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PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

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

RESOLUTION ST- 63
July 10, 2003

R E S O L U T I O N

RESOLUTION ST-63 GRANTING LOS ANGELES TO PASADENA METRO BLUE LINE CONSTRUCTION AUTHORITY TO DEVIATE FROM CERTAIN TRACK OVERHEAD CLEARANCE REQUIREMENTS OF GENERAL ORDER 95, SECTION VII, RULE 74.4-E.

SUMMARY

This resolution grants Los Angeles to Pasadena Metro Blue Construction Authority (PBLCA) request for authority, on behalf of Los Angeles County Metropolitan Transportation Authority (MTA), to deviate from certain track overhead clearance requirements of General Order 95 (GO 95) Rule 74.4-E, Conductor Clearances Under Bridges, Etc., on the Pasadena Gold Line (PGL). It specifically authorizes reduced overhead track clearance throughout Figueroa, Colorado, and Marengo Boxes.

THE PROJECT

The PGL is a new 13.7-mile light rail system being built from Union Station in Los Angeles to Sierra Madre Villa Blvd. in Pasadena. It has a projected service date of July 2003. The design of the PGL Light Rail Project includes an overhead contact system (OCS) consisting of a full catenary (messenger wire, hangers, and a trolley or contact wire) to supply traction power for the propulsion of light rail vehicles (LRV). The system will operate at a nominal voltage of 750 VDC.

While PBLCA is constructing the project, the MTA will operate the PGL trains as part of the MTA transit system.

BACKGROUND

By letter dated April 3, 2003, PBLCA requested, on behalf of MTA, authority to deviate from clearance requirements of GO 95, Section VII, Rule 74.4-E, Conductor Clearance Under Bridges, Etc., for a 200 foot section of the alignment through the Colorado Box, which is a cut and cover section. Later, by a letter dated June 11, 2003, PBLCA requested to extend the authority to deviate from clearance requirements throughout all of the boxes including Figueroa, Colorado, and Marengo.

Overhead clearance requirements for electric railway contact and feeder conductors and their supporting messengers are specified in GO 95. Rule 74.4-E, Conductor Clearances Under Bridges Etc., states, "A reduction of the clearances given in Table 1, to a minimum of 14 feet for trolley contact conductors is permitted for subways, tunnels or bridges, and for 0-750 volt conductors within exclusive and semi exclusive rights-of-way as defined by Alignment Classification 9.04-a and 9.04-b (1) contained in General Order No. 143-A, "Safety Rules and Regulations Governing Light Rail Transit", provided the railway does not operate freight cars where the vertical distance from the top of car or load to trolley contact conductor is less than 6 feet. This will require the grading of the trolley contact conductor from the prescribed construction down to the reduced elevation." The PGL Figueroa, Colorado, and Marengo Boxes are constructed to have a minimum of 13 feet 6 inches overhead track clearance.

PBLCA states that the PGL track runs through two cut and cover sections, the Figueroa Box in Los Angeles, and the Colorado Box in Pasadena. These sections were designed to provide a vertical clearance dimension of 15 feet between the top of rail and roof of tunnel. Based upon this dimension, a constant tension catenary system was designed with the messenger installed at 14 feet 6 inches and the contact wire supported at a height of 14 feet. The static clearance from the top of the messenger to the tunnel roof is 5 1/2 inches which is more than the minimum air gap required by American Railway Engineering and Maintenance-of-Way Association (AREMA), but the minimum necessary to install the insulated pulley assembly that enables the along track movement of the wires. The 6-inch dimension between the contact wire and its supporting messenger is the minimum needed to fit the steady arm contact wire clip between the wire and the messenger pulley wheel. These support assemblies are spaced approximately 60 feet apart through the tunnels and require a 12 inches deep space between the underside of the contact wire and the tunnel roof for installation.

During course of construction of cut and cover sections at Figueroa Street and Colorado Boulevard, the vertical alignments of the rails were modified to improve the gradients at the approaches and through the cut and cover sections. These changes resulted in a reduction in the headroom between tunnel roof and the top of rails of 3 and 4 inches in some sections of the tunnel. This reduction in clearance makes it impossible to install the designed support assemblies and still maintain the designed contact wire height of 14 feet.

PBLCA corrected several areas in the Figueroa and Colorado Boxes to meet the minimum 14 feet by using different hardware. However, during actual start-up testing, it was observed that LRV pantograph carbons were being damaged, as the pressure of the pantograph would rise in such a way to strike the messenger wire and the rollers attached to it in the Colorado and Figueroa Boxes. The result has been grooved and damaged carbons that will eventually result in LRV damage and snagging the catenary wire.

The MTA Operation staff, PBLCA and its designers, Kiewit / Washington and Parsons Transportation Group, collectively agree that the best solution is to relax the 14 feet vertical clearance height requirement to a minimum height of 13 feet 6 inches in all areas throughout the boxes including Colorado, Figueroa, and Marengo. This concession will open up the distance between the catenary wire and the messenger wire, rollers, and will eliminate hard spots throughout the boxes. They believe this new height will result in a better and safer operation and it does not impair safety.

To support the deviation request, PBLCA also included the following observations:

1. MTA has incorporated a standard clearance envelope for all of their projects. This clearance envelope requires that all vehicles have a maximum height of 12 feet, 8.4 inches. Therefore, even with a minimum contact wire height of 13 feet 6 inches, a clearance of over 9 inches is maintained from all roof equipment for all current and future vehicles.

2. The light rail vehicle pantograph working range is 23 feet-3 inches to 13 feet 3 inches and is, thus, compatible with the contact wire heights indicated.

NOTICE

PBLCA states that a copy of the variance application letter was mailed and distributed to the potentially affected parties.

PROTESTS

No protest of the variance application has been filed with the Commission.

DISCUSSION

The Safety and Reliability Branch (SRB) evaluated this variance request from the vantage point of its impact on public safety. Factors influencing the SRB's evaluation included the presence of safety devices already in place (including the detection for over-current and current rate-of-rise), as well as additional safety enhancements proposed by the PBLCA in compensation for the increased risk posed by restricted vertical clearance as follows:

- PBLCA will install highly visible warning signs with reflective lettering at all access areas in advance of the box entrances notifying maintenance or emergency crews of the impending restrictions. These areas are not accessible to public.

- PBLCA will indicate on all warning signs the specific height restriction.

- PGL traction power substations will contain protective devices to interrupt the flow of electricity in the event the contact wire is dropped to the ground.

With the installation of warning signs and other safety measures proposed by PBLCA, the SRB believes that the additional risk to public and MTA maintenance or emergency crews posed by granting of this variance is acceptable.

COMMENTS

All parties in the proceeding have stipulated to waive the 30-day waiting period required by PU Code section 311 (g)(1) and the opportunity to file comments on the draft resolution. Accordingly, this matter will be placed on the Commission's agenda directly for prompt action.

FINDINGS

1. By letters dated April 3, 2003, and June 11, 2003, PBLCA requested authority, on behalf of MTA, to deviate from the requirements of General Order 95, Rule 74.4-E, Conductor Clearances Under Bridges, Etc., at specific location of the PGL.

2. PBLCA identified Figueroa, Colorado, and Marengo Boxes for reduced OCS contact conductor clearance.

3. MTA light rail vehicles are designed and equipped with pantograph to operate on tracks with an overhead OCS contact conductor height range of 23 feet 3 inches to 13 feet 3 inches and is, thus, compatible with the contact wire heights indicated.

4. General Order 95, Rule 74.4-E, Conductor Clearances Under Bridges, Etc., requires a minimum of 14 feet for trolley contact conductors for subways, tunnels, and bridges, and for 0-750 volt conductors within exclusive and semi exclusive rights-of-way as defined by Alignment classification 9.04-a and 9.04-b. (1) contained in General Order No. 143-A, Safety Rules and Regulations Governing Light Rail Transit.

5. MTA, the future PGL operator, has confirmed that it is agreeable to the reduced overhead clearance.

6. PBLCA, MTA, and staff are in agreement that the proposed reduced overhead contact wire clearance, at Figueroa, Colorado, and Marengo Boxes, will not significantly impact public safety.

THEREFORE IT IS ORDERED THAT:

1. PBLCA's request, on behalf of MTA, for authority to deviate from the requirements of General Order 95, Rule 74.4-E, Conductor Clearances Under Bridges, Etc., in the construction and operation of overhead OCS contact conductors at not less than thirteen (13) feet and six (6) inches from mean rail track level on its PGL is granted for Figueroa, Colorado, and Marengo Boxes and is contingent on safety measures proposed by PBLCA as described in the body of this resolution.

2. 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 July 10, 2003. The following Commissioners voted favorably thereon:

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William Ahern
Executive Director

MICHAEL R. PEEVEY
President
CARL W. WOOD
LORETTA M. LYNCH
GEOFFREY F. BROWN
SUSAN P. KENNEDY
Commissioners