Shaw. They were in the same training class in Toronto last February and also in HEF. He said he knew her well. She was based in ORF and lived there with her husband. He did not see her on the flight line and had not flown with her. He said they studied together during training. He described her has having pretty sharp knowledge about the airplane when they were wrapping up training – more so than most. Looking at the situation Skillings said Shaw was not shy and would speak up if something was going wrong. She was more or less like him, a type A personality – very assertive. He said she had a lot of knowledge from flight instructing and flying other aircraft. He last saw Shaw a couple days before the accident. She was in uniform and he told her that her hat was in the mailbox and she laughed (she had left it on an airplane). It was just a quick passing exchange.

The captain was married and had children. Skillings estimated the captain's age as mid-to-late 40's. He did not remember where the captain had worked before Colgan. He just remembered the captain saying that he had flown primarily in IAH on the SF-340 before

coming to the Q400. He estimated the captain's height and weight as 5' 10" and 215-230 lbs. The captain didn't talk about any exercise activities. He said the captain was a fairly heavy-set guy, husky, but not obese in any means.

Going into BUF they flew the ILS to runway 23, went into a deck of clouds, and got a visual on the runway about 4000 feet.

Whenever in IMC they put on the ice protection systems.

He characterized the captain's use of the autopilot. The captain used the autopilot pretty much on the approach as much as possible until about 1000-800 feet when he'd disengage it and start flying by hand. Skillings thought the reason was for a smoother flight for the pax. He said captains can be different in how they use the autopilot. For example, those transitioning from the BE1900 tend to use the autopilot less.

He said that when flaps are selected at 35 you cannot couple the autopilot.

The winds for the landings during the trip were fairly light and variable.

He was asked to characterize the captain's use of checklists and call-outs. Skilling said the captain was very on task at all times. He read checklists at a good rate. That is, slow enough to identify what's on the checklist and to check on the system that has to be checked. Skilling had no complaints in this area and said the captain used the checklist well and never cut any corners. The captain was a new transition and didn't miss any callouts, and all callouts were standard. None of the approaches they flew went down to MDA.

He was asked to provide an example of what he meant when he described the captain as laid back. He said it was in the way the captain conversed with other people. He liked to keep it a relaxed atmosphere. Said that he didn't want to get anyone stressed out. The captain would say that if I see him doing anything wrong to let him know and he'd do the same. The captain said it was a team up there and they should take care of business. Those comments he said coupled with the captain's southern accent was what he meant by the captain being a fairly laid back guy. The captain was not an intense person but was relaxed. In a situation that calls for multi-tasking Skillings was not sure what the captain's reaction would be but he didn't get that opportunity or they didn't get presented with that situation.

He was not sure why the captain was working in the office at EWR, and was not sure the day but knew that he was helping the regional chief pilot. The captain came into the cockpit to update the books. Skillings would have to call the captain he was flying with to figure out when it happened. It was a voluntary effort to do that. Skilling said you can only sit on the bench and watch TV so much and thought perhaps the captain was trying to stay motivated and do something. Skillings said for the most part people on reserve can do what they want: remain in the crew room, remain in the airport, etc. When on hot reserve you need to be within 15 minutes of reporting to gate in the event they need a

crewmember for something. Regular reserve need to be within 1 hour of reporting. They have one or two hot reserves during the day. Always at least one hot reserve person maybe two. Skillings has done hot reserve and he thinks it alternates quite a bit. The most junior guy doesn't always get stuck with it.

He said when he saw the captain doing the office duty it couldn't have been any later than 1700. Skilling said it was around the time of his last flight which was in the late afternoon or early evening (he overnighted in PIT the night of the 12th).

Skillings said the captain did not complain about how he slept on the night of the 11th. Downstairs at the hotel the captain got a cup of coffee and bagel – normal breakfast stuff. The captain never seemed sluggish or anything like that during the flights. He never complained at all about being tired or was grumpy during the day. After their trip ended on the 11th the captain said he was going to go back to his crash pad that evening. He had reserve either late in the week or the next day. Skillings doesn't recall the time he said he had to start reserve.

Regarding the captain's assertiveness he said on a 1 to 10 scale he'd give the captain an 8 on assertiveness.

Regarding the captain asking Skillings to turn off the pitot heat after landing, it was because the captain preferred to keep focused on taxiing the airplane. He mentioned to Skillings that he had read that it was part of the first officer's duties to do it but that it was not put into the checklist.

None of the flights into YYZ involved landing in icing conditions. They did not brief about that possibility because they were all on the same page that at some point they'd be in visual conditions.

He said the increased reference speed switch was turned on if there were icing conditions. After exiting icing conditions he made sure that was shut off. Knew someone who had left it on and it could potentially lead to stick shaker on landing. Some crews are concerned about the ref speed increase switch on while on final.

They bugged speed bugs for non icing conditions flap 15.

Before going into clouds on the way up to YYZ the captain selected the icing protection system on. One time they did get the ice detect message prior to the captain selecting it on. Skillings did his part on his side making they weren't accumulating ice. He characterized the usage of the system as being turned on when entering conditions on climb and shutting it off when on top of the deck of clouds, and the same thing during descent. He said they picked up just trace amounts of rime ice. Skillings always looks back on the wing to make sure nothing is accumulating to unreasonable proportions.

Windshield heat is part of the ice protection system – they turned everything on.

Interview ended about 1800

Interview:	**Jack Wohner, Q400 Captain**
Date/time:	**18 February 2009, 1532 est**
Location:	**Marriott Buffalo-Niagara, Amherst, NY**
Present:	**Cox, Byrne, NTSB; Weston, Dittmar, Colgan; Wickboldt, ALPA; Conway, FAA; Simpkins, Bombardier; Webster, TSB-C**
Represented by:	**Dane B. Jaques**

During the interview Captain Wohner stated the following information:

John H. Wohner. Age 60. DOH Sept, 2000. ATP Multiengine land. I am typed on the SF-340, DHC-8. Total time 9000 hours. Time in Q400 about 7-800 hours. I came to Colgan with 3000 hours. Came to the Q400 January, 2008. Initial training was in Toronto with FSI but the check airman was Colgan, Dean Bandavanis.

He has flown with FO Shaw. She was a good pilot, not necessarily the very best but definitely good for a low time pilot. She progressed normally and onward progression to being a captain in the appropriate time. Personally, she was attentive, very supportive of the PIC, ready to point out errors when necessary such as speed control which she has pointed out to me. Can you think of an example of typical speed control issues? Yes the typical is that because of the great amount of power, I would tend to not pull back power quickly enough at level off. First there is a visual cue on the airspeed tape, but there is defiantly a loud tone warning if you hit the limit. There is a visual cue for low speed also on the bottom end, of course, and after that is the stall warning. Have you ever had a situation where you were slowing and got close to the underspeed? No.

If you are slowing in level flight could you quickly get into this low speed cue and it really gets your attention. That red cue can change with the increase ref switch, correct? Yes – 20 kts. When do you move that switch to ON? We move it when we put on the other deicing equipment. What flaps do you usually use? 15 flaps. I am more comfortable with a flap 15 landing. It is a flatter landing angle compared to a steeper flap 35 approach. What happens if you forget to turn the switch off? Well then you will have a stall speed above the planned landing speed, which is your cue to turn it to off.

What headset do you use? I use a special light speed ear plug type headset. Do most pilots use larger ones? Yes most do. Did Shaw wear a noise cancelling head set? She wore a ear protective headset but I don't know what type it was. Can you still hear the engine noise and know if power is up or not? Yes.

Did you see the NASA film on tail stall? Yes indeed I have. What do you think of this? It scares me every time I see it and it really drives home the extent of the possible dangers. They show several types of situations. How do you know what is severe ice? Well if my wings are not shedding ice or the side window icing, then I assume I have severe icing. Moderate is when the ice is shedding quite well. Back to the NASA film, you say this

made a big impression on you? Definitely, it really got my attention. He's seen it every year in recurrent and each time it scares him at how serious that condition can be. The video addresses other things, like icing is in a small isolated area and change your position to get out of it. But what always strikes him with the video is the risks associated with severe icing. What did you take away from this tail stall part of the video? The thing that stuck in my mind was that you can't power out of it, and that the downward movement might be more than I can overcome. It made a big impression because before coming to Colgan I had limited ice training, being a GA pilot.

So you are saying that reducing power and not letting the nose drop is the fix. Yes. How can you tell the difference? A regular stall is not associated with the tail but instead the main lifting surfaces of the wing. In a regular stall you'd get the warnings you usually get the stall warnings. The indications of a regular stall – the nose is going up, the trim is going up, the flight attitude on the display is going up, the airspeed is bleeding up, a half dozen indications of it. The pitch trim is down by his side, but the attitude indicator will show him the nose is creeping up on the primary flight display; and if that happens the pitch trim must be going up.

Which Colgan manual describes the recovery procedure? The tail stall is not described in either of the Colgan manuals. Does the tail stall apply to the Q400? I don't believe it does. Does it apply to the SF-340? Yes, I believe it does. I think once I encountered severe ice in the Saab. I told ATC, requested a change in altitude, and cleared the area.

Can you recall what you talked about when you last flew with FO Shaw? Yes we talked about her planned move to Seattle. She was quite excited about this. This was roughly in the January time frame.

When was your last trip with Shaw? January. Was it an overnight? No. Was she a good stick and rudder pilot? Yes. How about systems knowledge? It seemed good. How about her reputation among captains? She was a good FO. When you were flying with her, did she seem on top of procedures? As I said, she came to Colgan with very little experience and she got better all the time and was right on track. No one complained about flying with her. How about the level of conversation when you were flying together? It was normal conversation about her or me or flying. Were there any sterile cockpit difficulties with her? No. Are some FO's difficult to adhere to sterile cockpit procedures? No – I have a reputation as a tough captain – I don't have problems with any FO's. She never made a configuration change without being prompted by the captain.

Did you know Captain Renslow? No

Captain Wohner, you mentioned that were know as a pretty strong captain but I also note that you said that FO Shaw corrected you for high airspeed closing in on overspeed. Was this because FO Shaw was confident enough to do this part of her job, even if you might be annoyed at her, or was this just due to your CRM briefings? I think it was both. She was not afraid to speak up. How did you take that? I appreciated it!

Where did you do your training for initial? Toronto. Did you do stall training? Yes. Can you go through the procedure for this? He would normally configure for stall with the AP on and disconnect the AP as the speed began to bleed down. For recovery he'd maintain altitude add full power call stall, set full power, retract flaps, maintain altitude and increase airspeed. Pitch attitude to maintain he does not remember explicitly – he is sure they did but can't remember. The ATP standards he can't recall now but his goal is less than a 100 feet. Procedures covered in the checkride as well. Pusher – he has had that demonstrated but can't remember if it was in the Q400 or the Saab. He has had 2 PC's since his checkride. Nothing different, in those – to the standards.

Compare the Piper flying and Q400 in stall recovery? Well in the Q400 you power out of the stall, but in the Piper you dive out of the stall. Do you see FO mistakes in power management? Yes, it may often be overspeeding on descent and I teach them to reduce their descent while pulling off some power and then resuming the descent. He sees more FOs reducing their vertical speed rather than decreasing their power to stop the overspeed.

Regarding the high speed and low speed cue: what color are they? Red. Are both red? I think so. In cruise, do you have to pull a little power even in cruise to keep from overspeeding? Yes, even in cruise. Does turbulence affect the airspeed indicator? Yes significantly. About headsets, did you say that most pilots wear noise protection? Well they wear come kind of muff headset, if that's noise protection.

He's made mistakes because he's been tired.

Do you use the airspeed cues to use your power modification? Yes I do. There's a trend needle which catches your attention before overspeeding or underspeeding. Have you ever practiced or trained a tail stall recovery procedure for the Q400? No.

The trend needle is where? It is on the airspeed indicator (he diagrams this for Roger) and the arrow gets very long if you are accelerating rapidly. It is on the PFD and you have to read what it is saying. Turbulence plays a factor in its movement. Where are the displays for engine power? They are right on the center panel with engine readouts. It is displayed both in dial form and digitally. I use the digital readouts.

Are you a check airman? No, I was one on the Saab. Did you say that maintaining altitude is the most important in stall recovery? Well, yes, but you also don't want to fall out of the sky from the stall.

Interview ended 1627.