PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Safety and Enforcement Division
Rail Transit Safety Branch

Resolution ST-197
January 19, 2017

RESOLUTION

RESOLUTION ST-197 GRANTING APPROVAL OF THE
ANGELS FLIGHT RAILWAY FOUNDATION
2016/17 RESTORATION AND REFURBISHMENT PROJECT
SAFETY CERTIFICATION PLAN

SUMMARY

This Resolution grants the Angels Flight Railway Foundation's request for approval of the Safety Certification Plan for the 2016/17 Restoration and Refurbishment Project.

PROJECT DESCRIPTION

The Angels Flight Railway Foundation (AFRF) is submitting to the California Public Utilities Commission (CPUC) a Safety Certification Plan (SCP) which addresses the requirements listed in CPUC Resolution ST-170 (dated February 12, 2015), ordering the Angels Flight Railway Company to file a Safety Certification Plan and a Safety Certification Verification Report under the provisions of General Order 164-D.

CPUC Resolution ST-170 requires AFRF to submit an SCP certifying all major project work performed on the system since the September 5, 2013 derailment, which includes:

- Safety Rope Carrier Brake
- Track and Wheel Wear Standard Operation Procedure
- Failsafe Ensuring Safety System Controls are not Bypassed

CPUC Resolution ST-170 also requires AFRF to adopt all National Transportation Safety Board (NSTB) recommendations resulting from the derailment on September 5, 2013, which includes installation/modification of:

- Passenger Evacuation Walkway
- Increase Height of Vehicle Passenger Lower End Gates

BACKGROUND

Angels Flight is a landmark funicular railway that was originally built in 1901 in the Bunker Hill region of downtown Los Angeles. Since 1997, Angels Flight has been effectively owned by the AFRF through a 99-year long-term ground lease with the now defunct Community Redevelopment Agency of the City of Los Angeles (CRA/LA).

Between 1901 and 1969, Angels Flight was owned by six different entities. CRA/LA was the eventual owner of Angels Flight and dismantled the funicular in 1969. In 1996, after 27 years of storage, CRA/LA oversaw the project to restore and reconstruct Angels Flight. The funicular was reopened to the public after being reinstalled two blocks south of its 1969 location. The track structure was rebuilt and the drive system was redesigned.

On February 1, 2001, the redesigned drive system failed, resulting in one of the cars rolling free down the 33-degree incline before colliding with the other car. One passenger was killed as a result of the incident, five passengers received serious injuries, and two passengers received minor injuries. Additionally, debris from the collision fell and injured a nearby pedestrian. The accident was thoroughly investigated by CPUC and the NTSB. The funicular was taken out of revenue service and shut down for several years as a result of this incident.

In January 2007, Angels Flight Railway Company (AFRC) personnel, the operators of Angels Flight acting on behalf of the AFRF, met with CPUC staff (Staff) to communicate their intent to refurbish and re-open Angels

Flight. AFRC contracted engineering and manufacturing services to refurbish Angels Flight.

Angels Flight was once again reopened to the public in March 2010, with improved safety features that included a secondary safety cable, redundant fail-safe braking, and fail-safe carrier track brakes. The mechanical drive was once again redesigned, a state-of-the art controller was installed, and the entire system was refurbished in conformance with funicular standards (ANSI B77.2 – 2004) developed by the American National Standards Institute.

After the reconstruction project was completed in March 2010, Staff authorized AFRC's return to operation. Immediately after revenue operations commenced, however, the NTSB informed Staff that the NTSB recommendations (emergency walkway, etc.) had not been implemented as intended. Debate amongst the three organizations on how the recommendations should be implemented would continue due to differences in the interpretation of the ANSI B77.2 Funicular standards.

On September 5, 2013, a derailment occurred in which a downward moving Angels Flight car derailed. Although there were no injuries during the derailment, and it resulted in only minor displacement with just the wheel dropping off the track, this was a serious incident. Several contributing factors were identified as causes of the derailment, including improper operating practices that bypassed safety functions of the funicular system, inadvertent carrier brake activation, and carrier brake design issues.

Angels Flight has been shut down since this derailment.

This derailment was investigated jointly by Staff and NTSB personnel, who worked together with AFRC to develop a comprehensive corrective action plan. This corrective action plan included the redesign and installation of the carrier brake, start button reconfiguration, safety function reprogramming, fault logger reprogramming, replacement of

wiring, operator training, better protection against passenger ejection, and construction of an evacuation walkway.

To assure AFRC completed all actions necessary to resolve all open issues and comply with SCP requirements in General Order 164-D, on February 12, 2015, Staff's recommended Resolution ST-170 was passed requiring a SCP submittal for the corrective action plan implementation and also requiring construction of an emergency walkway and higher vehicle end gates in accordance with NTSB recommendations.

On June 2, 2016 and October 13, 2016 Staff met with representatives of AFRF. At these meetings Staff was informed that this restoration/refurbishment project and subsequent operation of Angels Flight would be managed, under the supervision of AFRF, by a joint partnership led by ACS Infrastructure Development (ACS) and including SENER Engineering and System, Inc. (SENER). Accordingly, Staff was informed that it is anticipated that the joint partnership to be formed by ACS and SENER will enter into a long-term agreement with AFRF for ongoing operations of Angels Flight.

DISCUSSION

Open NTSB Recommendation

There is currently one open NTSB Recommendation to the CPUC pertaining to Angels Flight, stemming from the investigation into the February 1, 2001, accident. Recommendation R-03-15 states:

> Before certifying Angels Flight to restart passenger service, independently verify that the drive system meets accepted industry standards and engineering practices and that the funicular includes provisions for (1) emergency stopping under all foreseeable failure modes, including track brakes or some other independent backup system on the cars to prevent a runaway car if a failure occurs in the cable or its associated braking systems; (2) containment of passengers in the event of a collision; and (3) emergency egress and ingress for passengers and emergency responders. (R-03-15)

Subsequent to CPUC allowing Angels Flight to resume service in 2010, NTSB classified the Recommendation as "Closed—Unacceptable Action." NTSB asserted that CPUC had allowed resumption of service without Angels Flight addressing the "emergency egress and ingress for passengers and emergency responders." CPUC disagreed that the existing walkway adjacent to, but approximately 20 feet below track level, was insufficient to meet the requirements of the American National Standards Institute (ANSI) standards for funiculars.

During the September 2013 investigation of the most recent derailment accident, NTSB again was critical of the Angels Flight evacuation methods and absence of a track-adjacent emergency walkway. Implementation of this SCP will fully implement acceptable responses to the open NTSB Recommendation. In addition to a new Safety Rope Carrier Brake system the SCP specifies both a track-adjacent walkway, as well as raising the car end-gates to prevent passengers from being ejected during any type of incident.

Subsequent to SCP implementation NTSB will be able to reclassify this Recommendation as "Closed - Acceptable Action."

Safety Certification

Commission General Order 164-D, Section 11, requires that Rail Fixed Guideway Systems prepare a project-specific Safety Certification Plan for all projects[1] that initiate preliminary engineering after February 27, 2003. AFRF is responsible for ensuring that all entities involved in design, construction, operation, and maintenance of the Restoration and Refurbishment Project comply with the requirements of the Safety Certification process.

After several meetings with Staff and its contractor, SENER, on November 28, 2016, AFRF submitted an SCP for the Restoration and Refurbishment Project.

[1] General Order 164-D provides that "*Major Projects (Projects) means new rail systems or extensions, the acquisition and integration of new vehicles and safety critical technologies into existing service or major safety critical redesign projects, excluding functionally and technologically similar replacements*."

Staff reviewed the SCP in accordance with General Order 164-D Section 11, Requirements for Safety Certification Plan, as well as the requirements of ST-170. Staff finds the SCP is in compliance with General Order 164-D, and will address the open items and NTSB recommendations. Based upon the results of this review, Staff recommends that the Commission grant approval of the AFRF SCP.

NOTICE

On December 19, 2016, the AFRF request for approval of their SCP was published on the Commission's Daily Calendar.

COMMENTS

The draft resolution of the Safety and Enforcement Division in this matter was mailed in accordance with Section 311 of the Public Utilities Code and Rule 14.2(c) of the Commission's Rules of Practice and Procedure. No comments were received.

FINDINGS

1. On November 28, 2016, AFRF submitted its SCP for the Restoration and Refurbishment Project for Staff review.
2. This SCP identifies the process by which the project will be certified as meeting the established safety and security criteria and standards to operate in revenue service.
3. Staff reviewed the SCP and found it to be in accordance with General Order 164-D, Section 11, the Rail Transit Safety Branch Program Management Standard Procedures Manual, State Safety and Security Oversight of Rail Fixed Guideway Systems, Section 9.
4. Implementation of the SCP will fully address open NTSB recommendation R-03-015, and allow it to be classified as "Closed – Acceptable Action."
5. Staff reviewed the SCP and found it to be in accordance with the requirements of Resolution ST-170, ordering the AFRC to File a Safety Certification Plan and a Safety Certification Verification Report under the provisions of General Order 164-D.

THEREFORE, IT IS ORDERED THAT:

1. The request of the Angels Flight Railway Foundation for approval of the Safety Certification Plan for the 2016/17 Restoration and Refurbishment Project is granted.

2. The Angels Flight Railway Foundation shall keep California Public Utilities Commission Staff apprised of project progress and provide advance notice of testing and project milestones so it may observe and inspect as it believes necessary.

3. The Angels Flight Railway Foundation shall submit the Safety Certification Verification Report to California Public Utilities Commission Staff upon project completion.

4. This resolution is effective today.

I certify that the foregoing resolution was duly introduced, passed, and adopted by the Commission at its regularly scheduled meeting on January 19, 2017. The following Commissioners voted favorably thereon:

/s/ TIMOTHY J. SULLIVAN
TIMOTHY J. SULLIVAN
Executive Director

MICHAEL PICKER
President
CARLA J. PETERMAN
LIANE M. RANDOLPH
MARTHA GUZMAN ACEVES
CLIFFORD RECHTSCHAFFEN
Commissioners