SAN DIEGO METROPOLITAN TRANSIT SYSTEM VINTAGE TROLLEY

SAFETY CERTIFICATION PLAN

Revision: 0

Date: 5/9/11

REVISION TRACKING

Rev. #	Rev. Date	Section(s) Affected	Comments
0	1/07/2011	n/a	Initial issue

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LIST OF EXHIBITS

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LIST OF ACRONYMS

Acronym	Definition
CCR	California Code of Regulations
CFR	Code of Federal Regulations
COC	Certificate of Conformance
CPUC	California Public Utilities Commission
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HTM	Hazard Tracking Matrix
PCC	Presidential Conference Car
PE	Preliminary Engineering
PHA	Preliminary Hazard Analysis
SC	Safety Certificate
SCP	Safety Certification Plan
SDTI	San Diego Trolley, Inc.
SDMTS	San Diego Metropolitan Transit System, (System Operator)
SRC	Safety Review Committee

INTRODUCTION

The Federal Transit Administration (FTA), under Code of Federal Regulations (CFR) 49, Part 659, requires each State to designate an agency to oversee the safety of rail fixed guide way systems. The California Public Utilities Commission (CPUC) has issued General Order (GO) 164-D to implement the provisions of 49 CFR 659 which requires a safety certification program to be in place for major projects. The safety certification program was developed for the CPUC, in accordance with CPUC requirements, and will be made available to other agencies, including the Federal Railroad Administration (FRA).

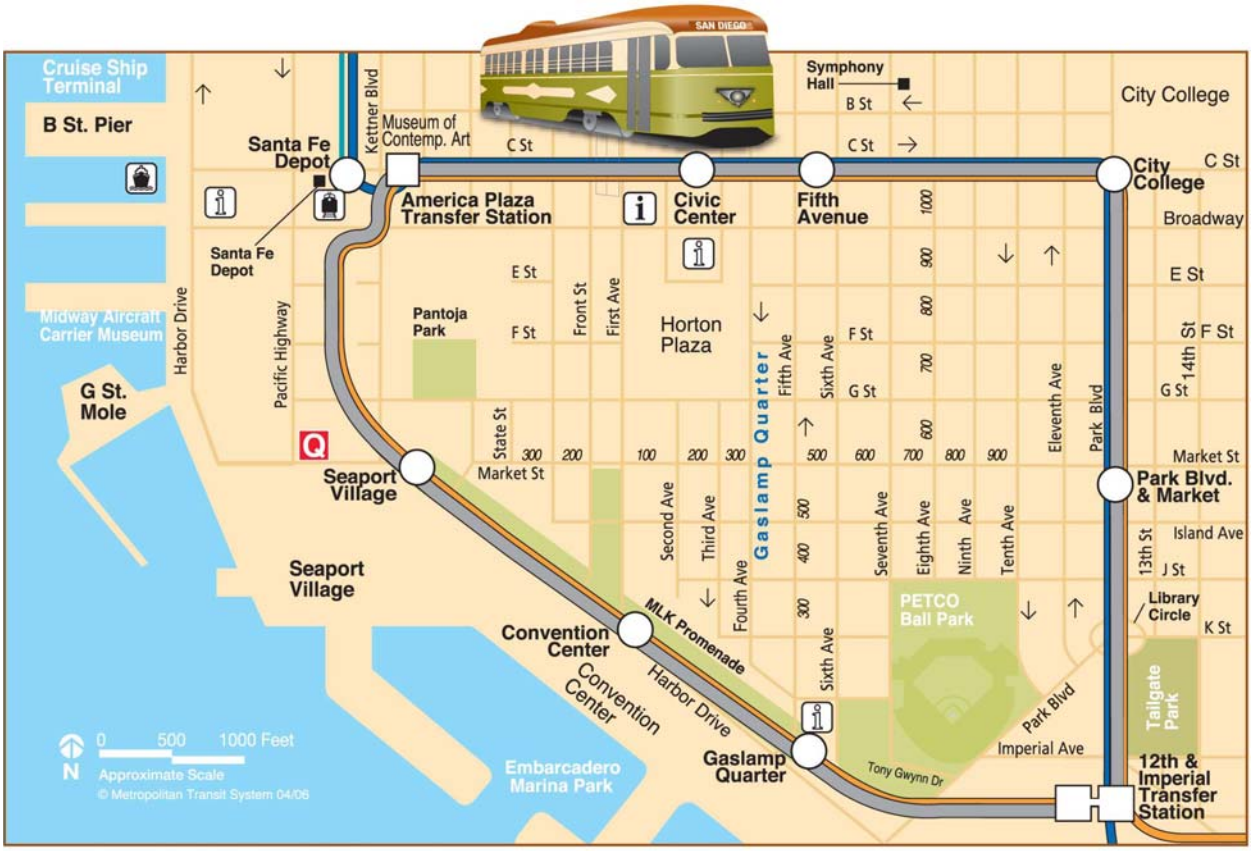
The San Diego Metropolitan Transit System Vintage Trolley (Vintage Trolley) is a historic Presidential Conference Car (PCC) streetcar operation utilizing an existing loop of track through the San Diego downtown area. The line segment selected for this operation runs clockwise from the 12th and Imperial Transit Center along the Bayside Corridor to America Plaza, traveling east on C Street, then south on Park Blvd. to complete its loop at the 12th and Imperial Transit Center. This route is the most visible segment of the San Diego Trolley system and serves a large population of residents, workers, and tourists. The addition of historic streetcars will augment regular trolley service during limited mid-day hours on weekends.

The Vintage Trolley will initially use one historic PCC streetcar, the same vintage that served San Diego from 1936-1945. As additional PCC's are restored, a second will be deployed, others will

be used as spares for while PCC vehicles are undergoing maintenance or additional service is required. Operation and maintenance (O&M) of the Vintage Trolley falls to the San Diego Metropolitan Transit System(SDMTS). SDMTS is responsible for maintenance of the overhead catenary and track systems, operation and maintenance of the vehicles, and training of mechanics and train operators.

The track over which the SDVTI operates is existing currently used by the San Diego Trolley, a light rail operation and part of the SDMTS operating system.

EXHIBIT 1: SILVER LINE VINTAGE TROLLEY SERVICE



This Safety Certification Plan (SCP) applies to the Vintage Trolley Rolling Stock, specifically compliance of vehicles with CPUC GO 143-B, testing, start-up, commissioning and support of Vintage Trolley operations utilizing existing infrastructure specifically Overhead Catenary System traction & substation power, rail, track and Train to Wayside control systems. The plan may be revised and expanded as the project progresses.

PURPOSE

The intent of the SCP is to identify the processes to verify and document that the rehabilitation of existing systems and installation of new systems and equipment are in compliance with safety

requirements; training, operations and maintenance manuals have been provided; rules and procedures are written; and operations personnel are trained in the rules and procedures. Additionally, it provides a framework for ensuring that appropriate safety related activities have been performed and documented to support each Certificate of Conformance issued.

OBJECTIVES

The SCP objectives are to verify by documentation prior to commencing trolley operations involving Vintage Trolley Rolling Stock that each of the following is accomplished for the certifiable elements.

- Identified, assessed, and resolved system safety hazards to acceptable levels for all conditions, associated with the completed project;
- Review Vehicle Equipment and Performance verifying conformance with all applicable safety requirements of GO 143-B as well as applicable local codes with respect to safety.
- Facilitated regulatory inspection of Vintage Trolley Rolling Stock.
- Developed the necessary operating procedures, and rule book modifications prior to commencing Vintage Trolley operations.
- Trained, qualified or certified San Diego Trolley, Inc. personnel who will operate and maintain the Vintage Trolley Rolling Stock.

DEFINITION OF SAFETY CERTIFICATION

Safety Certification is the process of verifying compliance with a set of formal safety requirements. For Vintage Trolley vehicle certification, the process will ensure that the required verification activities are performed and documented, and Certificates of Conformance are signed and issued by responsible parties.

The goal of the Safety Certification Program is to verify that all practical steps are taken to optimize the operational safety of the San Diego Vintage Trolley, Inc. (Vintage Trolley). This report will confirm, at the time of final inspection and completion all identified safety-critical elements are safe for passengers, employees, emergency responders, and the general public before start of revenue operation.

The program will be conducted by SDMTS/San Diego Trolley, Inc., a self-certifying agency, under the auspices of San Diego Vintage Trolley, Inc. with input from the Transportation, Safety and Light Rail Vehicle Maintenance Departments.

RESPONSIBILITY

The San Diego Trolley System Safety Manager is responsible for overseeing the activities of the Safety Certification Plan, and chairing the Safety Review Committee (SRC) defined in Section 3.1. A summary of the safety certification program responsibilities is shown in Table 1-1.

SAN DIEGO TROLLEY RESPONSIBILITY

San Diego Trolley Inc. is responsible for certifying the safety of the Vintage Trolley rolling stock, rehabilitation, modernization, testing, and compliance with CPUC guidelines as well as applicable state and local codes. San Diego Trolley Inc. is responsible for confirming rules and procedures are developed and implemented and Operations and maintenance training must be completed. The PCC vehicle will be tested and safety certified in incremental segments. As each segment is certified, San Diego Trolley inc. will prepare a Project Segment Safety Certificate (PSSC), which will be maintained in the Vintage Trolley Vehicle History book. Safety Certification Verification Records will be readily available for CPUC inspection.

CPUC RESPONSIBILITY

The CPUC is responsible for review and approval of the Vintage Trolley System Safety Certification Plan. In addition, the CPUC is involved in reviewing the rehabilitation project status. Staff inspectors may participate in and witness testing and operational maintenance readiness of the project. Besides reviewing and approving these documents, CPUC staff may request Vintage Trolley Safety Certification Verification Records and supporting documentation at all phases of the project such as hazard analysis, conformance checklists, etc.

TABLE 1: SUMMARY OF VINTAGE TROLLEY SYSTEM AND EQUIPMENT SAFETY CERTIFICATION PROGRAM PRIMARY RESPONSIBILITIES

#	Safety Certification Tasks	Responsibility
1.	Safety Certification Plan (SCP) for Vintage Trolley	
	Prepare Draft Safety Certification Plan (SCP)	SDTI
	Internal Review and Comment	SDTI
	Incorporate Comments and Finalize for Submittal to CPUC	SDTI
	Send formal SCP to CPUC Staff for review & approval	SDTI
	CPUC Review and Comment	CPUC
	Respond to CPUC Comments	SDTI
	Formal Approval of SCP by Commission	CPUC
2.	Develop GO 143-B Conformance Checklist	
	Develop Checklist	SDTI
3.	Develop Design Criteria Conformance Checklists	
	Develop Checklist	SDTI
4.	Conduct Independent Safety Audits	
	Periodic Through Design	
5.	Verify GO 143-B Conformance Checklists and Issue Certificates	
	Complete the Checklist	SDTI
	Review of content and reference checks, Issue Certificate	
6.	Develop Safety-Related Testing Conformance Checklists	
	Develop Safety-Related Testing Conformance Checklists	SDTI / CPUC
7.	Verify Specification Conformance Checklists	
	Inspect/Monitor Contractor Compliance with Specifications	SDTI / CPUC
	Complete Checklist	
	Review of content and reference checks	
	Issue Certificate	

8.	Verify Safety-Related Testing Conformance Checklists	
	Receive/Review/Confirm Adequacy of Agency Provided Testing Data	CPUC
	Complete Checklist	SDTI / CPUC
	Review of content and reference checks	CPUC
	Issue Certificate	SDTI
9.	Field verification and inspection of equipment installed	
	Monitor installation and equipment inspection	CPUC
	CPUC provided opportunity to inspect project progress	CPUC
10.	Verify crossover and signaling activation of existing equipment	
	Required by GO164-D, 49 CFR Part 213, 49CFR Part 236. May not apply as all are existing crossings.	SDTI
11.	Verify Operations & Maintenance Manuals Conformance	
	Receive SDTI provided manuals and route for review and approval	CPUC
	CPUC review and comment on Draft Operations & Maintenance Manuals	CPUC
	Review/Comment/Approval manuals routed by SDTI	SDTI
	Issue Certificate	SDTI
12.	Verify completion of Integrated Tests	
	Monitor Testing and Receive SDTI provided test data	CPUC
	CPUC provided opportunity to witness performance of tests	CPUC
	Review/Oversight of Integrated Tests	SDTI
	Issue Certificate	SDTI
13.	Verify completion of Rules and Procedures	
	Develop operating rules and Standard Operating Procedures for Vintage Trolley	SDTI
	CPUC review and comment on Draft Operating Rules & Procedures for Vintage Trolley	CPUC
	Confirm final Rules and Procedures are implemented	SDTI
	Issue Certificate	SDTI
14.	Verify completion of Operations Training	
	Develop Operations Training Plan	SDTI
	Conduct Training Sessions	SDTI
	CPUC provided opportunity to witness operations training	CPUC
	Confirm completion of Training sessions	SDTI
	Issue Certificate	SDTI

SCOPE OF SAFETY CERTIFICATION PROGRAM

The safety-certifiable elements of the Vintage Trolley were developed in cooperation with the California Public Utilities Commission (CPUC) per GO 143-B requirements conformance in a Safety Certification Plan (SCP) developed in the service planning stages. The following outlines the methodology employed:

Define and identify those safety-critical system elements to be certified:

- Safety Certification of Vintage Trolley Vehicles
- Safety Certification of Operating Practices

- Vintage Trolley Dynamic Envelope – verify out swing of Vintage Trolley PCC vehicle dynamic clearance is maintained when another SDTI train passes at the Americana Plaza Transfer Station.
- Grade Crossing Approach Activation – verify Vintage Trolley activates grade crossing protection warning devices on the Bayside Corridor.
- Substation Power – verify relays & circuit breakers do not open when Vintage Trolley draws power (works as intended)
- Overhead Contact Wire – verify overhead contact clearance of 19' above top-of-rail and side clearances are met per GO95 requirements
- Signal System – verify Vintage Trolley vehicle Train-Wayside- Communication loop sends/receives correct route call and indications at Switch 31 at the Broadway Wye and Switch 15 north of Imperial Transfer Station.
- Station Clearances – verify Vintage Trolley vehicle gap is acceptable at all station platforms along the Silver Line.
- Emergency Response Familiarization – orientation to Vintage Trolley vehicle access for Fire/Life Safety Issues
- Radio Communications – verify Vintage Trolley is capable of sending/receiving radio communications with Operations Control Center.

The following steps (2-8) are repeated for each system element.

1. Define and develop a Certifiable Items List (CIL).
2. Identify safety requirements.
3. Verify and document compliance with the safety requirements.
4. Identify and verify that operation, maintenance, and training plans, procedures and programs have been established.
5. Identify and verify that safety-related tests have been conducted.
6. Document any exceptions to the requirements.
7. Resolve all open items.
8. The Safety Certification Process is completed with these final steps, the contents of which are presented in the Appendices of the report.
9. Issue Certificate of Conformance for each certifiable element or sub-element upon satisfactory completion.
10. Issue project Safety Certification.

TABLE 2: CERTIFIABLE FACTORS AND SCOPE (SEE SAFETY CERTIFICATION REPORTS FOR FURTHER DETAILS)

#	Certifiable Factor	Scope
1.	Safety Certification of Vehicles	This certifiable factor will apply to the Vintage Trolley rolling Stock as a whole. One Certificate of Conformance will be issued to certify compliance with CPUC GO 143-B as well as other applicable state and local codes.
2.	Safety Certification of Operating Practices	This certifiable factor will apply to the development of Standard operating procedures to be put in place for the operation of the Vintage Trolley Vehicles.
3.	Vintage Trolley Dynamic Envelope	This certifiable factor will Confirm the out swing of the Vintage Trolley rolling stock. This will ensure Vintage Trolley vehicle dynamic clearances are maintained when passing an SDTI LRV consist at America Plaza Transfer Station
4.	Grade Crossing Approach Activation	This certifiable factor will verify that the Vintage Trolley activates the grade crossing gates on the Bayside Corridor.
5.	Substation Power	This certifiable factor will Verify that all relays and circuit breakers do not open when Vintage Trolley draws power (work as intended)
6.	Overhead Contact Wire	This certifiable factor certifies Overhead Contact Wire clearance of 19' above top of rail is maintained and side rail clearances are met as per CPUC GO 95 requirements.
7.	Signal System	This certifiable factor will Verify that the Vintage Trolley vehicle TWC equipment sends / receives correct route call to sign aspects at switch 31 and switch 15 at the 3rd track entering the Imperial Transfer station.
8.	Station Clearances	This certifiable factor will verify Vintage Trolley vehicle gap is acceptable at station platforms along the silver line.
9.	Emergency Response Familiarization	This certifiable factor will verify orientation to the Vintage Trolley vehicle access for Fire / Life Safety response.
10.	Radio Communications	This certifiable factor will verify that the Vintage Trolley is capable of sending and receiving audio communications with the Operations Control Center.

SAFETY CERTIFICATION PLAN REVISIONS

The SCP will be revised as necessary. Changes may be proposed by any department and submitted in writing to the San Diego Trolley Systems Safety Manager for review and consideration. The Safety Review Committee, defined in Section 3.1, will review and approve the changes to the Plan. The revised Plan will be submitted to CPUC for approval of proposed revisions, in accordance with General Order 164-D. The revised Plan will become effective when the revisions are approved by CPUC Staff.

CERTIFICATION PROCESS AND PROCEDURES

This section describes how the certification process will function and provides an overview of the process by describing the various steps in general terms.

BACKGROUND

The Safety Certification Program consists of ten Certifiable Elements which apply to the safety certification of the Vintage Trolley Project.

Safety Certification of Vehicles. This certifiable element will apply to the Vintage Trolley Rolling Stock as a whole. One Certificate of Conformance will be issued to certify compliance with CPUC GO 143-B as well as other applicable state and local codes.

Safety Certification of Operating Practices This certifiable element will apply to the development of Standard operating procedures to be put in place for the operation of the Vintage Trolley Vehicles.

Vintage Trolley Dynamic Envelope This certifiable element will Confirm the out swing of the Vintage Trolley rolling stock and that Vintage Trolley vehicle dynamic clearances are maintained when another SDTI train passes at America Plaza Transfer Station

Grade Crossing Approach activation. This certifiable element will verify that the Vintage Trolley activates the grade crossing gates on Harbor Blvd.

Substation Power This certifiable element will Verify that all relays and circuit breakers do not open when Vintage Trolley draws power (work as intended)

Overhead Contact Wire. This certifiable element certifies Overhead Contact Wire clearance of 19' above top of rail is maintained and side rail clearances are met as per CPUC GO 95 requirements.

Signal System. This certifiable element will verify that the Vintage Trolley vehicle Train-Wayside-Communication equipment sends / receives correct route call to sign aspects at switch 31 and switch 15 at the 3rd track entering the Imperial Transfer station.

Station Clearances.. This certifiable element will verify Vintage Trolley vehicle gap is acceptable at station platforms along the Silver Line.

Emergency Response Familiarization. This certifiable element will verify orientation to the Vintage Trolley vehicle access for Fire / Life Safety response.

Radio Communications This certifiable element will verify that the Vintage Trolley is capable of sending and receiving audio communications with the Operations Control Center.

When all applicable Certificates of Conformance have been issued, SDTI will issue a Safety Certificate thereby permitting the Vintage Trolley Rolling Stock to commence revenue service on the Designated Silver Line route detailed in Exhibit 1-1.

EXHIBIT 2: SAFETY CERTIFICATION PROCESS

SAFETY CERTIFICATION STEPS

In general terms, the safety certification process of the San Diego Vintage Trolley shall consist of four steps:

Step 1 – Create a list of Certifiable Elements

The first step of the process is to identify the certification requirements for each certifiable element within the Vintage Trolley SCP This is defined in Section 1.5.

Step 2 – Define the Conformance Checklists

The second step of the process involves the creation of various "Conformance Checklists" and starts by breaking down the Vintage Trolley Project into certifiable elements and items to be tracked for compliance with safety requirements.

The purpose of the checklists is to provide a method to track and verify the compliance of each requirement.

TABLE 3: SAFETY CERTIFICATION ACTIVITIES

#	Task (as applicable)	SDTI Submittal	CPUC Reviews
1.	Develop Safety Certification Plan		
2.	Identify Certifiable Elements		
3.	Implement Certification Tracking System		
4.	Perform Preliminary Hazard Analysis and Resolve Related Issues		
5.	Perform supplementary Hazard Analysis, if necessary		
6.	Develop Safety-Related Testing Conformance Checklists		
7.	Verify Safety-Related Testing Conformance Checklists		
8.	Complete Rules and Procedures and Issue Certificates		
9.	Complete Operations Training and Issue Certificates		

10. Issue Safety Certificate

The checklists form the backup documentation for the Certificates of Conformance. Each list, therefore, must be prepared and reviewed to ensure compliance with the goals of the SCP.

Regardless of the structure and scope of the various checklists, combined they need to identify the safety requirements for all certifiable elements covered in the Vintage Trolley Safety Certification Program.

Step 3 –Verify Compliance with the Requirements

This step consists of using the conformance checklists to conduct appropriate reviews to verify that the safety related requirements identified in Step 2 are incorporated into the Vintage Trolley Rolling Stock. Methods to accomplish this include: document reviews, audits, inspections, and testing. As requirements are verified, the appropriate checklists are completed, and include documentation of the method of verification, the date, and the name of the individual performing the verification. The responsible party verifies and signs off on each line item in the checklist. When complete, the responsible party submits the checklists to the Safety Review Committee (SRC) for review and acceptance. The objectives and function of SRC are defined in Section 3.

Step 4 – Document the Review and Approval Process

Documentation is essential to provide evidence of the various reviews, analyses, tests, inspections, training, and hazard resolution activities performed to ensure the safety of the system. Once all the conformance checklists are executed, validated and reviewed, the responsible party must complete and sign the associated Certificate of Conformance, and submit it to the SRC for review and acceptance. Checklists shall be submitted to the CPUC staff upon request. Detailed documentation requirements for the issuance of certificates are further described in Section 5.

FILING SYSTEM

A formal filing system shall be developed and maintained for the safety certification process to ensure that all Certificates of Conformance are accurately completed and signed by the appropriate levels of authority, and that all certificates are adequately supported by checklists or other records that verify the work performed.

REPORTING OF PROGRESS

Details of the reporting of inspection, test and final certification reporting requirements, are described in Section 6.

PROGRAM MANAGEMENT

SAFETY REVIEW COMMITTEE (SRC)

The Safety Review Committee (SRC) is a "working group" established to provide general guidance and support to the safety certification effort and to address detailed safety issues associated with certification activities. The objective of the SRC is to assure the timely implementation of the SCP.

The SRC is comprised of project representatives of San Diego Trolley Inc and is chaired by the SDTI System Safety Manager. The System Safety Manager will identify representation to SRC on an as needed basis. The organizational chart below highlights the type of roles to be represented on the SRC.

EXHIBIT 3: SAFETY REVIEW COMMITTEE ORGANIZATIONAL CHART

The SRC reviews compliance with stated safety requirements for certifiable elements, and recommends to the Chair acceptance of conformance documents following satisfactory verification. Status reports on safety certification are provided to the SRC at its meetings to review progress.

The SRC may perform audit and inspection activities of project functions to review safety compliance. For example, the SRC representatives may witness system tests to verify that test procedures are followed correctly, and that test results are acceptable.

On the Vintage Trolley Project, the SRC will perform the following project-specific functions:

- Review and approve conformance checklists for the rolling stock as well as Wayside related elements
- Participate in safety audits
- Review records, and may conduct vehicle or site inspections for safety related items
- Review and approve submitted Certificates of Conformance
- Monitor and audit overall implementation of the Safety Certification Program
- Review Preliminary Hazard Analysis for adherence to safety standards
- Review and approve issue of Safety Certificate.

In accordance with General Order 164-D, the safety certification process for rail projects must involve the staff of the CPUC from the beginning of Conceptual Engineering. Therefore, a member of the CPUC staff may serve as an ex-officio member of the SRC.

HAZARD MANAGEMENT

This section describes the hazard analysis process as it applies to the Vintage Trolley System Safety Certification Plan. Within the Certification Program, the term "hazard" is defined to include identified or perceived hazards that may occur over the system's lifecycle. As part of the Vintage Trolley System Safety Certification Program the responsible parties will identify, analyze, and resolve hazards throughout the course of the Certification Program. The hazard management process is intended to verify that known hazards have been satisfactorily identified, tracked, and resolved through a formal resolution process.

The goal of the hazard analysis is to provide adequate information so that SDTI can certify that the Vintage Trolley project will provide an acceptable level of safety upon its completion.

HAZARD IDENTIFICATION

Defining the physical and functional characteristics of the Vintage Trolley creates the foundation of the hazard identification process. These characteristics are presented in terms of the major elements that make up the system such as personnel, facilities, systems, equipment, procedures, the public, and the environment. The perceived hazards will be identified using several techniques including:

- Historical hazard or accident data
- Operational experience and lessons learned
- Identification of credible hazard
- Checklists of potential hazards
- Input from the SDTI / CPUC Staff
- Other methods as appropriate.
- Hazard Analysis

Hazard Analysis is a risk assessment of the safety of the Vintage Trolley System with regard to known hazards. The purpose of hazard analysis is to assess the severity and probability of the mishap risk associated with each identified hazard. Severity and probability generally are determined based on qualitative rather than quantitative analysis. The results and conclusions of the analyses of identified hazards, assessed in terms of severity or consequence and the probability of occurrence will be presented in accordance with FTA Hazard Analysis Guidelines. A Preliminary Hazard analysis (PHA) will be performed in the Restoration phase, based on the following definitions of Hazard Severity and the Probability of Occurrence will be used to develop the PHA. SDTI will maintain a copy of the PHA Report.

HAZARD SEVERITY

Hazard severity categories are defined to provide a qualitative measure of the worst credible mishap resulting from personnel error, environmental conditions, design inadequacies, procedural deficiencies, system, subsystem or component failure, or malfunction, as follows:

Category I: Catastrophic: Death, system loss or severe environmental damage.

Category II: Critical: Severe injury, severe occupational illness, major system, or environmental damage.

Category III: Marginal: Minor injury, minor occupational illness, minor system, or environmental damage.

Category IV: Negligible: Less than minor injury, occupational illness, or less than system or environmental damage.

FREQUENCY OF OCCURRENCE

The assessment of the hazard also includes a probability of occurrence. A qualitative hazard probability can be derived from research, analysis, and evaluation of historical safety data from similar systems. The frequency of occurrence is assigned by level, A to E, for hazards and are listed in Table 4 below.

TABLE 4: FREQUENCY OF OCCURRENCE DEFINITIONS

Descriptive Word	Level	Specific Individual Item	Fleet or Inventory
Frequent	A	Likely to occur frequently	Continuously experienced
Reasonably Probable	B	Will occur several times in life of an item	Will occur frequently
Occasional	C	Likely to occur sometime in life of an item	Will occur several times
Remote	D	Unlikely, but possible to occur in life of an item	Unlikely, but can reasonably be expected to occur
Improbable	E	So unlikely, it can be assumed occurrence may not be experienced	Unlikely to occur, but possible

HAZARD RESOLUTION

Hazard resolution is the process whereby hazards are identified, eliminated, mitigated or accepted. Risk assessment estimates will be used to determine whether individual system or subsystem hazards are to be eliminated, mitigated, or accepted. Individual hazards will be documented, discussed, and resolved with emphasis on the following mitigation methods:

- Design to eliminate hazards
- Eliminate the system/subsystem component
- Incorporate safety devices
- Utilize warning devices
- Implement special procedures and training
- Accept the hazard.

To classify the assessment, hazards identified in formal hazard analysis will receive a classification based on Table 5. Unacceptable and undesirable hazards shall be mitigated to an acceptable level by one or more of the above-mentioned methods.

TABLE 5: VINTAGE TROLLEY RISK ASSESSMENT MATRIX

Event Frequency	EVENT SEVERITY			
	I - Catastrophic	II - Critical	III - Marginal	IV - Negligible
A – Frequent	Unacceptable	Unacceptable	Unacceptable	Acceptable /WR
B – Reasonably Probable	Unacceptable	Unacceptable	Undesirable	Acceptable /WR
C - Occasional	Unacceptable	Undesirable	Undesirable	Acceptable
D – Remote	Undesirable	Undesirable	Acceptable /WR	Acceptable
E – Improbable	Acceptable /WR	Acceptable /WR	Acceptable /WR	Acceptable

WR = with review by SDTI / CPUC

The Risk Assessment Matrix is used to categorize hazards as acceptable, acceptable with certain conditions applied, undesirable and unacceptable. Hazard severity categories are defined to provide a qualitative measure of the worst credible mishap resulting from personnel error, environmental conditions, design inadequacies, procedural deficiencies, system, subsystem or component failure, or malfunction.

HAZARD TRACKING

This process will include documentation of hazard resolution activities through the use of a hazard tracking system. The tracking system will record identified hazards, and track/record resolution through the use of one or more of the mitigation methods listed in Section 4.3 above. The effectiveness of the mitigation will be scrutinized to determine that no new hazards have been introduced. All identified Hazards are tracked through to resolution. As each hazard is eliminated or controlled to an acceptable level, the responsible party updates the hazard open items list. The update must include a description of the measures taken to resolve the hazard.

CERTIFICATION

When all hazards have been satisfactorily resolved the San Diego Trolley System Safety Manager must complete and sign the Hazard Resolution Certificate of Conformance and submit the certificate to SDTI senior management for acceptance. The acceptance of the Certificate of Conformance is subject to review and approval by the SRC.

CERTIFICATES OF CONFORMANCE

Throughout the project as conformance checklists are finalized, the responsible party is required to complete, sign, and submit respective Certificates of Conformance to appropriate parties identified in this Safety Certification Plan for review and acceptance.

ISSUANCE

Upon receipt of each completed Certificate of Conformance, the entity responsible for acceptance will review the conformance checklists and other relevant backup documents as necessary to verify that the documentation is completed properly. Relevant backup documents will depend on the nature of each Certificate of Conformance, but may include evidence of document reviews, submittal of contract deliverables, and resolution of identified hazards, inspection reports, and test records. Acceptance of each certificate, in part, will be based on the successful completion of the review and, if necessary, an independent audit by the SRC.

EXCEPTIONS

Exceptions, if any, must be noted on each applicable certificate and tracked through resolution. Each exception and associated restrictions/workarounds must be explained. Restrictions/workarounds must be adequate so that the level of safety is not reduced.

Exceptions will be tracked using a Safety Certification Open Items List. The SRC will monitor and track open items until resolution.

Format of Certificates of Conformance

Exhibits 5-1 through 5-11 show the sample format of the various Certificates of Conformance.

SAFETY CERTIFICATE

In order to complete the safety certification process the SRC reviews and approves issue of the Project Safety Certificate, prepared by the San Diego Trolley System Safety Manager, for sign-off by the responsible personnel. This document indicates that the Safety Certification process for all 10 certifiable factors is complete.

EXHIBIT 4: SAFETY CERTIFICATION OF VEHICLES

VEHICLE SAFETY CONFORMANCE CERTIFICATE
CERTIFIABLE ELEMENT No. 1

Certificate of Conformance

Safety Certification of Vintage Trolley vehicles

Completion of this Certificate indicates that the Certifiable Element shown below complies with all applicable specifications of safety requirements.

CERTIFIABLE ELEMENT: Safety Certification of Vehicles
Specification Conformance Checklist reference: Items_____

EXCEPTIONS:

VERIFIED	ACCEPTED
_____	_____
(Signature and Date) Assistant Superintendent Light Rail Vehicle Maintenance	(Signature and Date) System Safety Manager, MTS/Rail
CONCURRED	ACCEPTED
_____	_____
(Signature and Date) Superintendent Light Rail Vehicle Maintenance	(Signature and Date) MTS Chief Operating Officer – Rail Division

EXHIBIT 5: SAFETY CERTIFICATION OF OPERATING PRACTICES

SAFETY CERTIFICATION OF OPERATING PRACTICES CONFORMANCE CERTIFICATE
Certifiable Factor No. 2

Certificate of Conformance

Safety Certification of Operating Practices

Completion of this Certificate indicates that the Certifiable Element shown below complies with all applicable specifications of safety requirements.

CERTIFIABLE ELEMENT: Safety Certification of Operating Practices
Specification Conformance Checklist reference: Items_____

EXCEPTIONS:

VERIFIED	ACCEPTED
_____	_____
(Signature and Date) Assistant Superintendent of LRV Maintenance	(Signature and Date) System Safety Manager, MTS/Rail
CONCURRED	ACCEPTED
_____	_____
(Signature and Date) Superintendent Light Rail Vehicle Maintenance	(Signature and Date) MTS Chief Operating Officer – Rail Division

EXHIBIT 6: VINTAGE TROLLEY DYNAMIC ENVELOPE TESTING CONFORMANCE CERTIFICATE

VINTAGE TROLLEY Dynamic Envelope Testing Conformance Certificate
Certifiable Factor No. 3

Certificate of Conformance

Completion of this Certificate indicates that the Certifiable Element shown below complies with all applicable specifications of safety requirements.

CERTIFIABLE ELEMENT: Safety Certification of PCC Dynamic Envelope
Specification Conformance Checklist reference: Items_____

EXCEPTIONS:
.

VERIFIED	ACCEPTED
_____	_____
(Signature and Date) Assistant Superintendent of LRV Maintenance	(Signature and Date) System Safety Manager, MTS/Rail
CONCURRED	ACCEPTED
_____	_____
(Signature and Date) Superintendent Light Rail Vehicle Maintenance	(Signature and Date) MTS Chief Operating Officer – Rail Division

EXHIBIT 7:GRADE CROSSING APPROACH ACTIVATION CONFORMANCE CERTFICATE

GRADE CROSSING APPROACH ACTIVATION CONFORMANCE CERTIFICATE
Certifiable Factor No. 4

Certificate of Conformance

GRADE CROSSING APPROACH ACTIVATION
Segment: Bayside Corridor

Completion of this Certificate indicates that the Certifiable Element shown below complies with all applicable specifications of safety requirements.

CERTIFIABLE ELEMENT: Safety Certification of Grade crossing Approach Activation
Specification Conformance Checklist reference: Items_____

EXCEPTIONS

VERIFIED

_____
(Signature and Date)
Assistant Superintendent of LRV Maintenance

ACCEPTED

_____
(Signature and Date)
System Safety Manager, MTS/Rail

CONCURRED

_____
(Signature and Date)
Superintendent Light Rail Vehicle Maintenance

ACCEPTED

_____
(Signature and Date)
MTS Chief Operating Officer – Rail Division

EXHIBIT 8: SUBSTATION POWER TESTING CONFORMANCE CERTIFICATE

SUBSTATION POWER TESTING CONFORMANCE CERTIFICATE
Certifiable Factor No. 5

Certificate of Conformance

Completion of this Certificate indicates that the Certifiable Element shown below complies with all applicable specifications of safety requirements.

CERTIFIABLE ELEMENT: Safety Certification of Substation Power Testing
Specification Conformance Checklist reference: Items_____

EXCEPTIONS:

VERIFIED	ACCEPTED
_____	_____
(Signature and Date) Assistant Superintendent of Maintenance of Way	(Signature and Date) System Safety Manager, MTS-Rail
CONCURRED	ACCEPTED
_____	_____
(Signature and Date) Superintendent of Maintenance of Way	(Signature and Date) MTS Chief Operating Officer – Rail Division

EXHIBIT 9: OVERHEAD CONTACT WIRE CONFORMANCE CERTIFICATE

OVERHEAD CONTACT WIRE CONFORMANCE CERTIFICATE
Certifiable Factor No. 6

Certificate of Conformance

Completion of this Certificate indicates that the Certifiable Element shown below complies with all applicable specifications of safety requirements.

CERTIFIABLE ELEMENT: Safety Certification of Overhead Contact Wire Conformance
Specification Conformance Checklist reference: Items_____

EXCEPTIONS:

VERIFIED	ACCEPTED
_____	_____
(Signature and Date) Assistant Superintendent of Maintenance of Way	(Signature and Date) System Safety Manager, MTS - Rail
CONCURRED	ACCEPTED
_____	_____
(Signature and Date) Superintendent of Maintenance of Way	(Signature and Date) MTS Chief Operating Officer – Rail Division

EXHIBIT 10: SIGNAL SYSTEM CONFORMANCE CERTIFICATE

SIGNAL SYSTEM CONFORMANCE CERTIFICATE
Certifiable Factor No. 7

Certificate of Conformance

Completion of this Certificate indicates that the Certifiable Element shown below complies with all applicable specifications of safety requirements.

CERTIFIABLE ELEMENT: Safety Certification of Signal System
Specification Conformance Checklist reference: Items_____

EXCEPTIONS:

VERIFIED	ACCEPTED
_____	_____
(Signature and Date) Assistant Superintendent of Maintenance of Way	(Signature and Date) System Safety Manager, MTS - Rail
CONCURRED	ACCEPTED
_____	_____
(Signature and Date) Superintendent of Maintenance of Way	(Signature and Date) MTS Chief Operating Officer – Rail Division

EXHIBIT 11: STATION CLEARANCE CONFORMANCE CERTIFICATE

STATION CLEARANCE CONFORMANCE CERTIFICATE
Certifiable Factor No. 8

Segment Stations: Bayside Corridor, C Street, Park Boulevard

Certificate of Conformance

Completion of this Certificate indicates that the Certifiable Element shown below complies with all applicable specifications of safety requirements.

CERTIFIABLE ELEMENT: Safety Certification of Station Clearances
Specification Conformance Checklist reference: Items_____

EXCEPTIONS:

VERIFIED	ACCEPTED
_____	_____
(Signature and Date) Assistant Superintendent of Transportation	(Signature and Date) System Safety Manger MTS-Rail
CONCURRED	ACCEPTED
_____	_____
(Signature and Date) Superintendent of Transportation	(Signature and Date) MTS Chief Operating Officer – Rail Division

EXHIBIT 12: EMERGENCY RESPONSE FAMILIARIZATION CONFORMANCE CERTIFICATE

EMERGENCY RESPONSE FAMILIARIZATION CONFORMANCE CERTIFICATE
Certifiable Factor No. 9

Certificate of Conformance

Completion of this Certificate indicates that the Certifiable Element shown below complies with all applicable specifications of safety requirements.

CERTIFIABLE ELEMENT: Safety Certification Emergency Response Familiarization
Specification Conformance Checklist reference: Items_____

EXCEPTIONS:

VERIFIED

_____
(Signature and Date)
Assistant Superintendent of Transportation
MTS - Rail

_____
Concurred (Signature and Date)
System Safety Manger MTS-Rail

CONCURRED

_____
(Signature and Date)
Superintendent of Transportation MTS - Rail

ACCEPTED

_____
(Signature and Date)
MTS Chief Operating Officer – Rail Division

EXHIBIT 13: RADIO COMMUNICATIONS CONFORMANCE CERTIFICATE

RADIO COMMUNICATIONS CONFORMANCE CERTIFICATE
Certifiable Factor No. 10

Segments: Bayside Corridor, C Street, Park Boulevard, SDTI Yard Limits

Certificate of Conformance

Completion of this Certificate indicates that the Certifiable Element shown below complies with all applicable specifications of safety requirements.

CERTIFIABLE ELEMENT: Safety Certification Radio Communications
Specification Conformance Checklist reference: Items_____

EXCEPTIONS:

VERIFIED	ACCEPTED
_____	_____
(Signature and Date) Assistant Superintendent of Transportation MTS - Rail	(Signature and Date) System Safety Manger MTS-Rail
CONCURRED	ACCEPTED
_____	_____
(Signature and Date) Superintendent of Transportation MTS - Rail	(Signature and Date) MTS Chief Operating Officer – Rail Division

EXHIBIT 14: MAINTENANCE TRAINING CONFORMANCE CERTIFICATE

TRAINING CONFORMANCE CERTIFICATE - MAINTENANCE
Certifiable Factor No. 10b

Certificate of Conformance

Segments: Bayside Corridor, C Street, Park Boulevard

In accordance with the requirements of the Crossover and Signaling System Safety Certification Plan, I certify, to the best of my knowledge, that:

1. Adequate Training has been performed with appropriate MTS Maintenance staff, and contains instructions on safety features for normal and emergency operations.
2. All known elements and issues concerning maintenance training – which impact safety have been satisfactorily resolved.

Exceptions --- (Each exception and associated restrictions/workarounds must be explained. Restrictions/workarounds must be adequate so that the level of safety is not reduced. Use additional sheets if necessary.)

VERIFIED	ACCEPTED
_____	_____
(Signature and Date) Assistant Superintendent of Maintenance of Way	(Signature and Date) System Safety Manger MTS-Rail
CONCURRED	ACCEPTED
_____	_____
(Signature and Date) Superintendent of Maintenance of Way	(Signature and Date) MTS Chief Operating Officer – Rail Division

EXHIBIT 15: PROJECT SEGMENT SAFETY CERTIFICATE

MTS/SDTI VINTAGE TROLLEY

Project Segment Safety Certificate

Segment:

In accordance with the requirements of the Vintage Trolley Safety Certification Plan, I certify, to the best of my knowledge, that:

1. All safety certification activities identified in the Safety Certification Plan and deemed appropriate for this Project Segment have been completed and there are no unresolved items outstanding.
2. All safety-related tests were successfully completed, verified and accepted, and the results are available for inspection.
3. No unacceptable hazards to persons and property are known to exist, and SDTI is not aware of any safety hazard that would prevent the Vintage Trolley from being utilized in trolley operations with existing systems and equipment.

Exceptions --- (Each exception and associated restrictions/workarounds must be explained. Restrictions/workarounds must be adequate so that the level of safety is not reduced. Use additional sheets if necessary.)

ACCEPTED

_____
(Signature and Date)
System Safety Manger MTS-Rail
ACCEPTED

_____
(Signature and Date)
MTS Chief Operating Officer – Rail Division

REPORTING REQUIREMENTS AND CERTIFICATION DOCUMENTATION

Periodic Reports

Periodic Safety Certification Status reports will be generated and distributed to key project stakeholders to inform them of the status of the Safety Certification Program. SDTI will develop and distribute periodic progress reports of the Crossover and Signaling System Certification Program that contain the following information:

Certificates completed during the period

Audit activities during the period

Problems encountered during the period

Outstanding issues to be resolved

Progress on resolving problems

Overall certification milestone progress to date

Planned activities for next period.

Additional Safety Certification Documents

Conformance Checklists

As described in Section 2, Conformance Checklists are developed to list the safety requirements of the project as they apply to the certifiable elements and certifiable factors they are supporting. A sample design criteria conformance checklist format is shown in

Exhibit 16.

EXHIBIT 16: SAMPLE DESIGN CRITERIA CONFORMANCE CHECKLIST SAMPLE

VINTAGE TROLLEY PROJECT

CRITERIA CONFORMANCE CHECKLIST

CERTIFIABLE ELEMENT:	DATE:	
SUB-ELEMENT:	PREPARED BY:	VERIFIED BY:
CONTRACT NO.:	REVISION:	

		CRITERIA VERIFICATION			
REQ. I.D.	REQUIREMENT	Status	Initial	Date	VERIFICATION DOCUMENT REFERENCE

DEFINITIONS:

CERTIFIABLE ELEMENT: Refers to the portion of the contract to be certified, i.e.; train control, LRV, etc.

SUB-ELEMENT: Refers to a part of a certifiable element for which safety requirements have been developed.

CONTRACT NO: Specifies the contract number(s) assigned to the certifiable element.

PREPARED BY: Individual preparing the checklist and the organization represented by that individual.

VERIFIED BY: Individual verifying the checklist.

REVISION: The current revision number of the specific checklist.

REQ. I.D.: Contains consecutive identification numbers for each safety requirement.

REQUIREMENT: Identifies or references the criteria requirements. Also includes, where applicable, the source, code, or standard which forms the basis of the design criteria.

CRITERIA VERIFICATION: Initials/name of the design engineer or other person who verified that the requirement has been incorporated in the contract documents, the status of the item, and the date. NOTE: For all partially compliant and non-compliant indications, additional information must be provided in the "Verification Document Reference" column. The status will be indicated by the following symbols.

C = Compliance; N = Noncompliance; P = Partial Compliance

VERIFICATION DOCUMENT REFERENCE: Identifies the specification section, drawing number, or file/location within the agency's document control system and/or contracts where the safety (or security) requirement has been incorporated.

EXHIBIT 17: SAMPLE CONSTRUCTION SPECIFICATION CONFORMANCE CHECKLIST

VINTAGE TROLLEY PROJECT

CONSTRUCTION SPECIFICATION CONFORMANCE CHECKLIST

PROJECT SEGMENT:	DATE:
CERTIFIABLE ELEMENT:	PREPARED BY: VERIFIED BY:
CONTRACT NO.:	REVISION:

Item No.	SAFETY REQUIREMENT	Specification Reference		EVIDENCE				
				Verification Responsibility	Verification Document Reference	Status	Verified	
		Section Page.	Paragraph				By	Date
1.								
2.								
3.								
4.								
5.								

DEFINITIONS:

PROJECT SEGMENT: Refers to the portion of the project segment to be certified.

CERTIFIABLE ELEMENT: Refers to certifiable element for which safety requirements have been developed.

CONTRACT NO: Specifies the contract number(s) assigned to the certifiable element.

PREPARED BY: Individual preparing the checklist and the organization represented by that individual.

- **VERIFIED BY:** Individual verifying the checklist.

REVISION: The current revision number of the specific checklist.

REQ. I.D.: Contains consecutive identification numbers for each safety requirement.

REQUIREMENT: Identifies or references the specifications requirements.

SPECIFICATION REFERENCE: Specification section and page number from where safety requirement is taken.

VERIFICATION RESPONSIBILITY: Department/Organizations responsible for verifying the safety requirement.

VERIFICATION DOCUMENT REFERENCE: Document reference providing evidence of compliance with specified safety requirement.

STATUS: the status of the item. NOTE: For all partially compliant and non-compliant indications, additional information must be provided in the "Verification Document Reference" column. The status will be indicated by the following symbols.

C = Compliance; N = Noncompliance; P = Partial Compliance

VERIFIED: Initials/name of the person who verified that the requirement has been incorporated in the manufactured/installed system/equipment