

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Consumer Protection & Safety Division
Safety and Reliability Branch
Rail Transit Safety Section

RESOLUTION ST-57
Date: August 22, 2002

R E S O L U T I O N

RESOLUTION GRANTING SAN FRANCISCO MUNICIPAL RAILWAY THE AUTHORITY TO DEVIATE FROM CERTAIN HIGH LEVEL PASSENGER PLATFORM PERSONNEL-REFUGE REQUIREMENTS OF GENERAL ORDER 143-B, SAFETY RULES AND REGULATIONS GOVERNING LIGHT RAIL TRANSIT, SECTION 9.07 FOR THE CONSTRUCTION AND OPERATION OF ITS PROPOSED THIRD STREET LIGHT RAIL LINE.

Summary

This resolution grants San Francisco Municipal Railway's (Muni) request for authority to deviate from the high-level passenger platform personnel-refuge requirements of General Order 143-B, Section 9.07 for the construction and operation of its proposed Third Street light rail line. The deviation allows for inclusion of the platform's necessary structural requirements without adversely affecting the safety function of the personnel-refuge area under the platform.

The Project

Muni's Third Street Light Rail Project, Phase One, will extend light rail train service 5.4 miles from the existing line near the Caltrain Station at Fourth and King Streets, South along the Third Street Corridor, to the San Francisco City and County line near Sunnydale Avenue. The line would include 19 high-level passenger platform stations. Phase One is currently scheduled to begin service in 2005. Phase Two, the New Central Subway, is still in its planning and study stages and is not addressed in this Resolution.

The Commission's staff (staff) has been involved in the ongoing safety oversight of Phase One, since 1998. That safety oversight activity has focused on

compliance with the Commission's safety requirements and working with Muni to identify and resolve safety hazards. In this instance, staff has been involved with Muni concerning the safety of high-level station platform requirements specified in General 143-B, Section 9.07.

Background

By letter dated May 7, 2001, Muni requested authority to deviate from the requirements of General Order 143-B, Section 9.07, concerning high-level passenger platforms, in the design, construction and operation of Phase One of its proposed Third Street light rail line. That section of the General Order provides for the use of high-level passenger platforms constructed to the nominal level of the floors of the light rail system's revenue passenger vehicles. The General Order specifies that a personnel-refuge area, measuring thirty (30) inches high and thirty (30) inches deep, be provided under the high-level platform. The under-platform personnel-refuge area provides a safe refuge space for a person who might be trapped on the track by the adjacent high-level platform, as a train or other on-track equipment is approaching.

Title 49 Code of Federal Regulations, Part 659 (49 CFR, Part 659) Rail Fixed Guideway Systems; State Safety Oversight required Muni to implement its System Safety Program Plan, on January 1, 1997, under the safety oversight of the Commission. Before the promulgation of 49 CFR, Part 659, Muni, as a municipal utility, was exempt from the Commission's jurisdiction.

Before coming under the Commission's safety oversight authority, Muni planned, designed and constructed similar reinforced concrete, high-level passenger platforms in its subways and at other locations on its light rail system. Those platforms were constructed to the nominal level of the floors on Muni's light rail vehicles. Using sound engineering and construction practices, however, the personnel-refuge area under the platform can only be built twenty-seven (27) inches high, above top of rail, at the outside edge of the platform and then taper to twenty-six (26) inches high at the inside wall of the refuge space. Muni can extend the personnel-refuge area laterally, under the platform, to thirty-three (33) inches from the outside edge.

Subsequent to Muni's request, staff met with Muni representatives on several occasions to discuss the matter. At staff's request, Muni studied and provided a report on anthropometrical data supporting its position that the personnel refuge space design being proposed is adequate and safe. Staff reviewed Muni's report

and compared it with similar information gathered by staff and found the conclusions in Muni's report to be valid.

According to the anthropometrical data, the vertical and horizontal space available in Muni's proposed design meets that necessary for a 97.5 percentile American male to assume a position on hands and knees within the proposed personnel refuge area. The space available far exceeds that necessary for the same person to assume a prone or supine position. The 97.5 percentile American male is the accepted standard, in the United States, for architectural design consideration to accommodate large persons.

Staff also noted that Muni's current San Francisco Municipal Railway Rules and Instructions Handbook; revised July 2000 contains a section 4.45 Station Movements. That section incorporates seven specific rules for addressing safe train operation in the area of passenger stations. Five of those rules are pertinent to the operating safety of the requested deviation. Those rules are as follows:

4.45 Station Movements

4.45.1 Full stops must be made at all stations, unless otherwise authorized by proper authority.

4.45.2 All manually operated trains and other rail equipment in service must make mandatory stops at all high level platforms whether there are intending passengers or not. The high level platforms are in the subway, along the Embarcadero, Caltrain, Stonestown and San Francisco State University. An operating out-of-service train need not make stops, but must operate at a speed not to exceed 10 mph, paying attention to the tracks, pedestrians, traffic and signals.

4.45.3 Trains passing through a station without lighting must travel at ‘restricted speed’.

4.45.4 Passengers must not be discharged into a station that is not lit.

4.45.5 When approaching occupied passenger stops on the surface, occupied passenger safety islands or any place where people are standing or walking on or near the track, the operator must sound the gong and operate according to conditions, alert for unexpected movements.

The “restricted speed” referred to in rule 4.45.3 is defined in the same rulebook as:

Restricted Speed – *Operate on sight*, not to exceed 10 mph.

The “Operate on Sight” referred to in the Restricted Speed definition is defined as:

Operate on Sight – At a speed that will permit stopping within one-half the range of vision of another train, stop signal, switch not properly aligned, track defect or obstruction.

Muni representatives also pointed out that none of the stations included in this phase of the project, have track areas that are physically constrained on the side opposite the platform. As a result, the side of the track that is opposite the passenger platform should normally provide a clear means of egress for any

person finding himself or herself on the track, at the station, as a train approaches.

Discussion

The requested deviation should be approved with mitigations. Based on the available anthropometrical data, a twenty-seven (27) inches high refuge area should provide minimal but adequate space. It should allow the vast majority of the general public, in an emergency, to crawl on their hands and knees under the proposed passenger-platform. That would provide a place of safe refuge, on the platform side of the track, from an approaching train or other on-rail equipment. A person too large to crawl on hands and knees could roll into the personnel-refuge area in the event of an emergency.

Staff is concerned that the surface conditions of the top and bottom of the refuge space would be critical to a person's prompt emergency entry into that area. The proposed twenty-seven (27) inch height is ten (10) percent less than the thirty (30) inch height required by General Order 143-B. Staff believes that with the reduced height, the probability of a person's body or clothing coming into contact with the upper surface of the refuge space is considerably increased. A smooth snag free surface is necessary to allow a person to quickly enter the refuge area. Any wire, nails, bolts, rough concrete or other materials protruding from the concrete surface could easily snag a person or a person's clothing and impede their entrance into the personnel-refuge area.

The bottom surface of the refuge area is similarly critical to the safety of a person entering that space in an emergency. Any rough or sharp protrusions or accumulations of debris on the bottom surface of the refuge area could similarly impede a person's prompt entrance into that space.

Staff also concluded that the cross-sectional area of the personnel-refuge space, while adequate, is minimal. Any addition of electrical conduits, boxes or fixtures or the installation of water lines, drains or plumbing fixtures or other materials or equipment within that personnel-refuge area would adversely affect its safe use.

The San Francisco Municipal Railway Rules and Instructions Handbook; revised July 2000, Section 4.45 Station Movements, includes rules that focus on operating trains safely in station areas and specifically at high platform stations. Those rules include requirements for train operators to make full stops at stations, limit

train speeds when passing through stations, sounding audible warnings and being alert for pedestrians on or near the tracks at stations.

Comments

This is an uncontested matter in which the resolution grants the authority requested. Pursuant to Public Utilities Code Section 311(g)(2), the otherwise applicable 30-day period for public review and comment is being waived.

Findings

1. By letter dated May 7, 2001, Muni requested authority to deviate from the requirements of General Order 143-B, Section 9.07, concerning high-level passenger platforms, in the construction and operation of its proposed Third Street light rail line.
2. Prior to coming under the Commission's safety jurisdiction, Muni had designed and constructed reinforced concrete, high-level passenger platforms, at the nominal level of the floors on its light rail vehicles. Those platforms are located in the subways and at other locations on its light rail system. The design of the personnel-refuge areas under those high-level passenger platforms is similar to that being proposed by Muni.
3. Using sound engineering and construction practices, the height of the personnel-refuge area under the proposed platforms is limited to twenty-seven (27) inches at the outside edge of the platforms and twenty-six (26) inches at the inside wall of the refuge space.
4. The proposed personnel-refuge area would provide vertical space and horizontal space that is adequate for the general public to crawl into or to roll into in the event of an emergency, if the staff proposed mitigations are adopted.
5. Providing a smooth surface to the entire top and bottom of the refuge areas is critical and necessary to a person's ability to quickly and safely enter into that emergency space. Any wire, nails, bolts, rough concrete, sharp projections or accumulations of debris or other material on the top or bottom surfaces of the

space could easily snag a person or a person's clothing or otherwise impede their entrance into the personnel-refuge area and should not be allowed.

6. The cross sectional area of the personnel-refuge space proposed by Muni, twenty-seven (27) inches to twenty-six (26) inches high and thirty-three (33) inches deep, is minimal and should not be further reduced. Any addition of electrical conduits, boxes or fixtures or the installation of water lines, drains or plumbing fixtures or other materials or equipment within that space would adversely affect the safe use of the personnel-refuge area and should not be allowed.
7. San Francisco Municipal Railway's current operating rules, San Francisco Municipal Railway Rules and Instructions Handbook; revised July 2000 section 4.45 Station Movements, provide essential pedestrian protection and should not be modified to reduce that protection.

Therefore, IT IS ORDERED that:

1. San Francisco Municipal Railway's request for authority to deviate from the high-level passenger platform personnel-refuge requirements of General Order 143-B, Section 9.07 for the construction and operation of its proposed Third Street light rail line is granted subject to the following conditions.
 - a) San Francisco Municipal Railway shall use sound safety design, construction and operating practices in accordance with its System Safety Program Plan to design, construct and operate the Third street light rail line.
 - b) Personnel-refuge areas under the high-level passenger platforms shall be at least twenty-seven (27) inches high at the outside edge of the platforms, twenty-six (26) inches high at the inside wall of the refuge space and extend laterally under the platforms not less than 33 inches from the outside edge.
 - c) Personnel-refuge areas under the high-level passenger platforms shall have smooth, snag free surfaces on the top and bottom surfaces of the refuge areas, which will not impede a person's ability to quickly enter into that emergency space.

- d) Personnel-refuge areas under the high-level passenger platforms shall be free from the installation of electrical conduits, boxes or fixtures, water lines, drains, plumbing fixtures or other materials or equipment or the accumulation of debris within the designated personnel-refuge area.
 - e) San Francisco Municipal Railway shall maintain and enforce operating rules that, at a minimum, provide the levels of pedestrian protection established in San Francisco Municipal Railway Rules and Instructions Handbook; revised July 2000, section 4.45 Station Movements.
2. Authority to deviate from the high-level passenger platform personnel-refuge requirements of General Order 143-B, Section 9.07 is limited to the construction and operation of the San Francisco Municipal Railway's Third Street light rail line.

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 August 22, 2002. The following Commissioners voted favorably thereon:

WESLEY M. FRANKLIN
Executive Director