NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

October 23, 2017

Group Chairman's Factual Report

AIR TRAFFIC CONTROL

OPS17IA010

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A. INCIDENT

Location: Mount Wilson, California
Date: December 16, 2016
Time: 0125 Pacific standard time (PST)
0926 coordinated universal time (UTC)
Airplane: Eva Air flight 015 (EVA015), Boeing 77W

B. AIR TRAFFIC CONTROL GROUP

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C. SUMMARY

On December 16, 2016, at about 0125 PST, Eva Air flight 015 (EVA015), a Boeing B77W was vectored by a Southern California Terminal Radar Approach Control (SCT TRACON) air traffic controller into rising terrain near the Mt. Wilson observatory, in Mt. Wilson, California after departing runway 07R at Los Angeles International airport (LAX). EVA015 passed within about 0.3 nautical miles (nm) of several antennae located on top of Mt. Wilson whose tops rose as high as 6,634 feet above mean sea level (msl)[1]; EVA015 was indicating 6,300 feet msl. Instrument meteorological conditions prevailed, and EVA015 had filed an instrument flight plan for the 14 *Code of Federal Regulations* Part 129 regularly scheduled flight from Los Angeles International Airport, Los Angeles, California to Taiwan Taoyuan International Airport (TPE), Taipei, Taiwan. There was no damage reported to the aircraft, and no reported injuries to the passengers or crew.

D. DETAILS OF THE INVESTIGATION

On January 9, 2017, the air traffic control group convened at SCT located in San Diego, CA. The group met with the SCT Air Traffic Manager, SCT Staff Manager, Los Angeles District Manager, SCT NATCA Facility Representative (FACREP), Air Traffic Supervisor's Committee (SUPCOM) Chairman, Operations Support Group (OSG) Quality Control (QC) Manager, SCT QC Staff Support specialist, SCT Training Manager, SCT QC Manager, and SCT Traffic Management Officer (TMO) for a facility inbrief. The group conducted a tour of the SCT operations floor, reviewed a playback of the incident on the Standard Terminal Automation

[1] All altitudes are in feet above mean sea level (msl) unless otherwise noted, and in the case of cloud ceilings which are in feet above ground level (agl).

Replacement System (STARS)[2] display with the incident controller preference sets selected, reviewed facility data, and conducted interviews.

On Tuesday January 10, 2017, the group reconvened at SCT and continued interviews and collected additional data pertinent to the incident (see attachment 1 Interview Summaries).

On Wednesday January 11, 2017, the group reconvened at SCT and continued interviews before travelling to Seattle, Washington to conduct interviews with members of the FAA Western Service Area (WSA) Quality Assurance (QA) and QC sections.

On Thursday, January 12, 2017, the group convened at the WSA and met with representatives of QA and QC sections. The group collected data and conducted interviews of the QA specialist, QC specialist, and the QC team manager.

On Friday, January 13, 2017, the group reconvened at the WSA and continued collecting data and conducted interviews with the QC group manager, QA team manager, and the QA group manager. The group completed the onsite portion of the investigation and departed.

On January 17, 2017, the non-travelling accredited representative from the Taiwanese Aviation Safety Council provided the aircrew statements from the crew of EVA015 (see attachment 3).

E. FACTUAL INFORMATION

1.0 History of Flight

After arriving to the facility, the SCT air traffic controllers in the Del Ray area combined the operational control positions to the Manhattan sector position.

At 0116:00[3], LAX air traffic controllers instructed the pilot of EVA015 to line up and wait on runway 07L; the pilot requested runway 07R and the air traffic controller instructed EVA015 to line up and wait on runway 07R. At 0117:49, EVA015 was cleared for takeoff with the wind reported as 070 at 9, gusts 18 [knots]; the pilot readback the takeoff clearance. The LAX air traffic controller transferred communications with EVA015 to SCT at 0119:54.

At 0120:07, the pilot of EVA015 contacted the SCT Manhattan sector air traffic controller and reported climbing and passing 1,900 feet for 5,000 feet. The flight was departing LAX on the Ventura Seven Departure (VTU7.VTU) standard instrument procedure (see figure 1). The SCT Manhattan controller advised the pilot of radar contact and instructed him to climb and maintain 7,000 feet and to fly heading 090 degrees. The pilot read back the altitude but requested clarification on the heading; the SCT Manhattan controller again issued the heading as 090 degrees and restated the 7,000-foot altitude. The pilot acknowledged the heading and altitude.

[2] A system that receives radar data and flight plan information and presents the information to air traffic controllers on high resolution, 20" x 20" color displays allowing the controller to monitor, control, accept hand-off of air traffic, and assist with weather avoidance.
[3] All times pacific standard time unless otherwise noted.

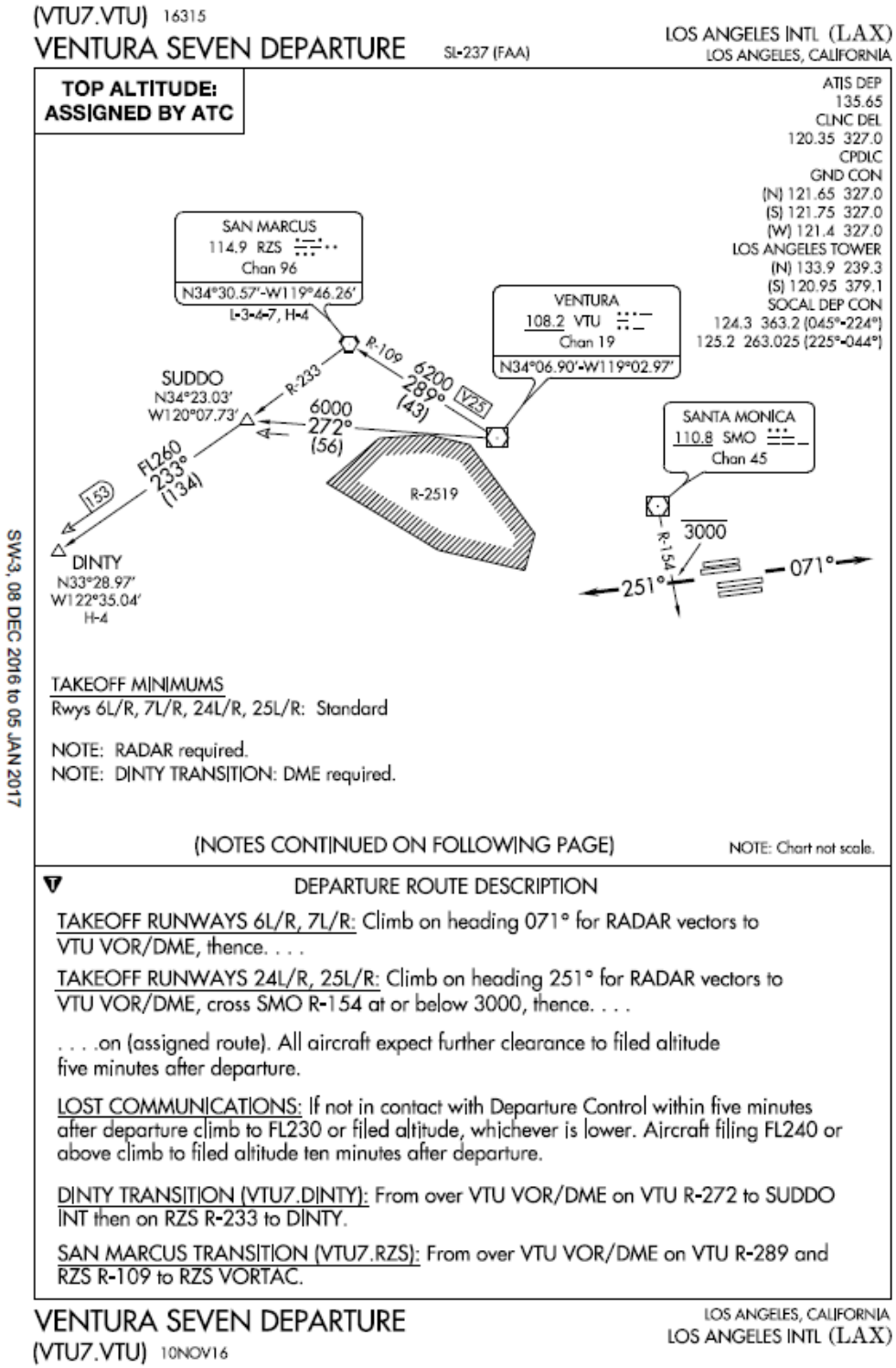

Figure 1 - Ventura Seven Standard Instrument Departure (VTU7).

At 0121:16, the SCT Manhattan controller instructed the pilot of EVA015 "turn left heading of 180, climb and maintain 7,000." The pilot of EVA015 read back the heading and

altitude and requested a "high speed climb[4]." The SCT Manhattan controller approved the request. Radar data indicated EVA015 began to make a left turn.

About 41 seconds later, the SCT Manhattan controller instructed the pilot of EVA015 to "turn right, right turn heading one eight zero." The pilot of EVA015 acknowledged the instruction and read back the right turn to a heading of 180 degrees. Radar data indicated the aircraft stopped the left turn to 180° and slowly began to turn right. At 0122:10, the SCT Manhattan controller instructed the pilot of EVA015 to "expedite your right turn." The pilot replied "roger [unintelligible] passing heading zero one zero, continue heading." The SCT Manhattan controller instructed an Air Canada Boeing 788 that was about 5.45 nm west of EVA015 to expedite a climb and to turn left heading 360°.

At 0122:30, the SCT Manhattan controller instructed the pilot of EVA015 "stop your climb"; the pilot of EVA015 acknowledged. The SCT Manhattan controller then instructed the Air Canada flight to expedite to 12,000 feet. At 0122:50, the SCT Manhattan controller instructed the pilot of EVA015 to "turn left, left turn to a heading of ah, two nine ah, correction two seven zero." The pilot of EVA015 acknowledged the left turn to 270 degrees.

At about 0123:04, the SCT Manhattan controller asked the pilot of EVA015 "what are you doing, turn southbound now, southbound now, stop your climb." The pilot of EVA015 replied "confirm EVA015 heavy, maintain 5,000, left, right, right heading [unintelligible]." At 0123:24, the SCT Manhattan controller called the Los Angeles arrivals sector air traffic controller and requested a point out reference EVA015. The Los Angeles arrivals sector approved the point out, and urged the SCT Manhattan controller to watch out for the minimum vectoring altitudes (MVAs) due to rising terrain. The SCT Manhattan controller acknowledged the caution.

At 0123:30, the pilot of EVA015 contacted the SCT Manhattan controller and requested a confirmation of the assigned heading. The SCT Manhattan sector controller instructed the pilot to "turn southbound, southbound now." The pilot of EVA015 responded "roger turn southbound now, EVA015 heavy." Radar data showed EVA015 in a left turn.

At 0124:03, the SCT Manhattan controller instructed EVA015 to "climb and maintain five thousand, and ah, are you, are you southbound now, I see you going northbound, climb and maintain six thousand." The pilot of EVA015 responded "roger, turning ah, we are turning south, and ah maintain five thousand, EVA015 heavy." The SCT Manhattan controller contacted LAX Air Traffic Control Tower (ATCT) and instructed them to stop departures. At 0124:17 the SCT Manhattan controller instructed the pilot to "climb and maintain seven thousand." The pilot of EVA015 acknowledged the climb. At 0124:22 the Low Altitude Alert (LA) began to flash on the SCT Manhattan controllers radar display and continued flashing until 0125:37.

At 0124:25, the SCT Manhattan controller instructed the pilot of EVA015 "I see you're going southbound, turn south, correction I see you going northbound now, turn south now, climb and maintain seven thousand," there was no response. The SCT Manhattan controller again instructed the pilot of EVA015 to "climb and maintain seven thousand and turn south now." The

[4] This request permitted the pilots to retract the flaps and to speed the aircraft up beyond the 200 knot restricted limit below LAX class B airspace.

pilot of EVA015 responded "[unintelligible] right turn to southbound, continue climb seven thousand." The pilot of EVA015 reiterated "continue right turn, and ah climb to seven thousand to a heading one eight zero."

At 0125:31 the SCT Manhattan controller again instructed LAX ATCT to stop departures.

At 0126:25, the pilot of EVA015 contacted the SCT Manhattan controller and reported they were heading 180 degrees at 7,000 feet. The SCT Manhattan controller acknowledged and again instructed EVA015 to "climb and maintain, ah maintain seven thousand." The pilot of EVA015 acknowledged the instructions. There were no further transmissions pertinent to the incident.

While the SCT Manhattan sector controller was vectoring EVA015, the pilot of an aircraft on approach to LAX elected to go around while attempting to land LAX runway 09R. The LAX controller contacted the SCT Manhattan sector controller and requested a heading and altitude for the aircraft. The SCT Manhattan controller issued an initial heading of 090 degrees and a climb to 2,000 feet. The SCT and LAX ATCT Letter of Agreement (LOA) dated March 13, 2014 indicated eastbound aircraft flying a go around from LAX would be assigned an eastbound heading and a climb to 3,000 feet. The LOA stated [in part]:

(9) Go arounds/missed approaches:
(a) Assign all west traffic go arounds/missed approaches 2,000 feet.
(b) Assign all east traffic and over ocean go arounds/missed approaches 3,000 feet.

After establishing communications with the SCT Manhattan sector controller, the pilot was issued a heading of 180 degrees and to climb and maintain 2,000 feet. The SCT Manhattan sector controller then issued a climb to 5,000 feet and transferred communications to another SCT sector. However, the aircraft had entered a 2,700 foot MVA at an altitude of 2,000 feet while climbing to 5,000 feet.

2.0 Air Traffic Controller Training

The incident controller was certified on the operating position on April 9, 2014 and was certified on all operating positions in the area specialty on January 13, 2014. She was designated as an on the job training instructor (OJTI), and able to teach developmental controllers how to work the operating position.

As part of the facilities annual training, certain refresher training was required per SCT order 3120.1K, *SCT Air Traffic Technical Training*. Between the months of July to December of 2016, annual refresher training addressing LAX East Operations was required to be conducted. The refresher training included required briefings on East operations and simulation scenarios for air traffic controllers to work. The incident air traffic controller did not complete the required simulations.

According to the SCT 7232.2C (Change 20), *Standard Operating Practices*, when LAX was operating in an East flow, and the aircraft was departing to Los Angeles Air Route Traffic Control Center (ZLA ARTCC) sector 14, the required heading for aircraft in communication with

the Manhattan sector on the Ventura Seven Departure was a right turn to an initial heading of 250 degrees. The SCT 7232.2C addresses coordinated handoff procedures and states [in part]:

8-14-5. COORDINATED HANDOFF PROCEDURES

SECTOR	TYPE	DEST/RTE	ALT	HDG/INFO
ZLA 14	**J**	**PERCH AND VTU DEP**	**130**	**RV250**
		LNDG SBA-APREQ ALT	**100**	
STADIUM	**PQ**	**VTU**	**60**	**RV310**
	M	**LNDG SBA**	**60**	**RV250 (STADIUM CT**
		OTHER VIA VTU	**90**	**VECTORS)**
DOWNEY	**J**	**LNDG LAX EXERT routes on**	**A/D 90**	**Direct SLI**

3.0 Airport and Radar Data

Prior to the incident on December 15, 2017, LAX had been landing and departing in a west configuration. The winds were predominantly out of the east at 090° at 8 knots gusting to 15 knots, and several aircraft had elected to "go around" due to a tail wind during landing. LAX ATCT changed the landing and departing configuration to an east configuration about 0000 on December 16th. The airport changed back to a west configuration at about 0233.

In general, two types of radar are used to provide position and track information for aircraft cruising at high altitudes between airport terminal airspaces, and for those operating at low altitude and speeds within terminal airspaces such as SCT.

Air Route Surveillance Radars (ARSRs) are long range (250 nm) radars used to track aircraft cruising between terminal airspaces. ARSR antennae rotate at 5 to 6 rotations per minute (rpm), resulting in a radar return every 10 to 12 seconds. Airport Surveillance Radars (ASRs) are short range (60 nm) radars used to provide air traffic control services in terminal areas. ASR antennas rotate at 13 to 14 rpm, resulting in a radar return every 4.6 to 5 seconds.

A radar detects the position of an object by broadcasting an electronic signal that is reflected by the object and returned to the radar antenna. These reflected signals are called *primary returns.* Knowing the speed of the radar signal and the time interval between when the signal was broadcast and when it was returned, the distance, or range, from the radar antenna to the reflecting object can be determined. Knowing the direction, the radar antenna was pointing when the signal was broadcast, the direction (or bearing, or azimuth) from the radar to the object can be determined. Range and azimuth from the radar to the object define the object's position.

To improve the consistency and reliability of radar returns, aircraft are equipped with transponders that sense beacon interrogator signals broadcast from radar sites, and in turn broadcast a response signal. Even if the radar site is unable to sense a weak reflected primary return, it will sense the response signal broadcast by the transponder and be able to determine the aircraft position. The response signal can also contain additional information, such as the identifying "beacon code" for the aircraft, and the aircraft's pressure altitude (also called "Mode

C" altitude). Transponder signals received by the radar site are called secondary returns. EVA015 was assigned a beacon code of 2031.

Radar data for this report was obtained from the FAA at SCT and were derived from ASR sensors. The SCT plot playback (.PPB) data was of good quality and was part of the STARS (Standard Terminal Automation Replacement) utilized by air traffic control. Figure 2 illustrates the radar flight track of EVA015 as it departed LAX runway 07R until the aircraft was clear of any obstructions and had resumed the departure procedure. Figure 3 illustrates the radar flight track of EVA015 as it traveled near Mt. Wilson CA at an altitude of 6,200 feet, the MVA for that segment was 7,800 feet. Figure 4 is a Google Earth image illustrating the plotted radar flight track of EVA015 and the locations and heights (msl) for the antennae on top of Mt. Wilson.

Figure 2 - Radar data showing EVA015 departing LAX and being turned northbound toward Mount Wilson.

Figure 3 - Radar data showing EVA015 making a right turn just south of Mount Wilson.

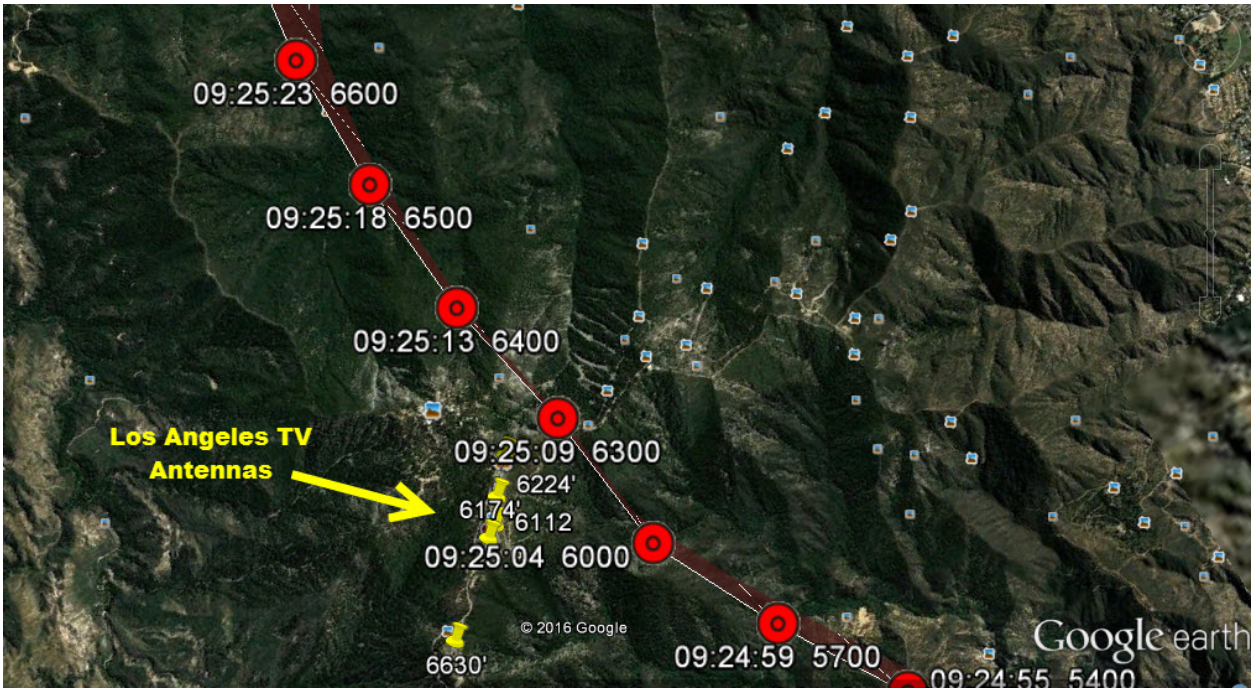

Figure 4 - Radar data overlaid on a Google Earth image with the TV antennas and the associated heights plotted.

4.0 Weather Data

The LAX weather at 0144 PST, wind from 090° at 8 knots gusting to 15 knots, visibility 1 ¼ miles in moderate rain and mist, runway 25R visual range 5,500 feet variable better than 6,000 feet, vertical visibility 400 feet above ground level (agl), temperature and dew point 13° celsius (C), altimeter 29.87 inches of mercury. Remarks: automated observation system, visibility north ¾ mile, hourly precipitation 0.09 inches, temperature 13.3° C, dew point 13.3° C.

5.0 Air Traffic Control Procedures

5.1 ATC Service

According to FAA Joint Order (FAA JO) 7110.65, *Air Traffic Control*, paragraph 2-1-1, *ATC Service,* the primary purpose of the ATC system is to prevent a collision between aircraft operating in the system and to provide a safe, orderly and expeditious flow of traffic. This includes collisions between aircraft and collisions with terrain or obstructions.

5.2 Duty Priority

The first duty priority for an air traffic controller is to separate aircraft and issue safety alerts. FAA JO 7110.65 paragraph 2-1-2, *Duty Priority,* states [in part]:

> **2−1−2. DUTY PRIORITY**
> **a.** Give first priority to separating aircraft and issuing safety alerts as required in this order. Good judgment must be used in prioritizing all other provisions of this order based on the requirements of the situation at hand.

5.3 Safety Alert

When the required separation between aircraft or terrain and obstructions decreases to less than applicable standards, and the separation is unsafe, a safety alert shall be issued to the pilot(s). FAA JO 7110.65 paragraph 2-1-6, *Safety Alert*, states [in part]:

> **2−1−6. SAFETY ALERT**
> Issue a safety alert to an aircraft if you are aware the aircraft is in a position/altitude that, in your judgment, places it in unsafe proximity to terrain, obstructions, or other aircraft. Once the pilot informs you action is being taken to resolve the situation, you may discontinue the issuance of further alerts.

5.4 Separation from Obstructions

According to the FAA, separation minima is the minimum longitudinal, lateral, or vertical distances by which aircraft are spaced through the application of air traffic control procedures. FAA JO 7110.65 paragraph 2-1-6, *Separation from Obstructions*, states [in part]:

> **5−5−9. SEPARATION FROM OBSTRUCTIONS**
> **a.** TERMINAL. Separate aircraft from obstructions depicted on the radar display by the following minima:
> **1.** When less than 40 miles from the antenna− *3 miles.*
> **2.** When 40 miles or more from the antenna− *5 miles.*

b. TERMINAL. Vertical separation of aircraft above an obstruction depicted on the radar display may be discontinued after the aircraft has passed it.

6.0 Air Traffic Organization (ATO) Occurrence Reporting

In January of 2012, the FAA issued new policies and procedures for collecting and investigating safety related incidents. There are two primary methods to report safety incidents within the FAA; Mandatory Occurrence Reports (MOR)[5] and the Air Traffic Safety Action Program (ATSAP). The purpose of these programs is to collect associated safety related data and conditions from air traffic incidents that have occurred within the National Airspace System (NAS). Air traffic controllers have the option of notifying a supervisor or other person responsible for the operation who will initiate an MOR, or, the controller may use the voluntary safety reporting program ATSAP to submit the incident. In some cases, both methods may be used to report the same incident. However, if an ATSAP report is filed and accepted, the incident will be addressed through the ATSAP process with all information being forwarded to the event review committee (ERC)[6].

6.1 Mandatory Occurrence Report (MOR)

The MOR is an electronic form accessed through the Comprehensive Electronic Data Analysis and Reporting (CEDAR)[7] web-based tool. The MOR is the FAA air traffic organizations (ATO) method to "upward report" incidents, to collect safety related data, and to manage operations within the NAS. The FAA JO 7210.632, *Air Traffic Organization Occurrence Reporting*, states [in part]:

2-5. How to Report. As soon as practical, without impacting operations:

a. Non-management personnel must report the occurrence:

(1) As soon as practical, to on-duty management/controller-in-charge (CIC) but no later than the end of duty shift; **or**

(2) According to FAA Order JO 7200.20 (*Voluntary Safety Reporting Programs*.)

b. Management personnel/CIC:

(1) Must ensure that all reported or observed occurrences are entered into CEDAR as the appropriate MOR before the end of the current duty shift.

(2) Must update the original MOR to note all new pertinent information when more than one report of the same occurrence is received.

(3) Each MOR is assigned a unique identification number. Upon request, management must provide employees with a copy of the MOR.

(4) For an employee-reported occurrence that does not meet any MOR criteria, remind the employee about their voluntary safety reporting system (VSRP).

[5] An occurrence involving air traffic services for which the collection of associated safety-related data and conditions is mandatory.

[6] A three-member group comprising representatives from each party to the respective VSRP non-punitive safety-reporting program. The ERC reviews and analyzes submitted confidential reports to determine acceptability of the report under the VSRP requirements, to identify actual or potential safety problems of accepted reports, and to ensure the appropriate follow-up action is taken and implemented for resolution when appropriate.

[7] A tool that provides a standard interface for the collection, retrieval, and reporting of data from multiple sources.

Management must still address any valid safety concerns identified by the employee.

This incident was reported through the submission of an MOR completed on December 16, 2016, by the SCT Operations Manager. It was completed after the Operations Manager in Charge (OMIC), who was responsible for the SCT operation during the incident, had left for the day. The MOR was marked significant after approval of the air traffic manager and submitted via the FAA Regional Operations Center (ROC).

On December 16, 2016, the FAA WSA QC staff contacted the FAA Compliance Services Group (CSG) and spoke with the on-call specialist about the incident. After a review of the incident using the emergency obstruction vectoring map (EOVM) was completed between the CSG specialist and WSA QC staff, the CSG specialist determined the incident was not serious enough to warrant a services rendered telcon (SRT)[8] and no further reporting of the incident would be required. A determination of the measure of compliance (MOC) was not calculated during this review. According to the FAA, any reported or detected loss of separation between other aircraft or terrain and obstructions that falls below 66% of the required separation is considered a risk analysis event (RAE) and an SRT may be initiated.

6.2 Air Traffic Safety Action Program (ATSAP)

Air traffic employees who are involved in a safety related incident, may utilize the ATSAP program to report an incident. ATSAP is a confidential written account of an event that involves an operational issue or event related to aviation safety and reported through the ATO safety action program. It is modeled after the aviation safety action program (ASAP), a voluntary safety reporting system utilized by air carriers.

Controllers filing an ATSAP report are required to complete the report within 24 hours of the end of the duty day or following notification of their involvement in a reportable incident. Following the submission of an ATSAP report, the ERC will decide if the report is considered sole-source[9]. If considered sole-source, the ERC will accept the report regardless of the time limits and the incident will follow the ATSAP process. If the ATSAP is not accepted, then the incident will follow the ATOs occurrence reporting guidelines.

For an accepted report, the ERC will review and examine the reported incident. For sole-source ATSAP reports, they may recommend skill enhancement training (SET) or a system corrective action to address the safety deficiency. For accepted reports that are considered sole-source and known incidents (MOR), the ERC will approve, disapprove, or modify any SET requests that come from the ATM, or request a system corrective action.

[8] A telephone conference conducted with the ATO Safety Event Response Group, the Director of Operations, Mission Support Staff, Office of Accident Investigation and Prevention, Operations Control Center, the involved Facility and others as needed to ERC review and assess ATO services associated with a significant or noteworthy event.

[9] According to the FAA JO 7210.788, the ERC must consider a report to be sole-source when all evidence of the event available to the ATO outside of the ATSAP is discovered by or otherwise predicated on the ATSAP report, or when a credentialed individual that has had an operational error or deviation files an ATSAP report. It is possible to have more than one sole-source report for the same event.

The incident controller reported she had trouble submitting an ATSAP report after the incident had occurred due to login issues. An interview with the incident controller revealed that she submitted her ATSAP report on December 17, 2016 and acknowledged it was more than 24 hours after being notified of the incident. The NTSB made efforts to determine if the ATSAP report was accepted by the ERC, however, FAA ATO declined to provide that information.

7.0 ATO Quality Assurance (QAP) and Quality Control Programs (QCP)

7.1 QAP

The FAA QAP is managed by FAA JO 7210.633, *Air Traffic Organization Quality Assurance Program (QAP).* QA is responsible for "identifying possible safety-related trends in the system rather than addressing single occurrences. QA is also responsible for ensuring all policies and procedures are being followed correctly and when not, whether mitigations, plans/efforts put in place are effective." There are several QA specialists within the group and each is assigned a group of airports or facilities to be responsible for; a WSA QA specialist was responsible for SCT.

As part of the QA process, the QA staff from WSA was responsible to review and validate electronic occurrence reports (EORs) and MORs submitted from the service delivery points (SDPs). This included the calculation of an MOC. The WSA QA specialist received the significant MOR involving EVA015 and validated the loss of separation MOR using radar and communications data. The WSA QA specialist reported SCT had done a good job reporting the significant incident and that the data supported the SCT MOR report.

7.2 QCP

The FAA QCP is managed by FAA JO 7210.634, *Air Traffic Organization Quality Control (QC).* QC is responsible to "assess the output (whether a product or service) of a particular process or function and identify any deficiencies or problems that need to be addressed." There are several QC specialists within the group and each is assigned a group of airports or facilities to be responsible for. The QC specialist responsible for SCT was not on duty; however, the QC on call specialist on duty fielded the initial report and participated in the required notification to the CSG, briefing the CSG on call specialist. A determination was made that the incident involving EVA015 was not serious and an SRT would not be conducted.

During interviews conducted by the NTSB, the QC Team Manager indicated that SCT and the QC on call specialist were aware of the severity of the loss of separation incident involving EVA015, and how close the aircraft came to both the terrain and obstructions. The CSG on call specialist decided the event was not severe enough to conduct an SRT, and, the QC on call specialist did not suggest to the CSG on call specialist that an SRT should be conducted. The QC manager told the QC on call specialist that he should not have let the CSG on call specialist off the telephone without fully explaining the significance of the incident and how close the aircraft was to the terrain and obstructions. After the CSG specialist declined to conduct the SRT, the incident was considered reported, and no further actions were scheduled.

On Monday December 19, 2017, the FAA's National Quality Assurance Group Manager, reviewed the data from the MOR involving EVA015. He had previously worked at SCT and recognized the severity of the loss of separation with terrain and obstructions. As a result, an SRT was immediately scheduled and conducted on December 19, 2017. The SRT confirmed EVA015

flew within "0.5 nm laterally, and below the published and charted altitude of a displayed obstruction." [10]

8.0 Skill Enhancement Training (SET)

SET is prescribed by FAA JO 3120.4N, *Air Traffic Technical Training*. The purpose of SET is to "improve an individual's knowledge, skills, and abilities" and may be assigned to air traffic controllers who are certified on position; it may not be used to correct performance that has resulted in decertification from the operating position. FAA JO 3120.4N states [in part]:

(1) SET for CPC/FPL/TMC[11].
(a) The FLM/STMC[12] must assign SET in writing to include the specific skills and requirements necessary to accomplish this training.
(b) The FLM/STMC is responsible for identifying the training to be administered to the specialist. Training must be tailored to meet the individual's needs. Methods may include OJT, CBI, instructor-led training, self-directed study, and simulation (evaluations may be used in SET if appropriate).

Because of the significant MOR for this incident, the incident controller was recommended for SET by the SCT Local Safety Council and the ATM. However, because the controller submitted an ATSAP report, the SET request was submitted to the WSA ERC for consideration. According to FAA JO 7200.20, *Voluntary Safety Reporting Programs (VSRP)*, "Keep confidential, to the extent feasible, information requested by, and all skill enhancement training recommended by the ERC." Accordingly, there is no record of the approved SET by the ERC.

Before this incident, the SCT Manhattan sector controller had received SET on March 16, 2015 because of a loss of separation event between two aircraft. On February 27, 2015, she was working the SCT Malibu radar sector in the DEL area separation was lost between two aircraft that she was responsible to provide separation between. The SET was recommended by the OM for the Del Ray area and concurred with by the WSA ERC. The SET noted that its purpose was to assist the controller with an "opportunity to improve your knowledge, skills, abilities, and performance in the radar environment."

9.0 Enhanced Ground Proximity Warning System

A request was made through the Taiwanese Aviation Safety Council for the Enhanced Ground Proximity Warning System (EGPWS) data from the aircraft. The EGPWS data provided to the NTSB indicated that at 0924:30, the EGPWS system generated 4 "caution terrain" alerts to the aircrew. At 0924:41, there were 4 more "caution terrain" alerts provided to the aircrew. At 0924:49, the EGPWS system generated a "pull up" alert that lasted until 0924:56. See attachment 4 EGPWS.

[10] FAA SRT result published December 20, 2017.
[11] CPC is "certified professional controller", FPL is "full performance level", and TMC is "traffic management coordinator".
[12] FLM is "front line manager", and STMC is "supervisory traffic management coordinator".

F. LIST OF ATTACHMENTS

Attachment 1: Interview Summaries
Attachment 2: MOR
Attachment 3: Crew Statements
Attachment 4: EGPWS Data

Submitted by:

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Andy Olvis
Senior Air Traffic Investigator

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