Factual Report – Attachment 1

Interview Summaries

AIR TRAFFIC CONTROL

DCA17IA148

Interviewee: Brian Delucchi (Local Controller (LC)/Controller-in-Charge (CIC))
Representative: Scott Conde, NATCA (National Air Traffic Controllers Association)

Date / Time: July 18, 2017 / 1700 PDT
Location: SFO Air Traffic Control (ATC) Tower (ATCT)
Present: Dave Waudby, Brandon Johnson, and Captain Shawn Etcher (NTSB). Sathya Silva, PhD (NTSB), participated by telephone.
Investigator: Dan Bartlett

During the interview Mr. Delucchi stated the following:

His air traffic control career with the FAA began in October 2008, when he attended initial training at the FAA Academy in Oklahoma City, Oklahoma. After successful completion of initial air traffic control training he worked at Metropolitan Oakland International Airport (OAK), Oakland, California from December 2008 to 2013, and SFO from 2013 to present. He was qualified and current on all positions in the SFO ATCT and was certified as a controller in charge (CIC) and on the job training instructor (OJTI). He held a current class 2 medical certificate with no waivers or restrictions. His supervisor was Cole Dietrich. His operating initials were DZ.

His regular work schedule for the days leading up to, and after the incident were:

Tuesday	1500 to 2300
Wednesday	1330 to 2130
Thursday	0630 to 1430 (30-minute early flex)
Friday	0530 to 1330
Fri/ Saturday	2230 to 0630 (Incident Shift)
Sunday	RDO
Monday	RDO

He did not work overtime and was on the "no overtime" list, a list used by management to identify employees who did not desire to work overtime. He had no pilot experience but had participated in the jump seat program several years ago, taking a roundtrip flight from San Francisco to Seattle on Alaska Airlines. He found the experience interesting. He wished he could do it more often, but they needed more people to cover staffing in the tower to take advantage of the opportunity.

He described his sleep schedule in the 72 hours prior to the incident as normal. He could not recall when he went to bed on Wednesday, but usually went to sleep between 2200 and 2230. He awoke at 0400 on Thursday for his morning shift. He went to bed about 2100 on Thursday evening, and woke up about 0500 on Friday for his morning shift. He took a 45-minute nap between shifts on Friday. He needed 5.5 to 6.5 hours of sleep a night and felt well rested for his shifts. When asked if he considered himself more of a morning or evening person, he stated that he was an "all day person;" he went to sleep when he was tired and woke up when he was rested. He could not recall the quality of sleep the nights prior to the incident. He had no history of sleep disorders and no problems adjusting to the midnight shift.

He enjoyed working at SFO, and his favorite part of the job was the people he worked with. If he could do anything to improve or change the working environment without restrictions, he would expand the airport to build more gates at the airport. He believed that morale was high at SFO.

He reported to the tower at 2230 on July 7, assumed the ground control (GC) position and worked that position for about 1 hour and 25 minutes. The front line manager (FLM) provided a brief to him and Mr. Shelton, the other CIC on the midnight shift. The brief reiterated airport closures; due to construction runways 28L and 1R were closed at 2300. Fifteen minutes after the briefing, he and Mr. Shelton evaluated the pending traffic on the flight schedule monitor (FSM), a US map depicting traffic in the national airspace system and expanded the radar view of traffic out to 40 miles. Northern California TRACON (NCT) had given SFO automatic release authority for departures, which indicated a normal traffic situation. About 2345, he and Mr. Shelton determined it was safe to combine all positions in the tower. After a quick two-minute break, he received a position relief brief and assumed all positions in the tower. Mr. Shelton took a break at about 2345.

Workload threshold limitations were based on "in the moment" situations, in addition to how a person felt about what was going on at the time. Defining workload limits was hard to quantify. Mr. Delucchi would not combine positions until he felt comfortable and had some predictability to the projected taskings. If traffic were to get too busy or complex, he would call the other controller to the tower, or direct the pilots who were calling on the clearance delivery (CD) and GC frequency, to stand by.

Mr. Delucchi said hat traffic was normal the night of the incident. Before the incident occurred, a Delta Airlines flight had landed, and he had issued a landing clearance to Air Canda flight 759 (ACA759). He was dealing with a Virgin America tug operator on the airfield when ACA759 asked to verify that he was cleared to land. He had just visually scanned the runways from departure end to approach end, which was his normal scan, when ACA759 asked for that verification. He further checked the radar monitor and the airport surface surveillance capability (ASSC) display, and then rescanned runway 28R before advising ACA759 that runway 28R was clear and "the runway was yours." He then grabbed the binoculars to see if there was a construction truck that had ended up on the runway. When he scanned the ASSC display, ACA759's target was displayed just right of centerline, and the bars on the runway were up. ACA759's target was just north of the yellow bar, which represented the extended runway centerline on the ASSC display. The position of ACA759 target on the ASSC display was normal; aircraft were offset to the north when they came in on the Bridge visual approach. However, the aircraft targets varied where they lined up with the runway. Arriving aircraft would sometimes display a little off the centerline of the ASSC display, depending on what direction the aircraft had approached the final approach course.

He recalled that a Frontier Airlines flight had contacted him and advised they did not have a gate available, an American Airlines flight had also contacted him, he did not recall what that pilot was asking and ignored that communication. He then heard a transmission made over the frequency, "where is he going." He did not know who transmitted that; the transmission was out of context. He saw that ACA759 was no longer visible on the ASSC display. He did not know where the aircraft's symbol on the ASSC display had gone, but occasionally they would have brief

blind spots on the ASSC, especially at the west end of the airport. He was not concerned about the aircraft disappearing on the ASSC display because he had observed him visually, in sight, out of the tower window. He had never seen an aircraft line up for taxiway C before this incident, so he had no point of reference for where the aircraft would have shown up on the ASSC display; or visually out of the window. He had never noticed an aircraft symbol disappear on final. He recalled that ACA759 looked slightly higher than normal. When ACA759 was about one-tenth of a mile on final, the airplane looked "extremely strange," regarding its proximity to the aircraft on taxiway C, and the taxiway itself. It was then Mr. Delucchi made the decision to send ACA759 around. There was no indication that ACA759 was in the wrong place until the aircraft was on short final. About that time, he heard a second transmission on the frequency, which he assumed was from one of the three United Airlines pilots holding short of runway 28R on taxiway C, state "he's lined up on the taxiway." Mr. Delucchi assumed it was a United Airlines pilot because three of the four aircraft holding short of runway 28R were United Airlines, and one was Philippine Airlines. The pilot making the transmission did not have a foreign accent. After the second transmission, "he's lined up on the taxiway," he directed ACA759 to go around, assigned a runway heading, and instructed the pilot to contact NCT. He noted the callsign, type aircraft, and time for documentation purposes and directed ACA759 to contact NCT. He took a minute to relax and then started departing aircraft from runway 28R. ACA759 landed shortly thereafter without incident.

After ACA759 landed, the pilot asked for and was provided the telephone number for the tower's unrecorded line. Mr. Delucchi was going to give him the number for the tower anyway. The pilot called a bit later and was concerned about the possible seriousness of the go around, and he sounded "shaken up. During the telephone conversation he was primarily attempting to calm the pilot down. They discussed the process of what happened. It was not a lengthy conversation, because he was still working ground traffic. Mr. Delucchi had calmed down between the time of the incident and the phone call with the pilot; he had not realized how close the aircraft had gotten to each other. Mr. Delucchi was slightly more concerned with how the pilot was taking it and did not want to "freak the guy out" since he seemed shaken. He did not think to get pilot contact information during the phone call, and during the phone call he had to advise the pilot a few times to standby while he worked traffic. Shortly thereafter, a Delta Airlines pilot, from a previous arrival flight, called the tower to advise Mr. Delucchi that he had a problem differentiating runway 28R from taxiway C. Mr. Delucchi did not know which Delta Airlines flight the pilot had flown.

About 0125, Mr. Delucchi entered the incident information into CEDAR[1]. He had a few problems getting the date and time to match up. After three attempts to enter the date, he got frustrated and let it go as entered. He filed a mandatory occurrence report (MOR), via CEDAR. A MOR was required when an aircraft had to go around within 1/2 mile from the landing threshold. Mr. Delucchi did not mark the MOR as significant because he believed this was a pilot deviation, and not an ATC error; therefore, not a significant ATC incident. This was however a subconscious decision at the time, he figured out the reason upon reflection afterwards. Mr. Delucchi worked until 0300, at which time Mr. Shelton relieved him.

[1] CEDAR (Comprehensive Electronic Data Analysis and Reporting) was a tool that provides a standard interface for the collection, retrieval, and reporting of data from multiple sources.

On the day of the interview, Mr. Delucchi said that he was in the process of filing an air traffic safety action program (ATSAP)[2] report, which was 11 days after the incident had occurred.

He had been provided peer support and information on intervention for stress/incident management. The NATCA critical incident stress management (CISM) process was in place and providing ongoing assistance as needed.

Airport lighting was set when he arrived in the tower at 2230. The location and placement of the construction lights at the intersection of runway 28L and 1R made visibility at the approach end of runway 28R difficult; however, the difficulty did not manifest itself until ACA759 was close to the landing threshold. To his knowledge, construction lighting had not been an issue in the past, and he was not aware if the construction lighting issue had been brought to the airport authority attention. Some construction events on the airport were manageable, but other times they could be challenging. On July 7, he wondered why runway 28L/1R was closed so early; the closure limited taxiway route options. The runway was typically closed around 2300. He did not recall hearing pilot complaints relating to taxi routes and construction.

Airport lighting to include taxiway, runway and approach lighting was controlled from the tower, but was configured with automatic settings based on the weather and visibility. Lighting intensities could be individually adjusted from the tower lighting control panel. To change the lighting on a taxiway, he would touch the taxiway button on the display, and choose options for which lights he wanted set. Lighting was normally on at night and in poor visibility. When runway 28L and 1R were closed, they turned off the runway and approach lights for the respective runways.

There was a lighted red "X" on the approach end of runway 28L, which indicated the runway was closed. The outline of the X was visible from the tower, but he could not determine if it was lighted or not, nor was it his responsibility to verify the lighted X was lighted. Operation and placement of the lighted X's was the responsibility of the airport authority. Taxiway C was a lighted taxiway, but Mr. Delucchi was not sure if the taxiway had centerline lighting, edge lighting, or both. He said taxiway C lights were blue.

ASSC training included classroom training, and the controllers had conducted some OJT when they were still working in the previous SFO tower. During the training the instructors demonstrated that ASSC targets could be tagged. Mr. Delucchi did not receive ASSC system limitation training. He did not know what he did not know about ACCS. He stated that system glitches, such as the occasional blind spots, were not reported or recorded. When the ASSC was first fielded at SFO, they had a sheet to report issues, but he had not used that sheet in a while. If he had any ASSC concerns, he shared those directly with another controller, who was on the equipment team at SFO. When asked if he was familiar with the term "capture zone" [coverage area of the ASSC], he stated he was not familiar with the term.

When local and ground positions were combined, such as was the case with single staffing on the midnight shift, they were prohibited from conducting line up and wait (LUAW) operations.

[2] ATSAP Report - A confidential written account of an event that involves an air traffic safety event or problem reported through ATSAP.

He explained that when aircraft were on a 5-mile final and compressing, it was hard to fit in a departure from runway 1, without using LUAW.

The decision to combine positions was up to the controllers' discretion. Mr. Delucchi looked at how many strips were on ground and local control positions to help make that decision. He would like to see fewer than a certain number of strips on each position before combining positions; it all depended on what was going on at the time.

The interview concluded at 1915 PDT.

Interviewee: Robert Shelton (Local Controller (LC) /Controller in Charge (CIC))
Representative: Scott Conde

Date / Time: July 16, 2017 / 1803 PDT
Location: SFO ATCT
Present: Dave Waudby, Brandon Johnson and Captain Shawn Etcher. Sathya Silva, PhD participated by telephone.
Investigator: Dan Bartlett

During the interview Mr. Shelton stated the following:

His air traffic control career with the FAA began in March 2008 when he attended initial training at the FAA Academy in Oklahoma City, Oklahoma. After successful completion of initial air traffic control training he worked at OAK from May 2008 to January 2011, and SFO from January 2011 to present. He was qualified and current on all positions in the tower and certified as a CIC and OJTI.

His work schedule leading up to and after the incident was:

Tuesday	1600 to 2400
Wednesday	1330 to 2130
Thursday	0630 to 1430
Friday	0530 to 1330
Fri/Saturday	2230– 0630 (Incident Shift)
Sunday	1330 to 2130 (Overtime Shift)
Monday	RDO
Tuesday	1600 to 2400
Wednesday	1330 to 2130
Thursday	0630 to 1430

Mr. Sheldon held a current class 2 medical certificate with no waivers or restrictions. He held no other FAA certificates. His supervisor was Cole Dietrich, and his operating initials were XX.

Mr. Shelton had worked day shift from 0530 to 1330, and then had reported to work for the regularly scheduled midnight shift. He arrived at work and signed in at 2230. He went to the

control tower and received a watch pre-brief from the FLM on duty. All positions in the tower were open when he took over the LC position. When Mr. Delucchi came over to his position to relieve him, he remembered that he looked at the traffic flow management system (TFMS) and noticed a sharp decline in the amount of traffic on the display and believed that it was a good time to combine positions. He did not recall when they started to be combined positions in the tower but recalled Mr. Delucchi relieved him around 2349. He then went on a recuperative break until about 0300. A recuperative break was an extended break on the midnight shift when traffic was slow.

Prior to the incident, the general practice for the overnight shift was to combine positions into a single person operation when the controller, who would be working single person operations, believed it was appropriate to do so. After the incident occurred, management imposed a restriction on combining positions to no earlier than 0015. The controllers had several tools to help them make the decision of when it was an appropriate time to combine the positions. One of those tools was the TFMS located in the back of the tower cab. It gave controllers a pictorial depiction of the forecasted traffic rate. The controllers also used NCT's handling of automatic departure releases for SFO, as a prediction tool. If NCT gave SFO all automatic releases, the traffic would not be as complex, and the departures would be able to depart faster. If NCT restricted the amount of releases from SFO, and mixed them with OAK tower departures, the traffic would remain elevated for a longer period.

Controllers would adjust their break times if there was weather in the area, and if the TFMS indicated increased traffic. Construction could impact the controllers' decision on when to start the midnight shift breaks. Depending on how much and where the construction was located, it could increase the controllers' work load and increase the need for additional attention.

The ASSC was a ground radar tool to assist the GC in identifying aircraft and their location, as well as preventing runway incursions. For the LC, it was a good tool that was used as an extra set of eyes to assist with scanning and situational awareness. He noted that false alarms were generated by helicopters operating from the south.

The normal midnight shift staffing was two controllers on duty. Occasionally there would be three controllers assigned when higher traffic volume was expected. After traffic died down and positions were combined to one position, the other controller would take a recuperative break.

He and Mr. Delucchi worked the midnight shift together frequently, and they usually alternated who would take a recuperative break first. They had a great working relationship. When he went up to the tower to relieve Mr. Delucchi at 0300, they had some discussion about the incident, but he did not get the impression it was a big deal. Mr. Delucchi simply stated that ACA759 had tried to land on taxiway C. He noted that Mr. Delucchi did not seem fatigued and seemed fine during the position relief.

When combining positions in preparation for the mid shift, CD combines to GC first, then GC to LC. Part of the decision to combine positions included evaluating the TFMS for incoming traffic and reference the US map tab on the TFMS.

After becoming familiar with the incident, and in hindsight, he considered it significant. He was curious what the aircrew were thinking and how fatigued they were at the time. He had never seen an aircraft fly an approach to a taxiway at SFO, so he did not have a point of reference. It was not possible to tell if an aircraft was lined up for the taxiway instead of the runway just by looking out the window. Every airline/pilot flew the approach differently.

When he worked LC position and an aircraft checked in on the Bridge visual, he would verify they were on the correct approach, clear them to land, listen to their readback and let the pilot fly the plane. If a pilot asked to verify they were cleared to land and/or asked if something was on the runway, he would assume the pilot saw something. He would check the ASSC display to see if there was a primary target on the runway, and visually check the runway with binoculars. The ASSC display showed green runway bars on the runway, which came on only when an aircraft was within a mile final. If there was a construction project adjacent to the runway, like there was on the night of July 7, his first thought would have been that an errant construction vehicle was on the landing runway.

When SFO ATCT sent aircraft around, they issue the pilot a vector between 265° and 310°. If they issue a heading of 265°, the altitude they issued would be 3,100 feet, due to terrain. If they issued any other heading, the altitude would be 3,000 feet.

The construction on the airfield could be a challenge; it changed which runways and taxiways that could be used. It did not necessarily increase workload, but that depended on what areas were closed. The construction on Runway 28L had been going on for months and he had noticed an increase in pilot requests to adjust the runway lights. Normally runway lights were in preset configurations that the controller selected based on visibility. The controllers also had the ability to manually adjust those setting if needed or requested by pilots. The approach lighting system was a similar but separate system.

If adverse weather was present and/or the TMFS indicated there was weather related delays, the controllers would adjust their break times on the midnight shift. By the time positions were combined, there were not a lot of flight plans in the system.

Mr. Shelton said, that when a pilot checked in on the visual approach, he would clear them to land and listen for a correct readback. The ASSC only provided a display of areas close in to the airport. If the aircraft was on a visual approach, the controller would look for them visually out of the windows. However, he would not be able to tell if an aircraft was lined up for a taxiway instead of the runway. The ASSC provided aircraft location information starting from about a two-mile final.

Runway 28L had a brightly lighted X on the runway. There was no indication of lighting outages at the airport that night. The lighting system was used to control runway and taxiway lighting at the airport. The controller input the visibility into the tower lighting panel, and the system decided the appropriate level of airport lighting. Controllers had visual indications, via the tower lighting panel, of whether the airport lighting was on and at the proper setting. Approach lights were never turned off.

The interview concluded at 1905 PDT.

Interviewee: Brent Descalopoulis (Front Line Manager (FLM))
Representative: Waived

Date / Time: July 17, 2017 / 1240 PDT
Location: SFO ATCT
Present: Dave Waudby, Brandon Johnson and Captain Shawn Etcher. Sathya Silva, PhD participated by telephone.
Investigator: Dan Bartlett

During the interview Brent Descalopoulis stated the following:

His air traffic control experience began in 1987 when he enlisted in the United States Air Force (USAF). He served for four years on active duty as an air traffic controller, and had been stationed at RAF Bentwaters, England, and Vandenberg AFB, CA. In November 1997, Mr. Descalopoulis was hired by the FAA through the Veterans Recruitment Appointment (VRA). As a direct hire he worked as a CPC at Palo Alto Airport (PAO), Palo Alto, CA from 1997 to 1999, and SFO from 1999 to present. He was detailed to FAA HQ, AJV-82, from 2015 to 2016. He was qualified on all positions at SFO ATCT and was a FLM at SFO. His operating initials were BD.

His work schedule for that week leading up to the incident was:

Friday	1600 to 2400
Saturday	Annual Leave
Sunday	Annual Leave
Monday	0530 to 1330
Tuesday	0530 to 1330
Wednesday	RDO
Thursday	RDO
Friday	1530 to 2330 (Incident Shift)

He worked about one overtime shift per week and one to two hours of credit per week. He held a current class 2 medical certificate with a restriction to wear corrective lenses while performing ATC duties. He stated that he was wearing them while on duty July 7, 2017. His supervisor was Dave Hearn.

Mr. Descalopoulis said that the two controllers assigned to the midnight shift arrived about 2230. After they received the pre- duty briefing, they relieved the GC and LC positions where they did position relief briefings. The following positions were open at that time: CD, GC, local control assistant (LCA), LC, and operations supervisor (OS)/CIC.

About 2230, Mr. Descalopoulis combined the LCA and LC positions, because it was near the end of the shift for the LCA controller. About 2315, he combined the CD and OS/CIC positions because it was close to the end of his shift. He gave the CICs a briefing for the OS/CIC position and left for the evening. Both controllers were CIC certified so there was never a set order who would sign on as CIC when the FLM left for the night. Mr. Delucchi signed on as the CIC that night.

Mr. Descalopoulis said there were times when he would not combine positions; due to situations such as unusual weather and excessive traffic volume. In those cases, he operated with a more conservative approach and kept positions opened longer, even though controllers got annoyed; however, there were no unusual events that evening. He did not recall any issues or unusual events on the evening of July 7, 2017; traffic was "pretty standard." They traditionally have a number of departures and arrivals between 2230 to 2345, and after 0000 the traffic volume decreased. On the evening of the incident runway 28Land 1R were closed.

The ASSC was a ground surveillance equipment system that included data on the aircraft. He believed it was a good tool for GC and LC. The ASSC provided safety logic similar to ASDE-X (airport surface detection system-model X), which was pretty good, but he believed it could be better. The ASSC covered the distance as far as five miles from the end of runway, but he was not sure how wide it covered. He said that when a departure was airborne the aircraft symbol and data tag would drop off the ASSC about 200 feet and typically re-acquire about 500 feet. He was not aware of a requirement to make a facility log entry when an aircraft target dropped off the ASSC, but he did make a log entry when it occurred. He believed the log entry was a way to track system issues. He had never seen an arrival target drop off the ASSC display. He cannot expect the LC to stare at the ASSC display.

SFO ATCT had five FLMs to cover all shifts, which did not allow any shift overlap between FLMs. When asked what his normal duties were during a shift, Mr. Descalopoulis said it was mostly watching the shift operations, which included monitoring the break rotation and calling for departure release times. If they were short staffed, he would combine CD to the OS/CIC position. He would always monitor LC on speaker or in his headset, to listen for and address conflicts and separation issues.

There was always some form of construction in progress at SFO. The ASSC was good to have because it could be configured to indicate runway and taxiway closures on the display. The ASSC display was beneficial because controllers could look at the display to see the closures. When there were closures, the ASSC could be set up to display an "X" on the closed runway and red/yellow on a closed taxiway; but they had to manually draw taxiway closures in the ASSC.

He had utilized the FAA flight deck training program and was amazed how the pilots caught their call sign, etc. in radio transmissions. He found the program very enlightening.

Mr. Descalopoulis reviewed the radar and audio playback of the incident and characterized the traffic level as not overly busy, even though numerous frequencies were being monitored. He did not classify the traffic volume as unusual.

He recalled instances when aircraft had lined up for the wrong runway; the pilot checked in to land on one runway, but the data tag displayed a different runway. Other aircraft landing on the parallel runways had also corrected air carriers that were lining up to an incorrect runway. He did not recall seeing an aircraft line up for a taxiway before this.

Controllers were not shy about speaking up, and his team operated with a "see something, say something" approach. They also talk about it during recovery training and requesting help.

Mr. Descalopoulis was on the SFO independent operational team for the ASSC, therefore he believed that he was better versed on the ASSC than other FLMs. The ASSC training included instructions on the functionality of the equipment, and how to use it, but not necessarily on the parameters of capability, like blind spots. The main function of the ASSC was to provide safety logic on the runway. The safety logic came from the ASDE-X system.

SFO ATCT recently added another dialogue box to the ASSC display, due to a previous incident at SFO, but he did not feel that it was a function of the ASSC. The dialogue box allowed controllers to see the position of the arrivals, and if they were lined up on the correct runway. He said there were areas where coverage did not exist due to ASSC coverage limitations.

He believed morale at the facility was decent, but insufficient staffing, six-day work weeks and increased traffic volume made controllers feel "stretched." Overall SFO ATCT was understaffed but staffing on July 7, 2017 was fine. He did work overtime and did not feel pressured to take the overtime he was offered.

The interview concluded at 1330 PDT.

Interviewee: Mark Paulus, Acting SFO Air Traffic Manager (ATM)
Representative: Waived

Date / Time: July 17, 2017 / 1030 PDT
Location: SFO ATCT
Present: Dave Waudby, Brandon Johnson and Captain Shawn Etcher. Sathya Silva, PhD participated by telephone.
Investigator: Dan Bartlett

During the interview Mark Paulus stated the following:

He had been on detail as the acting ATM since December of 2015. His detail began as a 180-day detail and, in April 2016, was extended to a 2-year detail. His position of record at SFO was operations manager (OM) and he expected to return to duties of an OM when a new ATM arrived in October of 2017. His air traffic control experience began in 1987 when he enlisted in the USAF and served for ten years as an air traffic controller. In 1998 he was a direct hire by the FAA. As a direct hire, he worked as a certified professional controller (CPC) at SFO from 1998 to 2003, OAK from 2003 to 2005, and Dallas-Fort Worth International Airport (DFW) Dallas-Fort Worth, Texas from 2005 to 2006. In 2006, he worked as a FLM, and acting ATM at PAO until he transferred to SFO as a FLM in 2008. In 2010 he was selected as an OM at SFO.

He accepted a detail to FAA headquarters in Washington DC from November 2014 to November 2015 before returning to SFO to assume the duties of acting ATM from November 2015 to present.

The authorized controller staffing at SFO was 30 (CPC's. SFO was currently staffed with 23 CPC's, two of which were on full time collateral duty assignments with NATCA. These two NATCA controllers were able to maintain currency at SFO and were regularly scheduled during

each pay period when available. Staffing was adequate for the required 7-person day shift, 7-person afternoon shift and 2-person midnight shift. Overtime was used most days and the amount of overtime varied weekly. He had not received a lot of complaints about excessive overtime.

SFO had seven developmental controllers (trainees) in various stages of training curriculum, which took about 18 months to complete. When a controller arrived at SFO, Mr. Paulus had a sit-down conversation with the trainee to discuss the training program and prepare them for the challenge. This training curriculum traditionally included 1.5 to 2 weeks of classroom training on CD/and flight data (FD) followed by 3 to 4 weeks of OJT. After qualifying on CD/FD, the developmental spent two days of classroom training for GC, followed by two weeks of tower simulator training at OAK. GC OJT usually lasted about six months. SFO had lots of complexity to operate at maximum efficiency. LC training began with one week of LCA/LC classroom training, followed by four to six months of OJT. It was very rare for a controller to train and certify on all positions at SFO in less than a year; it usually took about 18 months. All trainees at SFO were CPCs, meaning that the trainees had provided ATC services at other facilities prior to being assigned to SFO. Controllers transferring to SFO were required to have prior ATC experience.

The most recent controller training that was accomplished, addressed performance, and reinforced good operating practices. This training helped to prevent controllers from pushing the envelope and creating risk with successive departure and arrival separation.

Flight deck training was an invaluable tool and used by a cadre of SFO controllers. This training/exposure helped controllers understand the criticality of communications with pilots when they were on the landing rollout; when to talk to the pilot and when to wait a bit for the cockpit tasking to become more manageable. After the flight, the controllers filled out a lesson learned form and submitted it to the flight deck training office in Washington DC.

Staffing for the midnight shift at SFO always included two CICs. Staffing numbers would be increased for special events such as the super bowl, and unusual situations that could include adverse weather, unusual traffic situations and CIC training. If someone got sick, they would try to fill the space immediately. Normal evening traffic at SFO was the final departure/arrival period between 2200 and 2230, which included the Europe and Asia bound departures and the east coast red eye flights. Traditionally, traffic complexity began to lessen after midnight and tapered off significantly after 0100 daily. Traffic levels after 0100 tapered off to about 10 to15 operations per hour. After 0200 there were less than 10 operations per hour. Traffic picked up about 0530.

SFO did not work a lot of cargo traffic. SFO had only two to three cargo operations per night. The majority of cargo air traffic for the San Francisco area operated out of OAK. Traffic started to pick up again around 0530.

In February 2017, he put out new guidance that the LCA position be staffed between 0630 and 2200.The decision to combine positions for the midnight shift was made by the controllers on duty. The controllers knew what they were doing and were used to busy complex traffic. The off-going FLM evaluated evening traffic flow and workload by using the existing traffic prediction tools, then briefed the midnight shift CIC’s. Until this incident, there was no specific guidance on when positions could be combined; however, that has now changed to not earlier than 0015.

SFO ATCT had some “drift” with the correct application of LUAW procedures, and management had been reemphasizing correct application of the rules. He believed If LUAW were necessary to efficiently move traffic, then it was too busy to combine positions. The controllers knew that if they needed additional space between arrivals, to allow for departures, they could call NCT and coordinate additional arrival spacing.

Because of this incident a video replay of the incident was developed and briefed to all operational personnel. A performance record of conference was conducted on the LC involved in the incident and entered into CEDAR. The incident will be reviewed by the SFO local safety council (LSC) at their next meeting. The next meeting was scheduled for July 18th. They are reviewing the schedule to see if one can occur sooner.

Mr. Paulus provided the controllers the following shift guidance:

Do not combine GC and LC before 0015 (all nights). Consider expected traffic and workload (inbounds on TFMS screen and printed departure strips).

When one arrival runway is closed, increase the intensity of the approach lights on the other runway by at least one step.

During construction, ask the first arrival when it is dark if the construction lighting is distracting to them.

Recognize when an event is “significant” when completing an MOR. Don’t hesitate to contact ATM and OM if you’re unsure how to classify an event.

To maintain the highest levels of safety as we attend to reducing fatigue risk, ensure compliance with the NATCA/FAA CBA, and to standardize good operating practices, the following operational policies and procedures will be effective immediately:

The GC and LC position shall remain de-combined until no earlier than 0015. At that time, staffing and workload permitting, recuperative breaks may be taken to attend to personal needs and to rejuvenate one’s mental acuity.

During any break period, employees are subject to recall. When an employee is relieved from an operational position, and plans a recuperative break (e.g., one that is longer than those normally provided during other shifts), the FLM/CIC must be advised, and a plan for recalling the employee will be developed.

SFO ATC management scheduled a meeting with the airport authority to discuss pushing back the runway closure times to midnight. SFO ATC management recently had a discussion with airport authority but due to the length of the closures times, it was determined that the airport would keep the current runway closure times, so it would not extend the runway closures later into the morning.

After the incident with a Compass flight in February, Mr. Paulus mandated that each controller set the ASSC display to include the 2nd box focusing on the extended finals to 28R/Land 28L. He said unfortunately, that did not help prevent this incident from occurring, but he had positive feedback from the operational workforce regarding the additional display and made a request of the ASSC program office to develop an alert that would alarm when an aircraft's ground track was lined up to anything other than the runway assigned. He knew the program office was looking into it, but he was not sure of the status.

The FMS Bridge visual approach for runway 28R did not have the localizer frequency included on the chart. He planned to ask NCT if that was something that could be added.

He was not aware of any past commendations or performance issues with the incident LC. He believed the LC was a good/conscientious controller and a valuable employee. He was a "make it happen" type of person, and a valued member of the team.

Based on a review of the incident, he did not believe the LC was overwhelmed during the incident. He believed the LC had his equipment set up to facilitate all his tasks. Typically, the LC set up LC and TRACON in his ear and GC on the speaker.

There is overtime provided at the tower "here and there." There was no formal crew resource management training for the controllers. The controllers tried to set a tone of "not freaking out" about missing a hole for a departure, for example. He has not seen a macho attitude in his workforce. They are more experienced controllers and the SFO experience is pretty humbling.

There were construction projects at SFO on an almost continuous basis. SFO ATC management held monthly runway safety action team (RSAT) meetings with all local users invited. They held these in addition to the required annual RSAT meetings. The average attendance at the RSAT meetings was 20 to 25 people from the airport and airlines. Discussions included local impact of construction to locally based carriers and airport authorities.

Airport runway configurations utilize runway 28L/R about 85% to 90% of the time. In the winter, utilization includes arrival on runways 19L/R and departures on runways 10 L/R. If the wind was from the west, arrivals and departures utilized runways 19L/R. Runway 19 L/R and runway 10 L/R are utilized about 10% of the time and runways 19 L/R and 1L/R are utilized one or two days a year.

The ATC workforce morale was picking up. Traffic was increasing by several hundred operations per day over the last few years. Three to four years ago, a busy day would classify as 1290 or 1300 operations per day. Now they are running over 1420 operations per day. Overall morale was good. The controllers were hardworking and professional, and they found the work challenging and exciting. There were no morale issues at SFO.

The interview concluded at 1130 PDT.

Interviewee: Craig Meyers (Area B, Boulder Sector Controller)
Representative: Steve McCoy, NATCA

Date / Time: July 19, 2017 / 1530 PDT
Location: North California TRACON (NCT). Telephone Interview from SFO
Present: Dave Waudby, Brandon Johnson and Captain Shawn Etcher. Sathya Silva, PhD participated by telephone.
Investigator: Dan Bartlett

During the interview Craig Meyers stated the following:

His air traffic control experience began when he started his career with the FAA in March of 2009 when he was hired by the FAA and attended initial training at the FAA Academy in Oklahoma City, Oklahoma. After successful completion of initial air traffic control training he worked at NCT from 2009 to present. He was qualified and current on all operating positions in area B which included the Niles, Cedar, Boulder, Laguna, Wiley, Coyote, Woodside and Foster sectors. He was also qualified and current on the flight data and CIC positions in area B area. He was a CIC and OJTI. He held a current class 2 medical certificate with no restrictions or waivers. Due to a recent change in supervisors, he was not sure if his current supervisor was Todd Hower or Richard Hull. His operating initials were BR.

His work schedule leading up to, and after the incident was:

Tuesday	1530 to 2330
Wednesday	1415 to 2215
Thursday	0730 to 1530
Friday	0530 to 1330
Fri/Saturday	2200 to 0600 (Incident Shift)
Sunday	RDO
Monday	RDO

Mr. Meyers worked the area B combined sectors when ACA759 checked in from Oakland ARTCC, reporting on the DYMAND THREE arrival. During the initial radio communication, ACA759 did not report having the current ATIS (automatic terminal information service) information for SFO, information Quebec. Mr. Meyer did not catch the omission of the ATIS report because he had been coordinating with another controller at the time ACA759 checked in, and just missed it.

If a pilot needed weather information for an airport and for some reason could not get the ATIS information, he would provide the weather sequence to pilot, which would include wind, runway in use, cloud cover, dew point, temperature and altimeter. That weather information was available via the information display system, version 5 (IDS-5), located at the control positions. The information was typically updated automatically from the airport weather reporting systems; the updates did not include any remarks or NOTAM (Notices to Airmen) information provided in the ATIS.

Mr. Meyer used speed, altitude, and vectors to maintain separation and to sequence aircraft. On the night of the incident, he had been decreasing almost every aircraft's speed. He recalled that

he had provided a delay vector to ACA759 when the flight was at about 12,000 feet in order to add space for a preceeding aircraft. He recalled issuing a 300° heading for about 20 to 30 miles long to get the space he needed.

The type of approaches used for an airport was based on weather at the destination airport, and typically by the airport. Specific approaches may be requested by the pilot and would be coordinated as necessary with the tower via the traffic management unit (TMU) positions. Airport specific data was available in the IDS-5 if required. The tower provided weather sequences to NCT. Based on the weather conditions, they have pre-coordinated procedures/approaches that would be conducted.

The interview concluded at 1610 PDT.

Interviewee: Don Kirby (NCT ATM)
Representative: Waived

Date / Time: July 18, 2017 / 1300 PDT
Location: SFO ATCT
Present: Dave Waudby, Brandon Johnson and Captain Shawn Etcher. Sathya Silva, PhD participated by telephone.
Investigator: Dan Bartlett

During the interview Mr. Kirby provided the following information:

He arrived at NCT in 2002 as the assistant ATM. In 2004, he was selected as acting ATM, and in 2006 he was promoted to the ATM.

Mr. Kirby said he had about 750 hours of flight time. He began flying at age 16 and earned his private pilot certificate at age 17. He had a private pilot license, instrument rating, commercial pilot license, and ground instructor rating; he was not current.

NCT had six control areas, ‘A’ thru ‘E;’ each area had delegated airspace, and a training area ‘F.’ The areas were laid out in a “spoke” configuration. During the midnight shift, controllers worked their respective areas from a radar scope located in area D, which allowed for better communication and fatigue mitigation.

Approach control services to SFO were provided by area B, which had eight sectors: Woodside, Foster, Boulder, Niles, Cedar, Laguna, Wiley, and Coyote. Area B also had a flight data and a FLM/CIC position. At the time of the incident all the sectors in area B were combined to the position Mr. Myers had been working when ACA759 checked in with NCT. Ms. Haight relived Mr. Myers about 2355.

On a normal midnight shift, the FLMs went home around 2230 and an operations manager in charge (OMIC) took over supervisory responsibilities for NCT.

The NCT standard operating procedures specified that the first controller to talk to an aircraft when it entered NCT airspace was supposed to ensure the pilot was in receipt of the ATIS and issue approach information for the destination airport. In the case of the incident aircraft, the first sector the aircraft entered was the Boulder sector in area B.

He said there was a handful of aircraft at the time that ACA759 checked into the sector. Mr. Meyers, who had worked ACA759 when the flight checked in, told Mr. Kirby that he had been listening to the area D controller in his ear. At the time ACA759 checked in, the area D controller had called him up stating that she was ready to assume his airspace. Mr. Meyer said that he told the area D controller that "it was going to be a while."

He described the working relationship between SFO and NCT as "give and take." SFO was a complex airport with unique approaches. The majority of the time things ran smoothly, both procedurally and professionally, but there were always some problems that would come up periodically; points of contention were always worked through. He described that area B "pitched" to SFO, meaning that area B worked arrivals into SFO, and area D would "catch" from SFO, meaning that area D worked departures from SFO.

In the 15 years that he had been in the area, that was the first time he had heard of aircraft having a hard time acquiring the runway; and it happened not just once, but with two successive arrivals. In response to this incident he issued a procedural change when utilizing runways 28R and 28L that required aircraft to be placed on an ILS (instrument landing system) to a runway if the parallel runway was closed. NATCA was supportive of this change and there were certain flights that requested the ILS even before the change was implemented. The FMS Bridge visual was a legacy overlay of the Quiet Bridge visual. There were some environmental ramifications for the change.

NCT used the standard terminal automation replacement system (STARS) with FUSION, which pulled radar data from several radar sites within their airspace. The primary radar site was an airport surveillance radar, ASR-9, located at OAK. Normal spacing on final was determined by demand, rather than a set number. SFO tower typically needed about 4.5-mile gaps between an arrival and a departure from the crossing runways. When SFO did not have departures, NCT was able to decrease the spacing between arrivals. Under ideal visual flight rule conditions SFO could accept 60 arrivals per hour. A more sustainable rate was 45 arrivals per hour, but the normal rate was 34 to 36 arrivals per hour when mixed with departures.

There were no performance issues with Mr. Meyers. He was a private sector hire and was the unions designee for the local safety team. Ms. Haight was also a union lead for the safety team and she also did not have any performance issues.

When pilots stated they had the ATIS, NCT controllers expected them to have the information contained on the ATIS, and they expected that airline dispatcher to have provided pertinent NOTAMs for the destination airport.

They had not heard complaints from pilots since the construction started.

There was some peer pressure within the NCT group of controllers to find out why an aircraft went around, because all go arounds are categorized and analyzed. Usually go arounds occur because there was an aircraft on the runway, it was an un-stabilized approach, or because a passenger had been standing up in the back of the aircraft.

The approach controllers' normal radar range setting was typically 66 miles to the edge of the scope. At that range, the controller could not differentiate between SFO runways 28L and 28R.

NCT had a waiver for expanded visual operations to SFO if the ceiling was 500 feet above the minimum vectoring altitude. They could authorize visual approaches utilizing the weather observations taken on the San Mateo bridge. Visual approaches provided the airport with higher capacity, which was about 60 aircraft per hour. When choosing which approach to utilize, NCT would choose visual approaches over instrument approaches first, because of capacity reasons.

The interview ended at 1405 PDT.