

# California Public Utilities Commission Light Rail Transit Regulatory Development Program

---

W. R. SCHULTE, M. T. FLANIGON, AND J. S. RICH

**T**he California Public Utilities Commission (PUC) has legislative authority to regulate safety on rail transit systems in the state. This paper outlines the history, current practice, and future application of the PUC's safety regulation. The development of a formal program em-

ploying safety planning criteria, standards, and guidelines to accomplish regulatory goals is discussed in detail. The successful application of this programmatic approach to the recent start-up of the Sacramento and San Jose light rail systems is described.

THE HISTORICAL BASIS FOR today's safety oversight of the rail transit industry in California lies with the California Railroad Commission, which was established in 1911 as part of the reform movement that swept Governor Hiram Johnson into office. In 1946, the name of the commission was changed to the California Public Utilities Commission (PUC). The PUC regulated service, safety, and fares on the L.A. Railway, Pacific Electric, Key System, and all other electric railways in the state. Today, in the absence of any privately owned and operated rail transit systems, PUC regulation of light rail systems is limited to safety.

Until very recently, the PUC's safety regulation has principally involved after-the-fact reviews of new projects, operational safety inspections, and accident investigations. It was only with the passage of Assembly Bill 3209, approved July 24, 1986, that Section 99152 of the Public Utilities Code was

---

*California Public Utilities Commission, 505 Van Ness Avenue, San Francisco, Calif. 94102.*

amended to add new requirements for the development of a formal PUC safety oversight program with increased scope employing safety planning criteria, standards, and guidelines. Just as technical advancements have stimulated a rebirth of interest in light rail systems, so too have advancements been made in California's regulatory program to deal more effectively with today's modern rail transit industry. In keeping with the new industry requirements, a more clearly defined rail transit safety oversight program has been established to provide an improved level of light rail transit system safety in California.

## **PROGRAM GOALS AND OBJECTIVES**

PUC policy is based on an understanding that the operators of the light rail systems have the ultimate responsibility for safety, while the PUC staff's role is one of safety oversight. The goal of this policy is to develop an independent and effective program for the oversight of safety-related activities during all life-cycle phases of each system using established safety planning criteria, guidelines, and standards. The purpose of this goal is to ensure that applicable safety requirements are identified and addressed by the responsible rail transit properties as they move from conceptual design to daily revenue operations.

The objectives of this policy include, first, development of a programmatic approach that relies heavily on existing published standards; second, development of regulations that require each light rail property to establish a system safety program that identifies, documents, and evaluates safety hazards and either eliminates or reduces them to an acceptable level; third, development of a standardized accident investigation and reporting system; and, fourth, development of a manual of standard practices and procedures that require the PUC to perform its oversight role in a consistent, uniform, and effective manner with appropriate documentation. These objectives have been used as the basis for the PUC's safety oversight program. The program has been divided into two separate phases, which are described in detail below.

### **PHASE I—STEP 1**

Phase I, Step 1 of this program is to develop a new general order containing regulatory requirements for the development and application of system safety programs to be used by all public rail transit properties in the state. The new general order will complement the existing general orders dealing with rail transit safety by adding requirements that will be made mandatory for all new systems and system additions contracted for after the general order becomes

effective. The order may be made retroactive for existing systems. The order is to be generic in nature and applicable to all rail transit properties. It will require each property, whether light or heavy rail, to prepare a comprehensive system safety program plan supplemented by appropriate implementing project plans, specifications, drawings, procedures, and instructions covering the total scope of design, procurement, construction, testing operation, and maintenance.

The order will also establish the basis for scheduled reviews and necessary revisions to ensure that each property keeps its system safety program up-to-date. Each property will be obligated to submit its system safety program plan to the PUC staff for review and acceptance within a given time period after the order is published. Further, the order will establish the authority of the PUC staff to verify each property's conformance to its approved system safety program plan through a PUC oversight program of on-site inspections, audits, and document reviews with preestablished witness and hold points.

Modeled after MIL-STD-882B, System Safety Program Requirements, the order will be in keeping with selected requirements from MIL-STD-9858A, Quality Assurance Program Requirements. The order will complement those contained in the published guidelines of UMTA, the American Public Transit Association, and others for preparation of system safety program plans. It also will be compatible with the existing system safety program plans being used by the rail transit properties in California.

## **PHASE I—STEP 2**

Step 2 of Phase I will be to develop a set of design and performance safety standards and guidelines. These standards and guidelines will contain recommended safety practices for track and station construction, signaling systems, train control systems, communication systems, vehicle design and manufacture, preoperational testing and certification, system operating rules, preventive maintenance programs, etc. The standards will be contained in General Order 143-A, which has been developed through a consensus among representatives of the PUC staff and the California light rail transit industry. In early August, a final draft of General Order 143-A will be released for public comment prior to PUC hearings later in 1988.

A separate set of guidelines will be developed to clarify and expand upon the general order standards. The guidelines will be a living document, which will be revised and updated as conditions warrant.

Each transit property will be free to apply for exemptions or deviations from these requirements. When deviations are proposed, however, the transit property will be expected to describe, as a part of its system safety program, the basis for the deviation and present evidence to show that it is an

acceptably safe alternative. The subjects covered by these PUC standards and guidelines will be some of the same ones each property must address in its system safety program plans required by the new general order prepared under Step 1 of Phase I.

## PHASE II

Phase II of this program is to prepare a manual of PUC staff practices and procedures to provide the standardization, structure, organization, and individual accountability necessary to manage the day-to-day operation of the PUC's oversight program effectively. The manual, currently being prepared, will contain procedures and instructions to direct, guide, and monitor PUC staff activities. The procedures and instructions will be sufficiently flexible to deal effectively and economically with both light and heavy rail systems in all stages of design, procurement, construction, testing, operation, and maintenance.

Phase II began with the preparation of an overall policy statement to serve as a foreword to the manual. This was followed by the development of procedures and instructions for the PUC safety oversight program as it generally applies to all transit properties. Following the development of these general procedures and instructions, property-specific supplements are being prepared to describe more exactly the procedures to be followed by the PUC staff in their day-to-day safety oversight dealings with each of the different transit system properties. When completed, the first of these supplements will be a set of internal coordination procedures for controlling formal and informal communications, meetings, and correspondence between the various branches and sections of the PUC staff and each of the transit system properties.

The rest of the activity under Phase II will concern the preparation of whatever other transit property-specific procedures and instructions are needed to supplement the general procedures and instructions.

The specific procedures and instructions that are being prepared under Phase II cover the organization and reporting relationships within the rail transit safety section of the transportation division and the other divisions, branches, and sections that make up PUC's staff. They also cover the duties and responsibilities of the staff in the form of job descriptions giving titles and classifications for personnel dealing with rail transit safety oversight. Further, they will include general instructions for performing the design reviews, inspections, examinations, audits, and other oversight activities that are common to all transit system properties. Coordination plans for controlling communications between the PUC staff and each of the transit properties, accident investigation procedures, and requirements for the preparation

of routine records, reports, and other documents by PUC staff will also be included.

## **CURRENT LIGHT RAIL PROJECTS**

Obviously, in the case of the Sacramento Regional Transit and Santa Clara County Transportation Agency light rail projects, the PUC staff has had to employ a safety oversight program without completing all the program elements outlined above. Consequently, the staff looked at each property, focusing attention on what it had developed internally to serve as a safety assurance program. After reviewing the transit agency plans, the PUC staff added a complementary oversight program to make certain that full compliance with the applicable general orders was achieved.

The staff found that the construction management, start-up, and preoperational testing programs already in place readily addressed the PUC's safety concerns and created a sound foundation on which to build the PUC's own safety oversight program.

A single staff member from the rail transit safety section was designated project manager for the safety oversight program at Sacramento. Another staff member filled this role at Santa Clara. Appointing a single individual to manage the implementation of the program coordinated the PUC staff's functions. This approach also allowed the transit agencies' staffs to have one contact at the PUC who could answer questions, track formal submittals, and troubleshoot problems within the separate organizational units at the PUC.

In addition to the staff technical oversight reviews, the PUC and the transit properties have developed management overview groups (MOGs), which meet on a periodic basis to discuss management issues, such as project scheduling, mutual assistance, budget, political constraints, and review problems. The MOG meetings are not intended to focus on technical issues; rather they deal with program-related issues to ensure that the overall review program runs smoothly and effectively.

## **OVERSIGHT IN SACRAMENTO**

In the case of the Sacramento Regional Transit (RT) project, their system safety certification, simulated revenue service, and system integrated testing programs served as the foundation for our safety oversight program. The PUC's safety oversight program simply consisted of a preplanned set of sampling inspections, witness points, and document reviews to verify the efficacy of the Sacramento RT Metro programs. One of the more important sampling inspections included in the PUC's safety oversight program was a

survey to verify compliance with PUC orders for grade crossing protection and the adequacy of the light rail system from a traffic engineering point of view. This inspection identified and documented light rail vehicle (LRV)/automobile points of potentially hazardous conflict. The results of this inspection were used to advantage by RT Metro in making its traffic concerns known to the responsible city traffic engineers.

By using RT Metro's own performance and acceptance criteria in the area of wayside signaling, the PUC staff identified a signal system discrepancy. Periodic failures of a signal recorder were observed by PUC staff and related to regional transit management. This ready access to RT management was an important element in the success of the oversight program as it allowed the PUC to maintain effective communications without having to depend on a cumbersome formal process. The PUC believes that its safety oversight program served RT Metro well in this instance in that RT was able to make the necessary corrections well before final acceptance occurred. Early identification of problems allowed early resolution without causing any additional expense to the property.

As a final step in RT's safety certification program, the property prepared a document, signed by the general manager, attesting to the fact that all unacceptable hazards had been eliminated, all specified safety requirements had been complied with, and the systems, subsystems, components, structures, and equipment included in the project had been found safe for revenue service. Review and acceptance of this certification statement by the commission marked the end of the PUC's safety oversight program for start-up of the Sacramento RT Metro light rail system.

## **OVERSIGHT IN SANTA CLARA**

Oversight activity on the Santa Clara County Transportation Agency (SCCTA) Phase I light rail project proceeded on a similar course to that followed in Sacramento. (Phase II is still under construction as of this writing.) Through a combination of sampling inspections, document reviews, and selective witness points, PUC staff specialists confirmed compliance with state safety standards in the areas of vehicle performance, traffic engineering, interlocking signaling, traction power, trackwork, and station construction. Additionally, by means of firsthand observations and document reviews, PUC staff evaluated SCCTA's operations and maintenance training programs, operational rules and procedures, and emergency preparedness planning.

The major focus, however, was on oversight of the SCCTA internal testing and safety certification program. The program required preparation of approximately 1,000 checklists, which identified safety-related requirements, verified that the requirements were covered in the design drawings and

specifications, and then finally verified that the requirements had been met satisfactorily in the completed equipment, hardware, personnel training, or operating procedures. PUC staff reviewed all of the checklists to verify that the safety requirements had indeed been complied with. The last step in the certification process was the formal submittal of a statement signed by the agency director stating that the certification process had been completed and that the system had been found safe to operate.

By monitoring the safety certification process—as well as overseeing the integrated and simulated revenue service testing conducted by the SCCTA—PUC staff was able to verify that the process used to identify and eliminate or to control hazards was effectively applied to Phase I of the light rail project. This approach to safety regulation appears to have worked well for both the PUC staff and the SCCTA.

## **SUMMARY**

With the experience gained on the Sacramento RT Metro and SCCTA projects, the PUC has been able to further refine and develop its own safety oversight program. Thanks to the cooperation of the light rail systems' personnel, the state is forming an internal safety structure that ultimately will eliminate or control hazards to public safety. Both of the transit systems have accepted and addressed the most basic principle of PUC oversight: that the final responsibility for safety resides with the rail transit property itself. The PUC has, in turn, accomplished its legislative mandate by instituting an effective safety oversight program. Through this cooperative focus on safety, the most important goal of all is achieved: minimal risk to rail transit passengers and employees in the State of California.