

**SCT-SBD UPS RNAV Vis Approach SRMDH - Panel Member Approved 4-28-2021 Version 1-0
SCT/SBD Runway 24 RNAV Visual Approach/Go-around Procedures for UPS SRMDH**

EXECUTIVE SUMMARY

Title: SCT/SBD Runway 24 RNAV Visual Approach/Go-around Procedures for United Parcel Service

Initiating Organization: SCT/SBD

Impacted Organizations: SCT, SBD, REI, ONT

Safety Analysis Type: OPS

Signatures:

Concurrence:

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Approvals:

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Risk Acceptance:

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Project Overview

The Southern California TRACON (SCT) Empire Area (EMP) is responsible for the Inland Empire region airports. Air traffic most affecting San Bernardino International Airport (SBD), operates in/out of Ontario International Airport (ONT) and Redlands Municipal Airport (REI).

SBD is owned and operated by the San Bernardino International Airport Authority (SBIAA), a California joint powers authority comprised of the City of San Bernardino, City of Colton, City of Highland, City of Loma Linda, and County of San Bernardino. SBD has a single grooved-concrete runway, 6/24, 10,001 feet x 200 feet on 1,329 acres. For the 12-month period ending December 31, 2019, the daily traffic count averaged 166 operations a day; however, current activity is averaging closer to 250 to 300 operations daily. The city has contracted with SERCO-North America for Air Traffic Control (ATC) services, Monday through Sunday from 0700L-2100L. SBD tower is a Non-Federal Control Tower (NFCT). The SBD fleet mix includes aircraft ranging from helicopters to single/twin piston-engine General Aviation (GA) aircraft to turbine-engine cargo and air taxi operators, and large/heavy cargo jets.

Redlands Municipal Airport (REI) is 3 NM east of SBD and .8 NM east of the SBD Class D surface area. REI is an uncontrolled airport with a single asphalt runway, 8/26, that is 4,504 feet x 75 feet. The fixed wing traffic pattern is north of the airport while the helicopter pattern to the south. Ontario International Airport (ONT) is 25 miles west of SBD. ONT has two grooved-concrete parallel runways, 8L/26R and 8R/26L. Runway 8L/26R is 12,197 feet x 150 feet; Runway 8R/26L is 10,200 feet x 150 feet. ONT serves as a reliever airport for Los

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Angeles International Airport (LAX), San Diego International Airport (SAN), and John Wayne/Orange County Airport (SNA). The airport has a 24/7 FAA ATCT with all normal equipment amenities.

The proposed change is to publish a new SBD Runway 24 RNAV Visual approach procedure. In 2019, Hughes Aerospace Corporation, contracted by United Parcel Service (UPS), contacted SCT to coordinate the development of arrival and departure Instrument Flight Procedures (IFP) for their client. Although the SBDs Instrument Landing System (ILS) Runway 6 does provide published circling minima for Runway 24, UPS company policy prohibits its pilots from accepting an instrument approach to Runway 6 with a circle to Runway 24, a visual approach to Runway 24, or any closed traffic pattern associated with a go-around.

A Safety Risk Management Panel (SRMP) met virtually from 02/23/2021 to 02/25/2021 to assess the proposed NAS change and associated hazards. The SRMP was organized by SCT in coordination with San Bernardino International Airport (SBD) with support from Western Service Center (WSC) Quality Control Group (QCG). The SRMP was conducted in accordance with the FAA ATO Safety Management System (SMS) Manual, April 2019 Version. The SRMP included attendees representing SCT, SBD, REI, Flight Standards, Flight Procedures, the WSC Operational Support Group (OSG), the Airport District Office, the Regional Administrator, QA/QC, the Los Angeles District, the National Air Traffic Controllers Association (NATCA), UPS, and Hughes Aerospace.

SRM Panel attendees identified four hazards relating to loss of controller and pilot situational awareness with high, medium, or low risk. Based on the safety analysis, SRM Panel members determined that the change cannot be introduced into the NAS with an acceptable level of risk as defined in the FAA ATO SMS Manual, April 2019 Version.

Risk Summary

SRM Panel attendees conducted an in-depth safety analysis on publishing the proposed SBD Runway 24 RNAV visual approach procedure. SRMP attendees applied the ATO Safety Risk Management (SRM) process, beginning with a brainstorming exercise to develop a Preliminary Hazard List (PHL). Using the PHL as a foundation for the Hazard Analysis Worksheet (HAW), SRMP attendees analyzed each hazard to determine cause, system state, controls, and effects. Panel members determined severity, likelihood, and initial/predicted residual risk-and attendees identified Safety Requirements and determined Safety Performance Targets.

Panel attendees discussed and analyzed how SCT, SBD, and ONT controllers, REI, commercial airlines and General Aviation (GA) pilots, San Bernardino Sheriff Helicopters, and U.S. Forrest Service Fire Fighting tanker aircraft will be affected by introducing the proposed SBD Runway 24 RNAV visual approach procedure. Attendees drilled down into the details of how the proposed visual approach will function, including its impact on IFR and VFR traffic routes and pattern entry points, wake turbulence effects on surrounding airports, and unplanned go-arounds associated with visual approaches. SRMP attendees talked about communication between SCT and SBD, radar coverage areas, and procedures that promote safe operations. Attendees viewed and discussed presentations with graphics showing the affected areas and target points related to SBD in relation to airports in close proximity. Attendees agreed that effective communications and maintaining situational awareness are key to safe operations during busy traffic periods. Presentations and data used by the SRMP to complete its analysis in accordance with ATO SMS procedures are provided as attachments.

Panel attendees discussed how current operations would change with introduction of the proposed visual approach procedure. Attendees discussed aircraft arriving SBD during strong southwest winds and their effect on safe and stable landing operations. The proposed RNAV visual approach to Runway 24 was created in response to the tailwind component at SBD. Attendees reviewed an ops test screening, from FAA data, that included a wind analysis-extracted from a study conducted by Hughes Aerospace. The wind study

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was a compilation of five years of data. The wind study indicated SBD experiences a tail wind of about 10 knots or more between the hours of 1800 to 2400 daily. Attendees looked at how wind analysis was used to support and justify creation of the proposed visual approach procedure and the qualification as a Category Exclusion (CATEX) with an estimated use twice daily during a year.

Attendees agreed that wind direction and velocity were suitable indicators/predictors of assigned runways. Runway 6 is the preferred calm wind runway. When wind direction shifts to a southwest component, arrivals fly the instrument approach to Runway 6 and circle to Runway 24 or conduct a visual approach to Runway 24. UPS has instructed their pilots not to accept the instrument approach to Runway 6 and circle to Runway 24 or conduct the visual approach to Runway 24.

Attendees said there are no changes to existing conditions other than the proposed RNAV visual approach procedure to establish UPS aircraft with a safe, stable landing procedure in visual weather conditions (with a ceiling of 4,400 feet and visibility of five Statute Miles (SM)) to Runway 24. FAAO 7110.65 3-5-1 identifies the following: Except where a "runway use" program is in effect, use the runway most nearly aligned with the wind when 5 knots or more or the "calm wind" runway when less than 5 knots. SBD uses a 10-knot criteria for switching operations to Runway 24. Operators and pilots may ask for and accept higher tailwind component. The MD-11F aircraft cannot accept a tailwind component. An SRMP attendee representing UPS indicated their company had previously conducted an internal safety risk management analysis/study and that UPS has experience flying similar operations into uncontrolled airports.

SRMP attendees addressed noise abatements for SBD. Attendees revealed noise abatements procedures are in place, but are not mandatory. SBD attempts to keep most air traffic south of the airport. Attendees were briefed by OSG on Environmental CATX criteria. OSG described the environmental coordinated with California State Preservation and indicated a no impact determination. No historical properties are affected. Wind events associated with noise abatement were reviewed as well in determining no environmental impact.

SRMP attendees discussed the impact of go-arounds on pilot and controller situational awareness today and the potential go-around increase with implementation of the proposed SBD Runway 24 RNAV visual approach procedure. Attendees said when an operational conflict arises, SCT will hang on to aircraft until the conflict is resolved. Controller attendees representing SCT said there is a heightened awareness in terms of de-conflicting and issuing traffic prior to transferring communication to SBD, as the SDB NFCT does not have a radar display. SRMP attendees said they have not experienced approaches to Runway 24 at SBD wherein aircraft enter the base over REI; instead, they enter the approach on the downwind. Attendees said RNAV visual approaches would be treated as any other visual approach.

SRMP attendees discussed SCT delaying communication transfer until conflicts are resolved. SRMP attendees expressed concern over how delayed communication transfer may result in an arriving aircraft not being on the SBD NFCT frequency in the event of a potential go-around.

Attendees discussed whether the proposed RNAV visual approach procedure would change REI traffic flows associated with airborne traffic in comparison with current flight paths for aircraft departing, arriving, entering an established local traffic pattern, transitioning to/from the aerobatic area, and inbound from the northwest above SBD airspace, which would result in a rapid descent for pattern altitude in close proximity to the proposed RNAV Visual Runway 24 approach. SRMP attendees determined there would be no change to REI traffic flows with implementation of the procedure. Attendees discussed the at-or-above crossing altitudes for each RNAV fix as it relates to an optimal stable approach for the proposed RNAV visual approach procedure. SRMP attendees confirmed that RNAV fixes are fly-by, not fly over, and are built for a 3-degree glide path and published accordingly.

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Panel attendees talked about current controls that may provide a safe transition with the implementation of the proposed visual approach procedure. Attendees suggested controllers would receive briefings and enhanced training on the procedure along with pilot outreach to educate the flying community about the procedure and potential for RNAV go-arounds at SBD.

Panel attendees viewed presentations and data, which included proposed changes depicted/overlaid on existing sectors, existing Minimum Vectoring Altitude (MVA), current Standard Terminal Arrival Routes (STARs), existing approaches into ONT and REI, and existing RIV STARs/SIDs. The presentations focused on the proposed procedure in relationship to existing SBD approaches/traffic patterns, proposed go-arounds on an MVA Video map, SBD Class D and REI Class E over terrain, Performance Data Analysis and Reporting System (PDARS) information depicting SBD and REI arrivals, and PDARS capturing REI arrivals and aerobatic box.

The proposed SBD Runway 24 RNAV visual approach procedure is designed around the uncontrolled REI airport. There are safety concerns directly related to the ability of SCT and the SBD NFCT to issue traffic and/or safety advisories to inbound aircraft due to lack of standard ATC equipment. The procedure is designed to fly about 1.3 NM north and 1.73 NM east (App b. Slide 2) of REI, which is a known area of radar loss for SCT at or below 4,500 feet. SBD does not have an operating TDW and only provides traffic advisories of known or visually observed aircraft. With communication transfer from SCT to SBD taking place at or before JESEL, the approach segment from JESEL to the approach end of SBD Runway 24 would be conducted without ATC radar traffic advisories.

SBD - SCT coordination includes IFR clearances and cancelations, IFR/VFR inbound coordination with time estimate for appropriate fixes/locations, IFR releases, and hourly weather conducted verbally via landline. The SBD NFCT does not have a Flight Data Input Output (FDIO) or TDW.

Attendees mentioned as a briefing item for controllers the potential conflict between inbound/missed approach legs of the REI RNAV (GPS)-A instrument approach and the proposed SBD RNAV Visual Runway 24 approach procedure. It was stated current IFR approaches to REI and SBD, cannot be conducted simultaneously, due to airspace to be protected. Thus, the proposed procedure would not change this operation.

During PHL brainstorming, attendees identified and discussed potential hazards associated with current airborne operations verses the proposed change for the Empire Area, which encompasses SCT, SBD, REI, ONT, and RIV while fully considering each system state. Attendees compiled an extensive PHL, which was vetted for hazard, cause, system state, and effect. Facilitators moderated the deliberations from a neutral position and assisted attendees to differentiate between current system state, efficiency, and introduced risk as a result of the proposed NAS change.

SRM Panel attendees identified four hazards relating to loss of controller and pilot situational awareness with high, medium, or low risk. Based on the safety analysis, SRM Panel members determined that the change cannot be introduced into the NAS with an acceptable level of risk as defined in the FAA ATO SMS Manual, April 2019 Version.

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Hazard Summary

Hazard ID	Hazard	Initial Risk	Predicted Residual Risk
SCT UPS SBD Runway 24 RNAV Vis Approach-01	Loss of controller situational awareness Effect: Aircraft in close proximity to UPS aircraft conducting SBD Runway 24 RNAV visual approach	4D: Low	4D: Low
SCT UPS SBD Runway 24 RNAV Vis Approach-02	Loss of pilot situational awareness Effect: Aircraft in close proximity to UPS aircraft conducting SBD Runway 24 RNAV visual approach	1C: High	1D: High
SCT UPS SBD Runway 24 RNAV Vis Approach-03	Loss of pilot situational awareness Effect: TCAS RA resulting in loss of approved separation with IFR aircraft	4C: Medium	4C: Medium
SCT UPS SBD Runway 24 RNAV Vis Approach-04	Loss of controller situational awareness Effect: Loss of approved separation	4C: Medium	4D: Medium

Hazard SCT UPS SBD Runway 24 RNAV Vis Approach-01 - Loss of Controller Situational Awareness (Effect: Aircraft in Close Proximity to UPS Aircraft Conducting SBD Runway 24 RNAV Visual Approach)

SRM Panel attendees discussed the proposed SBD Runway 24 RNAV visual approach procedure in contrast to current Runway 24 approaches. Attendees stated that aircraft currently enter the downwind leg at a 45-degree angle turn base over or west of Church Street, and remain inside Class D airspace. Occasionally, aircraft extend on the downwind beyond Class D Airspace and turn base outside the east boundary. Attendees compared current visual approach procedures to the proposed SBD RNAV Visual Runway 24 approach procedure and said the two procedures do not mimic each other.

Panel attendees determined that controller loss of situational awareness is a hazard with multiple causes: IFR aircraft conducting SBD Runway 24 RNAV visual approach becomes involved with VFR aircraft in SBD arrival flight path, WUNPA versus REI straight in approach from east to Runway 26, lack of SBD tower radar display capability to issue safety alerts, SCT controller workload increased by relaying safety alerts to SBD NFCT, REI traffic pattern excursions north of airport, downwind aircraft north of REI head-on with SBD inbound aircraft, left downwind aircraft on RNAV approach coming in behind, aircraft deviates from SBD Runway 24 RNAV visual approach because of east side conflict with terrain, REI inbound/outbound traffic to the south interference with SBD Runway 24 RNAV visual approach at JESEL and ADOVE, aircraft from north transitioning above SBD Class D airspace and descending into REI traffic pattern, TCAS RA between JESEL and SBD, paragliders and other non-radio equipped aircraft conflicting with SBD Runway 24 RNAV visual approach track, and spill-outs from aerobatic area.

The hazard exists in the following system state: Empire/SBD/REI airspace, SBD Runway 24 RNAV visual approach in use, weather five miles visibility or greater, ceiling 4,400 feet or higher, SBD NFCT open, initial approach fix to Runway 24.

SRMP attendees talked about effects for SBD when transitioning aircraft outside of the Class D airspace. Attendees mentioned a potential Near Mid-Air Collision (NMAC). Attendees agreed there is potential for aircraft to come in close proximity to other aircraft, as SBD does not have a radar display in which to see targets in the area. Data identified two ASRS events/incidents during the last 23 years; one reportable event in 1998 and one in 2016.

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SRMP attendees discussed how visual approaches do not have an authorized missed approach procedure. Aircraft conducting a go-around off a visual approach are expected to enter the closed traffic pattern with the associated tower. Aircraft cleared for the proposed SBD RNAV Visual Runway 24 approach procedure that initiates a go-around at SBD cannot enter the closed traffic pattern. The SBD NFCT will instruct pilots to overfly or parallel the runway and then issue the following: fly heading 220, climb and maintain 5,000, and contact SoCal Departure 127.0. This facilitates a climb to the MVA per the AJV/P FAA Interpretation of FAA JO 7110.65 7-4-1 and pilot assumes terrain avoidance responsibility.

SRMP attendees said pilots typically do not assume terrain separation criteria when issued a heading below the MVA. Attendees said this proposed procedure would only be authorized when the SBD NFCT is operational. Attendees questioned whether the tower-assigned heading would be issued at the approach end of Runway 24, at mid-field, or at the departure end of the runway. SRMP attendees said the point at which the heading is issued could affect an aircraft's ability to realign with the approach procedure. Attendees said the location the turn is issued should not affect the aircraft's ability to re-execute the approach. When the tower is closed/not operational, runway-specific visual approaches, including RNAV visuals are not authorized. SBD Class D Airspace reverts to Class G (uncontrolled) airspace below 1,900 feet MSL. Attendees reviewed maps displaying MVAs for the areas affected. Attendees said that during the proposed RNAV visual approach, operating in VMC conditions, pilots would scan for traffic that may impact their route of flight. The clarification document is an attached (App h. & i).

Panel attendees determined the worst credible effect is aircraft in close proximity to UPS aircraft conducting the proposed SBD Runway 24 RNAV visual approach procedure. SRM Panel members determined that Severity is 4: Minor based on increase in controller workload leading to distraction and failure of the following two out of four severity indicators:

- Proximity. Failure transition point of 50 percent of required separation or less.
- Rate of Closure. Failure transition point greater than 205 knots or 2,000 feet per minute (consider both aspects and utilize the higher of the two if only one lies above the transition point).

Members determined that Likelihood is D: Extremely Remote based on no radar display at SBD and Likelihood Table 3.6 determination based on subject matter expertise and historical data: Qualitative Table: D – Extremely Remote Less than once per three years and equal to or more than once per 30 years.

SRM Panel attendees developed a Monitoring Plan, with a Safety Performance Target of less than one proximity event associated with the controller not issuing a known safety alert while conducting an SBD Runway 24 RNAV visual approach during two-year period.

Monitoring activity will be reviewing MORs through CEDAR with quarterly reporting for two years. Panel members agreed that initial risk is 4D: Low. Members did not identify Safety Requirements and members agreed that predicted residual risk would remain at 4D: Low.

Hazard SCT UPS SBD Runway 24 RNAV Vis Approach-02 - Loss of Pilot Situational Awareness (Effect: Aircraft in Close Proximity to UPS Aircraft Conducting SBD Runway 24 RNAV Visual Approach)

Panel attendees considered GA traffic flying into, out of, and around REI in close proximity to the proposed RNAV visual approach. REI is an uncontrolled airport that lies 3 NM east of SBD (App b.) and .8 NM east of the SBD Class D surface area. The traffic pattern has fixed-wing aircraft in the north pattern and helicopters in the south pattern. Four flight schools for fixed-wing and rotary-wing aircraft reside at REI. REI is home for air ambulance operations, law enforcement, utility patrols, the US Department of Forestry, and Cal Fire. The

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visual approach procedure is designed to fly about 1.3 NM north and 1.73 NM east (App b.) of REI, which is a known area of radar loss for SCT at or below 4,500 feet.

SBD does not have an operational TDW and only provides traffic advisories of known or visually observed aircraft. With communication transfer from SCT to SBD taking place at or before JESEL, the approach segment from JESEL to the approach end of SBD Runway 24 would be conducted without ATC radar traffic advisories.

SRMP attendees said the proposed SBD RNAV Visual Runway 24 approach procedure would typically be flown when the tail wind component of 10 knots is exceeded. At SBD, this typically occurs between 1800L and 2400L daily. When attendees questioned if the procedure would be requested even when the tailwind component is not exceeded, an attendee representing UPS indicated they would not. OSG Flight Procedures stated this proposed procedure would not be restricted to UPS, is not proprietary, and will be published/charted and available to all user groups. The SRMP questioned if the proposed SBD RNAV Visual Runway 24 approach procedure would be used if SBD is in a calm wind Runway 24 configuration, to which UPS and SBD answered - no. Identified RNAV fixes are fly-by not fly over, which could cause aircraft conducting the RNAV approach to be in closer proximity to the REI airport than depicted (App b. slides 6 & 7, App c. slides 57 & 58). Attendees said this proposed procedure would increase the number of large and heavy wake producing aircraft approaching Runway 24 into SBD and the impact of wake turbulence effecting experienced, inexperienced and student pilots flying into, out of, and around the REI airport (App b. slides 5, 6 & 7, App c. slides 57 & 58).

Panel attendees determined that pilot loss of situational awareness is a hazard with multiple causes: IFR aircraft conducting SBD Runway 24 RNAV visual approach becomes involved with VFR aircraft in SBD arrival flight path, WUNPA versus REI straight in approach from east to Runway 26, conflict with aircraft transitioning to/from aerobatic box to/from REI, SCT controller workload increased by relaying safety alerts to SBD NFCT, downwind aircraft north of REI head-on with SBD inbound aircraft, REI traffic pattern excursions north of airport, left downwind aircraft on RNAV approach coming in from behind, deviation from Runway 24 RNAV visual approach for east side conflict with terrain, VGSI (PAPI) unusable outside four miles from airport, traffic inbound/ outbound south of REI interfering with RNAV visual approach at JESEL and ADOVE, wake turbulence affecting aircraft at REI, aircraft from north transitioning above SBD Class D airspace and descending into REI traffic pattern, TCAS RA between JESEL and SBD, paragliders and other non-radio equipped aircraft conflicting with Runway 24 RNAV track, intermittent low-altitude radar coverage, and spill-outs from aerobatic area non ADS-B equipped aircraft associated with the RNAV visual approach.

The hazard exists in the following system state: Empire/SBD/REI airspace, SBD Runway 24 RNAV visual approach in use, weather five miles visibility or greater, ceiling 4,400 feet or higher, SBD NFCT open, initial approach fix to Runway 24.

Panel attendees determined the worst credible effect is aircraft in close proximity to UPS aircraft conducting the proposed SBD RNAV Visual Runway 24 approach procedure. SRM Panel members determined that Severity is 1 – Catastrophic based on hull loss to manned aircraft from the Flight Crew Hazard Severity Classification; experience operating in the REI traffic pattern; experience with smaller aircraft encountering wake turbulence from larger aircraft; number of inexperienced student pilots flying into REI; wake turbulence from heavy aircraft passing overhead or in proximity to the REI traffic pattern, as fixes are fly-by not fly over; small planes operating close to the ground; UPS aircraft operating less than 2,500 feet laterally and within 200 feet vertically of REI pattern altitude; circumstances requiring a flight crew to reject landing (i.e., balked landing) at or near the runway threshold; increased number of heavy aircraft in close proximity with low hour, inexperienced pilots at REI; student pilots are not consistent in remaining within the traditional traffic pattern

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at REI; RNAV procedure is designed to fly east of REI, which is a known area of radar loss for SCT at or below 4,500; aircraft are not required have ADS-B or transponders while operating in the vicinity of SBD and REI; no tower radar display in the SBD NFCT; SBD controllers unable to issue traffic advisories and safety alerts for aircraft conducting an RNAV Runway 24 approach outside SBD visual range and/or the Class D airspace; head to head conflict between REI traffic pattern and aircraft conducting the RNAV Runway 24 approach; if it was just UPS, it would be rank lower, when other aircraft added, moves Severity Classification to 1: Catastrophic based on Panel members using a combination of two Severity Classification Tables.

Severity table definition for Flight Crew for Catastrophic for "Hull Loss to manned aircraft." SMS Severity table definition for ATC Services with four severity indicators failing, taken from the ATC Services Hazard Severity Classification:

- Proximity. Failure transition point of 50 percent of required separation or less.
- Rate of Closure. Failure transition point greater than 205 knots or 2,000 feet per minute (consider both aspects and utilize the higher of the two if only one lies above the transition point).
- ATC Mitigation. ATC able to implement separation actions in a timely manner.
- Pilot Mitigation. Pilot executed ATC mitigation in a timely manner.

Members determined that Likelihood is C: Remote based on 250 aircraft assigned to REI, excluding transient and itinerant aircraft that land and depart regularly; REI aircraft transitioning to and from the aerobatic area; gliders, self-launching, to and from REI; RNAV 24 approach used when tail wind component is exceeded at SBD; RNAV Runway 24 approach will not be restricted to UPS aircraft only; no tower radar display in the SBD NFCT. SBD controllers unable to issue traffic advisories and safety alerts for aircraft conducting RNAV Runway 24 approach outside SBD visual range and/or the Class D airspace. Panel Members focused on Likelihood Table 3.6 and determinations were based on subject matter expertise and historical data (PDARS): Qualitative: C – Less than once per three months and equal to or more than once per three years.

SRMP members estimated one aircraft in close proximity to UPS aircraft conducting the number of UPS approaches into SBD, infrequent use of the RNAV visual approach to SBD Runway 24 procedure resulting in a catastrophic event less than once per three months and equal to more than once per three years.

Panel members agreed that initial risk is 1C: High. Members identified the following Safety Requirement: REI automated broadcast on Super Automated Weather Observing System (AWOS) and Common Traffic Advisory Frequency (CTAF) with the Airborne Communications Addressing and Reporting System (ACARS) automatically providing an estimated time of arrival for heavies in proximity of REI. Other non-UPS aircraft are not required to comply with the Safety Requirement. After determining if the Safety Requirement would affect initial risk, members agreed that predicted residual risk is reduced to 1D: High.

Hazard SCT UPS SBD Runway 24 RNAV Vis Approach-03 - Loss of Pilot Situational Awareness (Effect: TCAS RA resulting in loss of approved separation with IFR aircraft)

Panel attendees discussed aircraft conducting the proposed RNAV visual approach procedure and impacts related to a potential TCAS-RA resulting in loss of approved separation with another IFR aircraft. SRMP attendees talked about aircraft responding to a TCAS-RA and climbing into IFR aircraft transitioning above or in close proximity. Attendees mentioned safety logic is built into the TCAS system to avoid collision. Attendees said the enhanced Ground Proximity Warning System (GPWS) is designed to alert pilots if their aircraft is in immediate danger of flying into the ground or an obstacle. SRMP attendees agreed this is similar to what pilots encounter today in the NAS. Attendees said this risk was minimal with the introduction of the proposed SBD RNAV Visual Runway 24 approach procedure.

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SRMP attendees talked about separation criteria for aircraft in close proximity, specifically VFR aircraft not in communication with SCT. Attendees said there is no criteria for VFR separation. Attendees agreed that if controllers see something, they say something. SRMP attendees discussed historical data. Attendees said there have been no reported TCAS-RAs that have resulted in a safety event within the last four years. Attendees noted that pilots are trained for such conditions and that RAs are not abnormal maneuvers.

Panel attendees determined that pilot loss of situational awareness is a hazard with multiple causes: IFR aircraft conducting SBD Runway 24 RNAV visual approach becomes involved with VFR aircraft in SBD arrival flight path, WUNPA versus REI straight in approach from the east to Runway 26, conflict with aircraft transitioning to/from aerobatic box to/from REI, SCT controller workload increased by relaying safety alerts to SBD NFCT, downwind aircraft north of REI head-on with SBD inbound aircraft, REI traffic pattern excursions north of airport, left downwind aircraft on RNAV approach coming in behind, deviation from Runway 24 RNAV visual approach for east side conflict with terrain, traffic inbound/outbound south of REI interfering with Runway 24 RNAV visual approach at JESEL and ADOVE, aircraft from north transitioning above SBD Class D airspace and descending into REI traffic pattern, TCAS RA between JESEL and SBD, paragliders and other non-radio equipped aircraft conflicting with Runway 24 RNAV track, intermittent low-altitude radar coverage, spill-outs from aerobatic area, and non-ADS-B equipped aircraft associated with RNAV visual approach.

The hazard exists in the following system state: Empire/SBD/REI airspace, SBD Runway 24 RNAV visual approach in use, weather five miles visibility or greater, ceiling 4,400 feet or higher, SBD NFCT open, initial approach fix to Runway 24.

Panel attendees determined the worst credible effect is a TCAS RA resulting in loss of approved separation with another IFR aircraft. Panel members determined that Severity is 4: Minor based on operational/procedural impact; TCAS/RA reduction in safety margin; TCAS/RA to another IFR aircraft; controls identified; pilots trained; a gap of information from SBD NFCT – no radar display; unaware of traffic above of SBD Class D airspace; frequency change between SCT and SBD; near midair type scenario with go-around and transfer of communication back to SCT; heavy use area for VFR aircraft transitioning the area; historical data; and subject matter expertise. Severity is 4: Minor based on Panel members using a combination of two Severity Classification Tables: SMS Severity table definition for Flight Crew for Minor of “Near mid-air collision encounters with separation greater than 500 feet.”

Severity table definition for ATC Services with one to two severity indicators failing - taken from the ATC Services Hazard Severity Classification

- Proximity. Failure transition point of 50 percent of required separation or less
- Rate of Closure. Failure transition point greater than 205 knots or 2,000 feet per minute (consider both aspects and utilize the higher of the two if only one lies above the transition point)
- ATC Mitigation. ATC able to implement separation actions in a timely manner
- Pilot Mitigation. Pilot executed ATC mitigation in a timely manner

Members determined that Likelihood is C: Remote based on number of UPS approaches into SBD; proposed infrequency of use of the SBD Runway 24 RNAV visual approach procedure; and Likelihood Table determination based on subject matter expertise and historical data: Qualitative Table: C – Remote Less than once per three months and equal to or more than once per three years.

SRM Panel attendees developed a Monitoring Plan with a Safety Performance Target of less than three TCAS RAs resulting in loss of approved separation with an IFR aircraft associated with loss of pilot situational

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awareness and SBD Runway 24 RNAV visual approach during a two-year period. Monitoring activity will be reviewing MORs through CEDAR with quarterly reporting for two years. Panel members agreed that initial risk is 4C: Medium. Members did not identify any Safety Requirements and agreed that predicted residual risk is 4C: Medium.

Hazard SCT UPS SBD Runway 24 RNAV Vis Approach-04 - Loss of Controller Situational Awareness Effect: Effect: Loss of approved separation)

SRM Panel attendees talked about impacts due to controller expectation bias associated with go-around procedures at SBD. Attendees discussed enhanced training for pilots and controllers relative to the SBD Runway 24 RNAV Visual Approach procedure and associated go around procedure. Attendees reviewed and discussed MOR and Targets/PDARS data. SRMP attendees noted one significant MVA violation on a go-around in which the pilot made an incorrect turn.

SRM Panel attendees were concerned that the SBD NFCT did not have a TDW. A TDW would greatly enhance situational awareness for NFCT controllers, and allow for a seamless transfer of information between SBD and SCT. Attendees discussed adding statements regarding potential RNAV visual approach go-arounds on the Automated Terminal Information Service (ATIS). Attendees mentioned adding a note on charted visual approach procedures related to overflying or course information in relationship to the runway. Attendees agreed to not capture this as a Safety Requirement. Attendees discussed what constituted a go-around verses a missed approach. SRM Panel attendees agreed an unstable or abandoned approach would meet requirements for initiating a go-around. SRM Panel members added that a visual approach cannot be assumed into SBD due to hazy conditions.

Attendees determined that controller loss of situational awareness is a hazard caused by expectation bias associated with the SBD go-around procedure. The hazard exists in the following system state: Empire/SBD/REI airspace, SBD Runway 24 RNAV visual approach in use, weather five miles visibility or greater, ceiling 4,400 feet or higher, SBD NFCT open, initial approach fix to Runway 24.

Panel attendees determined the worst credible effect is a loss of approved separation. Panel members determined that Severity is 4: Minor based on historical data; subject matter expertise; target data for UPS; SBD does not have radar display; SBD no visibility of air traffic above Class D airspace; communication latency between SBD and SCT; proximity to terrain; transition frequency change from SBD to SCT; separation greater than 500 feet from crossing traffic above SBD; flight crew rejects landing initiating go-around; TCAS is not a big deal, will keep go-around 500 feet from other aircraft; and aircraft climb out can occur quickly as the ATCT advises a go-around.

Panel members determined that Likelihood is C: Remote based on wind that leads to a go-around; VMC conditions; the chances of an IFR aircraft in close proximity to an IFR aircraft is remote. Go-arounds based on Likelihood Tables 3.5 and 3.6 determinations based on subject matter expertise and historical data:

- 1 per 100,000 > (Probability) \geq 1 per 10,000,000
- Qualitative: C – Less than once per three months and equal to or more than once per three years

SRM Panel attendees developed a Monitoring Plan, with a Safety Performance Target of less than one loss of approved separation event associated with SBD Runway 24 RNAV visual approach go-around during a two-year period. Monitoring activity will be reviewing MORs through CEDAR with quarterly reporting for two years.

SRM Panel members identified the following Safety Requirements: conducting enhanced training related to the SBD Runway 24 RNAV visual approach and lack of radar coverage and developing/distributing a Letter to

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Airmen. After determining if the Safety Requirements would affect initial risk, members agreed that predicted residual risk is reduced to 4D: Medium.

SECTION 1: CURRENT SYSTEM

SBD is owned and operated by the San Bernardino International Airport Authority (SBIAA), a California joint powers authority comprised of the City of San Bernardino, City of Colton, City of Highland, City of Loma Linda, and County of San Bernardino. SBIAA has been reshaping SBD into a combined passenger airport and major cargo hub for FedEx, UPS, and soon Amazon Air. SBD also serves as a firefighting base for the US Forest Service and the San Bernardino County Sheriff helicopter fleet. The SBD fleet mix includes aircraft ranging from helicopters to single/twin piston-engine GA aircraft to turbine-engine cargo and air taxi operators, and large/heavy cargo jets. Airport expansion continues with new construction of cargo distribution facilities. Amazon Air recently announced the opening of its 658,000 square foot regional air hub capable of handling 14 large jets.

SBD is in the northeast corner of the San Bernardino Valley near the San Gorgonio Mountains. This geographical area marks the northeast boundary of the EMP, an extension of the Greater Los Angeles Basin. With the prevailing westerly winds in the basin, the SBD area is routinely the recipient of Southern California smog, resulting in limited visibility during the summer. This area is controlled by SCT EMP.

SBD has a single, grooved-concrete 10,001 foot by 200-foot runway, Runway 6/24. The runway is stressed to handle the Airbus A-380. For the 12-month period ending December 31, 2019, daily traffic averaged 166 operations; however, current activity is averaging closer to 250 to 300 daily operations. The city has contracted with SERCO-North America for ATC services, staffing the old Air Force control tower, Monday through Sunday from 0700L to 2100L.

NFCTs are not funded by the FAA and, therefore, do not receive standard FAA equipment such as a Certified Tower Radar Display (CTRD), Tower Display Workstation (TDW), or a Flight Data Input/Output (FDIO) device. As a result, the SBD NFCT has limited capabilities for accomplishing handoffs, point-outs, arrival sequencing, and inputting/modifying flight plan information directly into the STARS/En-Route Automation Modernization (ERAM). Inbound arrivals must be coordinated via telco line with an Estimated Time of Arrival (ETA). Departures are verbally coordinated. SBD ATC operations continue to increase at a rapid pace, including a 68 percent increase in IFR operations from 2017 to 2019.

SCT EMP is responsible for Inland Empire region airports, including SBD, ONT, San Gabriel Valley Airport (EMT), Brackett Field Airport (POC), Cable Airport (CCB), Chino Airport (CNO), Corona Municipal Airport (AJO), Flabob Airport (RIR), Riverside Municipal Airport (RAL), March Air Reserve Base (RIV), REI, Hemet-Ryan Airport (HMT), and French Valley Airport (F70).

In 2007, the SCT EMP area of jurisdiction expanded east into the Mojave Desert when EMP assumed control of former PSP TRACON airspace, which includes Palm Springs International Airport (PSP), Jacqueline Cochran Regional Airport (TRM), and Bermuda Dunes Airport (UDD). Air traffic that operates to/from REI and to/from ONT has the most effect on SBD operations.

REI is 3 NM east of SBD, or .8NM east of the SBD Class D surface area on 180 acres. REI asphalt Runway 8/26 is 4,504 feet by 75 feet. Since 1947, REI has been owned and operated by the City of Redlands. The airport master plan forecasts REI will remain a GA airport housing 350 aircraft by the middle of this decade. REI uses the SBD AWOS for weather information. REI is an uncontrolled airport. The traffic pattern has fixed-wing

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aircraft in the north pattern and helicopters in the south pattern. REI has four flight schools for fixed-wing aircraft and helicopters. REI is home for air ambulance operations, law enforcement, utility patrols, the US Department of Forestry, and Cal Fire.

ONT is 25 miles west of SBD. The airport occupies 1,741 acres surrounding two grooved-concrete parallel runways, 8L/26R and 8R/26L, which are capable of handling any heavy aircraft. Runway 8L/26R is 12,197 feet by 150 feet. Runway 8R/26L is 10,200 feet by 150 feet. ONT also serves as a reliever airport for Los Angeles International Airport (LAX), San Diego International Airport (SAN), and John Wayne/Orange County Airport (SNA). The airport has a 24/7 FAA-staffed ATCT with all normal equipment amenities. ONT serves Southern California as a passenger and cargo hub, handling flights from twelve air carriers and air taxis, while cargo is hauled by Amazon Air, Ameriflight, Asia Pacific Airlines, FedEx, Kalitta Air, and UPS with its Western Region hub on the airport.

The three airports are geographically and operationally related with close proximities, high-terrain features, and intertwined procedures. Principal factors that affect SBD traffic include proximity to mountainous terrain and limited visibility; proximity to RIV Class C airspace; proximity to ONT, ONT Class C airspace, and shared NAVAIDS; SBD ODO configuration; lack of CTRD and flight data processing; and proximity to REI.

Airport activity is dominated by ONT. Due to noise abatement, ONT runs "Contra-Flow" at night from 2200L to 0700L. Contra-Flow is an ODO configuration wherein arrivals land on Runways 26L/R and departures use Runway 8L/R. This is a complex cargo operation that consists of large/heavy jets. At 0700L, ONT returns to a normal Runway 26L/R configuration for all arrivals and departures. The departure rush begins at 0700L in the skies of Southern California. As SBD continues to increase its influence as a new cargo hub, its proximity to ONT is creating increased air traffic operations in the area as departures from both airports vie for the same two exit routes from SCT into Los Angeles ARTCC (ZLA) and beyond.

ONT jet departures are exiting SCT north via POM to GMN, PMD, and DAG or east via PDZ to TRM. EMP air traffic is constricted by these two exit routes due to terrain and established exit flows from SoCal into the ZLA en route structure. SBD uses the same two exit flows. Intermingled with two large international airports are smaller GA airports conducting a departure rush and large fleet of single and twin-engine cargo flights that support the large cargo aircraft. ONT dominates EMP during the evening rush (1600L to 1900L) as passenger and cargo aircraft are fielded from every direction and sequenced into ONT. The airspace becomes complex with SBD traffic sharing the same final arrival fixes.

The PETIS Radio Beacon (SB NDB) is the Initial Approach Fix (IAF) for ONT. SB is the Final Approach Fix (FAF) for SBD. ONT arrivals fly over SB westbound and SBD arrivals overfly SB eastbound, creating a complicated ODO situation made more complex by wake turbulence.

Normally, SBD arrivals land Runway 6 via the Runway 6 ILS approach and departures use Runway 24, an ODO. When Runway 24 is in use for arrivals and departures, arrivals that normally arrive via the Runway 6 ILS, circle to Runway 24 (also an ODO configuration).

REI adds complexity. Many pilots use the SBD Runway 6 ILS approach to fly through smog and haze to reach REI via a low approach at SBD. Alternatively, REI has an RNAV approach that arrives from the south and requires a circle to REI Runway 8/26. Given the close proximity of REI as an uncontrolled airport, ATC is complex in the northeast corner of the Inland Empire.

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REI has a single Obstacle Departure Procedure (ODP) for Runway 26 only (left turn direct PDZ). SBD has an ODP (direct PDZ) and, currently, four Instrument Approach Procedures (IAP): ILS or LOC Z Runway 6; RNAV (GPS) Y Runway 6; RNAV (GPS) Z Runway 6; and LOC Y Runway 6.

5M Model

Mission (purpose of NAS change/operation)	Identify potential safety hazards. If hazards are identified: analyze and assess risk, propose mitigations associated with proposed NAS change, provide risk controls, monitor risk mitigations to determine effectiveness, and establish Safety Performance Targets.
(hu)Man (operators, stakeholders)	<ul style="list-style-type: none"> • SCT Facility Manager (Frank Lias) • SCT NATCA (Stephen Loeffler, Milan Dudley) • SCT ATCS • SBD NFCT Manager (Michael Bunch) • SBIAA (Mark Gibbs) • LAX ADO • Regional Administrator Representatives • Quality Assurance Representative • FAA, HQ Air Traffic Procedures (Gary Fiske) • FAA, Western Service Area, OSG (Rohn Grant) • FAA, Western Service Area, Quality Control Group (QCG) • SBD ATCS/ ONT ATCT/ REI ATCS • SBD Airport Tenants/Industry (Corporate, GA, FBOs) • REI Airport Tenants/Industry (Corporate, GA, FBOs) • ONT Airport Tenants/Industry (Corporate, GA, FBOs) • UPS (Dave Zamiska) • Hughes Aerospace (David Frame, Bob Abbott) • Pilots
Machine (equipment used in system)	<ul style="list-style-type: none"> • Air Traffic Automation Platforms (STARS TDM) • Communications, surveillance, and navigation facilities • Manned and unmanned infrastructure
Management (procedures, policies governing/managing system)	<ul style="list-style-type: none"> • JO 7110.65, JO 7210.3 • SOP, LOA • FAR Part 139 • Operational supervision • Crew Resource Management
Media (environment system is operated)	<ul style="list-style-type: none"> • NAS • SCT Empire Area/SBD/REI airspace • Proposed SBD Runway 24 RNAV visual approach in use • Weather: five miles or greater, ceiling 4,400 feet AGL or higher • SBD NFCT open

SECTION 2: DESCRIPTION OF CHANGE/EXISTING SAFETY ISSUE

The proposed change is to publish an SBD Runway 24 RNAV Visual Approach procedure. In 2019; Hughes Aerospace Corporation contacted SCT to coordinate development of arrival and departure IFPs for UPS. Although the SBD Runway 6 ILS provides published circling minima for Runway 24, UPS policy prohibits its pilots from accepting a visual approach to Runway 6/24 and prohibits arrivals from landing Runway 24.

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Hughes developed an RNAV Visual Approach for Runway 24 to ensure a stabilized approach to SBD for UPS aircraft. During Hughes' coordination with SCT, adjustments to the RNAV Visual Approach were incorporated to ensure separation from RIV Class C airspace and compatibility with other IFPs.

Current go-around procedures are not described in the SCT-SBD Letter of Agreement (LOA), as go-arounds are coordinated in real-time based on air traffic and workload. SBD is authorized to use a single DVA heading of 250 degrees, which can be coordinated for go-arounds; however, this heading conflicts with the ONT Runway 26L/R ILS final approach course (258 degrees) and does not meet criteria for DVA headings. Since there is no published missed approach allowed for visual approaches, any go-around must proceed visually back to the traffic pattern for landing or be issued an approved DVA heading as outlined in the following FAA Joint Orders (JO):

- In accordance with FAA JO 7110.65Y, 7-4-1, "An aircraft unable to complete a landing from a visual approach must be handled as any go-around and appropriate IFR separation must be provided until the aircraft lands or the pilot cancels their IFR flight plan."
- In accordance with FAA JO 7110.65 5-8-2 a.NOTE-2. "ATC assumes responsibility for terrain and obstacle avoidance when IFR aircraft are below the minimum IFR altitude (MVA, MIA, MEA) and are taken off departure/missed approach procedures, or are issued go-around instructions, except when utilizing a Diverse Vector Area (DVA) with an aircraft departing from the surface."

AJV-P310 FAA provided an interpretation of FAA JO 7110.65 para 7-4-1 to the Western Service Area OSG group manager. Specifically with regard to aircraft outside of the local traffic pattern, when the controlling IFR facility cannot utilize Paragraph 5-6-3, what are the pilot/controllers' responsibilities for terrain and obstruction clearance during a visual approach go-around? AJV-P310 provided the following interpretation:

- Notwithstanding the content of subparagraph 7-4-1a, when ATC provides go-around instructions other than traffic pattern entry, pilots operating in visual meteorological conditions (VMC) and not flying a published procedural segment are responsible for their own terrain and obstruction avoidance until reaching an ATC assigned altitude. The controller is responsible to provide instructions to the pilot that facilitates a climb to an altitude that meets the minimum altitude for instrument operations. The utilization of Paragraph 5-6-3, Vectors Below Minimum Altitude, is not a prerequisite in the conduct of handling a go-around.

WSA OSG, after discussion and verification from AJV-P310, concluded the interpretation would allow for the following provisions:

- Aircraft must be assigned an altitude at or above the MIA/MVA.
- ATC must provide appropriate separation from other traffic.
- Headings below the MIA/MVA may be provided, to facilitate climb and provide separation.
- The pilot is responsible to advise ATC if they are unable to comply with instructions.

Use of an authorized DVA is an option for handling a go-around at SBD. The single DVA heading for SBD of 250 degrees directly conflicts with the ONT ILS final approach course of 258°. Unlike the SBD ILS Runway 6, which includes circling minima for Runway 24, (circling is prohibited by UPS policy) the New Special SBD RNAV Runway 24 Visual Approach procedure cannot be conducted concurrently with the ONT ILS Runway 26L/R due to the requirement for SCT to protect for the possibility of an SBD Runway 24 arrival going around.

SCT and SBD are revising sections of their LOA as follows:

5. Procedures g. Arrivals, TOWER must:

(6) When IFR aircraft on a Visual Approach, RNAV Visual Approach, or Contact Approach execute a Go-Around, instruct the pilot to overfly or parallel the RWY, then:

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- (a) Remain in the local traffic pattern for landing.
- (b) If the pilot requests to return to TRACON control, issue the following:
 - 1) Fly heading 220°.
 - 2) Climb and maintain 5,000.
 - 3) Contact SoCal Departure 127.0.

5. Procedures h. Arrivals, TRACON must:

- (6) When IFR aircraft execute a Go-Around from a Visual Approach or RNAV Visual Approach, the aircraft may:
 - (a) Elect to remain in the traffic pattern with TOWER for another landing attempt, or
 - (b) Request to return to TRACON control for radar guidance.
- (7) If the aircraft requests to return to TRACON control, TRACON must NOT provide any additional headings or vectors until the aircraft is at or above the MVA. [See par. 5. Procedures, (g) Arrivals, TOWER Must, (6) Arrivals]
- (8) Advise TOWER verbally when aircraft will execute a planned Low Approach or Missed Approach.

NOTE- When tower is closed/not operational, runway-specific Visual Approaches (VA), including RNAV Visuals, are not authorized. SBD Class D airspace reverts to Class G (uncontrolled) airspace below 1,900 feet MSL.

SRMP attendees identified the following Assumptions:

SBD Runway 24 go-around on a 220-degree heading to 5,000 feet and during VMC pilot responsible for terrain and obstruction clearance until reaching MVA.

- Aircraft can be cleared for RNAV visual approach SBD Runway 24 only when SBD NFCT is open and visibility is 5 miles and the ceiling at or above 4,400 feet AGL.
- Remove “or parallel runway” from the LOA for clarification and to avoid confusion.

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SECTION: 3 HAZARD AND RISK ANALYSIS

Hazard ID	Hazard Description	Cause	System State	Controls	Control Justification
SCT UPS SBD Runway 24 RNAV Vis Approach-01	Loss of controller situational awareness	<p>IFR aircraft conducting SBD Runway 24 RNAV visual approach becomes involved with VFR aircraft in SBD arrival flight path</p> <p>WUNPA versus REI straight in approach from east to Runway 26</p> <p>Lack of SBD tower radar display capability to issue safety alerts</p> <p>SCT controller workload increased by relaying safety alerts to SBD NFCT</p> <p>REI traffic pattern excursions north of airport</p> <p>Downwind aircraft north of REI head-on with SBD inbound aircraft</p> <p>Left downwind aircraft on RNAV approach coming in behind</p> <p>Aircraft deviates from SBD Runway 24 RNAV visual approach because of east side conflict with terrain</p> <p>REI inbound/outbound traffic to the south interference with SBD Runway 24 RNAV visual approach at JESEL and ADOVE</p> <p>Aircraft from north transitioning above SBD Class D airspace and descending into REI traffic pattern</p> <p>TCAS RA between JESEL and SBD</p> <p>Paragliders and other non-radio equipped aircraft conflicting with SBD Runway 24 RNAV visual approach track</p> <p>Spill-outs from aerobatic area</p>	<p>Empire/SBD/REI airspace, SBD Runway 24 RNAV visual approach in use, weather five miles visibility or greater, ceiling 4,400 feet or higher, SBD NFCT open, initial approach fix to Runway 24</p>	<p>JO 7110.65, JO 7210.2, JO 7210.3, SOP, LOA, STARS, ARSR/ASR, ATIS, TCAS, CA/MSAW, AWOS, FAR Part 139, controller/pilot training, controller/pilot intervention, ATC scanning, frequency monitoring, operational supervision, NOTAM, charts, chart supplemental, AIM, Outreach, CRM, daily briefings/ notes, TMI, AAUP, traffic management board, traffic situation display, CTAF advisories</p>	<p>JO 7110.65: Paras. 2-1-26, 2-1-28, 2-2-10, 2-2-11; Chap. 2, Secs. 2, 4, 6, 9; Chap. 3, Secs. 5, 8, 10; Chap. 4, Secs. 2, 4, 5, 7, 8; Chap. 5, Secs. 5, 7, 9, 10; Chap. 7, Secs. 4; Chaps. 10, 11</p> <p>JO 7210.3: 2-2-11, 2-6-1, 2-6-2, 2-6-3, 3-6-2, 3-6-7; Chap. 4, Sec. 3; 10-3-9; Chap. 10, Sec. 5; Chap. 12, Sec. 6</p>

Effect	Severity	Severity Rationale	Likelihood	Likelihood Rational	Initial Risk
Aircraft in close proximity to UPS aircraft conducting SBD Runway 24	4: Minor	Subject matter expertise, historical data, increased controller workload and distractions, the Severity Table ATC Services definition indicating a	D: Extremely Remote	Likelihood Table 3.6 determination based on subject matter expertise and historical data:	4D: Low

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Effect	Severity	Severity Rationale	Likelihood	Likelihood Rational	Initial Risk
RNAV visual approach		minimum reduction of ATC services and failure of two Risk Analysis Event severity indicators: rate of closure and any combination based on the Severity Table definition		<ul style="list-style-type: none"> Qualitative: D – Less than once per three years and equal to or more than once per thirty years 	

Safety Requirements	Org. Responsible for Implementing Safety Requirements	Predicted Residual Risk	Safety Performance Target
None	N/A	4D: Low	Less than one aircraft proximity event associated with controller not issuing a known safety alert while conducting an SBD Runway 24 RNAV visual approach during two-year period.

Safety Performance Target Monitoring		
Monitoring Activity	Reporting Frequency	Reporting Duration
Review MORs	Quarterly	Two years

Hazard ID	Hazard Description	Cause	System State	Controls	Control Justification
SCT UPS SBD Runway 24 RNAV Vis Approach-02	Loss of pilot situational awareness	<p>IFR aircraft conducting SBD Runway 24 RNAV visual approach becomes involved with VFR aircraft in SBD arrival flight path</p> <p>WUNPA versus REI straight in approach from east to Runway 26</p> <p>Conflict with aircraft transitioning to/from aerobatic box to/from REI</p> <p>SCT controller workload increased by relaying safety alerts to SBD NFCT</p> <p>Downwind aircraft north of REI head-on with SBD inbound aircraft</p> <p>REI traffic pattern excursions north of airport</p> <p>Left downwind aircraft on RNAV approach coming in from behind</p> <p>Deviation from Runway 24 RNAV visual approach for east side conflict with terrain</p> <p>VGSI (PAPI) unusable outside four miles from airport</p>	Empire/SBD/REI airspace, SBD Runway 24 RNAV visual approach in use, weather five miles visibility or greater, ceiling 4,400 feet or higher, SBD NFCT open, initial approach fix to Runway 24	JO 7110.65, JO 7210.2, JO 7210.3, SOP, LOA, STARS, ARSR/ASR, ATIS, TCAS, CA/MSAW, AWOS, FAR Part 139, controller/pilot training, controller/pilot intervention, ATC scanning, frequency monitoring, operational supervision, NOTAM, charts, chart supplemental, AIM, Outreach, CRM, daily briefings/ notes, TMI, AAUP, traffic management board, traffic situation display, CTAF advisories	<p>JO 7110.65: Paras. 2-1-26, 2-1-28, 2-2-10, 2-2-11; Chap. 2, Secs. 2, 4, 6, 9; Chap. 3, Secs. 5, 8, 10; Chap. 4, Secs. 2, 4, 5, 7, 8; Chap. 5, Secs. 5, 7, 9, 10; Chap. 7, Secs. 4; Chaps. 10, 11</p> <p>JO 7210.3: 2-2-11, 2-6-1, 2-6-2, 2-6-3, 3-6-2, 3-6-7; Chap. 4, Sec. 3; 10-3-9; Chap. 10, Sec. 5; Chap. 12, Sec. 6</p>

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Hazard ID	Hazard Description	Cause	System State	Controls	Control Justification
		Traffic inbound/ outbound south of REI interfering with RNAV visual approach at JESEL and ADOVE Wake turbulence affecting aircraft at REI Aircraft from north transitioning above SBD Class D airspace and descending into REI traffic pattern TCAS RA between JESEL and SBD Paragliders and other non-radio equipped aircraft conflicting with Runway 24 RNAV track Intermittent low-altitude radar coverage Spill-outs from aerobatic area non ADS-B equipped aircraft associated with the RNAV visual approach			

Effect	Severity	Severity Rationale	Likelihood	Likelihood Rational	Initial Risk
Aircraft in close proximity to UPS aircraft conducting SBD Runway 24 RNAV visual approach	1: Catastrophic	- Subject matter expertise - Historical data (PDARS) - Hull Loss to manned aircraft from the Flight Crew Hazard Severity Classification - Experience operating in the REI traffic pattern - Experience with smaller aircraft encountering wake turbulence from larger aircraft - Number of inexperienced student pilots flying into REI - Wake turbulence from heavy aircraft passing overhead or in proximity to the REI traffic pattern – as fixes are fly-by not fly over - Based on small planes operating close to the ground, UPS aircraft operating less than 2500 laterally and within 200 feet vertically of REI pattern altitude - Circumstances requiring a flight crew to reject landing (i.e., balked landing) at or near the runway threshold. - Increased number of Heavy aircraft in close proximity with	C: Remote	Panel members focused on Likelihood Table 3.6 and determinations were based on subject matter expertise and historical data (PDARS): <ul style="list-style-type: none"> Qualitative: C – Less than once per three months and equal to or more than once per three years - 250 aircraft assigned to REI excluding transient / itinerant aircraft that land and depart regularly - REI aircraft transitioning to and from Aerobatic area - Gliders, self-launching, to and from REI - RNAV 24 used with tail wind component is exceeded at SBD - RNAV Runway 24 approach will not be restricted to UPS aircraft only - No Tower Radar display in the NFCT at SBD. SBD	1C: High

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Effect	Severity	Severity Rationale	Likelihood	Likelihood Rational	Initial Risk
		<p>low-hour inexperienced pilots at REI</p> <ul style="list-style-type: none"> - Student pilots are not consistent in remaining within the traditional traffic pattern at REI - RNAV procedure is designed to fly east of REI, which is a known area of radar loss for SCT at or below 4,500 - Aircraft are not required have ADSB or Transponders while operating in the vicinity of SBD and REI - No tower radar display in SBD NFCT, SBD controllers unable to issue traffic advisories and safety alerts for aircraft conducting Runway 24 RNAV visual approach outside SBD visual range and/or the Class D airspace. - Head-to-head conflict between aircraft in REI traffic pattern and aircraft conducting Runway 24 RNAV visual approach - If just UPS, would be rank lower; when other aircraft added, moves Severity Classification to 1: Catastrophic <p>Four severity indicators fail based on ATC Services Hazard Severity Classification:</p> <ul style="list-style-type: none"> • Proximity. Failure transition point of 50 percent of required separation or less • Rate of Closure. Failure transition point greater than 205 knots or 2,000 feet per minute (consider both aspects and utilize the higher of the two if only one lies above the transition point) • ATC Mitigation. ATC able to implement separation actions in a timely manner • Pilot Mitigation. Pilot executed ATC mitigation in a timely manner 		<p>controllers unable to issue traffic advisories and safety alerts for aircraft conducting RNAV Runway 24 outside SBD visual range and/or the Class D airspace.</p>	

Safety Requirements	Org. Responsible for Implementing Safety Requirements	Predicted Residual Risk	Safety Performance Target
REI automated broadcast on Super AWOS and CTAF (SR) ACARS automatically provide	SCT (TWLA-SCT)	1D: High	Not applicable with a high initial/predicted residual risk level

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Safety Requirements	Org. Responsible for Implementing Safety Requirements	Predicted Residual Risk	Safety Performance Target
estimated time of arrival for heavies in proximity			

Safety Performance Target Monitoring		
Monitoring Activity	Reporting Frequency	Reporting Duration
Review MORs	Quarterly	Two years

Hazard ID	Hazard Description	Cause	System State	Controls	Control Justification
SCT UPS SBD Runway 24 RNAV Vis Approach-03	Loss of pilot situational awareness	<p>IFR aircraft conducting SBD Runway 24 RNAV visual approach becomes involved with VFR aircraft in SBD arrival flight path</p> <p>WUNPA versus REI straight in approach from the east to Runway 26</p> <p>Conflict with aircraft transitioning to/from aerobatic box to/from REI</p> <p>SCT controller workload increased by relaying safety alerts to SBD NFCT</p> <p>Downwind aircraft north of REI head-on with SBD inbound aircraft</p> <p>REI traffic pattern excursions north of airport</p> <p>Left downwind aircraft on RNAV approach coming in behind</p> <p>Deviation from Runway 24 RNAV visual approach for east side conflict with terrain</p> <p>Traffic inbound/outbound south of REI interfering with Runway 24 RNAV visual approach at JESEL and ADOVE</p> <p>Aircraft from north transitioning above SBD Class D airspace</p>	<p>Empire/SBD/REI airspace, SBD Runway 24 RNAV visual approach in use, weather five miles visibility or greater, ceiling 4,400 feet or higher, SBD NFCT open, initial approach fix to Runway 24</p>	<p>JO 7110.65, JO 7210.2, JO 7210.3, SOP, LOA, STARS, ARSR/ASR, ATIS, TCAS, CA/MSAW, AWOS, FAR Part 139, controller/pilot training, controller/pilot intervention, ATC scanning, frequency monitoring, operational supervision, NOTAM, charts, chart supplemental, AIM, Outreach, CRM, daily briefings/ notes, TMI, AAUP, traffic management board, traffic situation display, CTAF advisories</p>	<p>JO 7110.65: Paras. 2-1-26, 2-1-28, 2-2-10, 2-2-11; Chap. 2, Secs. 2, 4, 6, 9; Chap. 3, Secs. 5, 8, 10; Chap. 4, Secs. 2, 4, 5, 7, 8; Chap. 5, Secs. 5, 7, 9, 10; Chap. 7, Secs. 4; Chaps. 10, 11</p> <p>JO 7210.3: 2-2-11, 2-6-1, 2-6-2, 2-6-3, 3-6-2, 3-6-7; Chap. 4, Sec. 3; 10-3-9; Chap. 10, Sec. 5; Chap. 12, Sec. 6</p>

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Hazard ID	Hazard Description	Cause	System State	Controls	Control Justification
		and descending into REI traffic pattern TCAS RA between JESEL and SBD Paragliders and other non-radio equipped aircraft conflicting with Runway 24 RNAV track Intermittent low-altitude radar coverage Spill-outs from aerobatic area Non-ADS-B equipped aircraft associated with RNAV visual approach			

Effect	Severity	Severity Rationale	Likelihood	Likelihood Rationale	Initial Risk
TCAS RA resulting in loss of approved separation with an IFR aircraft	4: Minor	- Historical data - Subject matter expertise One to two severity indicators failing - taken from the ATC Services Hazard Severity Classification: <ul style="list-style-type: none"> • Proximity. Failure transition point of 50 percent of required separation or less • Rate of Closure. Failure transition point greater than 205 knots or 2,000 feet per minute (consider both aspects and use higher of the two if only one lies above the transition point) • ATC Mitigation. ATC able to implement separation actions in a timely manner • Pilot Mitigation. Pilot executed ATC mitigation in a timely manner - Operational/Procedural impact TCAS/RA reduction in safety margin - SMS Severity table definition for Flight Crew for Minor of "Near mid-air collision encounters with separation greater than 500 feet - TCAS/RA to another IFR aircraft - Controls identified - Pilots trained - A gap of information from SBD NFCT – no radar display	C: Remote	Likelihood Table 3.6 determinations based on subject matter expertise and historical data: <ul style="list-style-type: none"> • Qualitative: C – Less than once per three months and equal to or more than once per three years - Limited number of UPS approaches into SBD	4C: Medium

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Effect	Severity	Severity Rationale	Likelihood	Likelihood Rational	Initial Risk
		Unaware of traffic above of SBD Class D airspace - Frequency change between SCT and SBD - Near midair type scenario with go-around and transfer of communication back to SCT - Heavy use area for VFR aircraft transitioning the area			

Safety Requirements	Org. Responsible for Implementing Safety Requirements	Predicted Residual Risk	Safety Performance Target
None	N/A	4C: Medium	Less than three TCAS RAs resulting in loss of approved separation with an IFR aircraft associated with loss of pilot situational awareness and SBD Runway 24 RNAV visual approach during two-year period

Safety Performance Target Monitoring		
Monitoring Activity	Reporting Frequency	Reporting Duration
Review MORs	Quarterly	Two years

Hazard ID	Hazard Description	Cause	System State	Controls	Control Justification
SCT UPS SBD Runway 24 RNAV Vis Approach-04	Loss of controller situational awareness	Expectation bias associated with go-around procedure	Empire/SBD/REI airspace, SBD Runway 24 RNAV visual approach in use, weather five miles visibility or greater, ceiling 4,400 feet or higher, SBD NFCT open, initial approach fix to Runway 24	JO 7110.65, JO 7210.2, JO 7210.3, SOP, LOA, STARS, ARSR/ASR, ATIS, TCAS, CA/MSAW, AWOS, FAR Part 139, controller/pilot training, controller/ pilot intervention, ATC scanning, frequency monitoring, operational supervision, NOTAM, charts, chart supplemental, AIM, Outreach, CRM, daily briefings/ notes, TMI, AAUP, traffic management board, traffic situation display, CTAF advisories	JO 7110.65: Paras. 2-1-26, 2-1-28, 2-2-10, 2-2-11; Chap. 2, Secs. 2, 4, 6, 9; Chap. 3, Secs. 5, 8, 10; Chap. 4, Secs. 2, 4, 5, 7, 8; Chap. 5, Secs. 5, 7, 9, 10; Chap. 7, Secs. 4; Chaps. 10, 11 JO 7210.3: 2-2-11, 2-6-1, 2-6-2, 2-6-3, 3-6-2, 3-6-7; Chap. 4, Sec. 3; 10-3-9; Chap. 10, Sec. 5; Chap. 12, Sec. 6

Effect	Severity	Severity Rationale	Likelihood	Likelihood Rational	Initial Risk
Loss of approved separation	4 – Minor	Historical data, subject matter expertise, target data for UPS, SBD does not have radar display, SBD has no visibility of air traffic above Class D airspace, communication latency between SBD and SCT, proximity to terrain, transition frequency change from SBD to SCT, separation greater than 500 feet from crossing traffic above SBD, flight crew rejects landing and initiates go-around; TCAS not a big deal and will keep go-around 500 feet from other aircraft, aircraft can	C – Remote	Go-arounds based on Likelihood Tables 3.5 and 3.6 determinations based on subject matter expertise and historical data: <ul style="list-style-type: none"> 1 per 100,000 > (Probability) ≥ 1 per 10,000,000 Qualitative: C – Less than once per three months and equal to or more than once per three years 	4C: Medium

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Effect	Severity	Severity Rationale	Likelihood	Likelihood Rational	Initial Risk
		quickly climb out as ATC advises a go-around		- Winds that lead to go-around - VMC conditions - The chances of an IFR aircraft in close proximity to an IFR aircraft is remote	

Safety Requirements	Org. Responsible for Implementing Safety Requirements	Predicted Residual Risk	Safety Performance Target
Conduct enhanced training relating to SBD Runway 24 RNAV visual approach and lack of radar coverage Develop/distribute Letter to Airmen	SCT	4D: Medium	Less than one loss of approved separation event associated with SBD Runway 24 RNAV visual approach go-around during two-year period

Safety Performance Target Monitoring		
Monitoring Activity	Reporting Frequency	Reporting Duration
Review MORs	Quarterly	Two years

SECTION 5: DISSENTION

Not applicable.

SECTION 6: PANEL ATTENDEES

The SRM Panel convened 02/23/2021 through 02/25/2021 to perform an in-depth, thorough safety analysis of the proposed NAS change. SRM Panel members and SMEs leveraged their operational experience and expertise within the SRM process to maintain its integrity. The following table lists SRM Panel attendees.

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APPENDICES/SMTS Attachments

1. Final SCT - SBD SRMP Workbook- 01-26-2021
2. SBD RNAV VA 24 Overlays
3. SBD-SCT SRMP Resource Material Briefing
4. SCT-SBD HAW/Monitoring Plan
5. SBD Windrose Data
6. Redlands Airport Aerobatic Practice Area
7. SCT-SBD LOA 12-30-2020
8. Email: FW: Questions regarding Visual Approach Go-Around
9. Interpretation 7-41_Visual Approach
10. Projected Numbers Two Years of Data
11. Tower South Flow Configuration Go-Around Missed Approach Procedures