Attachment 13

to Operational Factors / Human Performance Group Factual Report

DCA11IA047

INTERVIEW SUMMARIES ADDENDUM

Interview Summaries Addendum

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Interview: Robert L. Owsley, Senior Manager for Flight Standards and Quality Assurance – Southwest Airlines
Date: September 13, 2011
Location: via telephone
Time: 1000 EDT

Present: Evan Byrne, David Helson - National Transportation Safety Board (NTSB); Greg Bowen– Southwest Airline Pilots Association; Keith Griffith – Southwest Airlines; Tom Phillips – Boeing; Tony James – Federal Aviation Administration

Captain Owsley was represented by Mr. Dane Jaques.

Captain (CA) Owsley stated the following information:

He was a captain at Southwest Airlines (SWA), and also Senior Manager for Flight Standards and Quality Assurance for SWA. He has been at SWA for almost 30 years (December will be his 30th anniversary with company). He has been in his current position for about 2 years. He started as a first officer in 1982 and was upgraded to captain in 1984. He later was selected as a check airman. About 3 years ago he was asked to conduct a Quality Assurance (QA) study, and subsequent to that was assigned to the newly established senior manager position. He has also helped to teach new hire classes and captain upgrade classes at the training center. He reported to Chuck McGill who was Vice President of Flight Operations. Captain Owsley had 3 people reporting directly to him: one was Manager of Flight Standards, one was Manager of QA, and one was a QA analyst. Each of those direct reports had some direct reports below them. The QA analyst was an analyst for both QA and flight standards.

He described his duties and responsibilities for both QA and flight standards. The QA had 3 basic branches: Training and Procedures Validation, Ops analysis, and Operational Risk Management. He said training and procedures validation was relatively straightforward. The ops analysis conducted data on the line to monitor the status of line operations. The operational risk management team conducted risk assessment and made recommendations on mitigation to management. For flight standards, he was responsible for overseeing check airman and check airman activities for the pilots. He did not play a role in development of flight ops procedures other than when the group writing procedures requested an evaluation of their procedures; and then QA would do an analysis and report the results to them.

Currently, a QA report would be requested by the VP of Flight Operations. However, when they first began the Step 3 reports, because the QA function in flight operations did not exist, it was done with an ad hoc group brought together with a specific request to perform the studies. He said setting up the QA department was an ongoing process. He got approval for the personnel and positions effective 1 January 2010, and those positions did not fill until the second quarter of 2010. The department was now about 12-18 months old. At the time they did the step 3 study they did not have his position, or a QA manager, or a full time analyst, nor associated staff support.

He was the designated lead for the project to accomplish the Step 3 and Step 4 QA reports, and SWA pilots assisted with the task. Some of the pilots were first officers, a check airman was involved, and a captain who was a representative for the union was involved.

He did not recall specific comments from the pilots about the study. He was not directly involved with the test group. He did not conduct the briefings or the simulator observations. All the data he had was the data contained in the reports. His role was to select the team members, bring them in, provide support for them, and basically was the lead. It was primarily a support function. He assisted with the study design. He did not directly participate in the observations or writing of the report.

Internally the reports were provided to the people who requested the study, which included the training development team, training department leadership, and the procedures team and leadership. What they did in this case was typically what they did – conducted a study upon request and then delivered the completed report to the group requesting the study.
The final reports were not shared outside the group. They had a couple consultants helping them. The consultants did not receive a copy of those reports. It was his understanding that NTSB was the first to see those reports outside of flight operations.

He was asked whether he got feedback from the requestor about the reports. He said they perform requested testing as specified by the requestor and then deliver a report to the stakeholders. They did not normally retest the product. He could not comment as to how the report was received as once they delivered it their role was complete. Occasionally if they incorporated a change and they wanted to come back and ask if it fixed the problem they would revisit it, but that was the exception rather than the rule.

The study, as designed, involved an evaluation of a close approximation of the ground training that a typical SWA line pilot would receive. Pilots in the study would then do two LOFT (Line Oriented Flight Training) profiles in the simulator to demonstrate those skills under observation.

The consultants they used were not involved in the conduct of the study, only the design of the study. This type of work was new to him when the study was performed as he was not a QA professional at the time, and not trained nor experienced in conducting QA assessments. To compensate for this lack of experience he sought outside help in how to properly design the study and implement it (including input from specialists in adult learning and human factors researchers from NASA).

He said they did not attempt to monitor or evaluate how the recipient responded to the findings in their reports. His instructions were to deliver the results to the person who ordered the test. He did not recall if anyone requested any follow-up evaluations based on these reports.

He designed a data collection tool that was provided to selected check airman as an addendum to their normal line check form. They designed that tool, and administered it during line checks, and built a series of repeated briefings to leadership as observations of line operations came in. He described this effort as originally Phase 2 of the QA analysis but it continued after the QA

reports had been completed. They originally reviewed these data monthly, and the use of the addendum was still ongoing but they had reduced the frequency to quarterly because the results of the observations had stabilized at a low level. Phase 1 was accomplished before procedures were implemented on the line. Phase 2 included observations of the pilot performance in line operations.

He stated that the QA reports speak for themselves. All the data collected was contained within the reports. He said he was not requested to do any evaluation after the SWA1919 incident.

He said that the QA department was always busy, but early on the audits were pretty much all they did. He said that now the department was mature, well organized, and fully staffed.

He was aware of the company's effort to request amendment of the Flight Standardization Board report regarding 737 differences training, but QA did not participate in that.

Captain Owsley said he was not aware of any procedural changes as a result of the incident.

He said the line checks using the addendum that addressed automation were still ongoing. That was an essential function for his department to monitor what was happening on the line and provide feedback to leadership. The form focused on implementation of automation procedures. He described the patterns of data collected using this form. He said when you implement change in an organization the data will respond and initially, as expected, there was some trend data showing that pilots were learning to use the automation on the line as they gained opportunities to practice using it. The trend data regarding automation issues have now leveled off to what he described as background noise or reflecting normal human-machine interaction. He said they were no longer seeing changes in pilot performance. They had been reviewing data monthly, but were now reviewing it quarterly. The last briefing given on these data was in the last 2 or 3 weeks but he was not in attendance and did not have recollection of the material on the PowerPoint slides. The briefing was conducted by his ops analysis people. He said they gave this briefing to leadership on regular basis so they can assess problem areas and address mitigations.

Regarding the level-off of trends, he said that when they talked to people at other carriers who were more experienced in automation, that they realized what they see now are the same kinds of errors and the same kinds and rates of errors that the other carriers were observing. He said pilots were always going to make errors so they tried to put in place barriers and controls. He stated that what they were seeing now was pretty typical in the industry with respect to pilot errors as it related to automation.

Their industry consultants and human factors people told them to expect to see an initial spike in errors as they first turned on the automation. That was why they deployed it in steps with controls (such as only using VNAV above 10,000 feet for a while) for this built in to allow pilots to use the equipment in line operations, with a subsequent implementation of additional procedures as pilots gained experience. He said that some of the observations of error may be related to automation and some may not. Stabilized approaches were an example he provided.

He said that could be an industry wide problem and he said it was hard to say that everything they see was as a result of automation.

Regarding the sample of 40 pilots used in the QA report, he said it was designed to the 95 percent confidence interval and was based on systematic random sampling. If they used a purely random sampling method, they would have needed about 100 participants for the same 95 percent confidence interval. He said systematic random sampling assured that every member of population has equal chance of being selected. He described it as a standard way to do research and sampling. First you determined an interval based on size of population and selectees you want. Next you take the whole seniority list, and select a random starting point within it using a random number generator. Then you take the interval and move away from the selected starting point by that interval to identify participants for the study. There were some limitations in the selection process, but it was more or less at random. The limitations were because not every name you landed on could participate for various reasons, due to being on vacation for example. He thought in general that the group selected was representative of the pilots at SWA and you could make inferences.

Regarding the line checks using the addendum, he said that there were 39 check airmen out of the total population of check airman who had been trained to use the form. Asked to estimate how many checks using this form are received on average each month, he said that each pilot had a line check done once a year unless over 60 and then twice a year, and a typical check airman did 2 line checks a month on average. He estimated that about 50 or 60 a month are completed using this form but that the ops analysis guy would have a specific answer to that question.

Regarding his comment that they were currently well received in flight ops and whether this had always been the case. He said when they started that the primary challenge was they were new. They really had not had an active QA department prior to that, nothing more than a small group test before that. The Step 3 and 4 audits were large scale products so QA was new to us and to them. He said the early reception was hard to describe but he was put in a position and had to learn to interact effectively with them. He said it just took time.

He said the type of study they did was a little bit new as far as in the airline world. He considered it to be representative of proactive safety activities as distinguished from the reactive methodologies of the past, and one that used inferential analysis verses descriptive analysis. He explained that retrospective look back is looking at facts and dissecting what contributed, deductive reasoning to stop a recurrence. He said in inferential analysis they tried to describe a potential reality that had not yet manifested based on present observation. He said the significance of the study was that they were establishing a proactive safety process to ferret out events that have not yet happened to prevent them before they happen. He said that was their goal and it was more typical of scientific inquiries, and had been done in the past

Regarding a statement in the QA reports indicating that training did not provide the pilot proficiency necessary to operate within the intent of the automation policy, Captain Owsley was asked if the QA reports produced action within the company to mitigate that issue. He stated that he was sure they did but he said he had no specific knowledge of what actions were taken. He said the QA reports did testing to a certain standard and provided those results. He said he

thought there were responses in training and procedures but he referred to those departments for specific answers as to what they did with the data.

He said that the automation training he received did prepare him to use the automation and fly the approaches and be comfortable in the procedures. He did an approach to OAK, an RNP approach to RWY 29 last night. He acknowledged that his experience with the training may not be typical as he was not the typical line pilot, and although he did not participate in the actual testing of the step 3 and 4 training, he did have a lot of exposure to it as part of his project manager position.

Captain Owsley said they used two separate LOFTs in the QA observations because one was conducted with structured environment and the other less structured. One leg was from Las Vegas to Los Angeles which was a highly structured city pair, departed on a SID (Standard Instrument Departure) with everything, course, and altitudes, loaded from the database, and transitioned to a STAR (Standard Terminal Arrival Route). The point of it was they were very structured flights with everything loaded in the database. The other one was Seattle to Spokane. Pilot would have to plan energy management and crossing points to a much greater degree than the other city pair.

He was asked if the LOFT's were conducted right after the training event. He said they built in a delay as they had consulted adult learning specialists because they knew there would be a time delay between training and implementation. Typically the "forgetting curve" is pretty steep for the first few days and then becomes asymptotic as you go out in time. He said the recommended interval between training and testing was 7-8 days which, according to their consultants, was representative of the retention pilots would have after a delay, so that is what they did. There was, by design, a retention delay built in based on recommendations from adult learning specialists.

Asked whether the reports were fact or opinion based, he said it was akin to an inferential analysis. He said they were trying to describe events that had not yet happened, a potential reality that was not yet manifested. He said they were inferring the future from present observations of performance. He said it was hard to say it was fact based but the techniques used followed sound statistical and inferential analysis principles.

He had not seen specific problems when he was doing check airman work in simulator observing. He said he did not have a very good sample size to talk about from that work as he was overseeing the check airmen group and was not doing as many observations as they were. For the RNP approaches he had seen in the simulator there were a couple of typical mistakes that he had seen, and he was not sure it was valid to talk about as he had seen it only a couple of times. It was a benign mistake; the aircraft didn't descend as expected because the pilot didn't set something up right and they had to discontinue the approach and do it again. He said his check airman have not told him that RNP approaches were unsafe approaches. He said they had been working with a new data collection tool and once that was complete, he would be able to provide a fact based answer.

He did not believe the Step 3 and 4 QA reports were shared with FAA. His attitude was senior leadership commissioned these reports and when the reports were completed they took ownership of them. He did not provide reports outside of flight ops senior leadership.

Interview ended at 1116.

Interview: Thomas Bruce Smith, Supervisor of Training, Flight Operations Training – Southwest Airlines
Date: September 13, 2011
Location: via telephone
Time: 1130 EDT

Present: Evan Byrne, David Helson - National Transportation Safety Board (NTSB); Greg Bowen– Southwest Airline Pilots Association; Keith Griffith – Southwest Airlines; Tom Phillips – Boeing; Tony James – Federal Aviation Administration

Mr. Smith was represented by Mr. Dane Jaques.

Mr. Smith stated the following information:

He was hired at Southwest Airlines (SWA) in May 2002 and had been in the Supervisor of training position since about November 2009. He was hired as a flight instructor doing simulator and classroom instruction. He was not a line pilot at SWA. He worked on a few other projects such as the standardized PT (proficiency training) in 2004-2005. In January 2008, his boss (John Kundig) asked him to form up a group to provide training in support of SWA's initiative to turn on the automation (autothrottles, VNAV, etc.). This effort lasted about 2 years during the period from January 2008 to sometime in 2010. Prior to SWA he was with Braniff 2 from 1987 to 1989, and then flew for Ansett Australia for 13 years before retiring from line flying. He returned to the US in February 2002. He has flown A320 and B-727 airplanes but had not flown the 737.

He reported to Ken Moriarty who was the Senior Manager of instructors. He said he currently ran special projects so he had people reporting to him who were working on a couple of projects now involving 737-800 and ETOPS. He said he had 5 people that reported to him. As one of the supervisors in the training center he took care of all simulator and ground school instruction, including initial, captain upgrade, and requalification training.

He was one of 7 instructors asked to participate in the automation training development team (TDT). The instructors were selected based on their previous automation experience. They developed the training modules but had nothing to do with procedures development as SWA made this transition.

His involvement in the development of the QA reports/studies was, “absolutely nothing.” He said his department did not receive those reports. He “did not know those reports existed until 3pm last Friday afternoon.” He stated that “none of the people that he worked with on his group had access to any of this”.

He said that the TDT did have a role in producing responses to the reports. Based on the QA recommendations that were forwarded to them they either accepted the recommendation or rejected it and changed the courseware. They also made some recommendations to the simulator profile and they made appropriate changes to those recommendations as they saw fit.
He said they had 3 things they were involved in the step 4 process. They got a QA step 4 training plan dated 15 October. They received a training development outline from the QA team without a date. They got a letter from Tim Leonard who was Manager of Training, dated 6 February 2010 that was a step 4 group 1 QA report and an 8 March 2010 group 2 QA report. Both of those documents were sent by Tim Leonard.

The TDT went through line by line evaluating what QA sent them. Some of the suggested changes they accepted and others they did not. Changes were made in both the ground school PowerPoint courseware and the simulator profile as they thought were necessary. For example; they were given slide numbers in some cases and would check the slide and make the change. Some proposed changes, such as slide colors, were rejected because the TDT did not give them a lot of weight. The review process was done with all 7 members of the TDT in the room and providing input.

For the simulator training they reflowed the simulator based on the QA comments which actually made it run a little bit better. They then flight tested it in the simulator to see if it did work right.

Mr. Smith was asked about a specific comment included in the Step 3 QA report. He stated that he “did not feel comfortable talking about this document as he did not receive it until last Friday” He said the information contained in these reports was not shared with him last February and March of 2010. He re-stated that he did not know these reports existed until last Friday.

Mr. Smith was asked to describe in what format this information was provided to him for him to have a role in responding to the elements of the reports.

Mr. Smith said The QA process did not start until the TDT was three quarters of the way finished doing the PowerPoint slides for the Step 3 ground school. As a result, the TDT helped the QA team play catch-up. He said as far as any things they needed to fix, he said there was “absolutely nothing that was shown to us” except some verbal items from speaking to Bob Owsley. After the sample pilots received the training he spoke with Bob Owsley who said guys were having a hard time identifying the 1000 foot mark on the PFD (primary flight display) and also having a hard time finding out where the RA readout was on the PFD when they were doing an HGS (heads up guidance system) approach. Based on those two things they beefed up the slides and gave a really detailed explanation of where the stuff was. He said most of the stuff they responded to was Step 4 material and it was only those items mentioned earlier that were received from them. As far as the Step 3 report, he said it was only a verbal report and “nothing was in writing.”

Mr. Smith was asked if any of the items contained in the Step 3 QA report or the Executive Summary contained in the Step 3 report were provided to him or his group prior to last Friday. He responded "No sir it was not."

Mr. Smith said he was not aware of any deficiencies observed regarding PFD interpretation or flap over speed /configuration problems on approach other than the two he previously mentioned receiving by verbal briefing. He was not made aware of any other observed deficiencies.

He said he was not aware of who was provided with the information contained in these documents last February and March of 2010. He stated that the Executive summary identified a few people that the reports went to, and he was not included. He said he assumed the reports went to people above him and the information "never got filtered down to us."

Mr. Smith was asked who William Ware was. He stated that Mr. Ware used to be an instructor here but was now a line first officer (FO). He had been brought in to work on the project. He was one of the seven instructors and he had the PowerPoint skills so "he was our computer guy."

Mr. Smith was asked if he was familiar with a 13 page spreadsheet document titled Step 3 QA Analysis. He said it was "part of our response to their stuff." A number of items were read from the document, including PFD familiarization and flap over speed and he was asked where he received the list of items. Mr. Smith stated that this list came from the Step 3 simulator observations and this was the TDT's line by line response to that. He said "I do not believe that was included in the Step 3 stuff that they sent or that I saw." He said it was based on a report on Step 3 simulator observations and that was the TDT response to that report. He said what he was talking about earlier was the final report which he had not previously seen. This memorandum was sent to David Newton who forwarded it to the TDT.

Mr. Smith was asked to clarify some of the information contained in the spreadsheet. He was asked what the items listed as "taught" meant. He stated that those blocks in the spreadsheet identified the specific slide, video, or other courseware that taught the information addressing the deficiency listed under the "QA Comment" column. Specifically, when discussing an item on page 3, the 7th comment, he was asked about the color coding which indicated the item was taught in the step 3 ground school on PowerPoint slide number 76. He stated that the PowerPoint slide was also "reworked to make it more easily understood" and that a simulator video was also change to emphasize what was in the PowerPoint.

Mr. Smith was asked to clarify what "taught" verses "action required" meant in the spreadsheet. He said that although the spreadsheet does not say action required for that specific issue, the PowerPoint slide was changed. Mr. Smith was asked to describe what was meant by "poor pilotage" in the TDT comment column on page 3 of the spreadsheet. He stated that it was probably a poor choice of words but that they viewed the issue as "piloting 101", that they likely had not taken any action on that because it was listed as taught already in the ground school and simulator.

He said he was a supervisor of training for special projects; he was not currently working on any training for automation or RNP.

Mr. Smith said there was interaction between QA and TDT but it was mainly verbal. On step 4 it was more formal. He said after changes were made all the test people were given training again with the final product. He said there was a lack of communication between QA and TDT but he thought changes were being made even though the QA people were not made aware. He said as far as written communications "they were pretty lax on both sides."

Interview ended at 1220.

Interview: Timothy J. Logan, Senior Director for Safety Risk Management – Southwest Airlines
Date: September 13, 2011
Location: via telephone
Time: 1330 EDT

Present: Evan Byrne, David Helson - National Transportation Safety Board (NTSB); Greg Bowen– Southwest Airline Pilots Association; Keith Griffith – Southwest Airlines; Tom Phillips – Boeing; Tony James – Federal Aviation Administration

Mr. Logan was represented by Mr. Dane Jaques.

Mr. Logan stated the following information:

He had been at SWA since February 2001. He had held his current position for about 5 years. He had a BS in aero engineering from Ohio State University. He worked at Boeing in flight test for the B757 / B767 and later went to work at ALPA on the accident investigation engineering safety team for about 9 years. He then worked at NWA as the Manager of Safety there and he ended up as the Director of Flight Safety and Quality Assurance. He came to Southwest Airlines (SWA) where he helped start the FOQA (Flight Operations Quality Assurance) program, referred to as FDAP (Flight Data Analysis Program) at SWA. He became Director of Flight Operational Safety, and then transitioned to corporate safety and took on the FAR 119 role of Director of Safety in 2006. He was a private pilot and not type rated on the B737. He did not fly the line at SWA.

Mr. Logan said he reported to Scott Halfmann who was the VP of Safety and Security. The security aspect of that was the TSA side of security and that role reported to the Executive VP of Operations, Mike Van de Ven. Mr. Logan said he had about 50 people in both safety and security. He said that although he had a Director of Security he did not get too involved in security matters under most circumstances in his role as Senior Manager of Safety Risk Management. He said he had the IEP (internal evaluation program) reporting to him, but they

had moved it to exist under one of the other directors so that that they could audit his safety position without any conflict. He said he also had safety risk management under him and a team of investigators that were responsible for investigating events.

He was asked to comment on the organizational structure at SWA as it related to the various safety groups in the operational departments and to his 119 Director of Safety position. He said that there were direct reporting safety organizations and distributed safety programs. At SWA they had kept the programs distributed in the operational departments. Programs like FDAP, ASAP (Aviation Safety Action Program), and CASS (Continuing Analysis and Surveillance System) were all reporting within their respective organizations, but they also reported to his office. They had an operational safety committee, director of flight safety, director of ground operations safety, director of QA, dispatch, and they all got together on a monthly basis and prepared reports to go to senior management and the Board of Directors. Any safety investigation was led by his team and they were responsible for coordinating with other operational units at the airline. He said he had a lot of interaction and coordination on a daily basis with the operational departments for his 119 position.

He said when SWA made the decision to make the investment and start the process to transition to full automation and RNP (required navigation performance) he started working with the then Director of Safety Ted Lawson. They talked about how they would use ASAP and FOQA data and started looking into doing a full LOSA (Line Operations Safety Audit) program. He said they did some smaller confined LOSA on certain aspects of the operation in 2004 when they had made a procedural change. He said they got some experience at that time with help from NASA but they felt this was a great opportunity to get a LOSA program started. That LOSA was conducted in May and early June of 2011.

They wanted to make sure they were looking at the right parameters from the perspective of the FDAP program. After the automation introduction they were expecting some trends towards unstable approaches. They had good data on that and they had driven the rate of unstable approaches down. They wanted to make sure they were able to watch those issues using the FDAP data and flap over speeds, crews' use of auto throttles and navigation issues. They wanted to make sure they had the data to look at when the automation program started.

It was not so much a QA effort as it was looking for trends that they needed to jump on right away. He said it gave them the ability to look at how well the automation program was working in the real world. There had been a lot of concern about how it would interact with the ATC environment.

He said they had to make some modifications to the measurements of the FDAP data to detect any problems, they made sure they could detect what approach was flown, whether it was a GPS (global positioning system), RNP (required navigation performance), ILS (instrument landing system) or even a visual approach. They had to add in measurements for the autothrottles and also had to make sure they could detect the RNP requirements. When data started coming in after introducing automation, they saw data that showed increased trends that then immediately started trending back down. He thought they had driven it down 200 percent from 2003 when

they started the FDAP program. They did not see any severe events such as loss of control or loss of airspeed as a result of the automation introduction using the ASAP and FDAP data.

They were particularly watching the flap exceedence rate mostly on arrival, and also on departure when crews would forget to retract flaps. They had seen those events before. Prior to implementation of automation, they put in an ACARS (aircraft communications addressing and recording system) notification for the crew to immediately report on flap exceedences to help with awareness. The rate had increased on flap exceedences but started to come back down. He said it had not come back to where they wanted it. To get the word out to crews on issues like this they would put out a bulletin or an alert and had an opportunity in recurrent training for flight safety folks to brief on safety issues. They would use that opportunity to go into the class and brief on what they were seeing. They also provided safety message information to crews via direct video feeds into the crew rooms. One message was that crews needed to prepare for the approach, and start their descent and planning earlier. They had a similar issue when they installed winglets. There was less drag and they had to educate the crews. It was an ongoing process of education. What was good about the data was that they could watch the rate go down after they issued a bulletin, did a training briefing, or did a video for presentation in the crew rooms. However, he stated that the flap exceedences have still not come back to the lower rate they had before introduction of automation so they were still working on getting guidance out to the crews.

He said the ASAP data showed that there were some instances of mode confusion, but most of that was when crews were on an RNP approach, and then were pulled off for some reason and were trying to get back on the approach. The result was either altitude deviations or navigation errors, and either they lost separation with other airplanes and submitted a report or ATC (air traffic control) alerted them. They needed to make sure the procedure was correct and that crews programmed the FMC (flight management computer) and the panel correctly.

He said with ASAP you could not tell the true rate because it was a voluntary program, report submission was voluntary and there was not 100 percent reporting like FDAP. He said it was a great program and they got a lot of great data out of it, and the crews were pretty honest with those reports.

Mr. Logan said he had no involvement with the Step 3 and Step 4 QA reports, and was unaware of them until he saw them during this investigation. He was aware of company actions in response to the reports, but he saw that after he was made aware of the reports. He said that was one of his first questions after he was made aware of the reports, “what did we do with them?” There was nothing documented, it was piecemeal.

He said he was more concerned that the Step 3 and 4 QA reports did not seem to match up with some of the other efforts his department had been doing so he questioned the reports. He explained that the process used did not follow an industry-standard QA process. He read the reports closely when he became aware of them and started asking himself questions about the sample size used. The report did not follow their audit procedures. He said the report had a lot of opinions in it. He said it was not based on any standard. He said he was a little concerned that it did not follow normal procedures and did not have an end process. That is, if there were

items identified that it had a way for things to be corrected. He said it was a little hard to go back and reconstruct what happened and added that they were so much farther down the road with the automation program from where they were back then when the audits were conducted and they had other data that they were looking at. He said they were waiting to see the results from the LOSA analysis which they were expecting in October or November (2011).

The audit process as it was currently done was identified in their Safety Program Manual. An important consideration was that it was a full loop audit. The loop must be completed. For example, this was what we are going to base it on, findings come out and are presented to an organization, the organization would have a set amount of time to respond, and then we communicate acceptance/rejection of the responses to our Chief Operating Officer. He said this report did not follow that process. He said they had this process and about the time the QA department was being stood up, they briefed the QA people at the time the Step 3 and 4 audits were conducted but he did not understand why they didn't follow those procedures.

He said they also had developed software with their finance folks regarding how to determine the correct sample size. He said they had what they felt was a scientific method of selecting the right sample size to get a 95 percent agreement on the validity of the results. He said he did not see that in the Step 3 and 4 QA reports, and he did not know why they chose the number of pilots they did and he did not see an analysis of that.

Regarding data – he said the audit reports stated that they were expecting to see 50 percent failure rates. He said the safety department did not see anywhere near that kind of failure rate in the data they were collecting. He said they were collecting data on about 60,000 flights per month and they were not seeing anywhere near 50 percent. He said he thought they did not even see 5-10 percent. He said if they had been seeing a 50 percent failure rate on approaches, they "would have reacted totally different." He said they did not see that from the data. They were looking at the data for the more significant events. A lot of what they saw, they had seen before. He said he was looking more for distractions on the flight deck due to new procedures.

They conducted a LOSA in about May and June of 2011 and were waiting on the data which should be delivered to SWA in October. The cockpit observations were conducted across a 5-6 week period. He said the observers in the flight decks had a defined checklist and were looking for errors made or deviations from SWA procedures so they could correlate that back to the checklist and / or how pilots were trained. The LOSA is based on a threat and error management model. He said he expected to be able to use these data to match up with their other data sources to assess system operation such as FDAP and ASAP. FDAP tells you what happens, but not necessarily why. ASAP was also partial view. LOSA was a further set of data they can look at. One benefit of LOSA is that it can be repeated in a couple years to see if improvements have the desired effect, and they could use the ASAP and FDAP in the interim.

They had a quarterly meeting with the CMO (Certificate Management Office), which was basically a data dump, and the CMO was allowed to look at the FDAP data. The CMO was already looking at the ASAP data as part of the weekly ERT meeting. With the AirTran integration they had not done that meeting recently; and they also had a change in the POI (principal operations inspector). They normally did a quarterly briefing with the POI. Internally

they met twice a month with all of flight ops (training, standards, procedures, regulatory compliance) and they went through the data in depth. Then they had a monthly senior leadership meeting within flight operations. Usually in attendance were the members of the Operational Safety Committee, Director of Cabin Safety, QA for Maintenance, and Dispatch Safety. He tried to attend those meetings and they were also attended sometimes by his boss and occasionally the Chief Operating Officer or the Chief Executive Officer.

He said there were no additional concerns brought up by pilots regarding the automation program other than those that were briefed in the safety meetings that were developed out of the these data. Specifically, mode issues, unstable approaches, and flap exceedence issues. He said they were trying to make sure that they were not attributing these issues to automation if it was only a distraction from a procedural change.

Since this incident occurred in April, he said they were in the process of reviewing items identified in the event and looking at FDAP and ASAP data on landing with Autothrottle and Auto pilot engaged and reverser deployment. He said they were looking at reverser issues as far back as the 1248 event to make sure they were getting reversers deployed in a timely manner and also if the spoilers were not armed. They were trying to figure out if there was any relationship between RNP or automation and those procedures or were they just a distraction that was brought in the same time. He said they saw some of these things before and they needed to keep monitoring. He said they had not seen anything that required them to change anything dramatically.

Regarding the structure of the company and the difference between the flight ops safety department and his safety department, he said even before he was moved to this the roll, and this was one reason why he moved over, he could argue both sides. Whether you keep it distributed or centralized. This issue was under review at the company right now. He said it was based off the guidance they were getting from SMS (Safety Management System). They reorganized the corporate safety department under the four pillars of SMS. He had safety risk management (SRM) under his side. He said they just hired an assurance director who was responsible for all of the assurance programs, including IEP, and to coordinate with the other department QA organizations. He said they also had a Promotions and Policies and Occupational Safety. He said they were currently looking at whether they should consolidate those programs but they were going to let the SMS guidance and checklists help them get there as far as their structure was concerned.

He said they were discussing changes to the pilot callouts on landing rollout. They were involved in discussions back in 2004 when they made their procedural changes and they were monitoring the data. One of the reasons they wanted to go back and look at past data was to help make the argument that maybe they need to review that. He said one of the things that may come out of their internal investigation was that they may make a recommendation that those procedures be reviewed by flight operations. He said they would probably not offer a specific recommendation but they would build a data case around it and point out that SWA philosophy needed to be reviewed. He said the LOSA information would also help with that.

He said he was unaware of a NASA report which included a LOSA involving 139 pilots after step 1 of the automation program.

Regarding the sample size of pilots used in the Step 3 QA report, he said he did not know how those numbers were determined, that they did not use the process that was normally used at SWA. He said he had not run the numbers through their decision process so he could not comment on what he thought the sample size should have been.

In order to determine whether an error was associated with automation or was due to another distraction, he said they would run the data back out past the implementation of the procedures. He said it was hard to identify if spoilers were armed or not armed, because the measurement was not set up for that. He said they had to modify the analysis to make sure they understood what that was to see if they could detect it and they needed to back up to see if they were having those same issues ahead of the implementation of automation, what the rate was, and what changes were going on at the time since they made the changes in steps. He said he wanted to make sure he was not blending issues and that since there was a lot of emotion included in the QA reports, he wanted to get away from the emotion and make the right decisions.

He said they started the FOQA program at SWA in 2003 and saw some of the same issues in unstable approaches and flap exceedences in almost every phase which he said was common. The SWA program was the second FOQA program he started with the first being at NWA. Drive down and get crews to understand, there were checklist discipline issues, the checklist was changed in 2004 to simplify the checklist in high workload areas. His concern was they were seeing some of the same things and he was hesitant to say it was due to using LNAV/VNAV. He said it could be due to the increased workload from having something new that you were not used to doing; it takes a second more to think about compared to a crew that did an ILS approach that they could do in their sleep. It was a new procedure and it was evolved so they wanted to make sure they put in the right controls. He said since they were seeing the trends coming back down, they believed that they would trend back down to the original rate.

He said that if he had seen the QA report back then he would have had an opportunity to do a thorough job of validating it. He noted that one of the things they did not do in that report was that they did not include everyone in the process. He said training was already working down a path, working with the FAA on what the procedures were going to be and what the training was going to be without QA actually being engaged in that. He said that was not good to start with that kind of process as you end up arguing over the data rather than arguing the results.

He said he believed that SWA pilots were using automation safely and following company procedures. His reason for thinking that was that he was watching trends each month, and observing that the trends were coming down. He also knew the activities that flight ops group was doing. They were not seeing egregious events. He said although 1919 was one there was more involved in that event. He said they have looked back and were not seeing similar significant events. In the case of 1919 there was a triple failure having the auto pilot and auto throttle engaged along with the spoilers not being armed, and procedures and barriers were missed resulting in the reversers not being deployed. He said they were always looking at the data for possible changes, but nothing makes them think drastic change in this case other than a

review of the pilot callouts. He was also concerned about the delay in deploying the thrust reversers, and the fact that they have to keep emphasizing that crews need to get the airplane in the landing position and get spoilers deployed, reversers deployed on a timely basis because that was what the performance data were based on. SWA prepared a bulletin for crews about this issue after the American Airlines event in JAC. He said they prepared it and were in the process of putting it out to the crews (or had put it out to crews) around the time that flight 1919 happened.

He was asked if the Step 3 and 4 QA reports should have provided suggestions on training or just maintained an audit function. He said for the most part they were supposed to stay away from providing solutions. They had gotten away from directing what the corrective action should be, but they were not the subject matter expert. They tried to develop what the finding was and identify a need for corrective action. In the Step 3 QA report they were offering up more specific findings than he thought was appropriate.

Interview ended at 1441.

Interview: Charles Joseph Magill, VP Flight Operations – Southwest Airlines
Date: October 04, 2011
Location: via telephone
Time: 1430 EDT

Present: Evan Byrne, David Helson - National Transportation Safety Board (NTSB); Greg Bowen– Southwest Airline Pilots Association; Keith Griffith – Southwest Airlines; Tom Phillips – Boeing;

Captain Magill was represented by Mr. Dane Jaques.

Captain (CA) Magill stated the following information:

He was hired by Southwest Airlines (SWA) in July 1993. He was currently the Vice President of Flight Operations based in Dallas and had held the position since about 2007. Prior to coming to SWA, he was in the Marines for 22 years (12 active and 10 reserves) and flew in the Gulf War. He was hired as a first officer and upgraded to captain after about 5 years. About two years later he was asked to be a check airman for a few years then became a base chief pilot in Houston for about a year. He then moved to Dallas to be the regional chief pilot and became the senior chief pilot for the airline and the FAR 119 certificate chief pilot. He reported directly to the Chief Operating Office. He said the flight operations department consisted of about 6,400 employees, about 6,000 of which were pilots and there were several departments reporting to him within flight operations such as the Flight Ops Safety Branch, Chief Pilot Branch, Certificate Chief Pilot, an Operations Branch, and the Senior Director of Crew operations which included all of

the scheduling and planning issues, schedule planning, line density, overnights, his department over saw all of the domiciles and contract administration .

Captain Magill said he was briefed over the past few weeks on the issues we were investigating and stated that he was very proud of this program at SWA. He said they have had 100's of people working for years to get the airline where they are with automation and RNP (required navigation performance) and some companies chose to do it by just sending out a bulletin. He said that was not good. SWA had invested $20 million to provide training to pilots through distance learning, classroom, and simulator to get pilots properly trained. He said he thought the automation and RNP training was industry-leading and that others in the industry have asked for the program. He said peers liked it and the CMO (Certificate Management Office) was ecstatic. He said he started the process about three years ago as a three-legged stool which included the labor group (pilots), the FAA (Federal Aviation Administration), and Flight Operations working together throughout the process. He compared the documents provided to the NTSB as being like a movie trailer where you only have a partial picture and do not get to see the whole thing.

Captain Magill said he started the QA (Quality Assurance) department because it was vitally important to have empirical data to make flight operations decisions. He said it was the best flight ops safety department in America today as they used empirical data and FDAP (Flight Data Analysis Program) analysis to change flight operations procedures. He said he always had checks and balances in place but wanted a stand-alone QA department. When QA was writing the step 3 report, the group was not yet fully developed or fully staffed and was in their infancy. He said they were pretty far along in the automation / RNP process and they had checks and balances in place when QA came on board so they could have excluded them from the process. But he wanted them involved to get exposure.

He said the staff and the company were putting together a timeline on what was done and when to demonstrate that whatever was read in the QA reports was considered and there was documentation to show that. He expected to have the information package to us shortly. They had been working very hard on it over the last few weeks as he wanted the NTSB to be comfortable with what SWA had done regarding RNP.

Captain Magill said there was nothing specific that initiated the QA reports and he did not give any specific marching orders for the conduct of the QA. He wanted QA to monitor and do QA on ground instruction, simulator events, and any other project they had. He said they were currently working on 17 different projects within flight operations and he wanted to make sure they were supporting the safety of the airline.

He was not a QA expert so he hired some and he sent his people away to school to get smart on how to run a QA program. He wanted an independent view and he did not want to cloud or influence the review. He had separated them into a stand – alone department that reported only to him. He said no specific marching orders were given, that the QA reports were very thorough, and that the Executive Summary provided sufficient information for him. He said after any QA report or briefing he always asked about safety and that at no time was safety ever in jeopardy. He said QA looks much different now than when they started in spring of 2009. He said he had to balance what he was getting from the QA department, his SME's (subject matter experts) and

the weekly RNP updates. Along with other checks and balances he felt comfortable with the program. He said the report came out when there was only about 30 days left in the training cycle and they had already trained about 5,000 pilots. He said if there had been an issue, they would have re-trained the pilots but there was not any show stopper or cause for alarm.

Captain Magill said he could not recall specific actions taken or recommendations made as it was a while back but he said all recommendations were considered and the TDT (training development team) responded to most of the recommendations for Step 3. He said he would defer to them to answer specific issues as he was certain they responded to every recommendation put forth. When they started Step 4, the QA department and TDT were working hand in hand on issues and he thought QA was satisfied with flight operations and where the program was going.

Regarding a statement in the Step 3 Executive Summary indicating that training did not build pilot proficiency necessary to operate within the intent of the flight operations automation policy, he said that statement got their attention and he pointed to the maturity level of their observations, that they indicated a much higher fail rate that did not come to fruition. He had to balance the observations with what he heard from other SME's, project managers and project leads.

Captain Magill said he was not sure who else received the QA reports but he thought besides himself probably the Director of Standards and QA. He said he had since changed the policy to ensure all directors of affected groups would get to see the QA reports. He said for example, if the QA department was asked to QA the simulator or ground instruction, he would want those department heads to see the QA report and respond to any recommendations. At the time the Step 3 and 4 QA reports were done, they had a QA department working very hard to provide a report, but it was not a closed loop system. He has now asked that they put down a suspense date, a resolution date, and a closed date in a QA database. He said, at the time, it was a brand new department trying to work through a new process. He said the Safety Department would more than likely be involved, that they worked like the QA Department in the sense that they both worked on empirical data. He wanted to fill the gap addressing accountability for action in the reports and he believed the gap was now filled.

He said his Flight Ops Safety Department worked hand in hand with the FAR 119 Safety department and that SWA had more daily downloads from aircraft, 58,000, than any other airlines. They had collected empirical data to analyze where crews might be put in a position that was not the best to be in. They did this through FDAP and ASAP (Aviation Safety Action Program). They did a trend analysis with those data and attack issues that they may see of interest. They can then change operational procedures to mitigate those issues.

Regarding the RBF's (Read Before Flight) memos from 2008 addressing thrust reverser and spoiler use, he said he would defer to the Director of Safety and the Director of Procedures to address that topic. He said he had a working group in place that was evaluating the use of thrust reversers and speed brakes on landing. He said something in 2008 had brought to their attention issues about distractions but he did not recall what specific issue instigated those memos. He said a presentation shown in the crew rooms in February of 2011 regarding spoiler usage on

landing was put out by the Flight Ops Safety department but he did not recall what prompted that at the time. He said his director of safety was putting out information such as that in an effort to be proactive for the pilot group. The Director of Flight Ops Safety was Captain Jeff Hamlet; Captain Ted Lawson held the position previously but he had since retired.

Monthly meetings were held by Flight Ops Safety, but they also include In-flight, Corporate Safety and the FAR 119 Director of Safety, Dispatch, and Maintenance. Most operating departments that had anything to do with flight were in this monthly safety meeting that flight ops held mainly to discuss trends and events such as turbulence injuries and dispatch issues.

He said he did not recall any data or issues regarding distractions on approach. He said the landing checklist used to include 7 or 6 items when he started but it was now down to 3 very basic items; gear, speedbrakes, and flaps, and he did not recall hearing any discussion about issues with distractions while trying to accomplish those items.

Regarding the February 2011 presentation indicating spoilers were not armed on 4 flights per day, Captain Magill said they flew close to 3,400 flights per day and to a statistician that would be considered an error but he was not one and anything like that warranted their attention. He said the presentation showed how they were being proactive with the FDAP data and that they wanted to make sure crews were informed that this was happening. He said the working group was almost finished with the study of speedbrake and thrust reverser use during the landing phase.

Captain Magill said there was a discussion in Flight Operations about the positive verse negative callouts for the speedbrake deployment on landing. He said in 2004 they had a SNORT (Southwest Normal Operations Review Team) that changed their procedures entirely. He said back then the mentality in operations was to “speak by exception”, that is, focus on flying the airplane and avoid calling out the obvious. He said they were looking at that now and he was trying to get SWA procedures more in line with the manufacturer’s procedures and that was one of the issues the working group was looking at.

Captain Magill said he had not spoken to the crew of 1919 directly but they had been debriefed following the incident. He did not know what distracted them. Neither of them had referred to RNP as an issue on the visual approach. From what he had heard, they were 8 miles from final approach with 2,000 feet of cloud cover and in VMC (visual meteorological conditions) the entire time. He said the crew indicated nothing prior to that affected their performance on the ground and he had not called for any changes in the procedures. He did not know what distractions may have affected the crew while still in the air. He said the landing checklist was as simple as it could be with only 3 items on it but he thought that was something the working group was looking at. He had not specifically commissioned any changes but he thought they would be looking into everything in the landing configuration down to stopping the airplane on the ground.

In the last couple years since he had been on the line the crews have not talked to him about any safety concerns at all. He could not recall one pilot coming up to him to discuss safety or how they operated the airline. Regarding the transition to automation and RNP, he said that he had

heard some voice their concerns. He said nobody liked change as it took you out of your comfort zone. He thought the SWA pilot group had done an exceptional job with learning and they had deployed it slowly, by limited altitudes of use for example. It was not embraced by all at first but the pilot group had accepted it and this way was better than just sending out a bulletin.

Regarding the classic aircraft in the fleet, Captain Magill said they were still in negotiations with GE on the LADS (large area display screen) program and he was not sure yet if they would continue with the upgrade of the fleet. He said they were retiring the -300 (Classics) faster than they thought they would and the LADS was an expensive proposition. He said they had installed dual CDU (control display unit) and GPS (global positioning system) in the classics but they still had limited capability as far as automation and RNP. Captain Magill said he had an operational risk assessment group looking into probability of a pilot flying the 192 classic aircraft by domicile. Every pilot was flying a classic about every 30 days. He said they had a similar issue when they retired the original classic (-200) in 2004-05. He said they would continue to look at that and when the numbers get smaller, they may eventually limit that aircraft to certain pilot groups or domiciles.

Regarding the previously mentioned working group, he said he did not know exactly when it was chartered or who was on it but it was headed by Captain Tim Leonard. He estimated that it may have been started up when they were looking at integrating procedures due to the merger with Air Tran but it may have been heightened by the incident that occurred in April 2011. He said the directors would have selected the participants and he said this group might be lead by Captain Steve Vaught, Senior Director of Procedures and Standards Training as the procedures group was moved out of Tim Leonard's unit during recent restructuring; Tim was now the Certificate Chief Pilot and handled Operations and Regulatory Compliance. He said he was expecting the results from that group soon but he did not have an exact date.

Captain Magill said they do not take lightly that the checklist is only 3 items and that if it can be done better, they were investigating it. The speed brake used to be non- automatic but pilots were forgetting to pull the handle. Boeing put in auto function so this may have been an issue for quite a while.

He said he thought SWA crews were following standard operating procedures. Regarding not arming the speed brake, he had flown for many years and as a check airman and he never saw it happen. He said they had a working group looking into this and if there was a better way to do it, they would.

Greatest challenge in transitioning to automation and RNP was convincing a highly educated, highly motivated group of aviators that they needed to change. He said SWA pilots were exceptional, were exceptionally trained, and they had type ratings before they came to SWA, which was the highest qualification in the industry, and they did a good job on what they do on a daily basis. He said making a change can be very disruptive but they showed the pilots why it was imperative they had to move on from analogue to PFD/ND's (primary flight display/navigation display), which was not new but was put in abeyance by the company for commonality sake. He said they had to make this move because as their founder was famous for

saying, “if you don’t change you die”. He said getting buy in from the pilot group was the biggest concern because making the change was necessary to excel in what they did.

Regarding the QA prediction of a high failure rate, he had to balance that with the information he was receiving from other project managers, and SME’s that showed something different. He was very proud of his QA department. But he believed that one of their predictions was a very high failure rate but that did not come to fruition. They were now a much different department today than there were in 2009.

Captain Magill said the current management team and flight ops team had made some sweeping changes but they continued to look at best practices in the industry. He thought we had seen a “trailer” in the QA reports but he wanted to make sure we could see the full picture.

Interview ended at 1540.

Interview: Jerry Earnest Griewahn, Aviation Safety Inspector, Partial Program Manager, NextGen for Southwest Airlines – Federal Aviation Administration
Date: October 11, 2011
Location: via telephone
Time: 1100 EDT

Present: Evan Byrne, David Helson - National Transportation Safety Board (NTSB); Greg Bowen– Southwest Airline Pilots Association; Keith Griffith – Southwest Airlines; Tom Phillips – Boeing; Tony James – Federal Aviation Administration

Mr. Griewahn was represented by Mr. Brooke Lewis.

Mr. Griewahn stated the following information:

He was a Federal Aviation Administration (FAA) Safety Inspector. He was a Partial Program Manager (PPM) of the NextGen (B737-700) at the SWA Certificate Management Office (CMO). He came to the FAA in 2001 and has been in his present position for about 3 ½ years and has been working on the Southwest Airlines (SWA) certificate for a little over 5 years. He reported to Brent Barker, a temporary supervisor. He had flown for 20+ years and had logged about 16,000 hours of flight time. He had previously been the Chief Pilot at Kitty Hawk Air cargo before FAA, had flown part 121, 135, and been a check airman, instructor, and has been with the FAA now for about 11 years.

He described a PPM as basically the same thing as an APM (Aircrew Program Manager) but when there were two of them in the office they shared responsibilities. His main function was the 737-700 and the other PPM specialized in the 737-300. They were basically the same thing as an APM.

He said he observed operations throughout the year, and he had EPI's (element performance inspection) and SAI's (safety attribute inspection) assigned to him via ATOS (Air Transportation Oversight System). He oversaw the check airmen and sat in on about 50-75 PC (proficiency checks) checks a year observing check airmen. He also observed training throughout the year, including new hire and recurrent. The PC's he observed were for check airman conducting PC checks of both first officers and captains. He characterized his workload as a nice steady pace – neither overworked nor underworked.

He said they had 7 inspectors in the office in various stages of training from a new hire to 4-5 years. Those inspectors were assigned SAI and EPI inspections, and go out to the simulator, and basically do the same thing that he did. Their EPI's were assigned to them; he conducted the EPI's that were assigned to him.

He did spend a lot of time in the simulator and in with the training program observing check airman. He thought that was very important, because when he did that he got a good feeling for what the carrier was doing. When he observed 50-75 checks a year he got a better grasp of what was going on out there as compared to only doing a few.

He said the NASIP (National Aviation Safety Inspection Program) and RASIP (Regional Aviation Safety Inspection Program) inspections are not done too much under ATOS. There were always ongoing hot topics or hot items that they were always working on and emphasizing. That went on all the time. ASAP (Aviation Safety Action Program) reports or FDAP (Flight Data Analysis Program) reports could drive the hot topics. If he saw something in the simulator and he observed 5 people do it for example that may be evidence of a systemic problem and he would work with the carrier to correct them.

He worked with the SWA manager of standards quite a bit, the chief pilot, and all levels of personnel in the training department.

He did not know about any internal audits done on the company. He did know about the DOD (Department of Defense) audit that went on throughout the year. He did not sit in on the last debrief but they usually did debrief the CMO and he usually sits in on that. He did not remember any concerns coming out of that audit in quite a while. The FAA did not play any role in those audits.

He was not aware of the internal step 3 and 4 QA audits being performed at SWA and he had not seen them after they were written.

He said that every training event that the crew's went through for the automation program he went through first. He said not necessarily as a true student but he participated as it was being developed to see if it met FAA standards. He thought the training went fairly well. He thought it went well for the carrier. They went through it in a good way – the step training. He said when you were taking 5,000 pilots from the analogue to the PFD/ND (primary flight display / navigation display) you have got to take it up in baby steps. Just like anything you have a

learning curve associated with practicing it. As they went from step 3 to 4 he noticed a tremendous improvement in pilots as they were back in the simulator.

He said SWA put up a hotline at the training center during step 3 and 4 for crew questions. That ran for 7 days on each one. He stopped in at least a couple times a day looking at the questions. He was looking for repeated questions because that would lead him to think there was something missed in training. He described the questions as sporadic on the topics which suggested to him that the airline had not missed any "big ticket items" in the training process. They had trouble on the OAK approach with some speed control issues but nothing really was serious or caused him concern.

Regarding the Flight Standardization Board (FSB) report, he said SWA thought that the FSB requirement in the training matrix table was pretty stiff for the transition that they wanted to do. They petitioned the AEG (FAA Aircraft Engineering Group) for what they wanted to do. The AEG asked for a T3 test. The FSB had put in a D/C/C requirement in the matrix but the FSB had put that in for a benchmark since nobody in the world had gone from an EFIS (electronic flight information system) moving map to the PFD/ND display. SWA agreed to do the T3 test. He said he and Gary Parks (another FAA inspector) took part in the T3 test. They did not want someone who was proficient so they were good candidates. Both of them went through the tests with the AEG observing. The test included a day of ground school and a simulator session. They went through the training, took the check and then he and Gary went back after 6 months and got a second check to see what was remembered. He thought the result of this was that they changed the training matrix to a C/B/B instead of D/C/C. Basically it addressed the level of training and checking that they must do.

He thinks the crews had done a wonderful job of adapting to flying the different aircraft configurations. He has not seen any issues in training regarding these differences. About 3 weeks ago he went out to complete a couple of EPI's; he flew 12 legs in the SWA system. Every crew was doing a very good job in the cockpit. He said he could tell they knew what they were doing and were in total command of the aircraft and that the learning curve had really taken off to the good side.

He said he could not think of any differences in use of spoilers between airplane models.

Regarding areas of needed improvement in training, he said they were working on stuff all the time so it was hard for him to point to an area that they needed improvement. He could not think of one specific thing that needed improvement but said there were some ongoing areas where they were collecting data.

He said he did not do anything with ASAP. The FDAP had meetings once a month where they would release findings from the data but that was basically all you get into. If there was a trend the whole CMO would collaborate on what should be done and where. He said ASAP data had shown an issue with crews resetting CB's (circuit breakers) but he thought that was an industry wide issue. He could not think of any other issues besides the CB's and recalled that that information had come out of ASAP and FDAP analysis.

He said he was not aware of any trends seen regarding spoiler arming and use but as a result of the 1919 incident, they were collecting data in PC's and PT's (proficiency checks and proficiency training) events over the next 60 days. They were failing the spoilers to see how many pilots were missing it and what they can do in training.

Regarding un-stabilized approaches he said the last FDAP indicated they had reduced tremendously after RNP (required navigation performance) where they were flying VPATH (vertical path). He said he had not seen any problems regarding checklist usage.

Mr. Griewahn said the company issued RBF's (read before flight) and presentations in crew rooms. A RBF is a memo put out when the crew logs on to check in and that is issued directly to the crew. The presentations were provided by TV screen briefings in the crew rooms and could be about anything regarding safety or training. Usually personnel from training or headquarters putting out something on safety or what changes were coming.

He was asked about a few RBF's from 2008 noting crews missing thrust reversers on landing. He said he was not familiar with those RBF's, he did not recall. He did not remember any issues with crews not using the thrust reversers on landing.

Regarding a briefing shown in the crew rooms earlier in the year (2011) indicating FDAP data showing that 4 times a day the speed brake was not armed for landing; he had not seen that briefing. He said he very seldom saw those TV screen presentations. He said he had not seen an issue with the speed brakes not being armed in the simulator or when flying the line and had not seen any trend in this area. He said the company was collecting that data where they were failing the speed brake in the simulator to see if crews were catching it. They were also thinking of going to a positive call instead of a negative call for the speed brake deployment on landing. He said in the next 60 days SWA says they will have enough data collected and analyzed where they can make a decision on what they were going to request from the CMO. Right now the pilot monitoring (PM) only calls if the spoilers or thrust reversers do not deploy. They were considering calling it every time. He was not able to remember what Boeing recommended as far as callouts. Throughout his career he had flown airplanes where it was done either way. He said either way will work as long as the pilot did it. He has not seen one instance of crew's forgetting these items.

He said he had never gotten a call from a pilot with any concerns.

He said he was involved in post incident debriefing after 1919. After the incident, other aircraft were landing without a problem. He described a 44709 check ride. He said when the administrator feels that a pilot's competency may be in question they administer a 44709 check ride that must address the area of concern. It was not a complete check ride. The CMO initiated one for the crew and put him in charge of the 709 ride. He reviewed the IR reports and the ASDE-X (airport surveillance detection equipment) reports. The ASDE-X showed the aircraft touching down at 238 fps (feet per second), 500 feet down the runway, then accelerated one knot, then started a rapid deceleration down to 214, 172, and 98 and then 67 fps when he left the runway. He said the airplane touched down at 141 knots and went down to 39 knots. He said he flew the simulator numerous times with Gary Parks with various distractions. They flew it with

distractions, forgetting the speed brake, and forgetting to run the checklist and said he could not tell with the data he had what happened from touchdown to the time they started to slow down. In the simulator they set it up the same way and flew it the same way. When they did the same as the crew did they went off the runway. He said at touchdown, if the spoiler came up, it stopped halfway down the runway and if thrust reversers were used without the spoiler the airplane stopped. That was why he had concern about the pilot's fixation after touch down on why the plane was not stopping. He said Mr. Parks administered the 709 ride to the captain last week including numerous distractions in the air and on the ground. He said the captain did get through the check ride successfully.

He said the captain told him he had fixated. In the industry, he had over 2,000 hours as a simulator instructor and had seen it a lot where a pilot got distracted by one light. He said a pilot expects the airplane to do something and when it does not happen it takes time to think about what's going on. In this case the FO identified the spoilers and thrust reversers. The speed brake in the 700 needs the thrust reversers up for spoilers to deploy. He said the 300 will deploy without thrust reversers being up but he said in this incident, there was a delay of 17 seconds before the thrust reversers went out.

He said SWA had in their FOM (Flight Operations Manual) that the captain will arm the spoilers and they need to verify it; it was the first item on the before landing checklist. The captain in this case incorrectly made an approaching minimums call at 1,000 feet. That got them distracted and took some of the FO's attention. Also they were deviating around a cell and the ATC clearance of 170 knots to the marker put the crew behind right off the bat. He said when they gave the speed restriction it hurt them a bit.

He said back in 2008 he observed the captain give an oral and PC check in the simulator when the captain was an instructor. He had no problem with the captain's ability to conduct and manage the check ride – but he did not observe the captain flying.

Mr. Griewahn was asked if the errant minimums call was due to a PFD/ND interpretation issue. He said he did not think so. He thought the captain was probably looking outside in visual conditions then looked back in to see a white line on the altimeter that he thought was the minimums. He said there were a number of distractions such as the bumps, going around a cell and the flap over speed that took his attention away.

Regarding the fixation on landing, he said he did not think it was a carrier wide problem but only a single pilot issue based on the number of observations he did. He thought to correct it, it would be beneficial to put out a RBF and re-emphasize it in training.

He said he had not seen the briefing regarding spoilers being missed 4 times per day and had not seen the data but not arming the spoilers 4 times a day would concern him. He said they were doing the study now on missed spoilers that should help.

Another area they are collecting data in was autobrake use. He said SWA had an aggressive emphasis on autobrake use and specifically, not knocking it off right away after landing.

Regarding improvements he saw from step 3 to step 4, he said there was improvement in general overall knowledge of systems, how they worked, how to fly, and better techniques.

He said in every PC they included distractions during V1 cuts, for example. He said overall there was not a dramatic problem with the crews. He said when they first started RNP, there was some confusion about when to set the MCP (mode control panel) altitude to zero but they had since corrected that.

He said he was not involved in the LOSA (Line Operational Safety Audit). He had heard about the LOSA program but had not been briefed on it.

He said some of the hot topics they were looking at were circuit breaker resets and captains authority issues. Other than those, he could not think of any others.

He said the EPI's for all of the inspectors were assigned by the assistant POI (principal operations inspector) based on the ACAP (Air Carrier Assistance Program). He said prior to the current temporary supervisor he had reported to the POI, Paul Kriner. He said Mr. Kriner was promoted to temporary POI and on temporary duty overseeing team working on merger of SWA and Air Tran.

He said the company had been emphasizing standardization in the past few years especially with the check airmen. He said when he arrived here the standardization was good but now it was much better.

Other than to re-emphasize the auto brake issue of letting them work he said they had not amended anything in the PC profile as a result of the 1919 incident. He said he thought the spoiler and thrust reverser issues were going to be a part of the potential recommendations the company would make in 60 days to him.

In order to address standardization, he said SWA came up with the nextgen PC check which was designed for the type of flying they were doing now. It incorporated the RNP approaches into the check. They also came up with a bank of questions for the check airmen to use in the orals. This got the pilots to get into the book and study. He said he was seeing better prepared, smarter pilots on the information they needed to have coming into the PC's as compared to before.

Interview ended at 1215.

Interview: David Lockette Sloan, Supervising Principal Operations Inspector for Southwest Airlines – Federal Aviation Administration
Date: October 11, 2011
Location: via telephone
Time: 1300 EDT

Present: Evan Byrne, David Helson - National Transportation Safety Board (NTSB); Greg Bowen– Southwest Airline Pilots Association; Keith Griffith – Southwest Airlines; Tom Phillips – Boeing; Tony James – Federal Aviation Administration

Mr. Sloan was represented by Mr. Brooke Lewis.

Mr. Sloan stated the following information:

He was the supervisory principal operations inspector for Southwest Airlines (SWA) and was based at the SWA Certificate Management Office (CMO) (SW29) located in Irving, TX. He held this position since February 28, 2010. He has been with the FAA for a little over 8 years. He started with the SWA certificate in February 2010, which was his first involvement with this certificate. Before this position he was the assistant Principal Operations Inspector (POI) at American Airlines (AAL) and prior to AAL he was the POI for Omni Air International. He retired from the airlines after 30 years, was type rated in DC-10, L1011, B727, and B737-800 NG and had logged about 26,000 hours total time.

He has about 16 personnel reporting to him at the CMO. Normally he had two assistant POIs that helped. He had an operations supervisor. There were also 2 Partial Program Managers (PPM) and 2 assistant PPMs who did all the simulator and certification work. He had 6 inspectors who did mostly ATOS (Air Transportation Oversight System) work and certification.

The two PPMs went to SWA on almost a daily basis. They oversaw the training department and simulators and revisions for the training manual. He also had another PPM that did 709 rides and enroute inspections and also helped out on the simulators. Additionally he met with the director of operations for SWA on an almost weekly basis – a weekly meeting to go over the operations issues. He also had the ATOS and SMS (Safety Management System) program too. He said SWA had almost completed Level 1 SMS. AirTran Airways had not even started SMS – so as a result of the proposed integration SWA has suspended progress on SMS implementation at this time.

He described his workload as busy. Like any other federal agency he could always use more help. When you talk about the flight operations, the flight attendant operations, and the ground agents, ground deicing coming up, ATOS assignments – it was a continuous program to be overseen.

Oversight of Operations takes up most of his time. For example, SWA just was authorized operations specification 384 for RNP and no sooner did they complete that then were going through a merger with AirTran Airways. They had a proposal to do ETOPS (Extended Operations) operation out to Hawaii – involving navigation class II training for literally thousands of pilots and SWA trying to integrate the two airlines was what was keeping him busy.

He said there were a couple of areas of emphasis. One of them was the dispatch release. The current flight plan that SWA had was not a usable flight plan for ETOPS operations so they would have to redo that. He was also looking at the minimum fuel supply for the dispatch

release. He was also looking at the crosswind limitations for SWA. For example, when SWA took delivery of their 737 they did not have winglets. At that time, the crosswind limitation was 36 knots. Now they have winglets on the airplane and the crosswind limitation has changed in the Boeing AFM to 33 knots. He had not seen that represented in the limitation section of the SWA FOM (Flight Operations Manual).

He worked mostly with Greg Crum at SWA who was the director of operations. He described his relationship with Mr. Crum as very good.

He said the DOD periodically came in and gave SWA an audit. He said the most recent one was possibly 6-7 months ago. The DOD called him before they go to SWA and asked him things about changes in management, the airline, and whether there were any problems or comments he wanted to make before they started the audit. He did not take part in the audit. He did receive an out briefing and a written copy of the audit after it was written up, reviewed, and approved by the general that does all that.

Other than the DOD audit he was not aware of any other external or internal audits at SWA.

He was asked about the SWA transition to automation and the QA department's audit of the Step 3 and 4 training. He said he was not aware of these audits. He was not made aware of the reports resulting from these audits. He had only heard that SWA had a QA department in flight operations but he did not know much more about this department. As for sharing the report with the FAA he said it depended on the scope of the report and why the report was done. Like any other airline SWA safeguards things like this to make sure they did not get out to the public. It would depend on the report whether it was shared with the FAA or not. As for an audit of the training at the airline he would not expect the director of operations to share it with him. Certainly the airline would put their spin on it but regardless of what it said the FAA still needed to be looking at things with an eye towards what were the regulations and did the training meet the regulations.

He was asked to discuss the Flight Standardization Board (FSB) report and the change in the document requested by SWA. He knew about the standardization board and he was familiar with the graphs that they put out with the different models and what you had to do to go from the 300 to the 500 or 500 to the 800, etc. He said he knew about that but he was not involved in the process of SWA requesting a change to that report. He was qualified on the 737-800NG but not current – having flown it 3,000 hours before retiring from the airlines. The training from the 500 to the 700 can be nothing more than bulletins handed out by the company or differences training. He thought that was the same from the 300 to the 500. In other words he did not believe the FSB dictated that all the pilots had to be brought in to classroom training and go through an approved training program and trained on the airplane – he said really it was very minimal. He said he did not see a problem with flight crews adapting to the differences in the fleet. As for differences between the classic and the 700's in spoiler arming or annunciation or deployment he said there was a spoiler do not arm light that he did not recall if it was on the 300s or not, but he did not know of any other differences off the top of his head.

He did as many enroute inspections as he could. He had not done simulator observations because he was not current in the airplane. He just went down to MCO (Orlando, FL) in the last 3 weeks and back, and down to HOU (Houston, TX) and back. He estimated doing a couple of enroutes every month or two. He has been very impressed with the flight crew's performance. He thought they did an excellent job.

He said he had never been contacted by a crewmember wanting to discuss any concern about safety or training issues.

Before he came to SWA he was the FAA representative to AAL's ASAP (Aviation Safety Action Program) program. He continued that interest when he came to SWA. He started attending their ASAP meetings on a regular basis. He was told by SWA that he was the first POI who ever sat in on an ASAP meeting. They have quarterly meetings they go to that are set up by SWA and they always asked him if there was a specific area he wanted to look at and if there was they would bring up the information for him. He meets with his FAA ASAP representative nearly every day looking for trends and crewmembers with repeat violations. They used ASAP and FDAP (Flight Data Analysis Program) quite a bit. At the ASAP meeting there was the company rep, the FAA rep, and the union rep.

The biggest one that they were working on was that SWA has had a number of pressurization events where airplanes have lost pressurization or failed to maintain pressurization and they had to divert sometimes. That has been a big program for them at the CMO. The next biggest one would be what he classified as captain's authority in the cockpit. There had been some captains who have just looked over to the FO and said "I'm going to use my captain's emergency authority and…" reset the CB (circuit breaker) or not follow the QRH (quick reference handbook) or checklist or something like that for example. CB resets have caused fumes into the cockpits.

As for arming or deployment of the spoilers he did not recall any issues. That was not to say there were not any. But they were looking for trends. SWA made 3,400 takeoffs and landings a day. If they had a report of one spoiler in a month or a week that did not catch his eye. But they were looking for repeated events. He just has not seen that.

He was asked about the FDAP briefing shown in the crew rooms indicating speed brakes not being armed 4 times a day on average. He had not seen anything about the speed brake not arming or anything like that. He was only going to see it if it was filed in the ASAP report. If the crews were not going to fill out an ASAP report he would not see it even if it was occurring.

He was briefed on the FDAP data every quarter – these were both the ASAP and FDAP briefings. He did not recall them covering speedbrake issues at these meetings.

He was asked about checklist usage issues and he said he associated those with using the captain's authority that he spoke about earlier. That was the only time that he had heard of not following a checklist was when a captain used his authority and chose not to.

Regarding un-stabilized approaches, he saw that quite a bit in the FDAP data. They were trying to figure out what caused it and to try to eliminate the excessive go-arounds that they have because of the un-stabilized approach.

As he recalled a lot of the un-stabilized approaches were initiated in visual approaches. A lot of times they were either high or close in and trying to get down, to save fuel and time, to accommodate Air Traffic Control, and sometimes they just put themselves in a bad position.

He said he was not aware of any initiatives or efforts at the company to address the issue of speedbrake not arming or deploying.

When asked about a LOSA (Line Operations Safety Audit) program, he said he knew that SWA was going to be starting a LOSA program.

He said he had authority over approval of the company manuals. He was asked about the differences between the manufacturer and SWA in callouts. He was not aware of any difference between the callouts that SWA had versus the Boeing AFM (Aircraft Flight Manual). He said they did revisions to manuals to update it to incorporate new procedures and they did have revisions to the manual almost constantly. They had probably about 30 manuals. So having a revision to a manual was not uncommon at all.

He always gave the revision to the appropriate PPM (700 or the classic PPM). If it was a general revision he would give it to either PPM. The PPM would review the revision and they would make comments if they so desired and then they would send it to him for recommendation. On revisions that were very large, covering 100's of pages, those revisions were treated differently. SWA would give them a heads-up and ask them to come over and look at the revisions on screen as they show the revisions to the FAA for their review.

He said the Boeing AFM is the AFM that Boeing puts out. The checklists in the Boeing airplanes were tailored for airplanes that were going through the testing process. In other words, if you look at the Boeing AFM you would not see a lot of things in that AFM that you would see on a SWA airplane because it did not have to do with certification. He said the regulations required that a company produce their own FOM; the airline cannot duplicate the Boeing AFM and call it their own FOM. So not everything is the same, you will find different procedures between the procedures for SWA 737's and the AAL 737's or CAL 737's.

Anytime something like 1919 happened, the office has an RFI (request for information). When this event took place as the POI he wanted to know what happened, how, and how to prevent it from happening again. He requested information from the company. Looked at the basic information on the pilots, then he talked to the PPMs or the company and tried to get more information.

He said he did not take part in the investigation of this incident.

It was his understanding that this incident investigation was still ongoing and was not completed. He thought SWA would probably wait for the information to be collected and completed before they made any recommendations themselves.

He did have a couple of concerns and he wanted to wait to see where everything falls. His concerns, as the airplane was approaching MDW it was clear to the crew that they would have to do an RNP approach if they wanted to get into MDW because they were using runway 13C. Runway 13C at MDW did not have a lot of approach plates, only 3 or 4, but only 1 RNP approach. So he was kind of taken back that when the pilots went to brief the approach they selected the wrong approach. They briefed the RNAV GPS approach instead of the RNAV RNP approach. He was stunned at how they could have missed that. But what really got his attention was the captain pulled out the wrong approach plate and the first officer who should be backing him up went right along with the captain briefing the wrong approach. The other concern is that the landing on 13C is predicated on using max autobrakes. That was the only selection that they could have used and landed safely at MDW on 13C. But when the guy touched down they disabled the system within about a second. Those were his two areas of concern. He said "the airplane was doomed" already.

He said there were not a lot of 709 rides. Since he took the job, counting this one there had only been one other he could recall.

He said he did not recall ever flying with or observing the incident crew in line observations, training or checking events.

Regarding why he thought the crew briefed the incorrect approach, he said he did not know. He said he has seen pilots do the same thing 1,000 times and then on the 1,001 time they did it differently and he did not know why.

He said he was not involved with ASAP. The FDAP had meetings once a month where they would release findings from the data but that was basically all he got into. If there was a trend the whole CMO will collaborate on what should be done and where. He said ASAP data have shown an issue with resetting CB's – he said that was an industry wide issue though. He had not been involved personally in those. Regarding the recent trends the office collaborated on, he could not think of anything off the top of his head that he could point to.

He said the issue with the CB's was something they noticed over a 4 month period, a report would come in saying a captain exercised his captain's authority to disregard a QRH checklist and land with flaps 30 instead of 15. Another one would reset CB's contrary to checklist. After a few it formed a pattern then they went to the ASAP guy and ask to look at those events. He said that was still ongoing. Another one was the pressurization problems he mentioned earlier where the whole office was involved in that; airworthiness and avionics for example. He said SWA formed a group to look at pressurization issues and had FAA people help out.

He said he did not know if it was a cultural issue because there were pilots coming from different directions. There were some pilots that did not want to do the checklist like they were supposed

to and reset circuit breakers. He said they sent a letter to SWA regarding the concerns and included a SAFO regarding CB's.

He said the regulations were broadly written and what might be safe to him might not necessarily be safe to another. He said he could not go to SWA and tell them to change their callouts just because he thought it was safer. He said that just "did not fly" because you had to have regulations to fall back on but the main thing to look at was "is it safe".

Regarding the pressurization events, a number of aircraft lost pressurization and had to do an emergency descent. He asked why the pressurization could not be controlled as it had a pressurization system. He said sometimes there was a mechanical failure preventing it. So they looked at the checklists at different airlines and they all started out the same with using oxygen masks, establishing communications and after the first 1 or 2 items they all varied a little. He said not all airlines had the same procedures.

Regarding standardization, he said when you had as much experience as he and his inspectors had, you could tell if a crew was changing their routine during an observation. He said they would be stumbling but when you saw a crew complete their checklists and do their maneuvers effortlessly, you could tell they were not just doing while being observed. He did not think crews were doing things differently just because he was observing.

Regarding how this crew missed arming the spoilers, he said he did not know how that happened. That was a check and response as he recalled. That was not to say in his 30 years of experience he had never missed an item on the checklist – he had seen it happen. He said "again, we're getting back to human factors" – he asked "why would a crew miss it this time when they had done it right 1,000 times before". He said he just did not know the answer to that.

Regarding the delay on landing to deploy spoilers and reversers, he said if he landed and left the autobrakes on max, and did not disable the system, he would have stopped even if he did not do anything. The fact that he disarmed the system and did not do anything he did not help himself at all. He recalled that many years ago on the 727 and there was a question about the speed brake handle and even if you did not arm the speed brake it would still come out. He did not know. He said obviously it did not in this case.

Interview ended at 1425.