

Washington Metropolitan Area Transit Authority



SAFETY & SECURITY CERTIFICATION PLAN

March 2015

REVISION HISTORY

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March 2012	2	Total Document Revision
March 2015	3	Total Document Revision

PREFACE

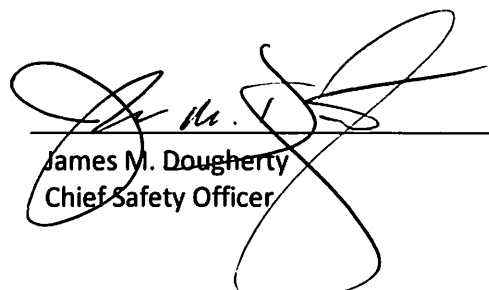
System safety and security play important roles in achieving and maintaining the Washington Metropolitan Area Transit Authority (WMATA) mission to provide exceptional service in a safe and secure operating environment. WMATA has implemented a Safety and Security Certification Plan (SSCP) to help in the achievement of this mission.

The goal of safety and security certification is to ensure that Metrorail extensions, new and rehabilitated facilities and vehicles; and new and rehabilitated Metrobus facilities and equipment are operationally safe and secure for customers, employees, and the general public. To this end, the SSCP establishes a formal verification process to ensure that safety and security requirements are incorporated into design, construction/ installation, procurement and testing activities; training programs; and operations and maintenance procedures.

This document identifies the management responsibilities and the technical process for the implementation of the SSCP. Only with the effective coordination and a team approach can the SSCP successfully fulfill its goals and objectives within WMATA.

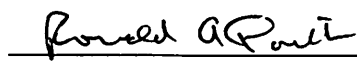
CONCURRENCES AND APPROVAL

This Safety and Security Certification Plan is submitted by the Executive Safety Committee for approval.



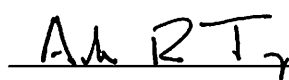
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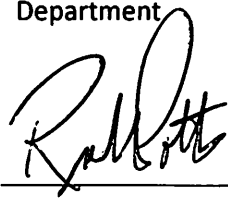
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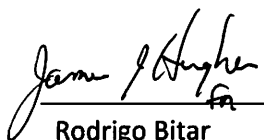
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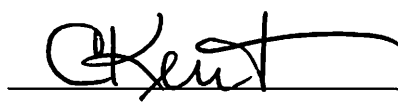
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1 INTRODUCTION

1.1 Authority

The Federal Transit Administration (FTA), through 49 CFR Part 659 – Rail Fixed Guideway Systems, State Safety Oversight requires rail safety oversight of the Metrorail system, a Washington Metropolitan Area Transit Authority (WMATA) rail fixed guideway system operating in the State of Maryland, the Commonwealth of Virginia and the District of Columbia. The Tri-State Oversight Committee (TOC) is the organization responsible for promulgating System Safety Program Standards and Procedures for, and providing rail safety oversight of, the WMATA Metrorail system.

TOC requires WMATA to prepare a System Safety Program Plan (SSPP) conforming to standards as defined in the TOC Procedures Manual for State Safety Oversight of the WMATA Metrorail System. The TOC Procedures Manual also requires the development and implementation of a Safety and Security Certification Plan (SSCP) for the Metrorail system. FTA Circular 5800.1, Safety and Security Management Guidance for Major Capital Projects also requires the development of an SSCP for major capital projects covered by 49 CFR Part 633. This SSCP fulfills the TOC, FTA Circular, and WMATA SSPP requirements and establishes the process for verifying the incorporation of essential safety and security requirements into all new and rehabilitated WMATA alignments, facilities, systems and equipment.

1.2 Background

The SSCP presents a comprehensive approach to ensuring the safety and security of future extensions, capital improvements, and the integration of new and rehabilitated facilities, systems and equipment. The SSCP is modeled after the FTA Handbook for Transit Safety and Security Certification (Reference 1.7.5), tempered with the experience gathered from other transit safety and security certification programs and the unique requirements of WMATA and its tri-state operations.

The key documents that form the baseline for safety and security certification include:

- WMATA System Safety Program Plan;
- WMATA Security and Emergency Preparedness Plan;
- WMATA design development drawings, standard drawings, standard specifications, design criteria manuals and directive drawings, which determine the safety and security requirements to be reflected in the contract specifications;
- Metrorail Safety Rules and Procedures Handbook (MSRPH) and other applicable WMATA operating rules and procedures;
- National Fire Protection Association (NFPA), American Railway Engineering and Maintenance of Way Association (AREMA), the transit industry, and other applicable codes and standards; and
- Contractual documents and specifications, which define the safety and security features of facilities, systems, and equipment.

1.3 Purpose

The purpose of the SSCP is to ensure that:

- Design and operating hazards and security vulnerabilities are identified, evaluated and properly controlled or mitigated, prior to the commencement of passenger service;
- All critical system elements are evaluated for compliance with the identified safety and security requirements during the design, construction/installation, testing, and start-up phases of a project; and
- WMATA bus and rail systems are operationally safe and secure for customers, employees, emergency personnel and the general public, prior to entering, or re-entering after modification, revenue service or use by WMATA personnel.

1.4 Goals and Objectives

WMATA will self-certify that system extensions and new and rehabilitated facilities, systems and equipment are as safe and secure as reasonably possible, within available resources, for use by passengers, employees, contractors, emergency responders, and the general public. For this reason, the goal of the SSCP is to achieve and demonstrate an acceptable level of risk through:

- Systematic approach to hazard and threat/vulnerability management;
- Compliance with safety and security codes, standards, and industry practices;
- Safety and security criteria adherence and specification compliance; and
- Design, construction/installation, testing, and start-up phase verification and review.

Specific program objectives that support the above goals include:

- Potential safety hazards are evaluated and resolved at the earliest possible phase of the project, with resolutions tracked and documented;
- Potential security issues are assessed and resolved at the earliest phase of a project, as possible, with actions taken tracked and documented;
- Appropriate codes, guidelines and standards are reviewed and applied so as to provide a basis for safety and security considerations in the design criteria;
- Facilities, systems, and equipment are designed, constructed, built, inspected and tested in accordance with design criteria and specifications;
- Necessary changes are made to system safety plans, system security plans, operating and maintenance plans and procedures, rulebook, and training programs;
- Personnel are trained and certified to operate and maintain the facilities, systems, and equipment; and
- Emergency response agencies are familiar with, received initial training and refresher training with the inherent hazards of WMATA operations and response to WMATA emergencies.

1.5 Scope

This SSCP is applicable to all new rail extensions, rail and bus rolling stock, systems, and facilities. Rehabilitation and modification projects are included in the certification plan if it affects safety or security critical systems. The WMATA SAFE staff and Project Manager evaluate and determine the level of certification for each project; which shall be made available to the Safety and Security Certification

Review Committee (SCRC).

Major rail capital projects over \$100 million, which are funded by the FTA, shall meet the required project certification activities, as described in the projects' Safety and Security Management Plans (SSMPs). FTA may also require a project-specific plan for other capital projects. The development of the project-specific appendices to this plan will be based on this plan.

The SSCP addresses three separate, but overlapping functional areas:

- System Safety and Security;
- Fire/Life Safety; and
- Occupational Safety.

The scope of the SSCP encompasses the equipment, operating and maintenance plans, facilities, and procedures for the following:

- System Elements - includes the passenger vehicles, third rail, train control system, voice & data communications, CCTV cameras and recorders, intrusion detection system, traction power substations, track, automatic fare collection equipment, supervisory control, fire protection and suppression systems, auxiliary vehicles and equipment, and buses.
- Fixed Facilities - includes rail stations, parking garages and parking lots, bus stops, pedestrian overpasses and bridges, rail and bus yards and shops, structures, and the central control facility. Equipment installed in stations and shops (such as Kiosk, HVAC, escalators, elevators, and lighting) is considered part of the facility. Similarly, equipment installed along the guideway (such as tunnel lighting, emergency access/exits, Emergency Trip Stations (ETS), pump, and fans) is considered part of the facility.
- Testing – includes contractual, integrated, and pre-operational tests.
- Safety, Security, System Assurance, Operational, Maintenance Plans and Procedures - includes items such as Emergency Preparedness Plan, Snow Emergency Plan, Operations and Maintenance Training Programs, Employee Qualification, Emergency Responder Training, Rule Book, Standard Operating Procedures, Quality Assurance/Quality Control Plans (including integrated testing and pre-revenue service), and Operations Administrative Procedures.

1.6 Revisions

The SSCP is reviewed by the Department of Safety and Environmental Management (SAFE) at least triennially and amended or revised, as required, to reflect process changes as determined by audit activities. Proposed revisions are reviewed by members of the SCRC and submitted to the Executive Safety Committee (ESC).

1.7 Reference Documents

The following documents were used either in the preparation of the SSCP, or are references for related information:

- WMATA, System Safety Program Plan, January 2014
- WMATA, Safety Rules and Procedures Handbook, July 2012

- Tri-State Oversight Committee Program Standard for State Safety Oversight of the WMATA Metrorail System, September 2012
- 49 CFR Part 659 Rail Fixed Guideway Systems, State Safety Oversight, Federal Transit Administration
- FTA Office of Safety & Security, Handbook for Transit Safety and Security Certification, November 2002
- Mil-Std-882D. Standard Practice for System Safety, U.S. Department of Defense, February 2000
- Mil-Std-882C. System Safety Program Requirements, U.S. Department of Defense, January 1993

1.8 Acronyms

Acronyms applicable to this Plan are presented below:

AGM	Assistant General Manager
BMNT	Office of Bus Maintenance
BUS	Department of Bus Services
CENI	Office of Chief Engineer, Infrastructure
CENV	Office of Chief Engineer, Vehicles
CFR	Code of Federal Regulations
CMNT	Office of Rail Car Maintenance
COG	Metropolitan Washington Council of Governments
CPDO	Office of Capital Program Delivery
CSO	Chief Safety Officer
COUN	Office of General Counsel
ELES	Office of Elevator and Escalator Services
ESC	Executive Safety Committee
FTA	Federal Transit Administration
IRPG	Office of Infrastructure Renewal Programs
IT	Department of Information Technology
MCAP	Office of Major Capital Projects
Mil-Std	Military Standard
MTPD	Metro Transit Police Department
NFPA	National Fire Protection Association
OEM	Office of Emergency Management
PRMT	Office of Procurement and Materials
QAAW	Office of Quality Assurance and Warranty

RTRA	Office of Rail Transportation
RTTO	Office of Train Operations
SAFE	Department of Safety and Environmental Management
SMNT	Office of System Maintenance
SRPG	System Renewal Program
SSMP	Safety and Security Management Plan
SSPP	System Safety Program Plan
SSCP	Safety & Security Certification Plan
SCRC	Safety & Security Certification Review Committee
TIES	Department of Transit Infrastructure and Engineering Services
TOC	Tri-State Oversight Committee
TRST	Office of Track and Structures
WMATA	Washington Metropolitan Area Transit Authority

2 PROGRAM MANAGEMENT, ORGANIZATION, AND RESPONSIBILITIES

2.1 Organizational Management Structure

The WMATA SSCP is managed by a coordinated effort of WMATA staff. SSCP implementation is the responsibility of all project staff, including contractors. The SCRC oversees the effectiveness of the SSCP, all SCRC Members must be WMATA employees.

2.2 Organizational Responsibilities

2.2.1 Department of Safety and Environmental Management

The Department of Safety and Environmental Management (SAFE), is responsible for managing and monitoring implementation of the SSCP on a day-by-day basis, and for verifying completion of all tasks that address safety and security critical elements. Other responsibilities include:

- Reviewing and updating, as required, the SSCP;
- Chairing the SCRC;
- Identifying and defining the certifiable elements, items, and safety and security requirements;
- Developing the compliance checklists;
- Reviewing verification documentation for each certifiable element to ensure compliance with the identified safety and security requirements;
- Advising the SCRC of documentation discrepancies or completeness that require resolution;
- Determining the hazard severity, probability, and hazard risk index of identified hazards;
- Establishing a hazard/threat log to track all identified safety hazards and security vulnerabilities to resolution;
- Reporting progress of the Safety and Security Certification effort to the SCRC;
- Preparing for issuance Certificates of Compliance for each certifiable element and the system as a whole;
- Reviewing the Safety and Security Certification process;
- Recommending revisions to the SSCP;
- Providing a final Safety and Security Certification Report for each project that has undergone safety and security certification through the SCRC; and
- Transmitting a final Safety and Security Certification Verification Report for each Metrorail project to TOC.

2.2.2 Metro Transit Police Department (MTPD)

The MTPD and the OEM unit within the MTPD, works with project managers to ensure:

- Security requirements are incorporated in project contracts and specifications;
- Development of the security aspects in compliance checklists;

- Security verification documentation supports compliance with the security requirements; and
- An appropriate security risk index is assigned to an identified vulnerability or threat, based on severity and probability.

2.2.3 Office of Chief Engineer, Infrastructure (CENI)

The Chief Engineer, Infrastructure (CENI) reports to the AGM/TIES and is delegated the responsibility for the acquisition, construction and for completing the safety and security certification process (with SAFE) for new facilities, and systems. This responsibility includes the research, planning, design, engineering, construction, manufacturing and testing of all new facilities and systems. CENI is responsible for the safe delivery of infrastructure renewal projects, managing adjacent construction and managing joint development projects. In addition, CENI is responsible for maintaining, updating and publishing the WMATA *Emergency Response Maps*. The Chief Engineer has established procedures to ensure CENI's compliance with applicable safety requirements for all projects assigned to CENI. CENI staffs are charged with the responsibility for implementing the SSCP for each project when safety and security certification is required. Additional safety and security program responsibilities include:

- Participation as active members of the SCRC;
- Assisting in the identification of safety and security certifiable elements, items and requirements;
- Assisting in the development of safety and security compliance checklists;
- Assurance that the project management organization (internal and consultants) incorporate safety and security requirements into the project design criteria and specifications;
- Assurance that project staff and/or the contractor(s) develops an adequate project document record keeping and submittal system to facilitate the verification process;
- Assurance that the contractor meets the identified safety and security specification requirements, under their control; and
- Assurance of the successful completion of all safety/security related specification and integration test program activities.

2.2.4 Office of Major Capital Projects (MCAP)

The Director of MCAP reports to the AGM/TIES and is responsible for ensuring that proper capital investments are made to support the safe operations of the Metro system. Under direction of Office Director, MCAP is responsible for engineering, design and construction of bus garages, parking structures, MTPD substations, yards, maintenance bays, shops, and other facilities to support Metro System operations. MCAP staffs are charged with the responsibility for implementing the SSCP for each project when safety and security certification is required. Additional safety and security program responsibilities include:

- Participation as active members of the SCRC;
- Assisting in the identification of safety and security certifiable elements, items and requirements;
- Assisting in the development of safety and security compliance checklists;

- Assurance that the project management organization (internal and consultants) incorporate safety and security requirements into the project design criteria and specifications;
- Assurance that project staff and/or the contractor(s) develops an adequate project document record keeping and submittal system to facilitate the verification process;
- Assurance that the contractor meets the identified safety and security specification requirements, under their control; and
- Assurance of the successful completion of all safety/security related specification and integration test program activities.

2.2.5 Office of Capital Program Delivery (CPDO)

The Senior Director of CPDO reports to the AGM/TIES and is responsible for streamlining internal processes within key groups and facilitating communication between logical internal and external partners. The CPDO office includes the offices of Infrastructure Renewal Programs (IRPG), System Renewal Program (SRPG), and Track Allocation and Support Services (TASS). CPDO staffs are charged with the responsibility for implementing the SSCP for each project when safety and security certification is required. CPDO staffs are charged with the responsibility for implementing the SSCP for each project when safety and security certification is required. Additional safety and security program responsibilities include:

- Participation as active members of the SCRC;
- Assisting in the identification of safety and security certifiable elements, items and requirements;
- Assisting in the development of safety and security compliance checklists;
- Assurance that the project management organization (internal and consultants) incorporate safety and security requirements into the project design criteria and specifications;
- Assurance that project staff and/or the contractor(s) develops an adequate project document record keeping and submittal system to facilitate the verification process;
- Assurance that the contractor meets the identified safety and security specification requirements, under their control; and
- Assurance of the successful completion of all safety/security related specification and integration test program activities.

2.2.6 Office of Chief Engineer Vehicles (CENV)

The Chief Engineer, Vehicles (CENV) reports to the AGM/TIES. CENV is responsible for operations and maintenance needs of rail car vehicles. CENV provides technical support to procurement of vehicles and contractor selection for rail car vehicles. CENV Program Management leads and coordinates with METRO vehicle stake holders (e.g. CMNT, PRMT, QAAW, SAFE, COUN, RTTO and RTRA) the delivery and acceptance of railcars which meet the specification requirements outlined in the vehicle procurement requirements and that the project remains legally compliant. Rail car system configurations are coordinated with respective departments for quality, maintenance, operators' use and safety to ensure that stakeholder's needs are incorporated and that the highest level of performance and service are delivered to WMATA customers.

CENV develops and maintains configuration controlled specifications and historical databases for rail car vehicles and configuration-controlled documents for rail car maintenance personnel. CENV staffs are charged with the responsibility for implementing the SSCP for each project when safety and security certification is required. Additional safety and security program responsibilities include:

- Participation as active members of the SCRC;
- Assisting in the identification of safety and security certifiable elements, items and requirements;
- Assisting in the development of safety and security compliance checklists;
- Assurance that the project management organization (internal and consultants) incorporate safety and security requirements into the project design criteria and specifications;
- Assurance that project staff and/or the contractor(s) develops an adequate project document record keeping and submittal system to facilitate the verification process;
- Assurance that the contractor meets the identified safety and security specification requirements, under their control; and
- Assurance of the successful completion of all safety/security related specification and integration test program activities.

2.2.7 Office of Bus Maintenance (BMNT)

The Office of Bus Maintenance is located within the department of Bus Services. The Managing Director of Bus Maintenance (BMNT) reports directly to the AGM-Bus, and is responsible for the acquisition, engineering, design, and maintenance activities of buses and motor vehicles, including training of maintenance staff. The Managing Director of Bus Maintenance implements the SSCP related to transit bus related projects subject to certification. BMNT staffs are charged with the responsibility for implementing the SSCP for each project when safety and security certification is required. Additional safety and security program responsibilities include:

- Participation as active members of the SCRC;
- Assisting in the identification of safety and security certifiable elements, items and requirements;
- Assisting in the development of safety and security compliance checklists;
- Assurance that the project management organization (internal and consultants) incorporate safety and security requirements into the project design criteria and specifications;
- Assurance that project staff and/or the contractor(s) develops an adequate project document record keeping and submittal system to facilitate the verification process;
- Assurance that the contractor meets the identified safety and security specification requirements, under their control; and
- Assurance of the successful completion of all safety/security related specification and integration test program activities.

2.2.8 Other WMATA Offices

SAFE, the Office of Engineering and Capital Projects, and Metro Transit Police are principally involved in the safety and security certification process. However, depending on the scope of a project other WMATA internal offices may be required to participate in the certification process.

2.2.9 Safety and Security Certification Review Committee (SCRC)

The SCRC was established as a subcommittee of the Executive Safety Committee (ESC) under WMATA Policy/Instruction No.10-2/2. The SCRC is responsible for overseeing SSCP implementation and for ensuring that certifiable levels of operational safety and security items (i.e. system, subsystem, and programs) are completed and verified. The SCRC is accountable to the ESC for the overall conduct and implementation of the SSCP and approval of the certification documentation, in accordance with the WMATA SSCP. As such SCRC voting members must be WMATA employees. The SCRC is responsible for the following:

- Reviewing the SSCP to ensure it meets project safety and security requirements;
- At its discretion, establishing project specific working groups responsible for implementing the safety and security certification process;
- Ensuring the safety certification process begins in the planning and design phases and continues through the testing and start-up phases of the project (as applicable);
- Ensuring certification checklists are prepared and completed in a timely manner;
- Resolving issues of verification documentation discrepancies and incompleteness (evidence of compliance with safety and security requirements);
- Approving mitigation/control measures for open issues, based on the recommendation of project staff, consultant/contractor, and SAFE. If consensus cannot be reached, the issue is submitted to the ESC for final resolution;
- Assigning responsibilities for implementation of mitigation/control measures for the open issue(s);
- Defining additional safety/security-related tests and analysis, as required;
- Determining whether to accept the existence of specific conditions or require corrective actions, including the specific method to mitigate and control the conditions, based on recommendations;
- Evaluating proposed hazard/threat resolution methodologies and evidence of compliance to safety/security requirements;
- Providing recommendations to the ESC regarding certification of projects; and
- Approving the final verification report for each project.

The Chief Safety Officer (CSO) or designee serves as chairperson of the SCRC and is responsible for preparing all committee materials, documents, agenda, and issuance of meeting minutes.

Note: SCRC representative designees have the same decision-making authority as the primary representative.

As conditions require, subcommittees may be formed for specific purposes, using special expertise to

resolve a hazardous condition or vulnerability. Other WMATA staff may be requested to provide their expert input on specific agenda items. Personnel from the following organizations may also be requested to provide information, assistance, and advice:

- Local and State Police and Fire Departments;
- Engineering Design and Construction Consultants, to include resident engineers; and
- Metropolitan Washington Council of Governments (COG).

The SCRC meets monthly, to assess the status of the certification effort of each project's SSCP. The SCRC may meet more frequently to resolve outstanding safety and security issues, as they arise, and to approve Certificates of Compliance, as they are completed, or less frequently if no committee business is pending.

SCRC actions are based on a consensus process involving all Committee members. In the event the SCRC is unsuccessful in resolving an issue, the Committee Chairperson summarizing the points of view prepares a written report. The report is submitted to the Executive Safety Committee for review and resolution. The final action taken will be noted in the SCRC minutes and the Open Items List.

2.2.10 Executive Safety Committee

The ESC is comprised of senior and executive management staff responsible for the oversight of several safety subcommittees, of which the SCRC is one. The ESC performs an executive management review of the SSCP. The ESC is also responsible for issuing the Project System Safety Certificate for each project, as recommended by the SCRC. The ESC is also responsible for resolving issues that cannot be resolved by the SCRC.

2.2.11 Passenger Rail Safety Subcommittee

The Passenger Rail Safety Subcommittee reports to the Metropolitan Washington Council of Governments (COG) Fire Chiefs' Committee. It is a standing subcommittee whose purpose is to provide a liaison between WMATA and fire/rescue agencies. The Subcommittee is comprised of representatives from the six major fire jurisdictions and the Department of Safety and Environmental Management. The responsibilities of the Subcommittee are to:

- Provide recommendations on Metro-related fire emergency equipment;
- Develop, update and maintain emergency procedures affecting WMATA;
- Review and recommend fire/life safety criteria changes as necessary for equipment and facilities during the design phase;
- Review and revise as necessary, Policy Agreements;
- Advise the Fire Chiefs' Committee on safety problem areas; and
- Provide liaison for fire service training.

The Subcommittee is informed of proposed facilities and systems and of design changes that may affect rescue procedures and fire protection and life safety features, before they are implemented by WMATA. WMATA and COG staffs also provide technical and logistical support to the SCRC.

3 SAFETY AND SECURITY CERTIFICATION PROCESS

Prior to any project starting the Safety and Security Certification Process the project must be assessed by SAFE certification staff with the support of the WMATA project manager assigned to the project (attachment 8) to establish the level of Certification to be performed.

3.1 Steps in the Safety and Security Certification Process

The Safety and Security Certification Process begins with system planning and design, and continues into the start of revenue service. It is imperative that the Safety and Security Certification process is completed and all Category I and II hazards associated with the use of a new or rehabilitated system or facility are eliminated or effectively mitigated prior to the start of in-service use. Certification of all non-operational certifiable elements for any new or rehabilitated rail line segment or rail related system or opening of a rail related facility must be fully completed prior to entering the pre-revenue demonstration phase of the project. The pre-revenue demonstration phase must be started a minimum of 30 days in advance of the anticipated opening date. This timeframe is required to allow the operating department and the TOC to conduct an operations readiness review of the system or facility being placed into service. When establishing an opening date for the rail line segment, system, passenger vehicle use, or facility, this timeframe must be considered. Non-rail related facilities or systems are not permitted to be placed into service prior to the issuance of the System Safety and Security Certificate.

The steps required to attain System Safety and Security Certification are discussed in the subsequent sections:

- Step 1 Identify Certifiable Elements;
- Step 2 Develop Safety and Security design criteria;
- Step 3 Develop design criteria compliance checklist and review for compliance with design criteria;
- Step 4 Develop specification compliance checklist and review for compliance with construction specifications;
- Step 5 Manage Test Requirements and Conduct Tests;
- Step 6 Develop Operational Checklist and Verify Compliance with Operational Requirements;
- Step 7 Manage "Open Items" and Safety Critical Items List (SCIL);
- Step 8 Verify operational readiness;
- Step 9 Issue Certificates of Compliance;
- Step 10 Issue System Safety Certificate of Compliance; and
- Step 11 Issue Safety and Security Verification Report and Final Project Close-out.

The above listed steps are performed for new extensions, systems, rolling stock, and facilities. The certification process for rehabilitated and modified systems, rolling stock, and facilities is tailored to the scope of the project and its safety/security affect, if any, on the current operating environment, including the operational elements. (See Section 3.3) The matrix below (Table 2) provides a list of the activities to be performed and the organizational elements available during each phase of the project, and designates responsibility for each task.

Table 1: SSCP Responsibilities Matrix Key

Safety and Security Responsibility Matrix								
TASK	Task Type	PE	FD	CONST	IN TST	COM	OPS	
Develop Safety and Security Policy Statement	MGT	✓	▶▶	▶▶	▶▶	▶▶	▶▶	
Establish Designated Function (DF) for Safety and Security throughout the project	MGT	✓	▶▶	▶▶	▶▶	▶▶	▶▶	
Develop Safety and Security Management Plan	MGT	✓	▶▶	▶▶	▶▶	▶▶	▶▶	
Establish Safety and Security Committees	SAFE	✓	▶▶	▶▶	▶▶	▶▶	▶▶	
Create Safety and Security Responsibilities Matrix	SAFE	✓	▶▶	▶▶	▶▶	▶▶	▶▶	
Develop SSCP	MGT/ENG	✓	▶▶	▶▶	▶▶	▶▶	▶▶	
Develop and Implement Hazard and Vulnerability Resolution and Tracking System	CTR	✓	▶▶	▶▶	▶▶	▶▶	▶▶	
Prepare Preliminary Hazard and Vulnerability List	CTR	✓	▶▶	▶▶	▶▶	▶▶	▶▶	
Identify Safety and Security Certifiable Elements	CTR / SAFE	✓	▶▶	▶▶	▶▶	▶▶	▶▶	
Establish Safety and Security Certifiable Items List	CTR / SAFE	✓	▶▶	▶▶	▶▶	▶▶	▶▶	
Establish Safety and Security Configuration Management	CTR	✓	▶▶	▶▶	▶▶	▶▶	▶▶	
Create Safety and Security Certification Project Folders	CTR	✓	▶▶	▶▶	▶▶	▶▶	▶▶	
Perform Preliminary Hazard Analysis and Threat and Vulnerability Analysis	CTR	✓	▶▶	▶▶	▶▶	▶▶	▶▶	
Prepare Safety and Security Design Criteria	ENG	✓	▶▶	▶▶	▶▶	▶▶	▶▶	
Perform Safety and Security Review of Preliminary Operations and Maintenance Procedures	MGT / SAFE		✓					
Perform Safety and Security Design Reviews & Additional Hazard and Vulnerability Analysis	ENG/MGT		✓	▶▶	▶▶	▶▶	▶▶	
Develop Design Criteria Conformance Checklists	CTR	✓	▶▶					
Complete Design Criteria Conformance Checklists	CTR		✓					
Develop Test and Evaluation Requirements	CT		✓	▶▶	▶▶	▶▶	▶▶	
Develop Specification Conformance Checklists	CTR		✓	▶▶				
Complete Specification Conformance Checklists	CTR			✓				
Issue Notices and Occupancy Permits	SCRC			✓	▶▶	▶▶		
Issue Certificates & Complete Folders	SCRC			✓	▶▶	▶▶		
Complete Integrated Tests	CTR			✓	▶▶	▶▶		
Review of Engineering Change Orders & Waivers	MGT/ENG SAFE			✓	▶▶	▶▶	▶▶	
Complete Operational Readiness Review	MGT/ENG						✓	
Perform Final Safety and Security Compliance Assessment	MGT/ENG SAFE						✓	
Issue Final Safety and Security Certification	SAFE						✓	
Issue Final Safety and Security Verification Report	SAFE							✓
<i>MGT = Management ENG = Engineering CTR = Contractors SAFE = Department of Safety and Environmental Management</i>	<i>PE = Preliminary Engineering FD = Final Design CONST = Construction MTPD = Metro Transit Police Dept.</i>	<i>IN TEST = Integrated Testing COM = Commissioning OPS = Operations</i>						
Checks (✓) indicate the initiation of the activity, and shaded arrows (▶▶) indicate on-going performance.								

3.1.1 Step 1 - Identify Certifiable Elements

The certification process begins with the identification of individual elements that are critical to the safety and security of WMATA customers, employees, emergency responders, or general public. These are referred to as “Certifiable Elements”. Certifiable elements are typically defined by contract and/or specifications. These elements are broken down into four major categories: facilities/equipment, systems, integrated test requirements, and operational requirements (passenger vehicles, passenger stations, maintenance facility, training, etc.) as shown in Figure 1. A log of the certifiable elements is maintained and is referred to as the Certifiable Elements List (CEL). Many of the major certifiable elements on the CEL are composed of numerous sub-elements (equipment and subsystems) that also require certification to complete the certification process of a major certifiable element. For example, each traction power substation requires individual certification and each is tracked as a sub-element of the major element “Traction Power”. Similarly, each passenger vehicle in the fleet needs to be certified before the fleet as a whole is certified.

The certifiable elements are composed of numerous items. These items make-up the whole of the major element and require safety or security verification before the major element is considered safe and secure for use. This is known as the Certifiable Items List (CIL). Specific certifiable items on the list are dependent on the project. For each of the certifiable items, the safety and security requirements are listed. The CIL and corresponding safety and security requirements are developed jointly by SAFE, MTPD and Project Management staff through hazard analyses and threat and vulnerability assessments.

The CEL and CIL may be modified by SCRC, as needed, in order to meet the SSCP requirements.

Figure 2 illustrates the process for tracking the certifiable elements, when elements are identified during the design phase and tracked throughout the project and certification process.

Figure 1: Certifiable Elements List Development

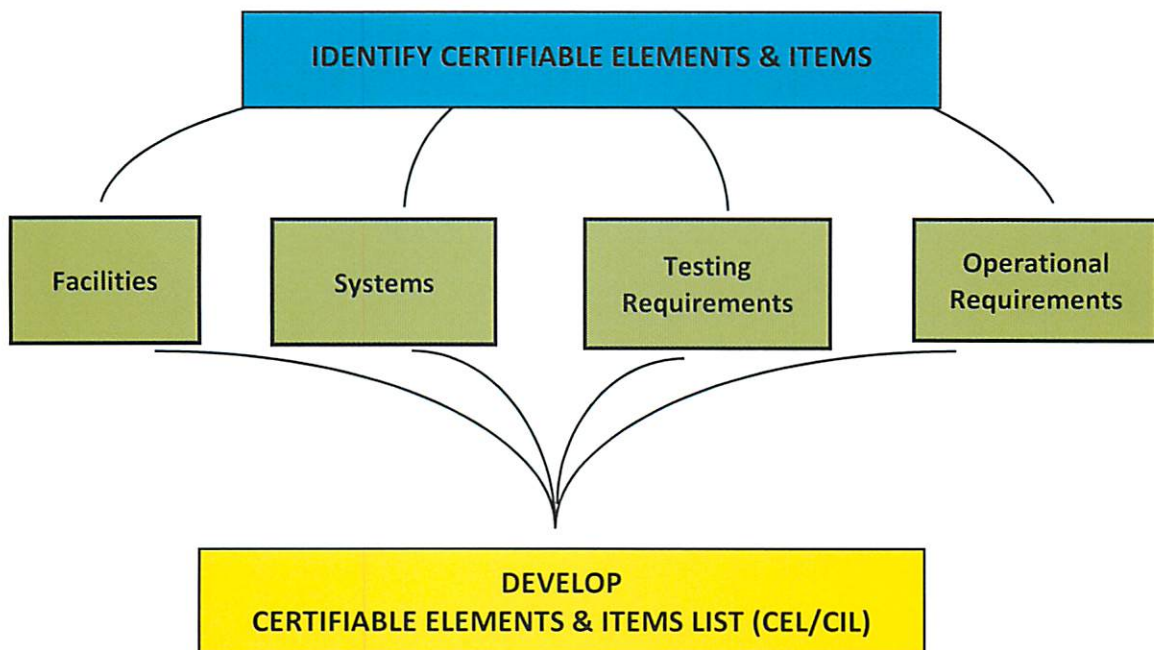
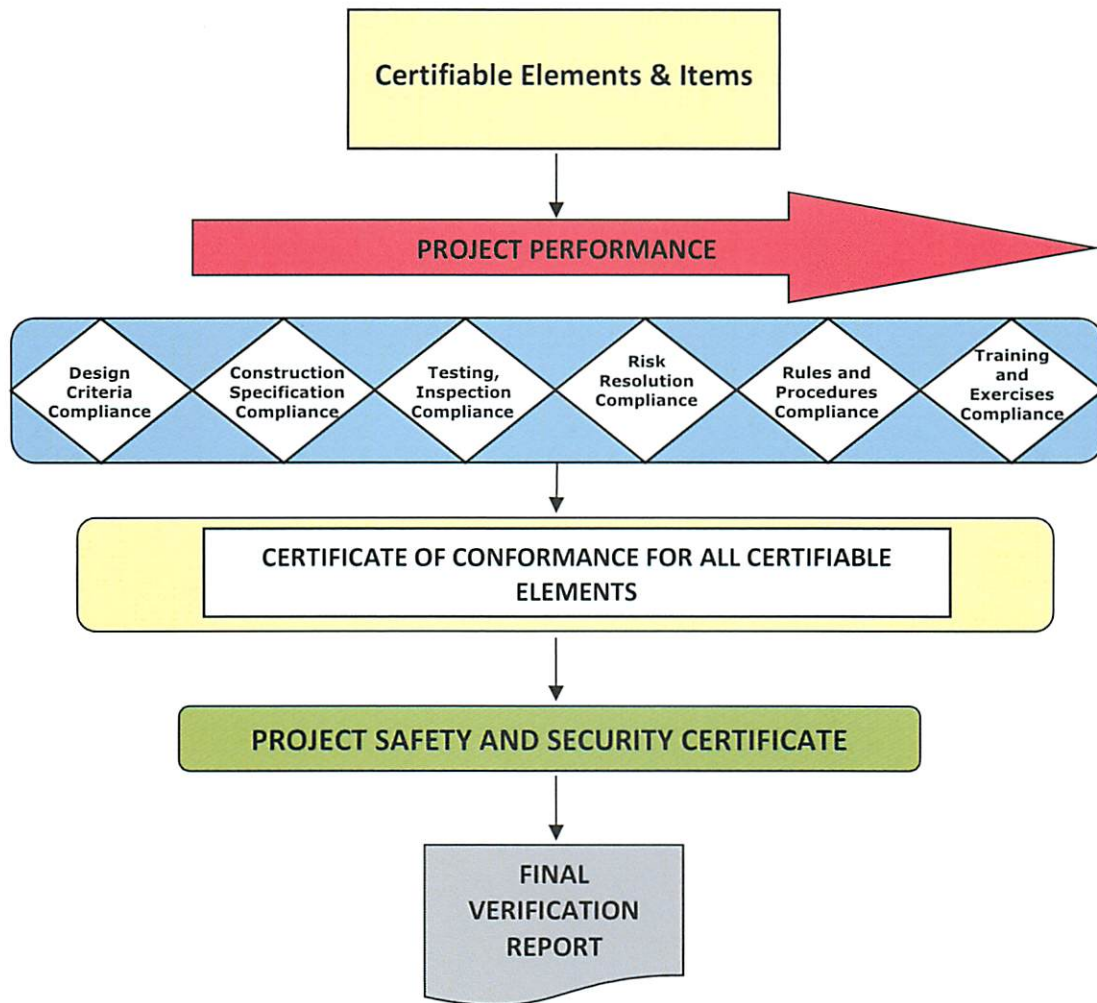


Figure 2: Certifiable Elements and the Certification Process



3.1.2 Step 2 - Develop Safety and Security Design Criteria

Suitable guidelines and controls are needed to guide project designs so that the safety and security aspects of each certifiable item are addressed. These guidelines and controls form specific criteria that are used to govern project design. Safety and security design criteria are generated from:

- Technical specifications from previous contracts;
- Agency design and performance criteria;
- Transit agency “lessons learned” from operating experience;
- The results of the preliminary hazard analysis (PHA);
- The results of the threat and vulnerability assessment (TVA);
- Transit industry safety and security practice and reports; and
- Applicable safety and security codes, standards, and regulations defined by Federal, State, and local agencies and standards boards and organizations.

Architectural and engineering design criteria and standards for the design, construction, reconstruction, maintenance, and operation of the Metro Rail and Metro Bus systems are established, maintained, and promulgated by the WMATA Design Control Board (DCB). The DCB is comprised of senior level representatives from Engineering and Capital Projects, Operations, Safety, and Metro Transit Police. The DCB updates the design criteria and standards, as warranted.

Safety and Security requirements are included in the following WMATA documents: Manual of Design Criteria, Design Drawings, Standard Drawings Technical Specifications and Scope of Work (SOW). Additional requirements are included from applicable local and state codes, hazard and vulnerability assessments and industry standards. These criteria define how the certifiable items’ safety and security aspects are addressed in the completed project and how their requirements become manifested into the final design drawings and specifications.

3.1.3 Step 3 – Develop Certified Elements/Items Checklist (CEL/CIL) to Review Compliance with the Design Criteria

Safety and Security are addressed during project design through the identification of safety and security design criteria for each certifiable element. Safety and security design criteria are intended to provide guidance to the project design team to support the definition of systems, sub-systems and components, the development of performance requirements, and the final specification of the engineered system (Figure 3). WMATA SAFE ensures that Safety and Security Certification is referenced in all their project contracts and specific documentation is included in the procurement package for design/construction services. [Reference request for proposals (RFP) Section 01115]

A compliance checklist (see Attachment 1) is used to verify that the safety and security-related criteria requirements are reflected in the contract design documents from the preliminary to final design review stage. The checklist documents that:

- Design documentation contains the safety and security-related requirements identified in the criteria;
- Designs meet safety code and regulatory compliance;
- Designs reflect transit industry safety and security standards and practices; and

- Safety and security-related design comments were addressed and successfully resolved.

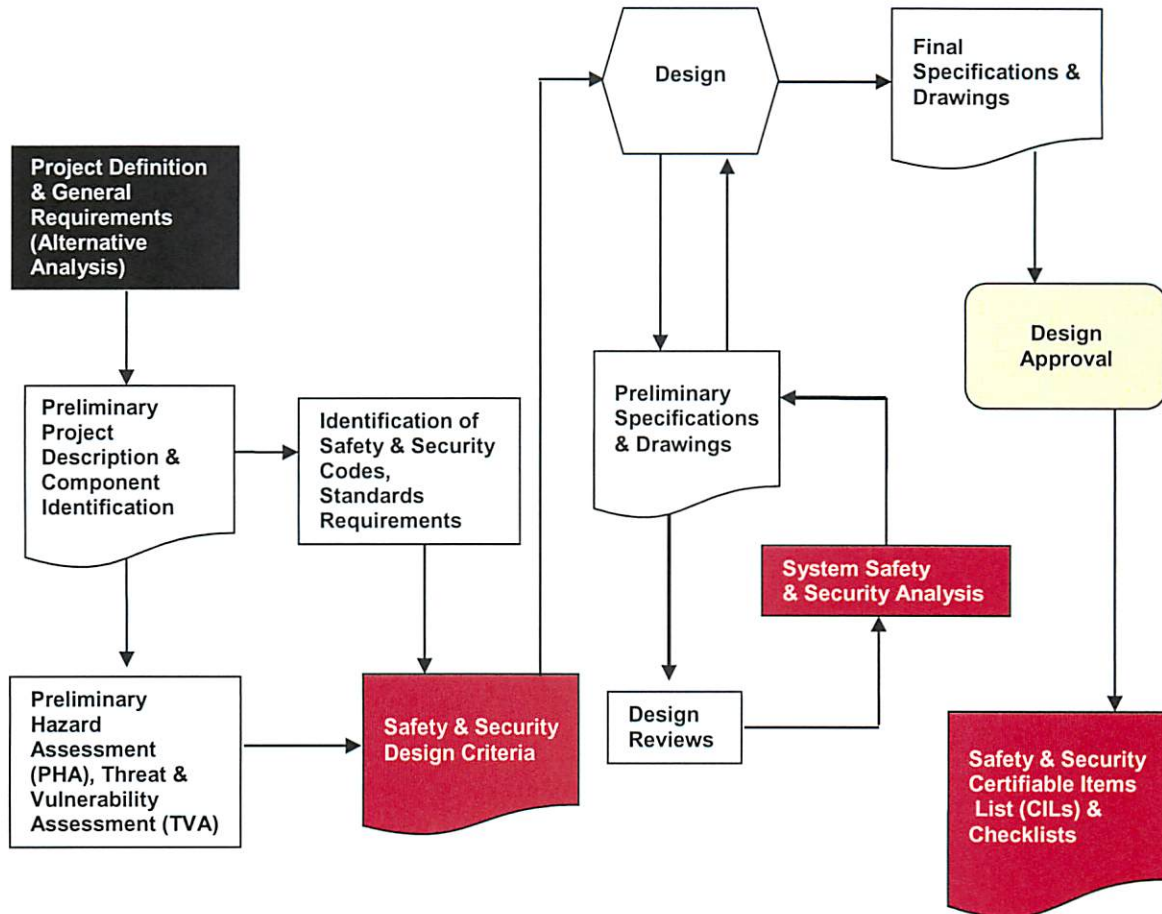
The SSCP is used to effectively manage the certification process, the criteria, code, and other requirements that are integrated on a single Design/Construction/Test Compliance checklist. These are combined under each element in constructing a CIL. This approach enables the use of a single checklist; and maintains a safety/security requirements continuity link as the project moves from the design phase to the specification/construction/installation/test phase.

SAFE is responsible for the management/initial development of the checklist; further development of the checklist by contractors depends on the specific RFP that the contract is based on. The checklist is then sent forward to Engineering and Capital Projects staff or the Chief Mechanical Officer, for rolling stock related projects. Modifications affecting existing track and elevators and escalators, are sent to TRST and ELES, respectively. The checklists are also sent to MTPD for security related systems. Project staff may recommend that:

- Items that are not certifiable be eliminated;
- Items that are not safety or security related be eliminated;
- Requirements considered to be safety or security critical are incorporated;
- Information to clarify the specific requirement and/or reference for an item be included; and
- Accepted industry practices are incorporated.

SAFE ensures that changes to the checklists are incorporated, if any, and assigns it to the appropriate Project Manager/Design Team Leader for completion. The Project Manager/Design Team Leader is responsible for having the appropriate design team member affirm that the design conforms to the referenced, pre-established codes, standards, and criteria and that these have been properly incorporated into the specifications and drawings. The design team members complete the Design portion of the checklist by identifying the specification sections and drawings, and other verification documentation and by signature. As the checklists are completed, SAFE reviews the documentation to ensure it supports the compliance with the criteria, codes, and standards. Any unresolved issues are tracked to resolution.

Figure 3: Safety and Security Design Criteria and Project Specifications



3.1.4 Step 4 – Perform Construction Specification Conformance

Specification compliance is performed to establish a formal process to verify that safety and security-related specification and contract document requirements are satisfied during the construction, installation, and testing phases of the project.

Many of the safety and security requirements in the specifications take the form of specific deliverables, such as manuals, hazard analyses, reports, approved contract submittals, factory test procedures and results, and inspection reports. However, other safety requirements may not take the form of specific contractor or in-house deliverable documents, but still require verification. Compliance with these types of safety and security-related requirements are subject to verification during audits, inspections and tests.

Prior to moving from the design phase to the construction phase, SAFE, in coordination with WMATA Project staff, develops the Construction and Test portions of the checklist within the Design/Construction/Test Compliance checklist (see Attachment 1). The safety and security requirements are derived from the contract documents, codes, and standards. Contractor and manufacturer conducted tests that verify safety or security functionality or performance requirements are included on the checklist. When consensus is reached on this section of the checklist, the checklist is given to WMATA project staff for completion. The assigned Project Manager is responsible for completing the Construction/Test portion of the checklist.

As this section of the checklist is completed, project staff prepares a binder that is used to assemble and organize the required verification documentation. Verification documentation includes:

- Inspection reports;
- Mill certificates;
- Photos;
- Visual Inspection Reports;
- Test reports; and
- Witnessing safety/security critical tests.

Drawings sets and other large volume documentation are only referenced.

A Visual Inspection Report (Attachment 2) may be used to verify safety and security requirements that cannot be verified with other documentation. The completed and signed Visual Inspection Report form, including comments to demonstrate compliance, is referenced on the Compliance Checklist and becomes part of the certification documentation. Each item being verified by a Visual Inspection Report shall have its own report, or each item shall be specially called out on a Visual Inspection Report being used to document multiple items. Photographic evidence will be presented with each Visual Inspection Report, unless item is unable to be photographed. The Visual Inspection Report shall not be used to verify items in a general multi – element or multi – segmental approach (i.e. “the entire track is installed”).

Checklists are updated when subsequently approved engineering changes impact safety or security.

As certification activities advance, SAFE monitors progress on the various checklists. This step is to ensure that the documentation effort is keeping pace with the project schedule. Any items that are lagging in the certification documentation or experience problems achieving certification are tracked and discussed at the SCRC meetings for resolution.

After completing the Construction and Test portions of the checklist, the Project Manager submits the checklist to SAFE for review. Throughout the process SAFE reviews the documentation to ensure that it supports the identified requirements. As a component of the review process, walk-through inspections of completed facilities, stations, vehicle rights-of-way, and vehicles are performed to determine that safety, security, and fire/life safety requirements have been incorporated into the construction/installation of the project and that new, previously unidentified hazards are not present.

3.1.5 Step 5 – Identify Additional Safety and Security Test Requirements

3.1.5.1 General

During the construction and start-up phases, many contractual and integrated tests are conducted for the purpose of verifying proper operation of equipment being furnished and constructed for the project. These tests are reviewed for safety and security considerations and test procedures approved before any test results are considered as meeting the test requirements. The test results are then verified per the procedures. The test plan, procedures, and test results are part of the Safety and Security Certification documentation package and are subject to review.

The need for additional tests may arise for various reasons throughout the project. SCRC reviews and determines the need and, if warranted, requests that the additional tests be conducted. The added tests are included in the Design/Construction/Test Compliance Checklist and their results documented.

SAFE and/or MTPD may observe safety/security critical tests, including but not limited to, first article inspections, mock-up reviews, qualification tests, performance tests, and acceptance tests. Testing of fire/life safety systems is coordinated with the jurisdictional Fire Marshal. Similarly TOC may wish to witness specific safety critical tests. Prior to or just after the start of each project, the Tri-State Oversight Committee will be requested to submit a list of those tests to WMATA. TOC will be provided a test schedule and be notified of the tests with sufficient time to permit attendance.

3.1.5.2 Test Required by Technical Specifications

Contractor testing, as required by the contract technical specifications, verifies the functionality of the involved system or equipment. Contractor testing is subject to certification. Contractor testing is tracked and verified on the Design/Construction/Test Compliance checklist. Typical specification tests include qualification, manufacturing, performance, and acceptance tests such as sprinkler systems, alarms, emergency management panels, fire management panels, and camera systems.

3.1.5.3 Integrated Tests and Pre-Operational Testing

WMATA specified tests may include integrated and pre-operational demonstration tests. Many of these tests are incorporated in the contract documents. Others are not necessarily required by contract specifications, but are required as part of an overall Test Plan. These tests are developed to verify the compatibility and safety/security functionality of equipment and systems. Non-contractual integrated and pre-operational demonstration tests are entered on the Design/Construction/Test Compliance checklist for tracking purposes. The Project Manager is responsible for the development and implementation of the integrated and pre-operational test demonstration plans, including test procedures related to each test, and the logging of all test documentation. SAFE assists in the development and/or reviews the development of the test plans and procedures.

Prior to conducting an integrated test, a number of safety and security specification compliance

requirements completed and/or issues resolved. Requirements and issues are dependent on the type and nature of the test. The Project Manager notifies SAFE of the intent to conduct an integrated test. SAFE, in collaboration with the Project Manager, determines the current level of verification for each element involved in the test. If the safety/security certification of the elements required for the test is not complete, SAFE issues a Temporary Use Notice (TUN), see Attachment 3. The TUN is forwarded to the engineer responsible for the particular element involved in the test. Only signatures for those elements that have not been issued a Certificate of Compliance are obtained. Any operation or test restriction is noted on the permit and the test procedure.

3.1.6 Step 6 – Develop Operational CIL and Verify Compliance with Operational Requirements

The safety and security-related plans and procedures, including training programs, are certified to assure that the major operations, maintenance, security, and safety programs, procedures, and plans have been developed and modified as necessary to meet the system safety and security program requirements, and are in place prior to revenue service. In addition, the personnel who operate, maintain, provide security, and respond to emergency situations must have an in-depth knowledge of these plans, procedures, and programs prior to beginning revenue service.

The Safety and Security Certification process provides verification that:

- Rules, procedures, and manuals meet code and regulatory requirements, if applicable;
- Operations, maintenance, and emergency rules, procedures, and plans have been developed, modified, reviewed, and implemented;
- Manuals, showing how to operate and maintain system equipment and facilities, have been developed, reviewed, approved, and accepted by the project team;
- Training programs have been developed and incorporate information regarding safety features of the system for normal, abnormal and emergency conditions;
- Training adequately addresses the operation and maintenance of safety and security critical systems and equipment;
- Safety/security related training for operations and maintenance personnel has been delivered, and successfully completed by all affected WMATA personnel; and
- Emergency training has been developed, performed, and completed by all personnel, including fire, police, and emergency medical services personnel.

Verification of these activities includes documentation of their completion and signatures of the appropriate officials or employees responsible for them. Operating and maintenance procedures and plans are judged as meeting the verification requirements or are recommended for modification. SAFE collects and maintains the required documentation.

3.1.7 Step 7 - Manage Open Items List and Safety Critical Items List (SCIL)

During the completion of the Compliance Checklists, instances of non-compliance with a safety or security requirement are noted. If the issue cannot be resolved at the project staff level, they are forwarded to the SCRC for resolution. Open items may be resolved by any of the following actions:

- Correction;

- Mitigation through physical modification, revised specifications or revised operating procedure;
- Deferral of corrections, with operational or use restrictions imposed; and
- Retention, as is, with supporting rationale.

In those cases where it is impractical to resolve the open item by meeting the original requirement, the SCRC will develop an acceptable resolution, including placing the item into service as-is, and provide documentation for resolution and acceptance.

If an open item is classified as a Category I (Catastrophic) or a Category II (Serious) hazard, it is transferred to a Safety Critical Items List (SCIL), (see Attachment 4). This includes those Category I and II open items identified through analyses or field reporting. All items on the SCIL are tracked to closure. When it is determined that an open item cannot be resolved to meet the safety requirement for issuance of a System Safety and Security Certificate, the SCRC will determine an acceptable resolution, notify the Executive Safety Committee Chair, and formally document the decision as part of the verification for the certifiable element. SAFE will coordinate the decision by issuing a document verifying closure or proposing an acceptable resolution for the open item. This process will ensure that the safety and security designed into the system are realized in the delivered, tested, and verified project.

3.1.8 Step 8 - Verify Operational Readiness

WMATA staff performs pre-revenue demonstration tests prior to the revenue service start date to verify the functional capability and operational readiness of the system. During the pre-revenue phase of the system, the procedures and plans are tested for effectiveness under simulated operating conditions for normal, abnormal, and emergency situations.

In addition, a final “walk-through inspection” of completed facilities and systems is performed.

3.1.8.1 Emergency Drills

Prior to start of revenue service, simulated emergency drills are performed at selected sites and coordinated by the Office of Emergency Management (OEM). The drills will test the effectiveness of emergency response and procedures and assure that outside emergency response personnel are prepared to adequately respond to WMATA emergencies. The drills are developed and conducted to:

- Familiarize emergency responders with WMATA operations and inherent hazards;
- Familiarize and train response personnel in emergency response plans and procedures;
- Evaluate and identify improvements to response plans and procedures before a real emergency occurs; and
- Maintain an adequate level of preparation for a possible emergency.

3.1.9 Step 9 – Review and Issue Safety and Security Certificates of Compliance

When a certifiable element or sub-element is ready for certification, a Certificate of Compliance is issued to document that all relevant safety and security requirements have been fulfilled. The following describes, in sequential order, the process for approving the Certificates of Compliance (Attachment 6).

Upon completion of the certification checklist for the certifiable element, the responsible project manager or engineer forwards the checklist, along with the supporting documentation to SAFE. The CSO

initiates a review of the checklist for completeness and reviews the supporting documentation. If the documentation adequately supports fulfillment of the safety and security requirements, the CSO prepares a certification package and forwards a recommendation regarding certification to the SCRC with restrictions, conditions, or approved temporary measures, as applicable.

The SCRC convenes to evaluate the evidence and resolves any exceptions to the requirements, open items or other issues related to issuance of the certificate. If the SCRC is satisfied that the requirements for the certifiable element or sub-element have been fulfilled, the appropriate project and WMATA staff signs a Certificate of Compliance, along with any restrictions, exceptions, conditions, or approved temporary measures.

The original, signed Certificate of Compliance and verification package are logged and filed in the Certification file. When removal of restrictions attached to a Certificate is appropriate, an addendum to the Certificate of Compliance is prepared. To become effective, the addendum is signed by the same levels of authority as that on the original Certificate.

3.1.9.1 Temporary Use Notice (TUN)

At times, it may be necessary to temporarily use a facility or system for purposes other than testing when it has not been certified. Such circumstances include, but are not limited to, the movement of a rail passenger car from one facility to another under its own power, or the use of a facility or system for training purposes. A Temporary Use Notice (TUN) must be issued for that facility or system prior to use:
By WMATA staff:

- When the facility or system is under the control of the contractor/vendor; and the facility/system is to be used by other; and
- On any portion of the current WMATA system.

The TUN is forwarded to each party involved in the temporary use, including the Project Manager and SAFE, for signature. All restrictions noted on the TUN must be followed or the TUN will be considered violated and the facility or system must be taken out of revenue service. The TUN expires upon completion of the open certification items and will be superseded by a Certificate of Compliance.

3.1.10 Step 10 - Issue System Safety and Security Certificate

The System Safety and Security Certificate of Compliance (Attachment 7) provides formal notification that the applicable portion of the operating system is safe and secure for revenue service. Prior to complete integration into revenue service, the CSO prepares the System Safety and Security Certificate of Compliance for the project. The SCRC confirms the service readiness of the capital project for use in WMATA operations and/or revenue service, and the Certificate is distributed for signature. The original, signed copy is retained in the Certification file for the project. Deferred work, approved temporary measures, and operational restrictions that remain in effect, if any, are highlighted under the "Restrictions" section of the certificate. The restrictions and approved temporary measures are tracked until finally resolved and approved by the SCRC.

The Safety and Security Certification process for all physical, non-operational elements of a rail extension or rail related system or facility must be completed and all Category I and Category II hazards eliminated or effectively controlled prior to the start of the pre-revenue demonstration phase of the project. Additionally, the pre-revenue demonstration phase must begin at least 30 days prior to the start of revenue service in order to satisfactorily demonstrate operational readiness. When determining the

revenue service/use start date for the new or rehabilitated line segment, system, or facility, sufficient time must be allocated in the project schedule for a readiness review by TOC and for the issuance of the System Safety and Security Certificate.

3.1.10.1 Issue Safety and Security Certification Verification Report

Within 60 days after the start of revenue service, SAFE prepares a Safety and Security Certification Verification Report for the project. The report summarizes the safety and security certification effort and the readiness of the line segment, facility, or system to be placed into service; an annotated matrix of the Critical Items List indicating the status (open/closed) of each item; Open Items List; and recommended actions and schedule for permanently closing out all open items, restrictions, and approved temporary measures. The report includes copies of the certification checklists, Certificates of Compliance for each certifiable element, and the System Safety and Security Certification document. A copy of the report for rail projects is submitted to the TOC.

3.1.10.2 Follow-up and Closeout

Typically there are contingencies in place when the system/facility enters into revenue service. The SCRC tracks these items and any others to closure, with the support of SAFE, ensuring the documentation is complete and accurate.

3.2 Design-Build Projects SSCPs

The FTA funded design-build rail projects valued over \$100 million require project specific SSCPs. Other projects that contain safety/security critical elements may require a project specific SSCP, as determined by the FTA or the WMATA Executive Safety Committee. Examples are infill rail stations, facility projects, rail car rehabilitation projects, and bus procurements. The SSCP is developed and executed by the design-build contractor, and reviewed and approved by SAFE in collaboration with the Project Manager. The design-build project SSCP is required to conform to the provisions contained in the FTA Handbook on Transit Safety and Security Certification guidelines, the requirements of 49 CFR Part 659 and the TOC, and the WMATA SSCP. Additionally, the plan must delineate the roles and responsibilities of WMATA and the Design-Builder's project staff in the design-build certification program. SAFE is responsible for reviewing the contractor's program to ensure that it is being implemented in accordance with the approved plan and within the required time frames.

SAFE collaborates with the appropriate Engineering, Capital Projects, and MTPD project staff to identify those projects that may require a project specific SSCP. While most projects (those under 100 million dollars) will not require a Certification Plan, SAFE intends on utilizing the safety certification process outlined within this document to ensure systems and equipment are safe for use. Projects may fall into one of four project categories, illustrated in Table 3.

Any project introduced into WMATA's Adopted Regional System (ARS) shall be assessed for the appropriate level of certification and will be safety and security certified in accordance with the WMATA Safety and Security Certification Plan (SSCP), WMATA System Safety Program Plan (SSPP) and all applicable Federal Transit Administration guidelines, Codes of Federal Regulation (CFR), and Circulars. External Entities building projects intended to be adopted into WMATA's ARS must comply with the Safety and Security Certification requirements or risk rejection of adoption by the Department of Safety and Environmental Management (SAFE).

Table 2: Examples of Projects Subject to Certification*

Project Categories				
Category 1	Category 2	Category 3	SAFE Acceptance	N/A
<ul style="list-style-type: none"> • Automatic Train Control • Automatic Train Protection • Compressed Natural Gas Facilities and Systems • Rail Operations Control Systems 	<ul style="list-style-type: none"> • Traction Power Substation • Electro-Mechanical Equipment (Deemed Safety Critical or Security Sensitive by SAFE or MTPD) • Rail Car Vehicles • Bus Passenger Vehicle • High-Rail Equipment (HRE) 	<ul style="list-style-type: none"> • Communication Systems • Fire Protection Systems • Fire/Intrusion Alarm Systems • AC Power Switchgear • Traction Power Equipment • Emergency Ventilation Systems • Maintenance Facility Equipment 	<ul style="list-style-type: none"> • Station Enhancements • Parking Facilities • Kiss and Ride / Bus loop Renovations • Minor Facility/Station modifications that do not impact Fire/Life Safety Systems. 	

The verification steps required for each of the project categories is as follows;

Category 1 – Design, construction, testing, training and manual/procedures/drawing updates verification steps are required

Category 2 – Specification, manufacturing/assembly, testing, training, and manual/procedures/drawing updates verification steps are required

Category 3 – Testing, training, and manual/procedures/drawing updates verification steps only are required.

SAFE Acceptance – Inspections conducted by WMATA SAFE Staff and/or designated Safety Certification Consultant to ensure the project under review has been built/installed in accordance with applicable codes and industry standards.

Not Applicable (N/A) – Project has been assessed by SAFE and it has been determined the project does not require Safety Certification.

*All Federal, State and Local codes and regulations apply as well as the applicable WMATA Design Criteria. The types of projects listed in the table 2 are only examples of projects that maybe selected for Safety Certification.

3.2.1 Project Specific SSCP Contents Minimum Requirements

The following is a list of bulleted items that at a minimum should be included within a project specific SSCP.

- Introduction- Project specific summary of the scope of work and background Information.

- Purpose- Purpose of the plan
- Responsibilities- Project management positions and their responsibilities in relation to the Safety and Security Certification Process
- Project's Scope of Work- A brief overview of the project's required scope, i.e., what will the project work on, do.
- Project Safety and Security Certification Working Group (and possible other project committees related to the process)- Committee or group created for the project for the purpose of administering and maintaining the project's SSCP and assuring that all participants assist and contribute to assuring certification processes are properly executed and the Certifiable Items List is appropriately populated toward the final safety and security certification and acceptance by the WMATA Safety Certification Review Committee (SCRC).
- References: Project Specific SSCP referenced documents
- Acronyms and Abbreviations: Project Specific SSCP's utilized acronyms and abbreviations
- Procedure: Description of how project items are identified as applicable for Safety and Security Certification, and how the certification of those selected items will be performed to sufficiently display the item is safe and secure for public use.
- Document Control: Description of how project documentation (specifically documentation related to the projects safety and security certification process) is going to be organized and maintained. In addition to descriptions and examples of project certification document certificate templates; certification process flow charts/figures, and a description of the process project contractor will utilize for the submission, review, and comment on certification documents such as an updated CIL and a revised SSCP. This includes an acceptable periodic timeframe for document submission in consideration of the fact that the projects safety and security certification process is expected to maintain a schedule in pace with that of the rest of the project. This should include a schedule for Safety and Security Certification within the project schedule. As well, it should include a description of how each element will be closed and how each of the forms for certification shall be used.

3.3 Rehabilitation and Modification System, Rolling Stock, and Facility Projects

Many facilities and systems, including rolling stock, require rehabilitation or modification due to their age and need for conformance with new requirements. These facilities and systems are subject to safety and security certification if the system or facility includes safety or security critical elements and/or has a safety/security impact on the current operating environment. However, certification is limited to the rehabilitated/modified sub-system itself, and to all systems and operational elements affected by the rehabilitation/modification. For example, an upgrade of a traction power substation transformer may require upgrading the rectifier, size of the cabling, switchgear, protective breakers, and the cabling to the third rail. In addition to verifying that those subsystems comply with the safety related specification and test requirements, the certification process also includes assurance that drawings, manuals, other safety critical maintenance documentation, maintenance procedures, and training have been revised to reflect the upgrade. As a result, the verification steps involved for a particular project are dependent on the type of project and its effect on other systems/subsystems. Rehabilitation/modification projects fall into one of four project categories, illustrated in Table 3.

Other projects, such as garage repair and Smart Trip Vending Machines are not subject to the certification process. However, projects not identified in Table #3, may be added; based on the scope and safety/security impact of the project, and on the recommendation of the SCRC to the ESC. Upon completion of the work, a Certificate of Compliance for Modification and or Rehabilitation Project (Attachment 5) is prepared and signed by all stake holders of the affected departments to include SAFE, the Project Manager, and Contractor/Operations.

3.3.1 Daily Certification to Ensure Operational Readiness for In-service Systems

Rehabilitation or modification work on safety critical rail operating systems, such as train control and track, may require the systems to be returned to revenue service at the end of the work shift or work period. To assure that the system may be returned for revenue service, a daily testing plan is developed to define the requirements for using the system in service per the requirements of the appropriate discipline engineering department head. Prior to the start of the work, the Project Manager is responsible to obtain approval of the daily testing plan from SAFE and appropriate maintenance and engineering department(s).

The daily testing plans and certifications are signed by the contractor employee performing the work, the Project Manager's designee, and SAFE. Daily testing and certifications are documented and maintained as part of the safety and security certification documentation.

4 HAZARD MANAGEMENT

4.1 Hazard Management Process

Hazard management is the formal process to systematically recognize, identify, evaluate, and resolve hazards associated with the design, construction, testing, start-up, and operation of the project for customers, employees, and the general public. Recognized hazards are identified and categorized as to their potential severity and probability of occurrence, and analyzed for potential impact. Those hazards are resolved by design, engineering control, procedure, warning device, or other method, so that they fall within the level of risk acceptable to WMATA management.

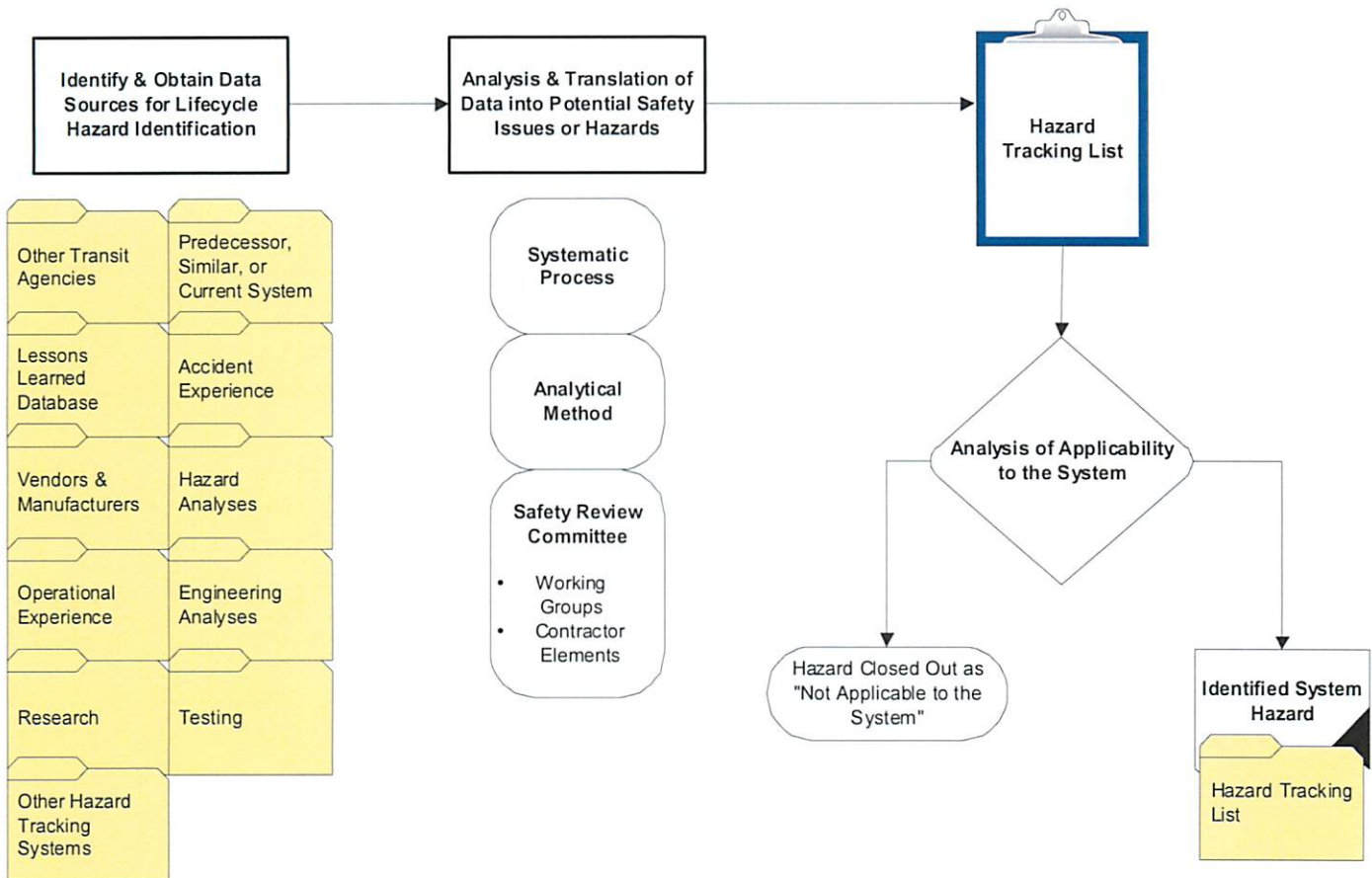
For capital projects, hazard management is most effective when applied during preliminary engineering and final design, but is used throughout each phase of a project, including start-up and operations. Hazard management is also used to evaluate the safety impacts of deviations from the baseline design, engineering/construction change orders and operationally approved temporary measures, and other modifications made during construction, testing, and project activation.

A Safety and Security Investigation Report (SSIR) (Attachment 9) is available for use by WMATA personnel to report hazards anywhere in the system including facilities, equipment, and operations (revenue and non-revenue).

Figure 4 illustrates the process used for identifying, resolving, and tracking safety hazards throughout all phases of project development activity. A more detailed description of the hazard management process is found in the WMATA System Safety Program Plan.

See next page for Figure 4- Safety Hazard Identification and Risk Acceptance Process

Figure 4: Safety Hazard Identification and Risk Acceptance Process



4.2 Hazard Identification and Resolution

System hazards are identified through specific hazard analyses, inspections, or reviews. A Preliminary Hazard Analysis (PHA) is performed during the preliminary and final engineering phases of the project to identify hazards and recommend possible countermeasures. The identified hazards are tracked to closure to ensure they have been adequately addressed through the safety certification process. SAFE is responsible for tracking all open items.

FTA has adapted category ratings for hazards. The most severe of these are:

- Category I (Catastrophic) – Defined as death or system loss; and
- Category II (Critical) – Defined as severe injury, severe occupational loss, or major system damage.

The goal of hazard management at WMATA is to verify that all identified Category I & II hazards are resolved or controlled to an acceptable level. The SCRC monitors the safety hazards from the identification stage to final resolution. The status of each Category I & II hazards are required to be resolved 30 days prior to the system, facility, or equipment is placed into service

Once the control measures are implemented, additional analyses may be required to ensure that the mitigation measures adopted to eliminate or minimize the risks are effective.

4.3 Requirements for Safety and Security Analysis

(Hazard and Vulnerability Categorization, Assessment, and Resolution)

All potential hazards and vulnerabilities identified during Preliminary Engineering (PE), Final Design (FD), Procurement, Construction and Installation, Inspection and Testing, Start-up and Integrated Testing phases will be evaluated for validity, categorized, assessed, and resolved as specified by Section 4.0. The project requirements for categorizing hazards and vulnerabilities based on their probability of occurrence and severity are shown below in Table 3-Aand4-B below.

Table 3-A: Hazard Categorization and Assessment

Probability of Occurrence of a Hazard			
Description	Probability Level	Frequency For Specific Item(s) (Events/Hour)	Selected Frequency For Fleet Or Inventory (Multiple of single items)
Frequent	A	Likely to occur frequently (Greater than 10^{-3})	Continuously experienced (10^{-2}). MTBE is less than 1000 operating hours
Probable	B	Will occur several times in the life of the item (10^{-5} to 10^{-3})	Will occur frequently in the system (10^{-3}) MTBE is equal to or greater than 1000 operating hours and less than 100,000 operating hours.
Occasional	C	Likely to Occur sometime in the life of an item (10^{-6} to 10^{-5})	Will occur several times (10^{-4}) MTBE is equal to or greater than 100,000 operating hours and less than 1,000,000 operating hours.
Remote	D	Unlikely but possible to occur in life of an item (10^{-7} to 10^{-6})	Unlikely but can be expected to occur (10^{-6}) MTBE is greater than 1,000,000 operating hours and less than 100,000,000 operating hours.
Improbable	E	So unlikely, it can be assumed occurrence may not be experienced (Less than 10^{-7})	Unlikely to occur, but possible (10^{-7}) MTBE is greater than 100,000,000 hours.

Table 4-B: Hazard Severity

Hazard Severity Categories		
DESCRIPTION	CATEGORY	MISHAP DEFINITION
CATASTROPHIC	I	Death or system loss
CRITICAL	II	Sever injury, occupational illness, or system damage
MARGINAL	III	Minor injury, occupational illness, or system damage
NEGLIGIBLE	IV	Less than minor injury, occupational illness, or system damage

WMATA has adopted a system for assessing the level of risk for each identified hazard to determine

what action(s) must be taken to correct or document the hazard risk. This risk assessment system has been incorporated into the formal system safety analysis which enables the ESC decision-makers to understand the amount of risk involved in accepting the hazard in relation to the cost (schedule, cost, operations) to reduce the hazard to an acceptable level.

The Risk Assessment Matrix (Table 3-C) identifies the Hazard Risk Index (HRI) based upon hazard severity category and probability and the criteria for defining further actions based upon that index.

Table 4-C: Risk Assessment Matrix

HAZARD FREQUENCY	SEVERITY CATEGORY 1	SEVERITY CATEGORY 2	SEVERITY CATEGORY 3	SEVERITY CATEGORY 4
Frequent (A)	1A	2A	3A	4A
Probable (B)	1B	2B	3B	4B
Occasional(C)	1C	2C	3C	4C
Remote (D)	1D	2D	3D	4D
Improbable (E)	1E	2E	3E	4E

Hazard Risk Index	Criteria by Index
1A, 1B, 1C, 2A, 2B, 3A	Unacceptable
1D, 2C, 2D, 3B, 3C	Undesirable – Management (ESC) decision
1E, 2E, 3D, 3E, 4A, 4B	Acceptable with ESC review
4C, 4D, 4E	Acceptable without review

Follow-up actions resulting from the Risk Assessment will be as follows:

- **Unacceptable:** The hazard must be mitigated in the most expedient manner possible before normal service may resume. Interim corrective action may be required to mitigate the hazard to an acceptable level while the permanent resolution is in development.
- **Undesirable:** A hazard at this level of risk must be mitigated unless a documented decision to manage the hazard until resources are available for full mitigation is issued by the CSO and forwarded to TOC [rail hazards only] for review and approval/disapproval.
- **Acceptable with review:** The CSO must determine if the hazard is adequately controlled or mitigated as is.
- **Acceptable without review:** The hazard does not need to be reviewed by the ESC and does not require further mitigation or control.

The Risk Assessment Process is used to prioritize hazardous conditions and focus available resources on the most serious hazards requiring resolution.

5 SECURITY RISK MANAGEMENT

For all Security related certification activities please refer to Metro Transit Police's System Security Emergency Plan (SSEP).

6 AUDITS

Each phase of the safety and security certification process, design through pre-revenue testing phase, is periodically reviewed to assure that the SSCP is being properly implemented and effective. The review is performed in accordance with the WMATA Internal Safety Audit Process (see Section 12.3 of the System Safety Program Plan).

Reviews of capital project elements include:

- Assurance that the Safety and Security Certificates of Compliance are supported by traceable documentation;
- Evidence that safety hazards and security vulnerabilities are tracked, analyzed and resolved in accordance with the WMATA System Safety Program Plan; and
- Overall assessment of the SSCP.

The review findings are included in the WMATA Annual Internal Safety Audit Report to TOC.

7 DOCUMENTATION

7.1 Verification Documentation

Backup documentation is critical to the success of the SSCP. Documentation provides a detailed trail of activities that demonstrate conformance with the safety and security for a project.

The documentation system promotes accountability, timeliness and accessibility. Accountability ensures that all certificates are completed accurately, signed by appropriate project staff, reviewed by the Safety and Security Review Certification Committee, and maintained in a secure manner. Timeliness ensures that each certifiable element is certified as safe and secure, prior to use. Accessibility allows quick verification that certificates are in place, and provides any other information required to support the certificates.

A master safety certification file resides within SAFE. The Project Safety and Security Certification file contains the following:

- Certifiable Elements and Items Lists;
- A summary sheet showing the certification status for the design, construction, testing, and pre-revenue phases of the project;
- Completed checklists for each certifiable element;
- Support documentation that may not be contained within the project files, such as Visual Inspection Reports;
- Test reports for safety critical systems;
- Integration test reports;

- Temporary Use Notices;
- Certificates of Compliance for all certifiable elements; and
- Original System Certificate of Compliance for the project.

7.2 Configuration Management

During the life of a project, it is not unusual for design and/or construction changes to be made to the system elements being certified. The SCRC monitors these changes for impact to the certification effort. If the impact changes the safety or security requirement or the required documentation, the safety/security requirement is re-verified. The Project Manager is responsible for obtaining the supporting documentation required as a result of the changes and assuring that changes to the design of equipment and facilities are documented in accordance Policy/Instruction 4.10/1, Configuration Management.

8 REPORTING REQUIREMENTS

8.1 Periodic Reporting

An important part of the safety certification process is briefing the ESC of the SSCP, including project certification effort status. Periodic reports are prepared by SAFE and submitted to the ESC. The frequency of the reports is dependent on certification activity levels, but quarterly at a minimum. The reports advise ESC of the:

- Safety and Security plan progress;
- Changes to project Certifiable Items Lists, if any;
- Significant problems encountered in the certification effort;
- Safety and Security Certificates of Compliance completed during the reporting period;
- Safety and Security Certificates expected to be issued in the next reporting period; and
- Certification Plan review findings and recommendations for improvement, if any.

The SAFE also prepares project certification progress reports for TOC and FTA, as requested.

8.2 Final Safety and Security Certification Report

A final Safety and Security Certification Report is prepared for each project falling under the SSCP (see Section 3.1.10). Reports for rail projects are transmitted to the TOC.

ATTACHMENTS

ATTACHMENT 1

SAFETY/SECURITY CERTIFIABLE ELEMENTS/ITEMS LIST (Example)

**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
SAFETY/SECURITY CERTIFICATION ITEMS LIST (CIL)**

Project: Certifiable Element: Revision: Checklist type: Master: Sub:			Design / Construction / Test Compliance CIL						SAFE Approval: Date: Page 1 of XX Engineering Approval: Date: Project Manager Date: Approval:						
Item No.	Description	Design Criteria Specification Reference	Design Specification Reference			Construction Installation Verification			Test Verification			SAFE Verification			Comments
			Doc Ref.	Verified By	Date	Doc Ref.	Verified By	Date	Doc Ref.	Verified By	Date	Status	Verified By	Date	

Certification Checklist Guide	
Project Certifiable	The project for which the checklist was prepared.
Element Revision	The current revision number of the specific checklist.
Date	The date of issue for the checklist.
SAFE Approval	SAFE staff approving the checklist.
Engineering Approval	Engineering design staff approving the checklist (design criteria only).
Project Manager Approval	Signature of the appropriate managers indicating formal approval of the checklist completed with the specified element type, safety and security requirements, criteria and specification reference.
Item No. Description	Describes the safety or security requirements for the certifiable element as stated in the criteria, contract specification or as shown on the contract drawings.
DESIGN PHASE	
Doc Ref	Identifies the specification section, drawing number or document control center (DCC) file where the safety or security requirement has been incorporated.
Responsible Designer	The name of the design team member assigned the responsibility for the verification of the checklist and assuring the collection of necessary documentation, including: CDRL approvals, inspection reports, factory certifications, and so on.
Verified By / Date	Initials/name of the engineer who verified that the requirement has been incorporated in the contract documents, and the date.
CONSTRUCTION AND TEST PHASES	
Verified By	Name of individual who verified the test results, and/or that the requirement had been met.
Date	Date when verification or the test took place.
Doc Ref	Complete with the applicable Document Control Number and where located. The entry should identify which document control system is used if approval has been granted not to use WMATA's.
SAFE VERIFICATION	
Status	Completed by SAFE with one of the conditions listed at the bottom of the form: OPN, CLD, and CEX for each safety or security requirement. <u>NA</u> : Not applicable <u>OPN</u> : Activity or issue is not completed, documentation not identified, or other situation prevents completing the item. <u>CLD</u> : Activity has been completed and documentation is identified and formally filed. <u>CEX</u> : Activity where the safety or security requirement cannot be completely satisfied but it presents no potential for a catastrophic or critical (Category I or II) hazard and the ESC has been formally advised. This designation would also be used in the case of an approved temporary measure.
Verified By	When each checklist page has been completed by the responsible engineer or project management staff, and the documentation has been verified, then the page will be signed and dated by SAFE. When the entire checklist is completed, the checklist package with the documentation will be transmitted to the Chief safety Officer and the document control center.
Date	Date when the verification took place.

ATTACHMENT 2

VISUAL INSPECTION REPORT (Example)



WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

VISUAL INSPECTION REPORT

Certifiable Element: _____

Sub-element: _____

Safety/Security Requirement Item No.: _____

Safety/Security Requirement:

Comments:

This is to certify that conformance with the specified requirement was verified by visual inspection.

WMATA Verification by

Date

ATTACHMENT 3

TEMPORARY USE NOTICE (Example)



**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
SAFETY AND SECURITY CERTIFICATION PLAN**

TEMPORARY USE NOTICE

TUN No:

Certifiable Element/Sub-Elements:

Restrictions Noted:

Project Manager Date

Facility/System Engineer/Manager Date

Test Engineer (if applicable) Date

Assistant Chief Safety Officer Date

Chief Safety Officer Date

TEMPORARY USE PERMIT EXPIRES UPON ISSUANCE OF CERTIFICATE OF COMPLIANCE

ATTACHMENT 4

SAFETY CRITICAL ITEMS LIST (Example)



**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
SAFETY AND SECURITY CERTIFICATION PLAN**

**SAFETY CRITICAL ITEMS LIST
(SCIL)**

Project: _____ **Prepared By:** _____ **Date:** _____
Certifiable Element: _____ **Approved By:** _____ **Date:** _____
Sub-Element: _____ **Revision No:** _____ **Date:** _____

Ref No.	Description	Potential Cause	Effect on System Subsystem	Effect on Other Systems Subsystems	Initial Risk Index	Control Measures	Residual Risk Index	Status

ATTACHMENT 5

CERTIFICATE OF COMPLIANCE REHABILITATION/MODIFICATION PROJECT

(Example)

ATTACHMENT 6

CERTIFIABLE ELEMENT CERTIFICATE OF COMPLIANCE

(Example)



**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
SAFETY AND SECURITY CERTIFICATION PLAN**

**CERTIFIABLE ELEMENT
CERTIFICATE OF COMPLIANCE**

Certifiable Element/Sub-Element:

Restrictions Noted:

The Certifiable Element complies with all applicable safety and security requirements and may be used for passenger service.

Project Manager Date

Facilities/Systems Chief Engineer Date

AGM Rail/Bus Operations Date

Chief Metro Transit Police Date

Assistant Chief Safety Officer Date

Chief Safety Officer Date

ATTACHMENT 7

SYSTEM CERTIFICATE OF COMPLIANCE

(Example)



**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
SAFETY AND SECURITY CERTIFICATION PLAN**

**SYSTEM
CERTIFICATE OF COMPLIANCE**

Restrictions Noted:

The System Certificate of Conformance signifies that all applicable safety and security requirements have been completed and the facility/system may be placed into service, with the noted restrictions.

WMATA Project Manager

Date

Chief Infrastructure Services Chief Engineer

Date

Rail/Bus Transportation

Date

AGM – TIES / AGM – BUS

Date

Deputy General Manager Administration

Date

Deputy General Manager Operations

Date

Metro Chief of Police

Date

Chief Safety Officer

Date

General Manager / CEO

Date



ATTACHMENT 8
PROJECT ASSESSMENT FORM
(Example)



*Department of Safety & Environmental Management (SAFE)
Safety & Security Certification - Project Assessment Form*

Project Title:					Date Assessed:	
Certification Category:		Safety Officer:			Assessed by:	
Mode:	Project Cost:	Funding Source:	Project Type:	WMATA Design Criteria?	Type:	Certification Mandated:
<input type="checkbox"/> Bus	<input type="checkbox"/> ≥ \$100 million		<input type="checkbox"/> Design-Build	<input type="checkbox"/> Yes	<input type="checkbox"/> MCAP	<input type="checkbox"/> FTA
<input type="checkbox"/> Rail	<input type="checkbox"/> < \$100 million		<input type="checkbox"/> Design-Bid- Build	<input type="checkbox"/> No	<input type="checkbox"/> IRPG	<input type="checkbox"/> WMATA Executive Safety Committee
<input type="checkbox"/> Facility			<input type="checkbox"/> Rehabilitation/Modification		<input type="checkbox"/> JDAC	<input type="checkbox"/> No
Type: <input type="checkbox"/> Security						
Unique characteristics (if applicable):						
Comments:						

WMATA SAFE (ACSO) Date

WMATA Project Manager Date

WMATA SAFE (Deputy Chief) Date

MTPD Certification Liaison Date
(Type: Security only)



ATTACHMENT 9
Safety and Security Investigation Report
(Example)



Safety and Security Investigation Report (SSIR)			
Identification			
Originator:	Organization:	Date:	Report Number:
Investigation Description <i>(Describe the investigation; ensure the applicable requirements, planned activities, procedures, specifications, drawing, standards, serial numbers, etc. are noted. Indicate who documented the investigation.)</i>			
Steps to Prevent Inadvertent Use of the Item or Process			
Corrective/Preventive Action and Disposition			
Planned Corrective/Preventive Action <i>(Describe for each cause what action(s) will be taken with the item or process including, as applicable, the completion dates, disposition of material, and responsible staff for each action. Describe, as applicable, what actions are needed to prevent recurrence of the identified investigation, such as process improvement, procedure revisions, training plan, etc., and include completion dates and responsible staff for each action.)</i>			
Independent verification required? Yes <input type="checkbox"/> No <input type="checkbox"/>			
Person(s) Responsible for the Corrective/Preventive Action and Disposition _____ <i>Name</i> <i>Date</i>		Approval of Corrective/Preventive Action and Disposition _____ <i>Name</i> <i>Date</i>	
Closing the Investigation Report			
Action Completed _____ <i>Name</i> <i>Date</i>		Independent Verification Completed (if required) _____ <i>Name</i> <i>Date</i>	
Distribution:			
Initial <input type="checkbox"/> Final <input type="checkbox"/>			