# INVITATION FOR BID (IFB)

# IFB NO.: FQ15155/WJG

## WASHINGTON METROPOLITAN AREA

## TRANSIT AUTHORITY

## BUS BAY, SAFETY AND ACCESS IMPROVEMENTS AT FRANCONIA SPRINGFIELD METRO RAIL STATION

## DATE: APRIL 9, 2015

## VOLUME 5

## WMATA SAFETY AND SECURITY PLANS AND DOCUMENTS

Washington Metropolitan Area Transit Authority

# DEPARTMENT OF OPERATIONS

## Administrative Procedure

| CATEGORY | TOPIC |
|---|---|
| Operational Interdepartmental Activity | Site Specific Work Plan |

| PROCEDURE NO. | TITLE |
|---|---|
| 200-33 | Site Specific Work Plan |

| LATEST REVISION NO. | LATEST REVISION DATE | LATEST REVIEW DATE | EXPIRATION DATE |
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| REV.00 | June 2, 2006 | June 2, 2007 | None |

**OAP APPLIES TO**

All WMATA Employees and Contractors

**OFFICE/INDIVIDUAL OF PRIMARY RESPONSIBILITY**

Office of Rail Reliability and Technical Services, Track Access for Maintenance and Construction Branch

**EFFECTIVE PAGES**

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| APPROVAL: Director of Rail Reliability and Technical Services | DIRECTED BY: Chief Operating Officer for Rail Service |
|---|---|
| Chris C. Barker **Date:** | Steven A. Feil, **Date:** |

DEPARTMENT OF OPERATIONS

**OPER ADMINISTRATIVE PROCEDURE 200-33** **JUNE 2, 2006**

**OPERATIONAL INTERDEPARTMENTAL ACTIVITY** **OPR: RRTS**

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
600 FIFTH STREET, NW, WASHINGTON, D.C. 20001

# SITE SPECIFIC WORK PLAN

## 1. PURPOSE

The purpose of this Operations Administrative Procedure (OAP) is to delineate responsibilities and requirements for the development of a Site Specific Work Plan (SSWP) for all personnel performing work, other than approved maintenance activities, on, around, or to WMATA rail facilities.

The purposes of a Site Specific Work Plan are as follows:

A. To describe the performance of construction and/or maintenance activities to be performed at specific locations where track access or other interface with the operating system is required. It includes all activities necessary to perform any work within the operating system.

B. To describe how each activity affects the operating system.

C. To define the scope of work, the schedule, the cut-in requirements, contingency plans for returning the system back to normal operations, and any modifications to the operating system between start and finish of the work.

D. To allow potential problems to be monitored and give warning of possible overruns by its schedule provisions.

E. To facilitate the implementation of the work crew supervisor's or contractor's contingency plans when schedule overruns cannot be averted.

F. To provide for review and approval of work activities.

## 2. SCOPE

This OAP is applicable to all personnel including Contractors and Consultants having a need to perform work on or adjacent to WMATA property. The Site Specific Work Plan (SSWP) shall provide pertinent information to all parties involved. All applicable parties must sign the SSWP to indicate their approval of the plan before track access is granted.

## 3. RESPONSIBILITIES

A. The Director of Rail Reliability and Technical Services (RRTS) is responsible for implementing and for approving revisions to this OAP.

B. The Manager of Track Access for Maintenance and Construction (TAMC) is designated the Reviewing Authority, and as such, is responsible for periodic review of this OAP and for reporting accomplishment of the review by January 31 of each year.

C. All personnel to include Contractors and Consultants who work on or adjacent to WMATA property are responsible for submitting a Site Specific Work Plan (SSWP) in compliance with this procedure and are responsible for performing the work as stated in their approved SSWP.

D. The Operations Liaison Office (OLIA), Department of System Safety and Risk Protection (SARP) and Track Access for Maintenance and Construction (TAMC) are responsible for the review, comments and approval of each SSWP.

E. The originating office must insure that all of the required signatures have been obtained.

F. The Manager of Track Access for Maintenance and Construction (RRTS/TAMC) is required to have the original Site Specific Work Plan (SSWP) with all of the designated signatures before track access is granted.

## 4. DEFINITIONS

**BOCC:** Bus Operations Control Center A sub-unit of OCC, responsible for the real time monitoring and control of Metrobus movement.

**Contingency Plan:** An alternate process for the completion of each milestone event.

**General Orders and Track Rights System (GOTRS):** is a mainframe computer program that is used by WMATA employees only to enter track rights requests in accordance with OAP 100-9

**Milestone:** A clearly identifiable point in a project/work activity that represents the completion of a related or important set of tasks.

**MOCC: Maintenance Operations Control Center** A sub-unit of OCC and it functions as a control and dispatch center for maintaining the Authority's fixed assets.

**OCCO: Operations Control Center Operations** is composed of MOCC, POCC, and ROCC.

**Piggybacking:** permission to work in the same section of track given by the supervisor of the work crew which possesses the track rights.

**Point of No Return:** A defined milestone in the project where it is determined that any further activities being performed will not allow the restoration of service to its functional state of revenue operations.

**Rail Service Adjustment (RSA):** A temporary adjustment to the Metrorail passenger train operating schedule in order to accommodate maintenance or construction activities on the Metrorail main line during revenue service.

**ROCC: Rail Operations Control Center** A sub-unit of OCCO charged with the oversight, control and direction of all vehicle movements on the Metrorail main line.

**ROW: Right-Of-Way** The land occupied by a railroad, the physical facilities, track, tunnels, surface and elevated structures through which Metrrorail trains operate.

**Timeline:** a table listing scheduled activities or events within a specific period.

**Track Rights:** the right of access and control that has been transferred from ROCC to another party for a specific time period and within specific geographic limits in the right-of-away.

**Site Specific Work Plan (SSWP):** Describes the construction and/or installation and associated schedule of work to be performed at specific locations where track usage or other interface with the operating rail road is required.

## 5. POLICIES

A Site Specific Work Plan (SSWP) shall be generated by the office planning to perform or manage a maintenance and / or construction activity in, or around any WMATA property. The requirements for a SSWP can be waived for routine preventive maintenance or inspections by the Manager of Track Access for Maintenance and Construction (TAMC) in conjunction with the Office of Operations Liaison (OLIA) and Department of System Safety and Risk Protection (SARP).

A. An Site Specific Work Plan (SSWP) is required as per Standard Operating Procedures (SOP) #19, in addition to the requirements of this OAP.

B. A written detailed plan must be submitted for review to the Office of Operations Liaison (OLIA), Manager of Track Access for Maintenance and Construction (TAMC) and Department of System Safety and Risk Protection (SARP) 45 days prior to the date of the requested work activity and it should include any required and approved Engineering Modification Instruction (EMI), as per OAP #200-4.

C. A Site Specific Work Plan (SSWP) that will require a Revenue Service Adjustment (RSA) must have approval of OCCO as required in OAP 100-9. The approved RSA form must be attached to the SSWP. (See attachment A Revenue Service Adjustment (RSA) form.)

D. Comments must be returned to the requesting party within 14 calendar days after the initial submission of the SSWP.

E. A Site Specific Work Plan (SSWP) must have signed approval from representatives from OLIA, SARP, TAMC and the maintenance manager or project manager submitting the work plan before track rights will be granted. The approved SSWP must be given to RRTS/TAMC 21 days prior to the date of the requested work.

F. Representatives from OLIA, SARP, TAMC and the maintenance manager or project manager submitting the work must sign off on the SSWP a minimum of 14 calendar days prior to the requested start date of work.

G. The Manager of Track Access for Maintenance and Construction (TAMC) in conjunction with an OLIA representative shall coordinate final scheduling of all approved Site Specific Work Plans (SSWP). This coordination activity shall have input from those personnel designated below, or their representatives during the Major Projects Meeting.

1) ROCC - Rail Operations Control Center (ROCC) Superintendent
2) MOCC - Maintenance Operations Control Center(MOCC) Superintendent
3) PLNT - Plant Maintenance, General Superintendent
4) SARP - Department of System Safety and Risk Protection
5) TSSM/ATC - Automatic Train Control Branch Superintendent
6) TSSM/COMM - Communications Branch Superintendent
7) TSSM/POWR - Power Branch Superintendent
8) TSSM/STRC - Structures Superintendent
9) TSSM/TRAC - Track Superintendent
10) .COM - Department of Communications
11) Other WMATA Offices/Branches/Sections, as required

H. All coordination activities shall be conducted and completed a minimum of 14 days prior to the date of the proposed work.

I. Any approved request(s) for track access may be canceled by the ROCC Superintendent in conjunction with the MOCC Superintendent to meet any emergency maintenance or other situation that could affect revenue service as stated in OAP #100-9.

J. The approval of an SSWP does not replace the General Orders and Track Rights (GOTRS) entry requirement as per OAP 100-9.

K. All SSWP's expire 60 days from the actual starting point of the work activity.

L. The Office of Operations Liaison (OLIA) will distribute copies of all approved SSWP's to all applicable departments.

## 6. PROCEDURES

***Note*: All SSWPs shall be submitted in writing a minimum of forty-five (45) days prior to the desired start date for the work activity.**
*All numbers correlate with Attachment B for the Site Specific Work Plan (SSWP) form.*

1. Scope: List a brief description of work to be completed.

2. Identify Start and Finish, Time and Date: List the program/project begin and end dates, as well as the time, for the proposed work activities.

3. Engineering Modification Instruction (EMI) Required and Approved: A comprehensive document is established to permit safe and efficient implementation of the effected equipment, facilities/systems. (as required in OAP #200-4)

4. Location: Identify the line, track and chainage of the proposed work activity. Include the following: (as required in SOPs #19, #28, #33)

   - power outage
   - track rights
   - work area
   - rail service adjustment (RSA)

5. Escort: Identification of qualified personnel required to perform the duties of the setting up the right-of-way (ROW) work area and giving access to WMATA facilities.

6. Support Personnel: Identification of the required support departments needed to accomplish scope of work. (as required in OAP #100-9 and SOP #19)

7. Equipment: Identification of all equipment necessary for the successful completion of the work activities. All contractor equipment shall be inspected, calibrated and certified by the applicable department for performing work in and around WMATA's property.

8. Material and Staging: Identify all materials required for the completion of the work activity. Identify the placement of all personnel and material to allow for schedule adherence. (as required in SOP #19)

9. Safety Requirements: Identification of the proper personal protective equipment (PPE) and work area, to include the protected and actual work zones. Include schematics of work site breakdown. (as required in SOPs #19, #28, #33)

10. Schedule Breakdown: Detailed summary of the work activity.
Include the following:
- time and date of each activity
- person/department/agency performing work
- duration of tasks in hours

11. Critical Milestones: A clearly identifiable point in a project/work activity that summarizes the completion of a related or important set of tasks. (as required in SOP #19)

12. SSWP Review: A copy of the SSWP should be sent to OLIA, SARP, OCCO, TAMC and the affected Rail Line Director for forty-five (45) day review and comments. Allow 14 business days for return of comments.

13. Incorporation of Comments: After receiving comments, the project manager is responsible for reconciling and incorporating all comments received into the SSWP and resubmitting the SSWP to OCCO, OLIA, SARP and TAMC.

14. Signatures: The SSWP shall be approved and signed by the following departments (in this order):

- Project Manager/Maintenance Manager
- Director/General Superintendent
- OLIA
- SARP
- RAIL/LINE DIRECTOR only when RSA is required
- RAIL/OCCO only when RSA is required
- RRTS/TAMC

## 7. ATTACHMENTS

A. Revenue Service Adjustment (RSA) form

B. Flow Chart for Site Specific Work Plan

C. Site Specific Work Plan (SSWP) form


# CONSTRUCTION SAFETY AND ENVIRONMENTAL MANUAL

March 2013

**Concurrences and Approval**

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March 15, 2013
**Date**

# CONSTRUCTION SAFETY AND ENVIRONMENTAL MANUAL

This Construction Safety and Environmental Manual (CSEM) provides guidelines for Washington Metropolitan Area Transit Authority (WMATA) construction, maintenance, and rehabilitation projects on which the contractor(s) provides all insurance coverage required under the contract. This CSEM is an essential contract document. This CSEM establishes WMATA specific procedures for certain activities and establishes safety responsibilities for WMATA and contractor personnel involved in construction and rehabilitation projects.

The prevention of accidents, injury, illness and environmental incidents in the course of completing, maintaining, and rehabilitating Metrorail and Metrobus Systems and facilities is of primary importance to everyone associated with WMATA. Accidents, injuries and illness cause suffering and hardship to those immediately involved and result in job delays and additional expense to the contractors and WMATA. Environmental incidents can cause damage to the environment and endanger public health.

The prevention of accidents and incidents is the direct result of a carefully planned safety and environmental management program, effectively implemented by the contractors' management and supervision.

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## 1.0 Purpose

This Construction Safety and Environmental Manual (CSEM) is established under Section 18.3 of the Washington Metropolitan Area Transit Authority (WMATA) System Safety Program Plan (SSPP), dated January 2012. This CSEM provides guidelines for WMATA construction and rehabilitation projects on which the contractor(s) provides all insurance coverage required under the contract and it is an essential contract document. This CSEM establishes WMATA specific procedures for certain activities and it establishes safety responsibilities for WMATA and contractor personnel involved in construction, maintenance and rehabilitation projects. It is intended to assist contractors in complying with the safety and environmental requirements of WMATA contracts.

## 2.0 Scope

This CSEM applies to all construction, rehabilitation, or maintenance projects administered by the Office of Chief Infrastructure Services (CENI). It in no way releases the contractor from the responsibilities and conditions contained in a contract with the Authority or required by federal, state or local regulations.

## 3.0 Objectives

The objectives of the guidelines delineated in the CSEM are:

1. Minimize personal injury and illness.
2. Maximize property conservation.
3. Achieve greater efficiency.
4. Reduce Direct and Indirect costs due to accidents.
5. Minimize exposures to chemical, biological and physical hazards.
6. Minimize impact on the environment and the community.

## 4.0 Safety Responsibilities

### 4.1 General Responsibilities

The contractor shall be responsible for ensuring compliance with the most stringent provisions of the applicable occupational safety and health statutes and regulations of the District of Columbia, State of Maryland, Commonwealth of Virginia or political subdivision in which the work is performed and the U.S. Department of Labor OSHA standards, pertaining to the safe performance of the work.

The contractor shall ensure compliance with the most stringent of federal, state and local environmental regulations and statutes including but not limited to: U.S. Environmental Protection Agency, D.C. Department of the Environment, Virginia Department of Environmental Quality and Maryland Department of the Environment.

WMATA Project Managers and Authority Representatives are responsible for monitoring the contractors' compliance with applicable safety and environmental regulations and ensuring contractors' compliance with the safety and environmental contract specifications.

The prime contractor is responsible for the safety and welfare of contractor and subcontractor employees and for the protection of property and the general public within the contractor's scope of work.

### 4.2 Prime Contractor Safety Responsibilities

The prime contractor shall take the initiative in accident, injury, and illness prevention, and has primary responsibility for safety on the project. This includes all individuals on site, the public, WMATA employees, subcontractors and suppliers working for the contractor. The prime contractor's responsibility cannot be delegated to subcontractors, suppliers or other persons. The contractor's safety superintendent is appointed to perform safety inspection services under the direction of the prime contractor's project manager. It is recognized that many potential hazards will be promptly corrected by mutually accepted means of informal communication between the safety superintendent and the WMATA Authority Representative.

However, it must be understood that formal communication concerning accident prevention is to be maintained between the contractor's Project Manager and WMATA Authority Representative in order to preclude any misunderstanding.

4.2.1 The prime contractor is responsible for all of the requirements for accident, injury and illness prevention and for construction and environmental safety contained in the contract with the Authority. The prime contractor shall contractually require its subcontractors to conform and adhere to the requirements of the CSEM and its provisions relating to specific subcontractor responsibilities found in Sections 4.0 and 5.0 of the CSEM.

In those contracts which interface with the Metrorail operating system, the contractor and subcontractors shall comply with the Metrorail Safety Rules and Procedures Handbook (MSRPH). In those contracts which interface with the Metrobus system, the contractor and subcontractors shall comply with the WMATA Department of Bus Service Employee Handbook (BSEH). In compliance with contract specifications and where applicable provisions of the MSRPH and BSEH, the prime contractor shall:

4.2.1.1 Upon notification of a contract award, submit a copy of the contractor's Health and Safety Plan together with a letter of management's statement of safety policy, signed by an executive officer of the corporation, in relation to the following:

1. The contractor's safety policy based upon compliance with WMATA's Construction Safety and Environmental Manual (CSEM), including detailed disciplinary action to be taken with respect to employees violating safety or environmental requirements.

2. The contractor's awareness and knowledge of all local, state and federal safety, health and environmental standards and regulations applicable to the contract with WMATA.

4.2.1.2 Submit resumes of the work experience and qualifications of the contractor's safety superintendent and designees to the Authority Representative (AR) as required by the contract. These individuals may be required to appear for a personal interview by the AR and WMATA's Department of Safety and Environmental Management. All information provided must be verifiable.

4.2.1.3 Establish and maintain an orientation program for new employees that include a review of the contractor's Health and Safety Plan including:

- Safety and health hazards present in the assigned and general work area
- Required personal protective equipment
- Method for reporting any unsafe conditions that the worker(s) may encounter
- OSHA and EPA mandated written programs applicable to the work
- Exposure monitoring that may be conducted
- Required training, licensing, certification, or medical surveillance
- Emergency procedures including emergency telephone contact numbers, emergency escape routes, and areas of refuge, nearest hospitals and accurate directions and route maps to hospitals
- Tobacco use policy – smoking is prohibited in the Metrorail system, in WMATA facilities and in WMATA vehicles
- Electronic Device Policy, including cellular phones, texting, etc.

4.2.1.4 Furnish copies of all warnings and/or citations of safety violations received from any jurisdiction, state or federal agency. Copies shall be sent within 48 hours to the AR.

4.2.1.5 Ensure that all employees, including subcontractors, comply with federal, state and local safety regulations and standards and with this CSEM.

4.2.1.6 Ensure that all personnel, including subcontractors and suppliers, receive the required WMATA Contractor Right of Way (ROW) Safety Training covering the rules and procedures for working in rail stations, in, or adjacent to, the train roadway, or in the yards, prior to starting such work.

NOTE: The training is valid for 12 months from the date of receiving the training.

4.2.1.7 If the site contains hazardous waste, hazardous substances, or a hazardous chemical release, develop a Health and Safety Plan which establishes policies and procedures to protect the workers and the public from the hazards posed by a hazardous waste site cleanup operation and hazardous chemical release.

4.2.1.8 The storage of hazardous and flammable materials (including such items as rags, mops, paper towels, or other combustible materials contaminated with hazardous or flammable products) on WMATA property, is restricted. Contractors seeking to store hazardous or flammable materials on WMATA property must request permission from the AR, who will review with SAFE-EMIH. It may not always be possible to grant permission to store hazardous or flammable materials on WMATA property.

If permission is granted, the contractor must store the materials in compliance with the jurisdictional codes and regulations. In addition, a copy of the Material Safety Data Sheet (MSDS) for each specific chemical and the quantity of each chemical to be stored on the site shall be provided to the Authority Representative. The contractor shall acquire permits for the use of hazardous materials as required by the jurisdictional Fire Marshal and/or other authority having jurisdiction (AHJ).

4.2.1.9 If the work requires transportation of hazardous materials or hazardous substances, contractors and subcontractors are required to provide evidence of Department of Transportation General Awareness Driver's Training in compliance with 49 CFR §172 and Commercial Driver's License in compliance with 49 CFR §390-397, prior to commencement of work.

4.2.1.10 All hazardous materials and hazardous substances must be stored in "Performance Oriented Packaging" in compliance with 49 CFR §178, Subpart L.

4.2.1.11 Contractors must submit MSDS for ALL chemicals to be used on Authority property to the Authority Representative. For projects in the operating system, all MSDS will be reviewed by WMATA's Department of System Safety and Environmental Management

(SAFE) and if approved, the materials can be used in the system. If they are rejected, the contractor must identify a substitute that will meet SAFE's criteria for approval in addition to the Authority Representative's criteria for performance. The MSDS must be recent (less than 3 years old) and comply with the OSHA Hazard Communication Standard 29 CFR §1910.1200. The contractor is responsible for complying with the requirements of the MSDS.

4.2.1.12 Contractor shall maintain a complete file of (MSDS) for all materials used at the job site. The contractor shall assure that all the employees at the job site receive proper training before the use of each chemical product.

This training must include information about the chemical and physical hazards and the proper use of the required personal protective equipment.

4.2.1.13 Establish and enforce disciplinary action for violating safety rules, procedures, or regulations.

4.2.1.14 After an incident involving a fatality or multiple hospitalizations, the contractor shall notify ROCC [if the incident occurs in the operating system] or "911" and preserve all evidence and immediately secure and stabilize the incident scene. The contractor must also notify the appropriate jurisdictional OSHA agency.

Note: if "911" is called, it must be from either an outside line or a wireless phone. The phones in the roadway will not access local fire and EMS.

## 4.3 Prime Contractor Environmental Responsibilities

The prime contractor shall take the initiative in environmental incident prevention, as the prime contractor has primary responsibility for environmental management on the project, including all individuals on site, public, subcontractors and suppliers working for the contractor. The prime contractor's responsibility cannot be delegated to subcontractors, suppliers or other persons. The prime contractor shall:

4.3.1 Assure all employees, including subcontractors, comply with federal, state, and local environmental regulations for air, water, land, noise, and wastes. Consolidated Plans (available on the WMATA Intranet and through the Authority Representative) are prepared by WMATA for bus divisions and rail yards in order to maintain the safety and health of employees, WMATA customers, and the community.

4.3.2 Obtain all environmental permits required by the contract and the federal, state, or local EPA regulations. Examples of some of these permits are: Prevention of Significant Deterioration (PSD) Permit, National Emission Standards for Hazardous Air Pollutants (NESHAP) Permit, National Pollutant Discharge Elimination System (NPDES) Permit, Spill Prevention Control and Countermeasure Plan (SPCC) Permit, and U.S. Army Corps of Engineers Permit for work in navigable waters and waters of the U.S. Copies of all permits should be forwarded to the WMATA Authority Representative. It is the responsibility of the prime contractor to ensure compliance with all permit requirements. In addition, the following information shall be maintained by the prime contractor at the work site:

1. Listing of any hazardous wastes and monthly volumes (kg/month) generated on site
2. Copies of Hazardous Waste Manifests
3. Copies of exception reports
4. Permits for the Treatment, Storage, and Disposal Facility (T/S/D/F).

4.3.3 Ensure that contractor and subcontractor employees cooperate with representatives of the Authority and federal, state, or local regulatory agencies during site inspections or investigations. Inspection and investigation activities may involve interviews with contractor and subcontractor personnel.

4.3.4 If waste water will be generated, submit a Waste Water Discharge Plan that describes how the contractor will treat and release waste water generated from the work site.

4.3.5 If the work involves response to spills of hazardous materials, ensure that the prime contractor or subcontractor personnel have appropriate training that complies with 29 CFR §1910.120.

4.3.6 If the work involves removal of paints or coatings, test the paint or coating to determine if they contain heavy metals such as lead that require special handling and disposal considerations. As a minimum, testing should be considered for the eight Resource Conservation and Recovery Act (RCRA) metals:

- Arsenic
- Barium
- Cadmium
- Chromium
- Lead
- Mercury
- Silver
- Selenium

If any of these are present, the components will require special handling and disposal to prevent exposure to workers, the public, and the environment. The contractor and/or subcontractor shall have all licenses and certifications required by the jurisdiction in which the work is performed. Jurisdictions that do not have their own state plans fall under the auspices of the EPA. The contractor's and subcontractor's employees are required to have medical monitoring and training required by the jurisdictional regulations. Documentation shall be provided to the Authority Representative prior to commencement of work. All documentation shall be authentic and verifiable. All materials must be handled and disposed of in compliance with the jurisdictional regulations. MSDS for replacement paints/coatings must be reviewed and approved, prior to use, by WMATA.

4.3.7 If the work requires disposal of hazardous wastes, utilize an EPA licensed Treatment/Storage/Disposal facility and ensure that the waste hauler has a state or local license and U.S. EPA identification number. The contractors and subcontractors shall be required to provide evidence of all applicable licenses and permits along with the name and address of the waste disposal facility where hazardous waste materials are to be disposed, prior to commencement of work.

## 4.4 Prime Contractor's Project Manager

The prime contractor's project manager is the management representative of the prime contractor. The prime contractor's project manager is responsible for the safety of all individuals on-site, including all employees and subcontractor employees, suppliers, agency officials and the public. As such, in addition to the responsibilities as might be assigned by the prime contractor noted in 4.2 and 4.3, the prime contractor's project manager shall:

4.4.1 Be responsible for the supervision of the Safety Superintendent in carrying out the duties and responsibilities of this position.

4.4.2 Plan and execute all work so as to comply with the stated objectives of the most current CSEM.

4.4.3 Comply with all of the provisions of the contract dealing with safety, environmental management and accident prevention requirements.

4.4.4 Comply with federal, state, and local safety and environmental codes, standards and regulations and WMATA safety rules and procedures.

4.4.5 Cooperate with WMATA's representatives and representatives of federal, state, and local regulatory agencies.

4.4.6 Authorize necessary immediate action to correct substandard safety and environmental conditions existing, reported or observed.

4.4.7 Review and take necessary immediate action on safety records through directives or personal interviews with superintendents, job foremen or subcontractors' management.

4.4.8 Attend safety meetings as required.

4.4.9 Participate in safety planning meetings held by the WMATA Authority Representative at the beginning of each phase of the job.

4.4.10 Ensure that personnel operating cranes and other mobile equipment, requiring a riding operator, are trained and certified by a recognized entity, to operate the equipment to which they are assigned.

4.4.11 Enforce disciplinary action for violating safety rules, procedures, or regulations. Disciplinary action shall include removal of persons who continually and deliberately violate safety requirements.

4.4.12 Cooperate with WMATA's designated safety representatives.

4.5 Prime Contractor's Safety Superintendent

On those contracts which require a safety superintendent, he/she shall:

4.5.1 Make daily safety inspections of job sites when work is performed and take necessary immediate corrective action to eliminate nonconformance with safety regulations or procedures. Record observations on WMATA Form C-21 (available from the Authorized Representative) Construction Safety Survey in compliance with reporting procedures.

4.5.2 Assure Form C-24, Supervisor's Report of Accident (available from the Authorized Representative) is properly completed and distributed in compliance with instructions.

4.5.3 Review accidents and incidents and recommend immediate corrective action.

4.5.4 Provide job foreman with appropriate material for use in conducting weekly tool box meetings.

4.5.5 Review safety meeting reports submitted by job foremen.

4.5.6 Periodically attend foremen "tool box" safety meetings and evaluate effectiveness.

4.5.7 Assist in the preparation of all accident investigation reports and ensure that reporting procedures are established.

4.5.8 Implement training programs for supervisors and employees as they apply to their specific responsibilities.

4.5.9 Encourage programs for recognition of individual employee's safety efforts and their contribution toward improved work methods.

4.5.10 Be responsible for ensuring that the necessary safety equipment, including required personal protective equipment, is made available to and used correctly by employees.

4.5.11 Coordinate activities with those of WMATA's designated safety representative and take necessary steps to immediately implement their appropriate recommendations.

4.5.12 Coordinate public relations aspects of the Contractor's Health and Safety Plan.

4.5.13 Attend safety meetings held by the Authority. The safety superintendent should share his/her experience, questions and problems with other superintendents at these meetings.

4.5.14 Participate in safety planning meetings held by the WMATA Authority Representative at the beginning of the job and on as needed basis.

4.5.15 Enforce and ensure compliance of the contractor's and subcontractor's employees with the prohibition on smoking in the Metrorail system, at WMATA facilities, and in WMATA vehicles.

4.5.16 Maintain a complete file of MSDS for all materials used at the job site. Assure that all the employees receive proper training before use of each chemical product. This training must include information about chemical and physical hazards and the proper use of required personal protective equipment.

4.5.17 Cooperate with WMATA's designated safety and environmental representatives.

4.5.18 Shall have Stop-Work Authority.

4.5.19 Shall have completed an OSHA 30-Hour Construction Training Course.

## 4.6 Contractor/Subcontractor Job Superintendents

Contractor's and subcontractor's job superintendents have the following specific safety responsibilities:

4.6.1 Plan and execute all work so as to comply with stated objectives of the WMATA Construction Safety and Environmental Manual.

4.6.2 Implement the safety and loss control requirements contained in the contract documents.

4.6.3 Provide and enforce the use, at all times, of the personal protective equipment required by WMATA, local, state and federal regulations.

4.6.4 Complete supervisory investigation report on all accidents (reference Supervisor's Report of Accident Form C-24).

4.6.5 Attend supervisory personnel safety meetings schedule by Prime Contractor's Project Manager.

4.6.6 Schedule weekly "tool box" safety meetings to be held by job foremen for all employees.

4.6.7 Periodically attend foremen's weekly "tool box" safety meetings to evaluate effectiveness and offer suggestions for improvement.

4.6.8 Take immediate action to correct unsafe practices or conditions when identified.

4.6.9 Report to the Prime Contractor's Safety Superintendent or Project Manager, all observed unsafe conditions or practices and violations of job security which are within their jurisdiction.

4.6.10 Cooperate with WMATA's designated safety and environmental representatives.

4.6.11 Enforce and ensure compliance of the contractors' and subcontractor's employees with the prohibition on smoking in the Metrorail system, at WMATA facilities, and in WMATA vehicles.

## 4.7 Contractor/Subcontractor Job Foremen

Job foremen are an integral part of an effective safety program and the amount of effort that they put into accident prevention on their daily assignments helps to determine whether or not a good accident record is maintained. A foreman's safety responsibilities shall include:

4.7.1 Instructing workers under his/her supervision in safe work practices and work methods at the time work is assigned.

4.7.2 Supplying and enforcing the use of proper protective equipment and suitable tools for the job.

4.7.3 Continuously checking to see that no unsafe practices or conditions are allowed to exist on any part of the job.

4.7.4 Acquainting the staff will applicable safety requirements and seeing that they are enforced.

4.7.5 Setting a good example for employees.

4.7.6 Making a complete investigation of accidents to determine facts necessary to take corrective action.

4.7.7 Promptly supply information for completing the Accident Report and Investigation Form (as directed by the Safety Superintendent and/or Project Manager).

4.7.8 Holding weekly “tool box” safety meetings with employees to:

- Discuss observed unsafe work practices or conditions.
- Review any accidents or near misses that have occurred with the crew.
- Encourage safety suggestions from employees and report them to the safety supervisor.

4.7.9 Seeing that prompt first aid is administered to an injured employee.

4.7.10 Reporting unsafe acts and violations of site security immediately to Project Manager, Job Superintendent, or Safety Superintendent.

4.7.11 Enforcing and ensuring compliance of the contractor’s and subcontractor’s employees with the prohibition on smoking in the Metrorail system, at WMATA facilities, and in WMATA vehicles.

## 4.8 WMATA Authority Representative (AR) or Project Manager

The WMATA Authority Representative (AR) is the collective term for individuals designated by the WMATA contracting officer as responsible for

administering/supervising contracts [e.g., Project Manager (PM), Resident Engineer (RE), Contracting Officer Representative (COR), Contracting Officer Technical Representative (COTR)]. The AR has the following safety responsibilities:

4.8.1 Be familiar with this CSEM and applicable OSHA and environmental regulations, WMATA safety rules and procedures and assure that all required programs and documents are submitted for SAFE's review prior to starting work and as required during construction.

4.8.2 Oversee the contractor's assumption of responsibility for timely application of safety and accident prevention procedures to all activities and to all persons on the project, including subcontractors, visitors and suppliers of materials and equipment.

4.8.3 Report to SAFE any observed unsafe working conditions. A degree of judgment is to be exercised by the WMATA Authority Representative in reporting unsafe working conditions. First-time infringements should be corrected by prompt reference of the incident to the contract's safety superintendent or, in his/her absence, the contractor's job superintendent. Consistent lack of good housekeeping practice, use of equipment in obviously poor condition, nonconformance with WMATA safety rules and procedures, and failure to adhere to occupational safety and health or environmental regulations are to be followed by appropriate corrective action and be reported to SAFE by the AR.

However, in the event of conditions that are immediately dangerous to life and health, the AR shall immediately stop the dangerous activity, notify SAFE and notify the contractor of what corrective action shall be implemented before the work can resume.

4.8.4 In cases involving consistent failure to comply with safety and environmental rules and regulations, notify the contractor in writing of nonconformance and include specific required corrective actions. Copies of all such notices shall be forwarded to SAFE.

4.8.5 In the event certain individuals continually and deliberately violate safety requirements, the WMATA AR shall have the individual removed from the work site.

4.8.6 Receive, review and maintain copies of the contractor's safety superintendent's daily inspection report (C-21), exposure monitoring results, and accident/incident report forms C-23, 24 and 26. Ensure that any required corrective is implemented immediately.

4.8.7 After an incident involving a fatality or multiple hospitalizations, the AR shall ensure that the contractor notifies OCC [if the incident occurs in the operating system] or 911 and preserves all evidence and immediately secures and stabilizes the incident scene. The contractor must also notify the appropriate jurisdictional OSHA agency.

NOTE: If "911" is called, it must be from a pay phone or a wireless phone. The phones in the ROW will not access "911." Most of the WMATA facility phones are such that, if an outside line is accessed, all "911" calls would be routed through the District of Columbia's "911" system, even if the call is made from a phone located in Maryland or Virginia.

4.8.8 At the beginning of the job and regularly on as needed basis, hold safety planning meetings with the prime contractor and representative(s) of SAFE.

4.8.9 Provide WMATA RWIC's (formerly Escorts) for contractors' forces working in or adjacent to the Roadway (ROW). All RWIC's shall have Level IV training.

4.8.10 Ensure that all members of the AR staff and all contractor personnel take WMATA's Contractor ROW Training offered by SAFE before commencing work on the Roadway or projects that affect the Roadway. The ROW training is valid for 12 months from the date of receiving training.

NOTE: All contractor ID badges shall be returned to WMATA at the completion of the project, prior to the release of retained funds, or a back charge of $100.00 per ID will be assessed.

4.8.11 Ensure that all members of the AR and Project Management (PM) staff receive OSHA 10-hour construction or equivalent training available through SAFE.

4.8.12 Receive, review, and monitor compliance with all environmental permit applications and final permits. Ensure that contract personnel involved are knowledgeable of the relevant environmental permit requirements.

4.8.13 Provide copies of all environmental permits to SAFE – Deputy Chief, Office of Environmental Management and Industrial Hygiene (EMIH) for all work in the operating system. For all work in the non-operating system, forward copies of permits to CENI Manager, Environmental Planning and Compliance.

4.8.14 Coordinate with SAFE to begin Safety and Security Certification, in accordance with the WMATA Safety Rules and Procedure Manual Procedure No. 2.2/0. Safety and Security Certification shall begin at the earliest practicable phase of the project, to ensure timely completion, prior to system, facility, or equipment operation, or start of revenue service.

## 4.9 Department of Safety and Environmental Management (SAFE)

The SAFE staff member assigned to the project shall be responsible for the following activities:

4.9.1 Monitor the effectiveness of the WMATA AR in enforcing the provisions of this manual, WMATA safety rules and procedures, and Occupational Safety and Health and environmental regulations and standards, and provide assistance where needed.

4.9.2 Act as liaison between WMATA, federal, state, and municipal authorities on matters relating to construction safety, occupational safety and health and environmental safety.

4.9.3 Work with WMATA rail and bus operations, and CENI to develop and coordinate safe work procedures.

4.9.4 Provide special assistance to contractors with unusual or complicated safety problems, as requested through the AR.

4.9.5 Assist with writing contract specifications on matters relating to safety, health and the environment.

4.9.6 Assist the Office of Media Relations (MREL) in public relations work regarding safety, health and the environment on CENI projects.

4.9.7 Participate in pre-work surveys of individual job site and in the Safety Planning Meeting with all new prime contractors.

4.9.8 Conduct periodic on-site safety inspections.

4.9.9 Direct the contractors, through the AR, to correct any unsafe or unhealthy condition(s) observed and/or brought to the attention of the project safety superintendent.

4.9.10 In the event of failure by a contractor to correct unsafe or unhealthful condition(s), recommend to the AR or the Chief Safety Officer, or designee that the work activity be stopped until condition(s) is corrected. SAFE/CENI will work with the AR to ensure that the contractor implements the required corrective action, prior to resuming the work activity.

4.9.11 In the event of a condition immediately dangerous to life or health, the SAFE representative has the authority to immediately suspend the dangerous activity. SAFE must immediately notify the AR or PM, who will contact the Chief of CENI or the appropriate Manager. SAFE will coordinate with the AR and the contractor, to develop the required corrective action. The AR will ensure that the contractor immediately implements the appropriate, effective corrective action prior to resuming the work activity.

## 5.0 Requirements

### 5.1 Contractor's Safety Submittals

The Prime Contractor, performing the work, shall submit the following documentation as required by the contract, which shall be subject to approval by the Authority Representative. The first four items shall be submitted in pre-award phase.

- For work and sites not addressed in the original Organizational Health and Safety Program, addenda may be added when the work and sites are identified; however, the addenda must be submitted to the Authority

Representative for review by WMATA prior to the commencement of specified work;

- Job Hazard Analysis (prior to each phase of work);
- Site-specific Emergency Response Plan;
- Site-specific Emergency Evacuation Plan;
- Site-specific Temporary Fire Protection System Plan;
- Site-specific Waste Water Discharge Plan (if waste water us generated);
- Site-specific Pollution Control Program;
- Site-specific Dust and Debris Control Plan;
- Bloodborne Pathogens Exposure Control Plan;
- Hearing Conservation Program if employees are exposed to continuous noise in excess of the OSHA Action Level (29 CFR §1910.95);
- Respiratory Protection Program if employees are required to wear respirators. If a respiratory program is required, the contractor also must provide documentation of training, medical clearance for respirator use and respirator fit testing for tight-fitting respirators;
- Hot Work Program;
- Lockout/Tagout Program;
- Site-specific Confined Space Program;
- Documentation of applicable training, licenses, and certifications;
- Results of noise monitoring, air monitoring, and soil, water or waste sampling;
- Documentation of medical surveillance;
- Documentation of Safety superintendent's experience in construction safety;
- Identify all materials or chemicals the contractor will use on Authority property (including welding rods), MSDS for these products, and a brief explanation of how they will be used and if any wastes will be generated;
- Documentation of licenses and certificates required for lead or asbestos abatement or other work requiring licensing;
- Documentation of licenses, certificates, and U.S. EPA identification numbers required for transportation of hazardous materials, hazardous substances, or hazardous wastes;
- Documentation of licenses, permits, and certificates required for disposal of hazardous wastes including the name and address of the waste disposal facility where hazardous waste materials are to be disposed; and Certificate of Insurance, including pollution liability coverage, endorsed to WMATA is required for contractors or subcontractors performing work involving hazardous materials, hazardous substances, hazardous wastes, or contaminated soil or water.

## 5.2 Protection of the Public

Many of the contracts which are subject to this manual involve contact with Metro customers and the public. Therefore, it is critical that contractors and subcontractors take all necessary precautions to prevent injury to customers, employees and the public and prevent property damage. For the purpose of this manual, the public shall include all persons not employed by the contractor or a subcontractor working under his/her direction. Precautions to be taken shall include but not be limited to the following:

5.2.1 For work that affects areas occupied by, or providing thoroughfare to the public, ensure that such work is specifically permitted by the contract or in writing by the WMATA AR.

5.2.2 When it is necessary to maintain public use of work areas involving sidewalks, entrances to buildings, lobbies, corridors, aisles, stairways, rail tracks, and vehicular roadways, the contractor shall protect the public with substantial guardrails, barricades, temporary fences, overhead protection, partitions, and shields. Provide effective artificial illumination to ensure adequate visibility. The protection shall be consistent with the type of hazard created or resulting from the work performed and be in accordance with the contract and this manual.

5.2.3 Keep sidewalks, entrances to building, lobbies, corridors, aisles, doors or exits clear of obstructions to permit safe ingress and egress of the public at all times.

5.2.4 Post conspicuous, appropriate warning, caution, and instructional safety signs where necessary. In addition, a flag-person shall control the moving of motorized equipment in areas where the public might traverse such pathways.

5.2.5 Provide sidewalk sheds, canopies, catch platforms and appropriate outside walls on any structure. The protection required shall be in accordance with the codes and regulations of the jurisdiction in which the work will be performed and requires approval by the AR.

5.2.6 Install a temporary fence around the perimeter of above-ground operations adjacent to public areas, except where a sidewalk shed or fence is provided by the contract, or as required by § 5.2.5. Perimeter

fences shall be at least six (6) feet high or as directed by the Authority Representative. They may be constructed of wood or metal frame sheathing, wire mesh or a combination of both as provided in contract specifications. When the fence is adjacent to a sidewalk near a street intersection, at least the upper section of fence shall be open wire mesh from a point not over four (4) feet above the sidewalk and extending at least twenty-five (25) feet in both directions from the corner of the fence, or as otherwise required by the local jurisdiction. The fence shall be constructed of solid material such as plywood, if demolition is to occur in the adjacent work area.

5.2.7 Provide substantial guardrails on both sides of vehicular and pedestrian bridges, ramps, runways and platforms. Pedestrian walkways elevated above adjoining surfaces, or walkways within six (6) feet of the top of excavated slopes or vertical banks shall be protected with guardrails, except where sidewalk sheds or fences are provided as required by § 5.2.5. Guardrails shall be made of rigid materials capable of withstanding a force of at least two hundred (200) pounds applied in any direction at any point in their structure.

The height shall be approximately forty-two (42) inches. Top rails and posts may be two (2) inches by four (4) inches dressed wood or equal. Vertical posts shall not be spaced over eight (8) feet apart.

5.2.8 Install barricades, meeting the requirements of the political subdivision having jurisdiction, where sidewalk sheds, fences or guardrails as referenced above are not required between work areas and pedestrian walkways, roadways or occupied buildings. Barricades shall be secured against accidental displacement and shall be maintained in place except where temporary removal is necessary to perform the work. During the period a barricade is removed temporarily for the purpose of work, a flag person shall be placed at all openings.

5.2.9 Provide temporary sidewalks when a permanent sidewalk is obstructed by the contractor's operations. They shall be in accordance with the requirements of the political subdivision having jurisdiction. Guardrails shall be provided on both sides of temporary sidewalks.

5.2.10 Maintain warning signs and lights, including battery operated lanterns, and electric lights, meeting requirements of the political subdivision

involved, from dusk to sunrise along guardrails, barricades, temporary sidewalks and at every obstruction to the public. They shall be placed at both ends of such protection or obstructions and not over twenty (20) feet apart alongside such protection or obstructions.

5.2.11 Prohibit fuel-burning types of lanterns, flares or other open flame devices within fifty (50) feet of open utility manholes.

5.2.12 Provide temporary walkways, including bridges over demolished work, with non-skid surfaces and maintain in good repair at all times.

5.2.13 Continuously control dust generated by construction operations by water sprinkling or other approved methods. In operating stations, or other locations where dust generated by the contractor's work will remain in the air to the discomfort of passengers or WMATA employees, dry vacuuming using a high-efficiency particulate aerosol [HEPA] vacuum will be employed to remove the dust before revenue hours.

## 5.3 WMATA Specific Requirements

The following specific requirements are required for work on WMATA projects. Items marked (S) must be addressed in contractor's submittal to the AR. Items marked (O) are to be observed by the safety superintendent at load test and noted on that day's C-21 Construction Safety Survey as observed.

### 5.3.1 Use of Crane to Raise and Lower Mancage or Work Platform

The use of a crane to lift/lower and/or suspend work platforms and mancages will be permitted only when other means of reaching the work areas are not feasible.

5.3.1.1 Requests for use of crane-suspended work platforms or mancages shall be submitted to the WMATA AR for approval with the following:

- Statement why conditions, methods or operations require the use of a crane-suspended work platform or mancage; (S)
- Description of the crane to be used and the manufacturer's instructions and requirements in the use of the crane to

lift/lower and/or suspend personnel on work platforms or mancages; (S)

- Drawing with certified structural calculations of the work platform or mancage suspension bridle and other components with computations used in the design sealed by a professional engineer in this field; and (S)
- Documented emergency plan in the event of crane failure. (S)

5.3.1.2 Prior to putting the crane and work platform or mancage in service, the contractor shall notify the WMATA AR in writing when he has complied with crane and work platform or mancage requirements. (S)

5.3.1.3 Copies of the last annual inspection report as well as the latest monthly inspection report shall be submitted to the WMATA AR prior to use of the crane. The WMATA AR shall ensure that daily inspections are made, and will receive monthly crane inspection reports. (S)

5.3.1.4 When a crane and work platform or mancage are to be used to lift/lower and/or suspend personnel, the contractor shall be responsible for ensuring compliance with the most stringent crane and work platform or mancage provisions of the applicable statutes and regulations of the District of Columbia, State of Maryland, Commonwealth of Virginia or other political subdivision in which the work is being performed, as well as with WMATA Crane and Work Platform/Mancage Safety requirements contained herein, and with the U.S. Department of Labor – Occupational Safety and Health Act provisions and ANSI A10.28-1983.

Further, the contractor shall comply with the crane manufacturer's requirements in the selection and use of a crane for lifting/lowering and/or suspending of personnel on a work platform or in mancages.

5.3.2 Crane Safety Requirements

5.3.2.1 Cranes used to lift/lower and/or suspend personnel on work platforms or in mancages shall have the following safety features installed and operating:

- Power-up and power-down load line, power shall not be disengaged while handling personnel; (S)
- The load line attached to the work platform or mancage shall have a minimum safety factor of eight (8), manufacturer's specifications shall be submitted, weight of loaded platform shall be submitted; (S)
- Automatic braking (dead-man control), load will stop when operator releases controls; (S)
- Anti-two block device shall be provided capable of preventing damage to the hoist rope and/or other machine components; (O)
- Boom angle indicator; and (O)
- Telescoping crane boom shall be marked to indicate, to the operator, its extended length. (O)

5.3.2.2 Alterations or modifications to the basic crane shall be prohibited, unless prior written authorization is obtained from the manufacturer.

5.3.3 Crane Test and Load Requirements

5.3.3.1 Crane load rating capacities shall be reduced by 50% of published load chart values when handling personnel on work platforms or in mancages. The following calculations shall be submitted:

1. Load Radius
2. Boom Angle
3. Capacity from Load Chart, 50% of Capacity
4. Weight of Loaded Platform (S)

5.3.3.2 The weight of the platform, personnel, attachments and all equipment contributing to the total weight of the boom and load shall be calculated to determine the maximum allowable load, and the calculations shall be submitted. Prior to handling personnel for the first time, the crane, with platform/mancage attached, shall be load-tested at one and one-half (1-1/2) times the rated capacity of the platform. (O) (S)

- Testing shall include movement of the platform/mancage through its entire permissible range of movement. (O)

- The test shall not produce instability of the crane or cause permanent deformation of any component. (O)

5.3.3.3 A visual inspection of the crane, platform/mancage and suspension components shall be conducted by a competent person and appropriately documented. (O)

5.3.3.4 A daily inspection of the crane, platform, or mancage and suspension components shall be made. Simulated lifts shall be made for each work situation, to ensure all systems and controls are functioning properly and all safety features provide are operating satisfactorily, prior to handling personnel.

5.3.4 Crane Operating Requirements

5.3.4.1 Crane shall be level during operations within one (1) degree. If crane is equipped with outriggers, they shall be fully extended and jack pads set on firm, level terrain at all times when handling personnel. Devices provided on outrigger jacks to prevent loss of support under load shall be engaged. (O)

5.3.4.2 A minimum of three (3) wraps shall remain on drum of the load line, when platform/mancage has reached its lowest point of travel. (O)

5.3.4.3 Lifting and lowering speeds shall not exceed 100 feet per minute. (Cable speed indicator is not required. Intent is that operator will conduct lift/lower operations slowly and cautiously at all times.) (O)

5.3.4.4 Personnel shall not occupy the mancage or platform while the crane is traveling. (O)

5.3.4.5 Brakes and locking devices shall be engaged when platform is in working position, with personnel aboard mancage or platform. (O)

5.3.4.6 Platform or mancage shall be used only with the specific crane for which it was approved and tested. (O)

5.3.4.7 A qualified signal person shall be assigned and positioned, so that he is constantly visible to both the crane operator and personnel

on the work platform, or in the mancage. He/she shall have no other duties while personnel are occupying the platform or mancage. (O)

5.3.4.8 When platform is used below ground or when clear, unobstructed visibility between personnel on platform and crane operator cannot be maintained, radio or telephone communications between the signalman on the platform and the crane operator shall be provided. Unassisted voice communication is not acceptable. (S) (O)

5.3.4.9 The crane operator shall be certified by the National Council on Crane Certification. The crane operator shall be thoroughly trained with related experience and shall be familiar with safe crane practices and also have a complete understanding of all manuals, including maintenance and operating instructions provided for specific crane in use. He/she shall have no physical deficiencies which would impair physical, visual or mental reactions or capabilities. (S) (O)

5.3.4.10 The crane operator shall remain at the controls at all times when handling personnel. If for any reason the operator must leave the controls, personnel shall be removed from the platform or mancage prior to his/her leaving. (O)

5.3.4.11 Handling of personnel shall be discontinued upon indication of any impending danger, including presence of thunderstorms. (O)

5.3.4.12 Special precautions shall be taken to protect personnel from electrical hazards. Maintain specified distances from electrical sources. (O)

5.3.4.13 The crane operator shall have a complete understanding of the WMATA crane and operational safety requirements and shall operate the crane accordingly. (O)

5.3.5 Work Platform and Mancage Design Criteria

5.3.5.1 The work platform or mancage shall be designed with a safety factor of eight (8), in conformity with established engineering

criteria. Design calculations shall be submitted and sealed by a professional engineer in this field. (S)

5.3.5.2 Platform shall be designed for a minimum of four (4) point suspension. Commercially manufactured mancages or torpedo cages may have three (3) point suspension. (S)

5.3.5.3 The work platform or mancage shall be posted as to the maximum allowable load. Workers shall be considered as weighing 250 pounds each. (O)

5.3.5.4 Guardrails of metal angle, channel or pipe conforming to 29 CFR 1926.500(f)(1)(OSHA Construction Regulations) shall be provided on work platform. Rebar is not to be used. The guardrail system must be enclosed from the toe board to the mid-rail to keep tools, materials and equipment from falling from the mancage or platform. (O)

5.3.5.5 The floor of the work platform or mancage shall be constructed of a non-slip material. (S) (O)

5.3.5.6 Overhead protection shall be provided on work platform or mancage, when exposure exists, to personnel from falling objects. (S)

- Overhead protection shall be designed as an integral part of the work platform or mancage.
- For special-purpose work platform where the nature of the work makes overhead protection impractical, special precautions must be taken to protect against falling objects. No work shall be permitted above the personnel-occupied work platform.

5.3.5.7 Provisions shall be made to secure tools and materials while platform is in motion. (S)

5.3.5.8 A grab rail shall be provided inside the platform or mancage to permit the worker to stabilize and support his/her body, rather than to hand-grasp the top guard rail, which could result in injury from striking or bumping into equipment or structures. (O)

5.3.5.9 Safe means of ingress and egress shall be provided to the platform. If a gate is used, it shall swing in only and have a positive latch/lock device. (S) (O)

5.3.6 Rigging Requirements

5.3.6.1 Wire rope, shackles, bull rings, cable eyes and other rigging hardware, shall have a safety factor of eight (8). Rotation resistant, wire rope shall have a safety factor of ten (10). All rigging equipment shall be in good condition, with no broken parts. All rigging equipment shall be inspected for damage and excessive wear by a competent individual, before each use. (S) (O)

5.3.6.2 Platform and mancage bridles and rigging shall not be used for any other purpose. (O)

5.3.6.3 The platform shall be suspended by a bridle consisting of at least four (4) separate wire rope cables with an angle of at least sixty (60) degrees from the horizontal. This does not apply to mancages as in 5.3.5.2 above. (O)

5.3.6.4 All cable eyes shall be manufacturer-fabricated with thimbles. Manufacturer's specifications shall be made available to the AR, upon request. (O)

5.3.6.5 The cable legs comprising the work platform bridle shall be connected to a bull ring or shackle, as means of attachment to the load line. (O)

5.3.6.6 The bull ring or shackle of the lifting bridle shall be attached directly to the load line block with a safety shackle. The bridle shall not be attached to a hook. Where a load block without hook cannot be fitted to the load line to permit use of a closed connection to the bull ring of the lifting bridle, a supplementary safety line connecting the work platform shall be added. This will connect the platform to the load line at a point above the hook, using closed connections, such as shackles.

The safety line will be designed to support the shock load of a loaded platform, which has fallen off the hook. Design calculations

shall be submitted and sealed by a professional engineer for safety line and connecting fittings. (S) (O)

5.3.7 Access and Egress for Work Stations

To reduce the risk of serious falls by workers, as soon as the work condition permits, as determined by the AR, the contractor shall replace temporary ladders with temporary stairs and/or personnel hoists or elevators, as the primary means of access to and egress from work stations. This same requirement shall apply to work stations at heights, such as aerial structures and multi-story structures.

Temporary stairs, personnel hoists and elevators shall be constructed, installed, and maintained, in compliance with provisions of applicable statutes and regulations of the U.S. Department of Labor Occupational Safety and Health Administration, the District of Columbia, State of Maryland, Commonwealth of Virginia, or other political subdivision in which work is being performed.

No materials, equipment or tools shall be transported on escalators or elevators in the operating system without advance approval of the WMATA AR.

5.3.8 Occupational Health Requirements

As set forth in the Contract Specifications Article “Protection of Persons and Property” of the contract, the contractor’s safety superintendent shall be familiar with industrial hygiene equipment and testing, as required for the protection of customers, contractor employees, WMATA employees and the public.

Instrumentation shall be provided by the contractor(s) at the job site to evaluate anticipated exposures to toxic substances and physical agents. Testing shall be conducted as necessary to assure the protection of customers, contractor employees, WMATA employees and the public. Copies of test results shall be promptly provided to the WMATA Authority Representative. Costs incurred in providing exposure monitoring shall be included in the contract price with no additional cost to WMATA. Examples of industrial hygiene/environmental monitoring that may be required include:

- Toxic substances such as, but not limited to carbon monoxide, nitrogen dioxide, sulfur dioxide, hydrogen sulfide, heavy metals, welding fumes, silica, volatile organic compounds and asbestos;
- Oxygen deficiency;
- Combustible and flammable gases;
- Illumination;
- Respirable dust (respirable particulate not otherwise specified)
- Occupational and environmental noise (continuous and impact/impulse);
- Water sampling;
- Soil sampling;
- Confined space monitoring; and
- Ventilation testing results.

### 5.3.9 Accident and Incident Reporting

All job related accidents and incidents shall be reported and investigated. All data relative to an accident or incident shall be complete and timely, with verification of the facts, and recommendations for specific action to control the cause of similar accidents or incidents. The prime contractor shall be responsible for the reporting and investigation of all accidents and incidents occurring incidental to work performed under the contract. An accident includes personal injuries requiring medical attention away from the work site or property damage exceeding $1,000.00. An incident includes near misses, overexposure to toxic substances, hazardous material spills/releases and events of non-compliance with safety or environmental regulations, procedures, or requirements.

Accidents and incidents shall be reported to the WMATA AR immediately. Refer to Section 5.3.10, Emergency Guidelines, for details.

Accident Reports C-23 and C-24 shall be completed and submitted to the AR within 48 hours after the accident or incident. For accidents involving conditions that are immediately dangerous to life and health, work shall be suspended until corrective actions are implemented.

### 5.3.10 Emergency Procedures Guidelines

5.3.10.1 The Prime Contractor will set up emergency procedures in their Health & Safety Plan for the following categories:

- Fire;
- Injury to Metro customer, employee, or WMATA employee;
- Injury to general public resulting from a possible slip, fall or vehicular injury;
- Property damage, particular to utilities; i.e., water, gas, sewage, electrical, telephone or pedestrian and vehicle routes;
- Public demonstrations;
- Bomb and chem-bio threats;
- Emergency evacuation;
- Hazardous chemical releases;
- Other incidents at contractor's job site.

5.3.10.2 Wherever practical, teams should be established, in advance, to handle the various types of emergencies. In other cases, emergencies must be handled by the ranking person present, with whoever is available to assist.

- Post, in a conspicuous place, a list of emergency phone numbers, along with the type of information to be transmitted for each emergency situation.
- Delegate responsibility for making emergency calls.

5.3.10.3 Actions to be taken during emergencies should be discussed regularly with contractor's supervisory personnel and at "tool box" safety meetings.

5.3.10.4 When an emergency occurs, which requires a response by the fire and emergency services, the person in charge shall:

- For emergencies in the Metrorail operating system, immediately notify the WMATA Operations Central Control (OCC) on 202-962-1970 and Metro Transit Police Department (MTPD) on 202-962-2121. Emergencies in the bus facilities should be directed to Bus OCC on 202-962-1815 and MTPD on 202-962-2121.
- For emergencies in the non-operating rail system [e.g., Metrorail extensions] call 911. Also notify the WMATA [SAFE] Rail Oncall Officer on 202-747-4485.

- For environmental incidents involving operations, maintenance, and support functions, including capital improvement and major construction renovation in the operating systems, immediately contact the Maintenance Operations Center (MOC) on 202-962-1530.
- Evacuate personnel and provide first aid;
- Stabilize the situation;
- Secure the area, preserve evidence;
- Notify the Authority Representative;
- Cooperate with the responding emergency services;
- Initiate an incident investigation – MTPD will be in charge of criminal or potentially criminal incident scene in the operating system. SAFE will be in charge of non-criminal investigations of accident/incident that occur in the operating system.

5.3.10.5 Provide information regarding the situation only to WMATA AR and WMATA Safety representative or regulatory agencies. Questions from the media should be referred to the WMATA, Media Relations Office on 202-962-1051.

5.3.10.6 Review emergency procedures regularly and modify as required. All such procedures shall be approved by and coordinated with the WMATA AR.

5.3.11 Accident Investigation Committee

At the discretion of the WMATA CSO/SAFE, the appropriate Safety Subcommittee may be convened to evaluate all reports and information obtained from investigative sources on any accidents resulting in a loss of life or serious injury, or any accident involving the operating Metrorail, Metrobus or MetroAccess system. The contractor shall make its employees available for interviews with the Safety Subcommittee as required. The Safety Subcommittee shall submit a written report to the CSO/SAFE. The AR will be responsible for ensuring that contractors implement corrective action plans that result from a SAFE, Safety Subcommittee, or external agency investigation.

### 5.3.12 Technical Inspection Tours

WMATA staff members, who are escorting technical and/or other official visitors in hazardous work areas, will comply with the safety requirements established by this CSEM, the MSRPH, BSEH, and/or the AR. Contractor or vendor personnel who request to inspect a site in the ROW, shall be provided a safety briefing by the AR (or Designee) and be escorted at all times by a WMATA employee, who has been trained as an RWIC in ROW safety. All tours shall be coordinated with the WMATA AR. An escort is required for each group of six (6) for tours on the ROW. Groups will be provided with appropriate personal protection equipment. Shoes must be safety shoes or sound leather shoes that tie. No athletic type shoes or open-toe shoes are permitted in any WMATA facility.

### 5.3.13 Metro Tours Safety Guidelines

It is of the utmost importance that a high degree of protection be afforded all persons touring Metro construction sites. The following guidelines have been prepared as general instructions for those personnel who are responsible for the organization, direction and safe conduct of these tours. Except for certain technical inspection tours made by WMATA staff members and their guests, the following procedures shall be implemented:

5.3.13.1 All group tours will be cleared through the WMATA Media Relations Office and the DGMO, allowing maximum advance notice.

5.3.13.2 The Media Relations Office will contact the WMATA AR for the sites to be visited to coordinate the tour plan and to assure that necessary safety precautions are taken.

5.3.13.3 The Media Relations Office will coordinate the following items with the person requesting the tour:

- Number of Visitors – Individual tour groups in non-hazardous areas should be limited to no more than 20 persons per tour escort; i.e. group of 40 will require at least two escorts.
- Clothing – Long pants, short or long-sleeved shirts, low-heeled shoes with hard soles and laces that provide full coverage to the feet. No athletic type shoes or open-toe shoes are permitted.

- Children – Children under age 16 will not be permitted to accompany tours.
- Protective Equipment – Hard hats, safety glasses, boots, reflective vests, raincoats, ear plugs, etc., will be supplied as required.
- Release and Hold Harmless Agreement – Each visitor will be required to complete this form prior to the beginning of the tour. (See Appendices)

5.3.13.4 Immediately prior to entering a job site, all visitors should be briefed about the need for careful and orderly conduct, and be briefed on the hazards of the location.

5.3.13.5 Groups shall be accompanied at all times by a member of the WMATA AR's staff while on the job site.

## 5.4 WMATA Construction Safety Recognition Awards Program

5.4.1 All WMATA construction contractors shall participate in the WMATA Safety Recognition Award Program and shall keep accurate records of each employee hours worked, exposure and accident experience and submit monthly reports to the AR in accordance with reporting procedures.

5.4.2 The awards based on the statistics reported on WMATA Form C-26, Injury and Illness Experience Summary, shall be made as follows:

- Special awards are issued for 100,000, 250,000 and 500,000 employee hours for work without a lost time injury. The project safety superintendent will also receive a personalized plaque.
- SAFE will approve all awards and will notify the AR when a contractor becomes eligible for an award. Awards will be presented to contractors at the WMATA safety meetings.
- A Special Safety Commendation Award will be presented to a contractor who performed an outstanding safety related service to the community. This award may also be presented to an individual employed on a Metro project for distinguished work in the field of safety. Recommendations for this award must be submitted through the WMATA AR to SAFE.

## 6.0 Contacts

### 6.1 Department of Labor OSHA

Each contractor shall be familiar with the Federal Occupational Safety and Health Act (OSHA) as it pertains to his/her work responsibility, and will implement it as federal law requires.

All fatality cases and/or accidents in which three (3) or more persons are injured in any one accident shall be reported to OSHA, Virginia OSHA or Maryland OSHA, depending on where the accident occurs, within 8 hours of the accident.

Regional Administrator
U.S. Department of Labor – Region III
(Delaware, D.C., Maryland, Pennsylvania, Virginia and West Virginia)
15220 Gateway Center
3535 Market Street
Philadelphia, PA 19104
Phone: (215) 596-1201

U.S. Department of Labor – Baltimore Area Office
G.H. Fallon Federal Building
Charles Center
31 Hopkins Plaza
Baltimore, MD 21201
Phone: (410) 962-2840

Commonwealth of Virginia – Department of Labor & Industry
P.O. Box 12064
Richmond, VA 23241-0064
Phone: (804) 786-2376
Manassas
Phone: (703) 392-0900

Safety Division
7890 Backlick Road
Springfield, VA 22150
Phone: (703) 451-1524

State of Maryland – Department of Labor & Industry (MOSH)
Laurel, MD 20707
Construction Safety Inspector Phone: (410) 383-2253
Washington Area Phone: (301) 470-1932
1040 West Street Phone: (301) 621-1930
Emergency - After Hours (410) 767-7233

Copies of the Occupational Safety and Health Act 1970 and related information on state plans, standards, and education and training programs may be secured from the offices listed above or from:

U. S. Department of Labor Occupational Safety & Health Administration
200 Constitution Avenue, N.W.
Washington, D.C. 20210
Phone: (202) 219-8063

## 6.2 WMATA–Department of Safety & Environmental Management

Department of System Safety & Environment Management
Washington Metropolitan Area Transit Authority
600 Fifth Street, N.W.
Washington, D.C. 20001
Office: (202) 249-SAFE (7233)

After Regular Business Hours Contact Safety Duty Officer via:
OCC – (202) 962-1970
ROCC – (202) 962-1952
BOCC – (202) 962 -1815

## 6.3 Public Relations Procedures

The procedure for handling inquiries from the press regarding emergencies such as accident, fire, explosion, etc., is immediate referral to WMATA AR by field or front office personnel of the contractor. Make no statement until such comment has been authorized by the AR. The same policy of referral to WMATA for action and approval should also be followed in connection with any news releases or

announcements related to the job by the contractor, subcontractor, suppliers, etc. Similarly, any requests for photo locations should be referred to the AR.

## 6.4 Emergency Medical Services

For incidents that occur on construction projects in the operating system immediately notify emergency services via the WMATA Operations Central Control (OCC) on (202) 962-1970 and Metro Transit Police Department (MTPD) on (202) 962-2121. Emergencies in the bus facilities should be directed to Bus OCC on (202) 962-1815 and MTPD on (202) 962-2121. Environmental incidents involving operations, maintenance, and support functions, including capital improvement and major construction renovation in the operating system, shall be immediately reported to the Maintenance Operations Center (MOC) on (202) 962-1530.

If you call 911 you must also call the above numbers to ensure required coordination between WMATA and the responding emergency services.

## 6.5 Government/Utility Contacts

| Washington, D.C. | Telephone |
|---|---|
| U.S. Park Police | (202) 619-7310 |
| U.S. Park Police Emergencies | (202) 619-7300 |
| U.S. Coast Guard-Search & Rescue | 1-800-418-7314 or (410) 576-2521 |
| U.S. Coast Guard-Search & Rescue Command Center | (202) 267-2100 |
| Harbor Police | (202) 727-4582 |
| D.C. Occupational Safety & Health | (202) 576-6339 |
| Federal Transit Administration-Office of Safety & Security | (202) 366-4043 |
| Environmental Protection Agency (General Information) | (202) 260-2090 |
| National Response Center (Emergencies) | 1-800-424-8802 |
| Sewer & Water Operations Division 24-hr. Emergencies | (202) 612-3400 |
| Verizon Communications-Repairs | 1-800-275-2355 |
| Potomac Electric Power Co. (PEPCO) | (202) 833-7500 |
| Emergencies | (202) 872-3432 |
| Power Outage | 1-877-737-2662 |
| Washington Gas-Washington Division | (703) 750-1000 |

| Alexandria, VA | Telephone |
|---|---|
| Construction Safety Inspector | (703) 838-4360 |
| Traffic Engineering | (703) 838-4328 |
| Virginia American Water Co. – Alexandria | (703) 549-0909 |
| Virginia American Water Co. - Alexandria After Hours | (703) 491-8814 |
| Sewer Maintenance | (703) 838-4488 |
| Water and Sewer Emergency - After Hours | (703) 845-7622 |
| Virginia Power Co. | 1-888-667-3000 |
| Verizon Communications – Repairs | 1-800-275-2355 |
| Washington Gas - Virginia Division | (703) 369-3536 |

| Arlington County, VA | |
|---|---|
| Construction Safety Inspector | (703) 228-3800 |
| Traffic Engineering | (703) 228-3575 |
| Public Utilities - Water & Sewer Maintenance | (703) 228-6485 |
| Public Utilities - Water & Sewer Emergency 24-hrs. | (703) 228-6555 |
| Virginia Power Co. | 1-888-667-3000 |
| Verizon Communications – Repairs | 1-800-275-2355 |
| Washington Gas - Virginia Division | (703) 369-3536 |

| Fairfax County, VA | |
|---|---|
| Virginia D.O.T. | (703) 383-2888 |
| Water Authority | (703) 698-5800 |
| After Hours Emergency | (703) 698-5613 |
| Sewer Maintenance Emergency | (703) 323-1211 |
| Sewer Location Information | (703) 324-5015 |
| Virginia Power Co. | 1-888-667-3000 |
| Verizon Communications – Repairs | 1-800-275-2355 |
| Washington Gas - Virginia Division | (703) 369-3536 |

| Montgomery County, MD | |
|---|---|
| Engineering Services | (240) 777-7220 |
| Construction Section | (240) 777-7210 |
| Traffic Engineering Emergency Services | (240) 772-2190 |
| Utilities Water and Sewer (WSSC) Emergencies | (301) 206-4002 |
| Potomac Electric Power Co. (PEPCO) | (202) 833-7500 |
| Emergencies | (202) 872-2000 |
| Verizon Communications – Repairs | 1-800-275-2355 |
| Washington Gas - Maryland Division | (703) 750-1000 |

| Prince George's County, MD | Telephone |
|---|---|
| Construction Regulation Division | (301) 883-5730 |
| Traffic Engineering - Highways & Bridges Division | (301) 883-5640 |
| Traffic Engineering - Emergency Services | (301) 499-8600 |
| Utilities Water and Sewer (WSSC) Emergencies | (301) 206-4002 |
| Potomac Electric Power Co. (PEPCO) | (202) 833-7500 |
| Emergencies | (202) 872-2000 |
| Verizon Communications – Repairs | 1-800-275-2355 |
| Washington Gas - Maryland Division | 1-800-752-7520 or (703) 750-1000 |

| | |
|---|---|
| District of Columbia – Occupational Safety & Health | (202) 576-6339 |
| 950 Upshur Street, N.W., Washington, D.C. 20110 | |
| 620 First Street, N.E., Washington, DC 20001 | (202) 523-1452 |
| D.C. Environmental Health Administration | (202) 535-2500 |

| | |
|---|---|
| Commonwealth of Virginia - Department of Labor & Industry | |
| P.O. Box 12064, Richmond, VA 23241-0064 | (804) 786-2376 |
| Manassas | (703) 392-0900 |
| Safety Division | |
| 7890 Backlick Road | |
| Springfield, VA 22150 | (703) 451-1524 |
| Virginia Department of Environmental Quality | (703) 583-3800 |

| | |
|---|---|
| State of Maryland - Department of Labor & Industry (MOSH) | |
| Construction Safety Inspector | (410) 383-2253 |
| Washington Area Phone | (301) 470-1932 |
| 1040 West Street, Laurel, MD 20707 | (301) 621-1930 |
| Emergency - After Hours | (410) 767-7233 |
| MD Department of the Environment Underground Tanks | (410) 631-3442 |

## 6.6 "MISS UTILITY"

"MISS UTILITY" is a single telephone number for MD and DC, 1-800-257-7777, for VA the number is 1-800-552-7001, which should be called whenever excavating, boring, pile driving and/or digging for the location of gas, electric, water, sewer and telephone lines. This number has been established through a combined effort of the utilities for your convenience. Our objective is to eliminate service interruption and to promote safety. The use of this service will result in a safer atmosphere for you and your personnel and to the communities we serve. It will further reduce lost production of labor and equipment to your company.

Each participating utility company will, depending on conditions, locate and identify the location of its facility by staking and/or marking the horizontal path on the surface. Our locating personnel are well trained to meet your needs at no expense to you.

The "MISS UTILITY" office address is:
Miss Utility
The Greens
14504 Greenview Drive
Suite 300
Laurel, Maryland 20707
Office Business Lines:
Baltimore Metro Line – (410) 792-9080
Washington Metro Line – (301) 470-3484

We request that you call "MISS UTILTY" forty-eight (48) hours before work is to begin on all planned projects, preferably between 7:00 AM and 5:00 PM Monday through Friday, excluding holidays. More advance notice is desirable if known. Emergencies will be processed as promptly as possible. "MISS UTILITY" will be operative on a 24-hour basis with trained personnel at your disposal. Note: The "MISS UTILITY" field layout is valid for only two (2) weeks following the date of the survey. If the two (2) week period expires before excavating the survey area, "MISS UTILITY" must be notified to update the initial survey.

## 7.0 Acronyms

| | |
|---|---|
| AC | Alternating Current |
| ACCS | Department of Access Services |
| AGM/ACCS | Assistant General Manager, Access Services |
| AGM/BUS | Assistant General Manager, Department of Bus Services |
| AGM/IT | Assistant General Manager, Information Technology |
| AGM/PLJD | Assistant General Manager, Department of Planning and Joint Development |
| AGM/TIES | Assistant General Manager, Transit Infrastructure and Engineering Services |
| AMTRAK | National Railroad Passenger Corporation's intercity passenger train service |
| ANSI | American National Standards Institute |
| APCA | Air Pollution Control Act |

| | |
|---|---|
| APTA | American Public Transportation Association |
| AR | Authorized Representative of the Contracting Officer |
| ATC | Automatic Train Control |
| ATO | Automatic Train Operation |
| ATP | Automatic Train Protection |
| ATS | Automatic Train Supervision System |
| BMNT | Office of Bus Maintenance |
| BOCC | Bus Operations Control Center |
| BSEH | Department of Bus Service Employees' Handbook |
| BTRA | Office of Bus Transportation |
| BUS | Department of Bus Service |
| CAP | Corrective Action Plan |
| CCTV | Closed Circuit Television System |
| CDL | Commercial Driver's License |
| CENI | Office of Chief Infrastructure Services |
| CENV | Office of Chief Vehicle Program Services |
| CERCLA | Comprehensive Environmental Response, Compensation and Liability Act |
| CFO | Department of Finance, Chief Financial Officer |
| CFR | Code of Federal Regulations |
| CIT | Construction Inspection and Test |
| CMNT | Office of Rail Car Maintenance |
| CNG | Compressed Natural Gas |
| COG | Metropolitan Washington Council of Governments |
| COMM | Communications Branch |
| COOP | Continuity of Operations Plan |
| COUN | Office of General Counsel |
| CPO | Office of Performance |
| CPR | Cardiopulmonary Resuscitation |
| CSCM | Department of Customer Service, Communications and Marketing |
| CSO | Chief Safety Officer |
| CSX | Rail-Based Transportation Company |
| CQAL | Office of Corporate Quality Assurance (SAFE) |
| CWA | Clean Water Act |
| DCB | Design Control Board |
| DC DOT | District of Columbia Department of Transportation |
| DCO | Deputy Environmental Compliance Officers |
| DGM/A-CFO | Deputy General Manager of Administration-Chief Financial Officer |
| DGM/O | Deputy General Manager Operations |

| | |
|---|---|
| DOT | Department of Transportation |
| DST | Daily Safety Test |
| EAC | Equipment Advisory Committee |
| EAP | Employee Assistance Program |
| ECO | Environmental Compliance Officers |
| ELES | Office of Elevators and Escalators |
| ELT | Executive Leadership Team |
| EMI | Engineering Modification Instruction |
| EMIH | Office of Environmental Management and Industrial Hygiene |
| EMS | Emergency Medical Services |
| EOP | Emergency Operations Plan |
| EPCRA | Emergency Planning and Community Right-To-Know Act |
| ERTF | Emergency Response Training Facility |
| ESC | Executive Safety Committee |
| ETEC | Emergency Tunnel and Evacuation Carts |
| ETS | Emergency Trip Stations |
| F&I | Fire and Intrusion Alarm System |
| FHWA | Federal Highway Administration |
| FIFRA | Federal Insecticide, Fungicide, and Rodenticide Act |
| FRA | Federal Railroad Administration |
| FTA | Federal Transit Administration |
| FY | Fiscal Year |
| GM/CEO | General Manager/Chief Ex/Chief Executive Officer |
| HOMT | Heavy Overhaul Maintenance |
| HR | Department of Human Resources |
| HRMS | Office of Human Resources Management Services |
| IDW | Intrusion Detection and Warning System |
| IRP | Infrastructure Renewal Program |
| IRPG | Office of Infrastructure Renewal Program |
| ISSAP | Internal Safety and Security Audit Process |
| IT | Department of Information Technology |
| MACS | MetroAccess |
| MARC | Maryland Area Regional Commuter Train Service |
| MAXIMO | IBM Asset Management Software |
| MCAP | Major Capital Projects |
| MCSR | Motor Carrier Safety Regulations |
| MD DOT | Maryland Department of Transportation |
| MOC | Maintenance Operations Center |
| MOSH | Maryland Occupational Safety and Health Service |
| MSDS | Material Safety Data Sheets |

| | |
|---|---|
| MSF | Metro Supply Facility |
| MSRPH | Metrorail Safety Rules and Procedures Handbook |
| MTPD | Metro Transit Police Department |
| NCA | Noise Control Act |
| NCTA | National Capital Transportation Agency |
| NEPA | National Environmental Policy Act |
| NFPA | National Fire Protection Association |
| NHTSA | National Highway Traffic Safety Administration |
| NRC | National Response Center |
| NTD | National Transit Database |
| NTP | Notice To Proceed |
| NTSB | National Transportation Safety Board |
| OAP | Operations Administrative Procedures |
| OCC | Operations Control Center |
| OCCO | Rail Operations Control Center |
| ODEV | Organizational Development |
| OEM | Office of Emergency Management |
| OIG | Office of Inspector General |
| OPMS | Office of Operations Management Services |
| OSHA | Occupational Safety and Health Administration |
| PA | Public Address System |
| PABX | Private Automatic Branch Exchange |
| PERS | Passenger Emergency Reporting System |
| P/I | Policy/Instruction |
| PIDS | Passenger Information Display System |
| PLJD | Department of Planning and Joint Development |
| PLNT | Office of Plant Maintenance |
| PME | Precision Measurement Equipment |
| PMI | Preventive Maintenance Inspection |
| PRMT | Office of Procurement and Materials |
| PSPC | Public Safety Policy Committee of Washington Metropolitan Council of Governments |
| QAAW | Office of Quality Assurance and Warranty |
| RCRA | Resource Conservation and Recovery Act |
| RFC | Requests for Change |
| RISK | Office of Risk Management |
| ROCC | Rail Operations Control Center |
| ROCS | Rail Operations Control System |
| ROW | Right-of-Way |
| RTRA | Office of Rail Transportation |

| | |
|---|---|
| RTTO | Office of Rail Transportation Train Operations |
| S&I | Service and Inspection |
| SAFE | SAFE Department of System Safety and Environmental Management |
| SARA | Superfund Amendments and Reauthorization Acts |
| SMNT | Office of Systems Maintenance |
| SOP | Standard Operating Procedures |
| SRPM | Safety Rules and Procedures Manual |
| SSCP | SSCP Safety and Security Certification Program |
| SSCPP | Safety and Security Certification Program Plan |
| SSO | State Safety Oversight |
| SSPP | System Safety Program Plan |
| STDS | Standard Time Distribution System |
| TIES | TIES Department of Transit Infrastructure and Engineering Services |
| TOC | Tri-State Oversight Committee |
| TPC | Third Party Claims |
| TRST | Office of Track and Structures |
| TSCA | Toxic Substances Control Act |
| TTY | Teleprinter System |
| UPS | Uninterruptible Power Supply |
| VA DRPT | Virginia Department of Rail and Public Transportation |
| VDC | Volts – Direct Current |
| VOSH | Virginia Occupational Safety and Health Service |
| VRE | Virginia Railway Express |
| WMATA | Washington Metropolitan Area Transit Authority |
| XML | Extensible Markup Language |

# APPENDICES

## FORM C-21: Construction Safety Survey

Form C-21 is for recording nonconformance with safety regulations or procedures. This form may be used to report any nonconformance with environmental regulations. The main use of this form is by the Contractor's Safety Superintendent. Others that are expected to use it include the WMATA Authority Representative and WMATA's Department of System Safety and Environmental Management.

A. Contractor's Safety Superintendent

This form must be used to report the results of the required daily safety inspection made by the Contractor's Safety Superintendent in accordance with contract specifications. Any nonconformance with safety regulations or procedures detected during the safety inspections, or at any other time, should be corrected immediately and reported on this form.

Completed copies indicating action taken and date completed shall be submitted daily to the WMATA Authority Representative for review and verification of completion of required action. The WMATA Authority Representative shall be responsible for forwarding copies of these reports to WMATA's Department of System Safety and Environmental Management (SAFE).

B. WMATA Authority Representative

This form shall be used by the WMATA Authority Representative and his/her designee to record any nonconformance with safety or environmental regulations or procedures noted during his/her tours of jobs sites. The WMATA Authority Representative will make known his/her recommendations to the Contractor's Safety Superintendent and/or Contractor's Project Manager for immediate corrective action.

The WMATA Authority Representative will submit a copy to the Department of System Safety and Environmental Management (SAFE), indicating abatement action taken or date to be completed.

The Contractor shall fill in action taken under appropriate column and return a copy of this report the office of the WMATA Authority Representative within 48 hours.

The WMATA Authority Representative shall follow up on action taken by the contractor and verify compliance by documenting it in the "Action Taken" column and returning a copy to the Department of SAFE.

Washington Metropolitan Area Transit Authority
Construction Safety Survey

CONTRACT NUMBER _____ REPORT NUMBER_____

CONTRACTOR _____ _____

| ITEM NUMBER | RECOMMENDATION | SAFETY REGULATION REFERENCE | ACTION TAKEN and/or DATE COMPLETED |
|---|---|---|---|
| | | | |

DATE:_____

SURVEY MADE BY (PRINT):_____

SIGNATURE:_____

_____DATE:_____

CONTRACTOR'S PROJECT MANAGER (SIGNATURE)

_____DATE:_____

AUTHORITY REPRESENTATIVE (SIGNATURE)

19.45 C-21

FORM C-23: Report of Accident or Damage to Equipment/Property

The form (C-23) shall be prepared covering each and every accident involving damage to equipment or property.

1. The form shall be prepared from information as a result of investigation or direct reports of the person or persons involved or contractor responsible,

2. Report shall be furnished within 48 hours.

3. This form shall be prepared by the contractor, who shall retain the original and submit copies to the WMATA Authority Representative and the Department of System Safety and Environmental Management.

4. All accidents involving damage to property, including raw materials or equipment; installed equipment, motor vehicles and heavy construction equipment, are reportable.

5. Investigation of alleged damage to private property.

    a. All buildings or other property that may be affected by the contractor's work will have been inspected by the contractor and a report submitted to the WMATA Authority Representative prior to the commencement of work.

    b. If, in the course of the contractor's work, property damage occurs which is allegedly due to the contractor's operations, this reporting procedure is to be followed.

    c. If, however, a property owner reports damage to his/her property, of which his/her complaint is the first intimation, and alleges that it is due to construction, he/she will probably request prompt inspection.

    d. If the property owner makes his/her complaint and request to the WMATA Authority Representative, the complaint will then be reported on Form 23.

    e. In complying with an owner's request for report of damage allegedly due to the contractor's work, particular care is required to see and record only the facts, and to avoid expressing opinion. The owner's opinion shall be recorded as "remarks by owner."

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
CONTRACTOR REPORT OF ACIDENT OR DAMAGE
TO EQUIPMENT OR PROPERTY
FORM C-23

DATE OF REPORT _____
CONTRACTOR _____ CONTRACT NUMBER _____
SUBCONTRACTOR _____ REPORT NUMBER _____

LOCATION OF ACCIDENT _____
_____

EQUIPMENT INVOLVED (DESCRIPTION & SERIAL NUMBER & OWNER) _____
_____

DAMAGE RESULTING FROM ACCIDENT _____
_____

PERSONAL INJURIES □ YES □ NO IF YES, PREPARE FORM C-24

ESTIMATED VALUE OF DAMAGES - $_____

WITNESSES TO ACCIDENT

| | |
|---|---|
| | WERE STATEMENTS OBTAINED FROM WITNESS? |
| | □ YES □ NO |
| | ARE STATEMENTS ATTACHED? |
| | □ YES □ NO |

REMARKS

| |
|---|
| |
| |
| |

DATE OF ACCIDENT_____ TIME OF ACCIDENT_____AM/PM
WEATHER CONDITIONS _____ TEMPERATURE_____
ROADWAY OR SURFCE □ WET □ DRY □ ICY □ OTHER
IF OTHER EXLAIN _____

SIGNATURE_____ TITLE _____

IF MORE SPACE IS REQUIRES, USE A SEPARATE SHEET FOR ADDITIONAL INFORMATION AND/OR SKETCHES

FORM C-24: Supervisor's Report of Accident or Incident

This form (C-24) shall be submitted by the contractor for each job-related accident or incident involving any of the following:

a. Any injury (other than first aid) to an employee of the contractor or any subcontractor or supplier;

b. Any injury to persons not directly connected with the project (including any alleged injuries reported by a patron or a member of the general public).

c. A near miss accident involving the contractor or subcontractor employees, patrons, or members of the public.

d. Overexposure or suspected overexposure to toxic substances experienced by the contractor or subcontractor employees, patrons, or members of the public.

e. Events including all spills or chemical release, of nonconformance with safety or environmental regulations, procedures, or requirements.

Submittal shall be made as soon as possible, but in no case later than forty-eight (48) hours after the accident. Pertinent facts which are not available within the above mentioned time shall be submitted as soon as available in the supplemental report.

This form shall be prepared by the contractor, who shall retain the original and submit copies to the WMATA Authority Representative and the Department of System Safety and Environmental Management.

| WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY<br>Supervisor's Report of Accident ~ Form C-24 | | |
|---|---|---|
| 1. Contract # | 2. WMATA Project Section (Example: F-10a) | |
| 3. Date of Accident _____<br>Time of Accident _____am/pm | 4. Date Supervisor Notified | 5. Date of the Report |
| 6. Name of Prime Contractor | 7. Location On-Site Where Accident Occurred | |
| 8. Name of Contractor/ Subcontractor Involved | 9. Injury:<br>O Lost Time O Medical Treatment Off-Site | |
| 10. Narrative of How Accident Occurred:* O Fire O Property Damage O Equipment Damage | | |
| Report of Accident or Damage to Equipment/Property | | |
| 11. Injured Name & Address | Employer Name & Address | 12. Injured Occupation<br>O Male O Female Age _____ |
| 13. Nature of Injury | 14. Part of Body Injured | 15. First Aid By Whom? |
| 16. Medical Treatment By Whom? | 17. Name(s) of Witnesses | |
| 18. Accident-Basic Type** | 19. Immediate Causes** | 20. Basic Causes** |
| 21. Supervisor's Corrective Action and Signature | | |
| 22. Project Superintendent's Review Comments and Signature | | |
| 23. WMATA Resident Engineer's Comments and Signature | | |

*Use additional paper, if needed. **See reverse side.

Form C-24 continued…..

| Accident Cause Analysis Flow Chart | | |
|---|---|---|
| ACCIDENTS | IMMEDIATE CAUSES | BASIC CAUSES |
| <u>Basic Types</u><br><br>- Struck by…<br>- Struck against…<br>- Contact with…<br>- Caught on…<br>- Caught in or between…<br>- Fall on same level…<br>- Fall from different level…<br>- Exposure…<br>- Over-exertion…<br>- Other… | - Operating without authority<br>- Failure to warn or secure<br>- Operating at unsafe speed<br>- Nullifying safety devices<br>- Using defective equipment<br>- Using equipment improperly<br>- Failure to use personal protective equipment<br>- Improper loading or placement<br>- Servicing equipment in motion<br>- Servicing hazardous equipment<br>- Horseplay<br>- Inadequate guards or protection<br>- Defective equipment or material<br>- Congestion or inadequate work space<br>- Fire and explosion hazards<br>- Unexpected movement hazards<br>- Projection hazards<br>- Poor housekeeping<br>- Hazardous environmental conditions<br>- Hazardous placement or storage<br>- Inadequate ventilation<br>- Inadequate illumination<br>- Unsafe personal attire | <u>Personal Factors</u><br>- Lack of knowledge or skill<br>- Improper motivation attempting to:<br>a) Save time or effort<br>b) Avoid discomfort<br>c) Attract attention<br>d) Assert independence<br>e) Seek group approval<br>f) Express hostility<br>- Physical or mental problem<br>- Distractions<br><u>Job Factors</u><br>- Inadequate work standards<br>- Inadequate design<br>- Inadequate maintenance<br>- Inadequate purchasing standards<br>- Normal wear and tear<br>- Abnormal use and wear |

Distribution: Original – SAFE C-24 (rev. 10/11)
Copies – Insurance Carrier, WMATA Authority Representative

FORM C-26: Accident Experience Summary

1. This form (C-26) shall be submitted monthly by the contractor to reflect the monthly accident and man-hour experience of the contractor and each subcontractor so that the project accident experience to date is readily available.
2. This form shall be prepared the Prime Contractor who shall retain the original and submit copies to the WMATA Authority Representative and the Department of System Safety and Environmental Management.

3. This report must be mailed to the WMATA Department of System Safety and Environmental Management no later than the last day of each month. If the last day of a month falls on other than a working day, this report shall be telephoned into the WMATA Department of System Safety and Environmental Management, on or before the last working day of each month. The completed report should then be mailed in on the following work day.

Washington Metropolitan Area Transit Authority

## Injury and Illness Experience Summary – OSHA Standards

Reporting Organization _____ Contract No. _____ Date _____

| INJURY AND ILLNESS CATEGORY | | TOTAL CASES THIS MONTH | DEATHS | LOST WORKDAY CASES | | | | NONFATAL CASES WITHOUT LOST WORKDAYS | TERMINATIONS OR PERMANENT TRANSFERS |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Total Lost Workday Cases | Cases Involving Days Away from Work | Days Away from Work | Days of Restricted Work Activity | | |
| CATEGORY | CODE | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| OCCUPATIONAL INJURIES | 10 | | | | | | | | |
| - OCCUPATIONAL ILLNESSES - | | | | | | | | | |
| Occupational Skin Diseases or Disorders | 21 | | | | | | | | |
| Dust Diseases of the Lungs | 22 | | | | | | | | |
| Respiratory Conditions Due to Toxic Agents | 23 | | | | | | | | |
| Poisoning (Systemic Effects of Toxic Materials) | 24 | | | | | | | | |
| Disorders Due to Physical Agents | 25 | | | | | | | | |
| Disorders Associated with Repeated Trauma | 26 | | | | | | | | |
| All Other Occupational Illnesses | 29 | | | | | | | | |
| TOTAL-OCCUPATIONAL ILLNESSES (Sum of codes 21 through 29) | 30 | | | | | | | | |

| Total Hours Worked This Month (includes Prime & Subcontractors) | | Signature of Project Superintendent |
|---|---|---|

INCIDENCE RATES FOR

| TOTAL RECORDABLE CASES | LOST WORKDAY CASES | NONFATAL CASES w/o LOST WORKDAYS | DAYS OF RESTRICTED WORK ACTIVITY | LOST WORKDAYS |
|---|---|---|---|---|
| | | | | |

The Incidence Rate is calculated as: N x 200.00/MH

Form C-26

N = Number of injuries and/or illnesses MH = Total hours worked by all employees during the month

200,000 = Base for 100 full time equivalent workers (working 40 hours per week, 50 weeks per year)

Release and Hold Harmless Agreement

In consideration of the below named representation of the Washington Metropolitan Area Transit Authority granting me permission to visit the construction of _____ site of the Authority, I hereby waive, release and hold harmless the Authority, its Directors, Officers, employees, agents, contractors and subcontractors from any and all claims I may now have, or may have in the future, for any and all injury, or losses to person or property arising from this exercise of visitation by this privilege.

| Signature | Representing |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

| Issued By | Title | Date |
|---|---|---|
| _____ | _____ | _____ |

# System Safety and Environmental Management

## Material Data Sheet Review Request

Return this form to the Chemical Safety Liaison Officer at Metro Supply Facility
Email to msds@wmata.com or Fax to (202) 962-5548
Please allow 3 weeks lead time for requests
***Attach clear copy of most recent MSDS***

| *Please provide the following information.* | | |
|---|---|---|
| ***Today's Date:*** | ***Requesting Dept.:*** | ***Contact Location:*** |
| ***Contact Name:*** | | ***Phone:*** |
| ***Locations where product will be stores:*** | | |
| ***Material Status (check all that apply):*** | | In Use_____ New Material_____ For Testing _____<br>Contractor MSDS_____ Yes _____ No<br>Contractor Name: _____<br>Contract No.: _____ |
| ***Trade Name (as shown on MSDS):*** | | |
| ***WMATA Stock No.:*** | | |
| ***SAFE MSDS No.:*** | | |
| ***Give name and MSDS number of existing product use:*** | | |
| ***Why is replacement necessary?*** | | |
| ***Where will product be used?*** | | |
| ***Description of Use:*** | | |
| ***How will product be applied?*** | | |
| ***Size of Container:*** | | |
| ***Quantity Used Per Week:*** | | |
| ***Physical State of Product:*** | | Aerosol Spray____ Gas____ Liquid___ Pellets___<br>Paste/Cream____ Powder___ Solid___ Other____<br>*(Please specify)*_____ |
| ***Manufacturer's Name & Phone No.:*** | | |
| ***Vendor's Name & Phone No.:*** | | |
| ***Best Time to Contact You (Requestor):*** | | |
| ***Comments:*** | | |

Ingredients Restricted at WMATA
April 2005

Products containing restricted ingredients are **not** acceptable for use by WMATA employees or by contractors performing work in Authority operating, maintenance, support, or storage facilities. Such products will be evaluated by SAFE for restricted use **only** if no less hazardous substitute is available that will perform the required function. In this situation, the organization must submit a written request to SAFE for a chemical to be evaluated for restricted use. The request must demonstrate that an exhaustive market search was conducted to identify a less hazardous substitute, but that none were available. It is not required to conduct a search for consumer products for which there are no known less toxic alternatives. These include, but may not be limited to vehicle fuels, batteries, lead solder, and cementitious products (grout, Portland cement).

**Carcinogens**

- Carcinogens, suspected carcinogens, probable carcinogens or possible carcinogens (e.g., asbestos, methylene chloride, toluene diisocyante).
- Benzene
- Carbon tetrachloride
- Chloroform (trichloromethane)
- Trichloroethylene
- Tetrachloroethylene

**Reproductive Toxicants**

- Glycol ethers including 2-Butoxyethanol (butyl cellosolve, CAS# 111-76-2), 2-Methoxyethanol (EGME, CAS# 109-86-4), 2-Methoxyethyl acetate (EGMEA, CAS# 110-49-6), 2-(2-Methoxyethoxy) ethanol (CAS# 111-77-3), Ethylene glycol dinitrate (EGDN, CAS# 628-96-6), 2-Ethoxyethanol (EGEE, CAS# 110-80-5), and 2-Ethoxyethyl acetate (EGEEA, CAS# 110-15-9).
- Teratogens

**Corrosives**

- Products used at a dilution rate with a corresponding pH that is greater than 11.5 (alkaline) or less than 3.5 (acidic). Concentrated chemicals will be considered only if a tamper-proof metering system (dilution or proportioning) is provided. Alkaline soap used in the automatic bus wash systems cannot exceed a pH of 10 at the discharge. A variance is allowed for acids in vehicle and equipment batteries.

- Products used outside with a pH greater than 8.5 or less than 6. This is in order to comply with storm water discharge requirements.

- Products used indoors (i.e., vehicle washing operations) with a pH greater than 10 or less than 6. This is in order to comply with sanitary sewer discharge requirements. POTWs accept waste water within pH range of 6 to 10. Waste water discharges must be neutralized to this range.

- Hydrofluoric Acid

**Flammables**

- Flammable solids

- Flammable liquids with a flash point less than 100 degrees Fahrenheit. Variances may be possible for paints and adhesives used under controlled conditions (i.e. properly ventilated spray paint booth). Fuels, such as gasoline, are approved for use as fuel for vehicles, generators, and other powered equipment, except in the Metrorail stations and underground segments of the rail system. Diesel-powered equipment shall be used in these locations.

**Sensitizers**

- Respiratory and skin sensitizers

**High Toxicity Chemicals**

- Highly toxic chemicals with a median lethal concentration ($LC_{50}$) in air of 200 parts per million (ppm) by volume or less of gas or vapor, 2 milligrams per liter (mg/L) or less of mist, fume, or dust or 2,000 milligrams per cubic meter or air ($mg/m^3$) or less of mist, fume, or dust, when administered by continuous inhalation for one hour to albino rats weighing between 200 and 300 grams each.

- Toxic chemicals with a median lethal concentration ($LC_{50}$) in air of more than 200 ppm, but not more than 2,000 ppm by volume of gas or vapor, more than 2 mg/L but not more than 20 mg/L of mist, fume, or dust, or more than 2,000 $mg/m^3$, but not more than 20,000 $mg/m^3$ of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs) to albino rats weighing between 200 and 300 grams each.

**Toxic Heavy Metals**

- Arsenic, beryllium, cadmium, chromium, lead, mercury and compounds lead solder is allowed for uses other than plumbing, because there is not presently a suitable substitute for lead in solder for these applications.

**Pesticides Banned or Severely Restricted by EPA**

**Ozone Depleting Substances**

- Existing systems that require certain refrigerants will be exempted, but new systems that require refrigerants will be required to comply with environmental regulations. Non ozone-depleting substances are preferred for use at WMATA. (List from 40 CFR Part 82)

**Chesapeake Bay Toxics of Concern**

- Atrazine, benzo(a)anthracene, benzo(a)pyrene, chlordane, chrysene, copper, fluoranthene, naphthalene, PCBs and tributyltin. (Cadmium and compounds, chromium and compounds, lead and compound, and mercury, are included under toxic heavy metals.)

**Phosphates**

- Cleaning agents that contain phosphorous may not be purchased or used in the WMATA system with the following exceptions:

    1. Detergents used for metal cleaning or conditioning, surface cleaning, or appliance cleaning.

    2. Phosphoric acid cleaning products including sanitizers, brighteners, acid cleaners, or metal cleaners.

    3. Dishwashing detergents with 8.8 percent or less phosphorous by weight.

**Chemicals Targeted for Elimination**

- Products containing mercaptans which are characterized by strong, repulsive odors (excluding natural gas).
- Aerosol mixtures of n-hexane and acetone
- Methyl ethyl ketone
- Methyl isobutyl ketone
- 1,1,1-trichlorethane (methyl chloroform)
- Xylenes
- Cyanide compounds (including hydrogen cyanide)
- Toluene

Washington Metropolitan Area Transit Authority


# SAFETY & SECURITY CERTIFICATION PROGRAM PLAN

March 2012

**REVISION HISTORY**

| Date | Revision | Comments |
|---|---|---|
| July 2003 | 0 | Initial Issue |
| October 2007 | 1 | Total Document Revision |
| March 2012 | 2 | 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 Program 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 Safety and Security Certification Program verifies, through a formal process, 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 Safety and Security Certification Program. Only with the effective coordination and a team approach can the Safety and Security Certification Program successfully fulfill its goals and objectives within WMATA.

## CONCURRENCES AND APPROVAL

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

3/9/2012

James M. Dougherty — Date
Chief Safety Officer

3/12/12

Michael A. Taborn — Date
Chief, Metro Transit Police Department

2012.03.15

Dave Kubicek — Date
Deputy General Manager Operations

3/12/12

Jack Requa — Date
Assistant General Manager - Bus Services

3/19/2012

Robert Troup — Date
Assistant General Manager – Transit Infrastructure Engineering Services

**APPROVED:**

March 29, 2012

Richard R. Sarles — Date
General Manager and Chief Executive Officer

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## APPENDIX

# 1 INTRODUCTION

## 1.1 Authority

The Federal Transit Administration (FTA) at, 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 Tri-State Oversight Committee 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 Program for the Metrorail system. The FTA Circular 5800.1, Safety and Security Management Guidance for Major Capital Projects also requires the development of a Safety and Security Certification Program (SSCP) for major capital projects covered by 49 CFR Part 633. Additionally, Section 3.3.5 of the WMATA SSPP establishes a Safety and Security Certification Program requirement not only for Metrorail facilities and equipment, but also for Metrobus facilities and equipment. This Safety and Security Certification Program Plan (SSCPP) 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 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 Safety and Security Certification Program (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:

- Identified safety hazards are identified, evaluated and resolved at the earliest possible phase of the project, with resolutions tracked and documented;
- Identified 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 trained on the inherent hazards of WMATA operations and response to WMATA emergencies.

## 1.5 Scope

This Safety and Security Certification Program Plan (SSCPP) is applicable to all new rail extensions, rail and bus rolling stock, systems, and facilities. Rehabilitation and modification projects are included in the certification program if it affects safety or security critical systems. The Safety and Security Certification Review Committee (SCRC) evaluates and determines the level of certification comprehensiveness for the rehabilitation and modification projects.

Major rail capital projects over $100 million which are funded by the FTA, require project-specific certification plans, as described in the projects' Safety and Security Management Plans (SSMPs). FTA may also request a project-specific plan for other capital projects. The development of the project-specific appendices to this plan will be based on this program 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 HVAC, escalators, elevators, and lighting) is considered part of the facility. Similarly, equipment installed along the guideway (such as tunnel lighting, emergency exits, blue light stations, 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 SSCPP is reviewed by the Department of System Safety and Environmental Management (SAFE) at least biennially 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) for approval.

The SSCPP is a WMATA controlled document. Each Plan copy is numbered and recipients are required to sign for the document, upon initial receipt and for Plan updates.

## 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 20, 2011;
- WMATA, Safety Rules and Procedures Handbook, September 2010,
- Tri-State Oversight Committee Program Standard for State Safety Oversight of the WMATA Metrorail System, January, 2011
- 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 |
| COG | Metropolitan Washington Council of Governments |
| CSO | Chief Safety Officer |
| ELES | Elevator and Escalator Maintenance |
| ESC | Executive Safety Committee |
| FTA | Federal Transit Administration |
| Mil-Std | Military Standard |
| MTPD | Metro Transit Police Department |
| NFPA | National Fire Protection Association |
| OEM | Office of Emergency Management |
| SAFE | Department of System Safety and Environmental Management |
| SMNT | Office of System Maintenance |
| SSPP | System Safety Program Plan |

| | |
|---|---|
| SSCP | Safety & Security Certification Program |
| SSCPP | Safety & Security Certification Program Plan |
| SCRC | Safety & Security Certification Review Committee |
| TIES | Department of Transit Infrastructure and Engineering Services |
| TOC | Tri-State Oversight Committee |
| TSSM | Office of Track and Structures Systems Maintenance |
| 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 within the WMATA staff. Safety and Security Certification Program implementation is the responsibility of all project staff, including contractors. The SCRC oversees the effectiveness of the SSCP.

## 2.2 Organizational Responsibilities

### 2.2.1 Department of System Safety and Environmental Management

The Department of System 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 Safety and Security Certification Program Plan;
- 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;
- Auditing the Safety and Security Certification process;
- Recommending revisions to the Safety and Security Certification Program;
- 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 Metro Transit Police Department, 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, Infrastructure Services (CENI)

The Chief of Infrastructure Services reports to the AGM-TIES and is responsible for the safe delivery of major capital projects, infrastructure renewal projects, and managing adjacent construction and joint development projects. In addition, CENI is responsible for maintaining, updating and publishing the WMATA Emergency Response Maps. The Chief of Infrastructure Services has established procedures to ensure 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 Chief, Vehicle Program Services (CENV)

The Office of Chief, Vehicle Program Services (CENV), is responsible for planning, directing, and overseeing development and implementation of all new/rehabilitation passenger rail vehicle capital projects, and maintenance of the Authority's existing rolling stock. The CENV is responsible for clearly conveying to the CENV staff, other WMATA offices, WMATA executives, and consultants, the mission and goals of each new vehicle purchase or rehabilitation project. The CENV establishes management policy and provides direction for the rail car project. The CENV verifies that the program conforms to WMATA policies and the overall program objectives. During the execution of the project, the CENV will have oversight of the schedule, the budget and the key characteristics of the new vehicles; and also interfaces with various governmental agencies. The Chief, Vehicle Program Services, has the responsibility to implement the Safety and Security Certification Plan for rolling stock related projects subject to certification. The Office of Chief, Vehicle Program Services Project staff:

- Participates as active members of the SCRC;
- Assists in the identification of safety and security certifiable items and requirements;

- Assists in the development of safety and security compliance checklists;
- Assures that safety and security requirements are incorporated into the design criteria and specifications;
- Assures that staff and contractor(s) develop an adequate project document recordkeeping and submittal system to facilitate the verification process;
- Assures that the contractor meets the identified safety and security design and specification requirements; and
- Assures successful completion of all safety/security related specification and test activities.

### 2.2.5 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 Safety and Security Certification Plan related to transit bus related projects subject to certification. The Office of Bus Maintenance project staff:

- Participates as active members of the SCRC for transit bus related projects;
- Assists in the identification of safety and security certifiable items and requirements;
- Assists in the development of safety and security compliance checklists;
- Assures that safety and security requirements are incorporated into the design criteria and specifications;
- Assures that staff and contractor(s) develop an adequate project document recordkeeping and submittal system to facilitate the verification process;
- Assures that the contractor meets the identified safety and security design and specification requirements; and
- Assures successful completion of all safety/security related specification and test activities.

### 2.2.6 Other WMATA Offices

The Department of System Safety and Environmental Management, Office of Engineering and Capital Projects, and Metro Transit Police are principally involved in the safety and security certification process. However, the Offices of Track and Structures (TRST) and Systems Maintenance (SMNT) are responsible for all track related renewal projects. Similarly, the Office of Elevator and Escalator Maintenance (ELES) has the responsibility for all elevator/escalator related renewal work that may be subject to the certification process.

Metrorail and Metrobus operations also support the certification process as it relates to the development of standard and emergency operating procedures and the training and qualification of maintenance and operating staff.

### 2.2.7 Safety and Security Certification Review Committee (SCRC)

The Safety and Security Certification Review Committee (SCRC) was established as a subcommittee of the Executive Safety Committee (ESC) under WMATA Policy/Instruction No.10-2/2. 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 prior to the start of new revenue service, or the placement of rehabilitated facilities and systems into service/use. The SCRC is accountable to the ESC for the overall conduct and implementation of the SSCPP and approval of the certification documentation, in accordance with the WMATA SSCP. The SCRC is responsible for the following:

- Reviewing the Safety and Security Certification Program Plan 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;
- 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.

WMATA undertakes a wide variety of projects, using many construction management types. For example WMATA may select: a design-build contractor; a design-build-operate-maintain contractor; a systems contactor for rolling stock and other systems procurements; or, a facility constructed under the auspices of a political jurisdiction and then turned over to WMATA to operate and maintain. The SCRC membership may change to meet the special requirements of a particular project, such as adding the start-up manager during the testing phase. SCRC composition for the common construction approaches is depicted in the following matrix.

**Table 1: Safety and Security Certification Participation by Department**
**(Participation including but not limited to)**

| SCRC Membership | Construction/Procurement Types | | | |
|---|---|---|---|---|
| | Design Build | Design Bid Build | DBOM** | Jurisdictional*** |
| SAFE | X | X | X | X |
| Metro Transit Police | X | X | X | X |
| Infrastructure and Engineering and Services | X | X | X | X |
| Car Maintenance | Rail Only | Rail Only | Rail Only | Rail Only |
| Vehicle Program Services | Rail Only | Rail Only | Rail Only | Rail Only |
| Transportation | Rail Only | Rail Only | Rail Only | Rail Only |
| Track & Structures Maintenance | Rail Only | Rail Only | Rail Only | Rail Only |
| Bus Services & Transportation | Bus Only | Bus Only | Bus Only | Bus Only |
| Vehicle Maintenance | Bus Only | Bus Only | Bus Only | Bus Only |
| Technology System Support | Bus Only | Bus Only | Bus Only | Bus Only |
| Procurement & Materials | X | X | X | X |
| Plant Maintenance | X | X | X | X |
| System Maintenance | X | X | X | X |
| Elevator and Escalator Maintenance | X | X | X | X |
| Quality Assurance Sections | X | X | X | X |
| Engineering, Safety and Security, and Program Management Services Consultant | X | X | X | X |
| TOC* | Rail Only | Rail Only | Rail Only | Rail Only |

X = **Multimodal**
* **Observer**
** **Design, Build, Maintain, Operate**
*** **Constructed by other jurisdictions**

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 at least monthly, to assess the status of the certification effort of each project's Safety and Security Certification Program. 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.

### 2.2.8 Executive Safety Committee

The Executive Safety Committee 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 Safety and Security Certification Program. 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.

### 2.2.9 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 System 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

## 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 controlled 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 Tri-State Oversight Committee (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 safety and security certifiable elements and items, and prepare the Certifiable Elements List and Certifiable Items List (CIL);

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 2: Safety and Security Certification Program Responsibilities Matrix Key

| Safety and Security Responsibility Matrix | | | | | | | |
|---|---|---|---|---|---|---|---|
| **TASK** | **Task Type** | **PE** | **FD** | **MANUF** | **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 Safety and Security Certification Program Plan | 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 | ✓ | ⏩ | ⏩ | ⏩ | ⏩ | ⏩ |
| Establish Safety and Security Certifiable Items List | CTR | ✓ | ⏩ | ⏩ | ⏩ | ⏩ | ⏩ |
| 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 | | | | | | ✓ |

*MGT = Management*
*ENG = Engineering*
*CTR = Contractors*
*SAFE = Department of Safety and Environmental Management*

*PE = Preliminary Engineering*
*FD = Final Design*
*MANUFAC = Manufacturing*
*MTPD = Metro Transit Police Dept.*

*IN TEST = Integrated Testing*
*COM = Commissioning*
*OPS = Operations*

Checks (✓) indicate the initiation of the activity, and shaded arrows (⏩) indicate on-going performance.

### 3.1.1 Step 1 - Identify Safety and Security Certifiable Elements (CEL) and Items, and Prepare the Certifiable Elements List and Certifiable Items List (CIL).

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 and the Project Management staff.

The CEL and CIL may be modified by SCRC, as needed, in order to meet the Safety and Security Certification Program requirements.

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

**Figure 1: Certifiable Elements List Development**

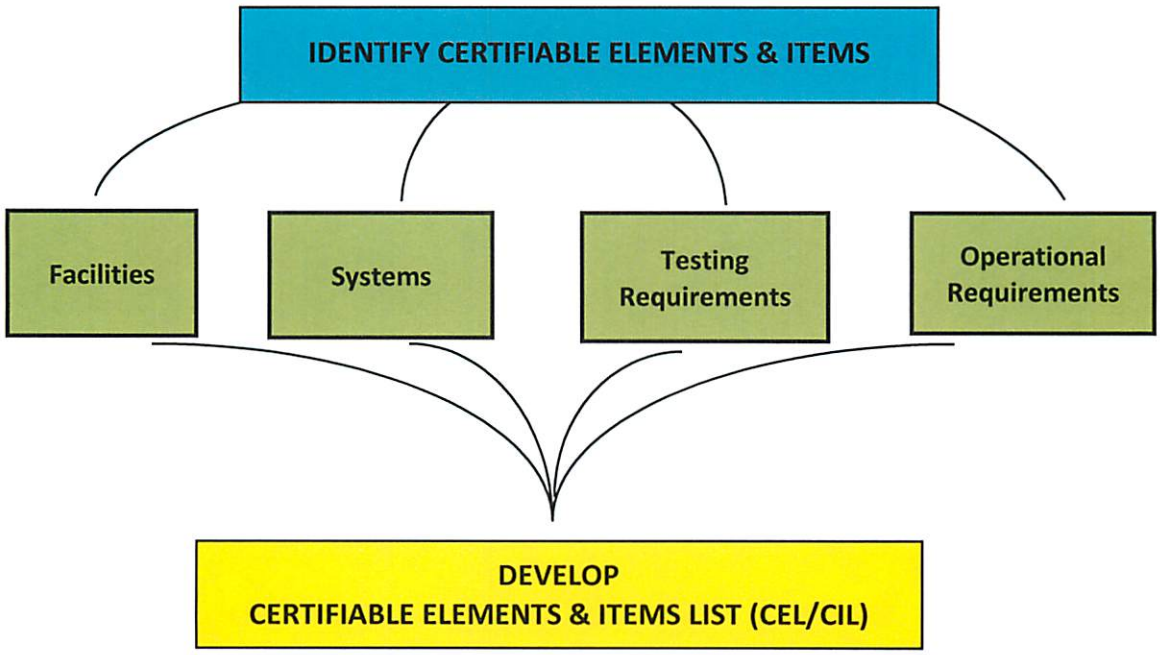
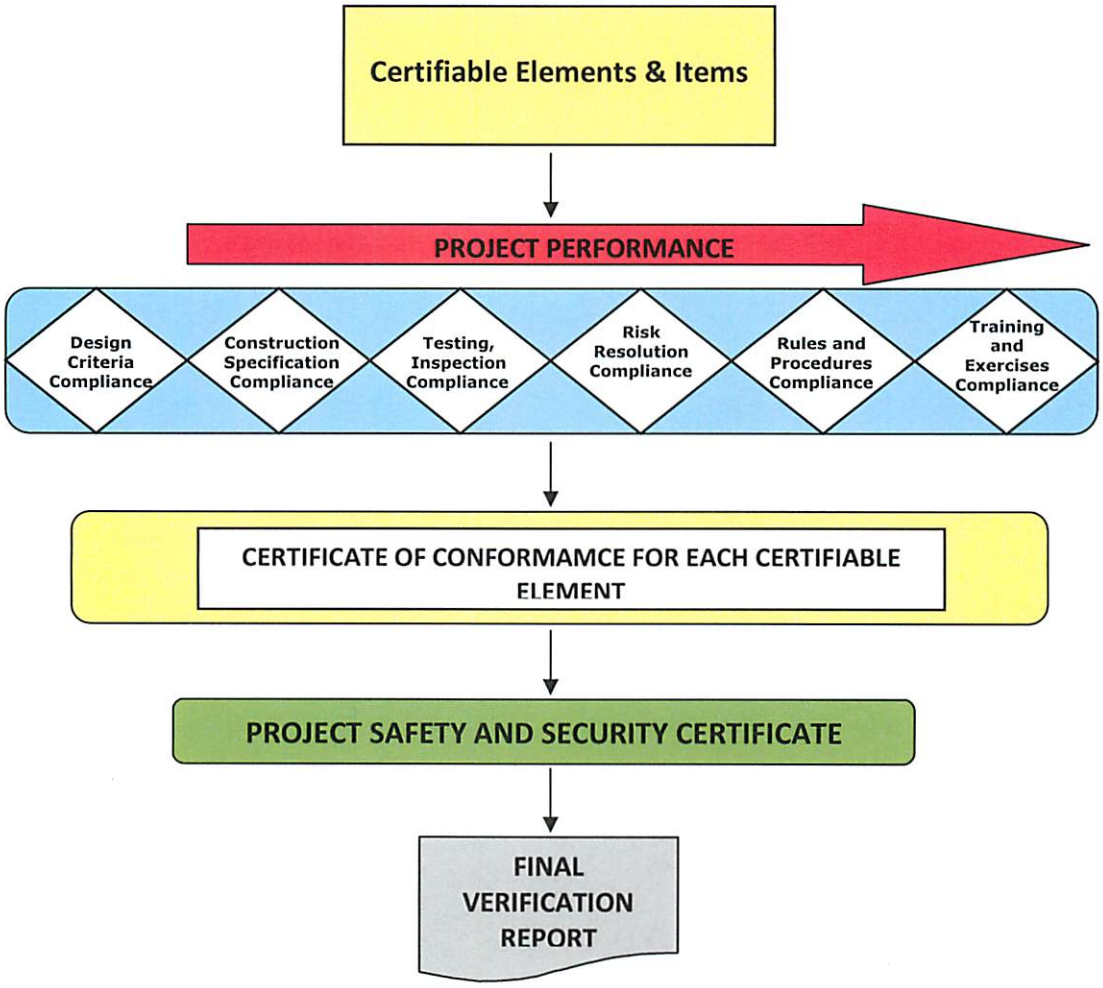


**Figure 2: Certifiable Elements and the Certification Process**



### 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;
- Existing 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, System 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 00115]

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.

A solid Safety and Security Certification Program (SSCP) and its plan the SSCPP 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.

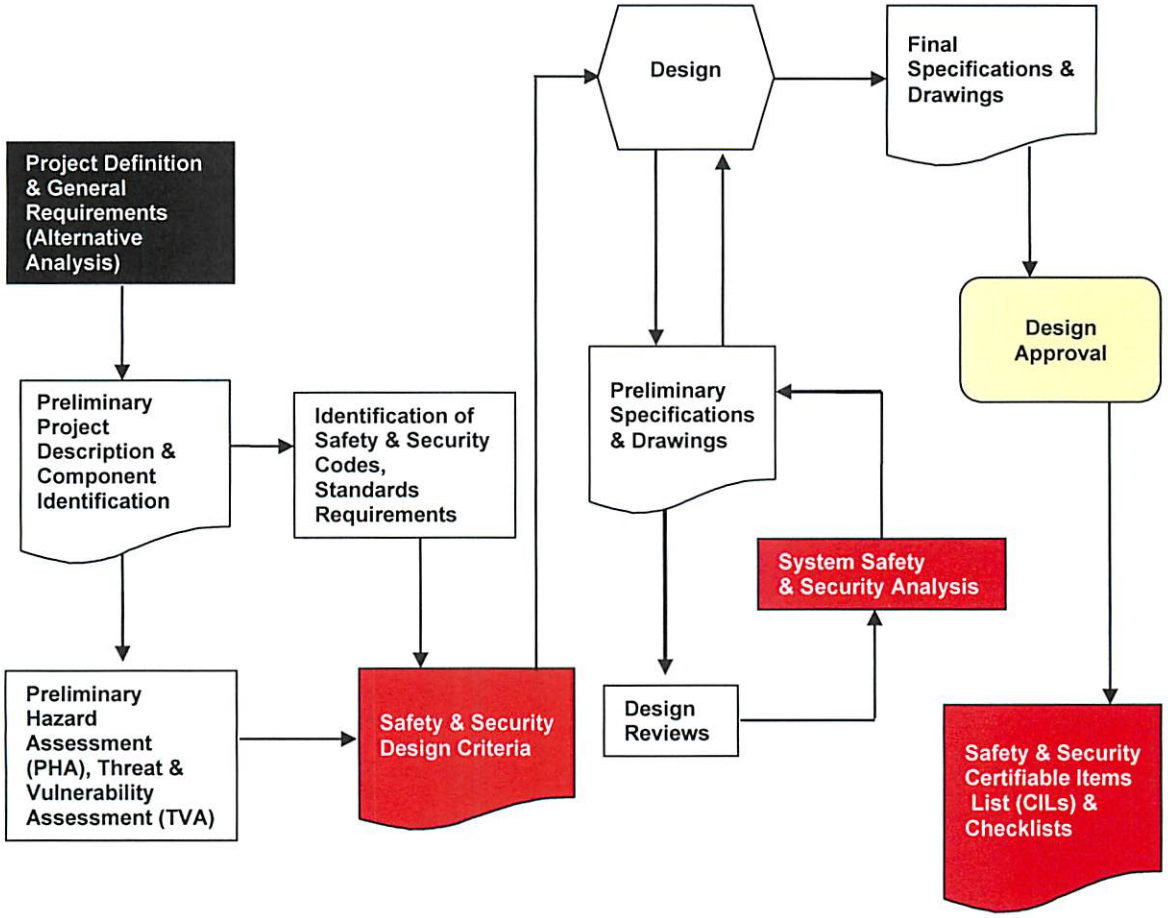
SAFE is responsible for the management/initial development of the checklist *. The checklist is then sent forward to Engineering and Capital Projects staff or the Chief Mechanical Officer, for rolling stock related projects. Modifications affecting existing track and elevators and escalators, are sent 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 audits the documentation to ensure it supports the compliance with the criteria, codes, and standards. Any unresolved issues are tracked to resolution.

* Further development of the checklist by contractors depends on the specific RFP that the contract is based on.

**Figure 3: Safety and Security Design Criteria and Project Specifications**



### 3.1.4 Step 4 – Develop and Perform Technical Specification Compliance During Construction

Specification compliance is performed to establish a formal process to verify that all 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.

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. SAFE audits the documentation to ensure that it supports the identified requirements. As a component of the audit 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 – Conduct and Manage 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 audit.

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 compatibly 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.

#### 3.1.5.4 Temporary Use Notice – Other Uses

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 required signatures must be obtained prior to the facility or system being used. All restrictions noted on the TUN must be followed. The TUN expires upon completion of the task.

### 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 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 alternative, including placing the item into service as-is, and provide rationale for the alternative.

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 issue or exception cannot be resolved to meet the safety requirement for issuance of a System Safety and Security Certificate, the SCRC will determine an acceptable alternative, 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 exception. 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 a minimum of 30 days prior to the revenue service start date to verify the functional capability and operational readiness of the system. The Tri-State Oversight Committee also reserves the right to conduct its own independent operational readiness review of a new line segment. 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 certified to verify the adequacy of emergency response plans and procedures Emergency drills are developed and conducted to:

Familiarize emergency responders with WMATA operations and inherent hazards;

Familiarize and train response personnel in emergency procedures;

Evaluate, and identify improvements to, response 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 audits 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.

### 3.1.10 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 final 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.

### 3.1.11 Step 11 - Issue Safety and Security Certification Verification Report

Within 30 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.

#### 3.1.11.1 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 Safety and Security Certification Program Plans

The FTA funded design-build rail projects valued over $100 million require Project Specific Safety and Security Certification Plans. 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, Metro Matters Yard 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 safety and security certification plan 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 Tri-State Oversight Committee, and the WMATA Safety and Security Certification Program Plan. 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 auditing the contractor program to ensure that it is being implemented in accordance with the approved plan and within the required timeframes.

SAFE collaborates with the appropriate Engineering, Capital Projects, and MTPD project staff to identify those projects that require a project specific Safety and Security Certification Program Plan.

### 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 twill 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 affect on other systems/subsystems. Rehabilitation/modification projects fall into one of three project categories, as illustrated in Table 3.

**Table 3: Typical Rehabilitation/Modification Projects Subject to Certification**

| Project Categories | | |
|---|---|---|
| **Category 1** | **Category 2** | **Category 3** |
| • Automatic Train Control<br>• Automatic Train Protection<br>• Compressed Natural Gas Facilities and Systems<br>• Rail Operations Control Systems<br>• PROTECT Systems | • Traction Power Substation Equipment<br>• Electro-Mechanical Equipment (Deemed Safety Critical or Security Sensitive by SAFE or MTPD)<br>• Rail Car Vehicles<br>• Bus Passenger Vehicle<br>• Rail Non-Revenue Vehicles to include High-Rail Equipment (HRE) | • Communication Systems<br>• Fire Protection Systems<br>• Fire/Intrusion Alarm Systems<br>• AC Power Switchgear<br>• Traction Power Equipment<br>• Emergency Ventilation Systems<br>• Maintenance Facility Equipment |

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.

*Only use Category 3 for Contractors/WMATA staff who are conducting the installation in accordance with existing WMATA departmental Standard Operating Procedures (SOP).

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. A sample list of those projects currently subject to safety and security certification is found in Attachment 8. 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 Site Specific Work Plan is developed to define the requirements for using the system in service. Prior to the start of the work, the Project Manager develops a Site Specific Work Plan in collaboration with SAFE, as described in OAP No. 200-33 – Site Specific Work Plan.

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

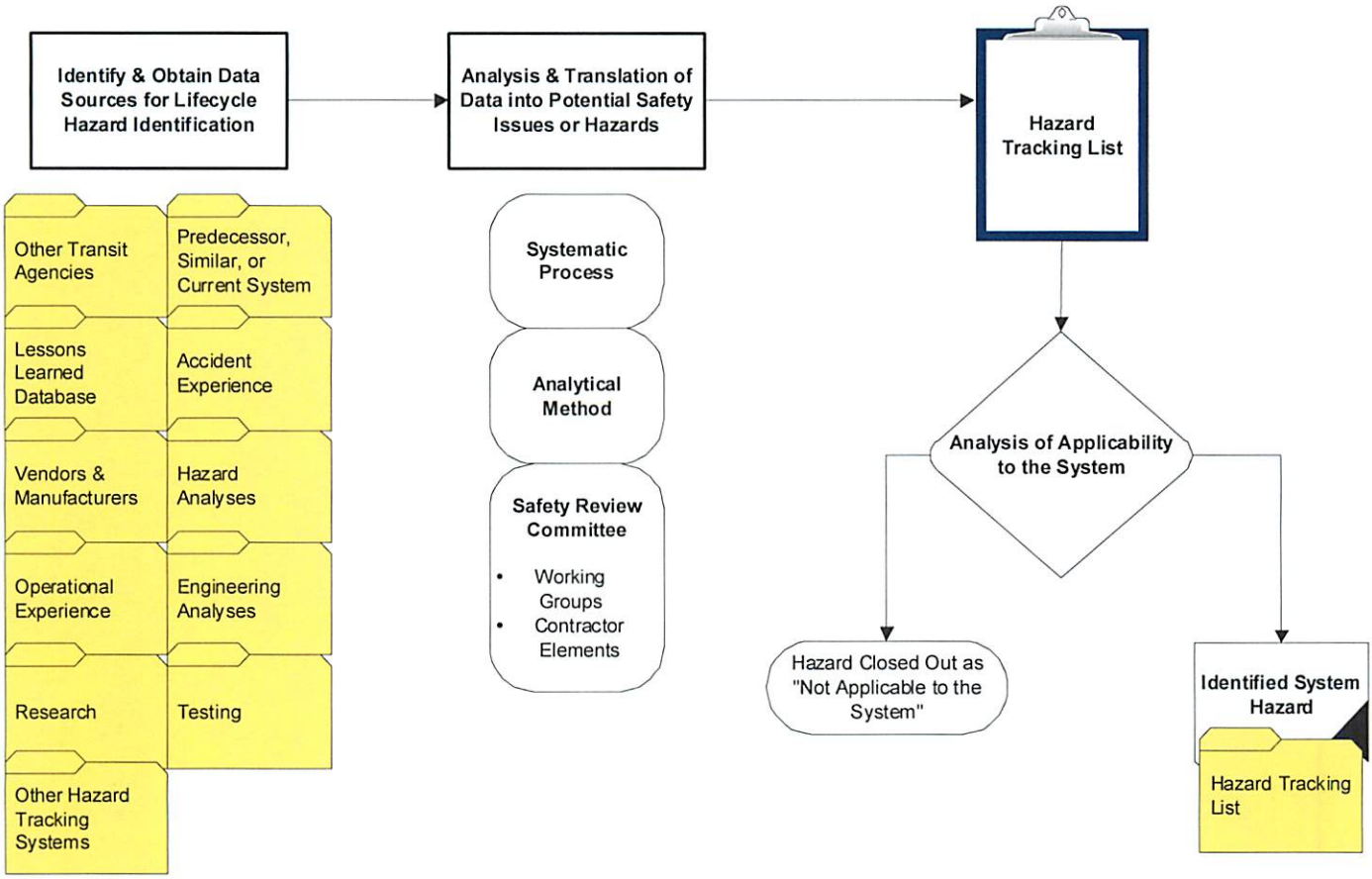
Hazard management is the formal process to systematically recognize, identify, evaluate, and resolve hazards associated with the design, construction, testing, start-up, and operation of the project for customers, employees, and the general public. Recognized hazards are identified and categorized as 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.

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, audits, 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 4-A and 4-B below.

**Table 4-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. |

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 4-B) identifies the Hazard Risk Index (HRI) based upon hazard category and probability and the criteria for defining further actions based upon that index.

**Table 4-B: 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

## 5.1 Security Risk Assessment Process

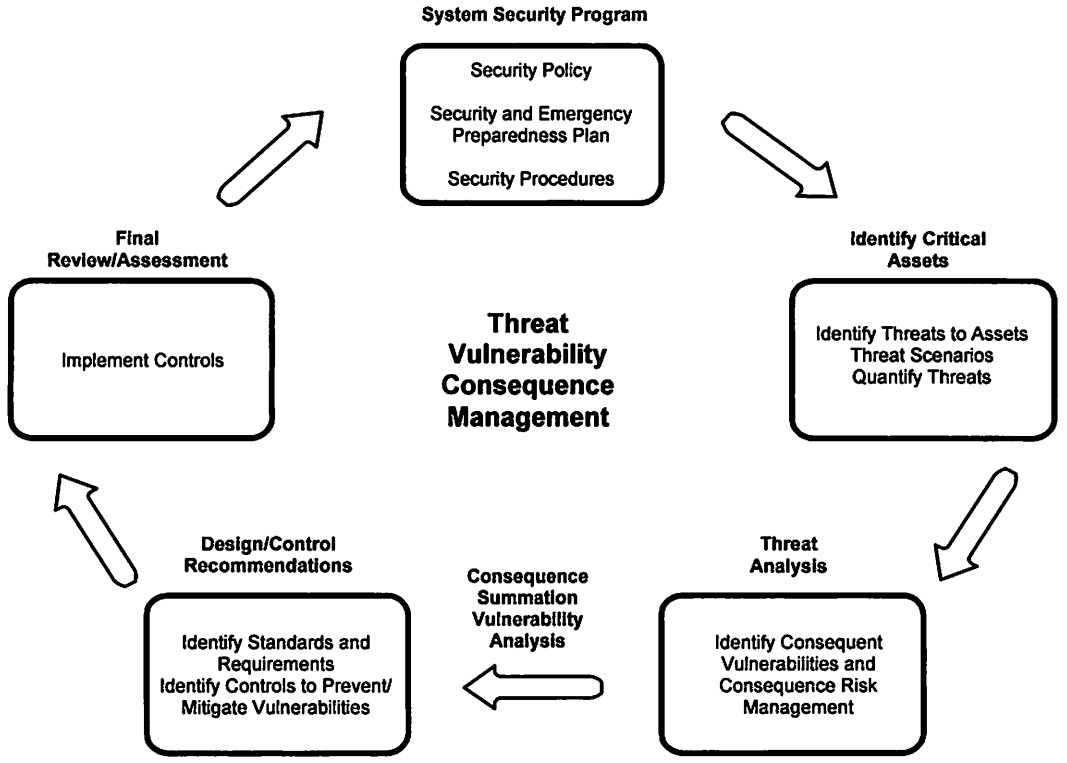
Planning in advance of a terrorist act, potential criminal activity committed on transit property, or other security incident is essential in providing passengers and employees with a safe and secure environment. A security incident may result in serious injuries or death, destruction of property and facilities, and the inability to continue transit operations to the region. To evaluate the susceptibility to potential threats and identify design corrective actions that can reduce or mitigate the risk of serious consequences from a security incident, WMATA conducts a Security Risk Assessment during each phase of each rail extension. Security Risk Assessments are also conducted for other capital projects, as determined by the SCRC or the ESC.

The Security Risk Assessment process consists of four activities:

- Identification of critical assets in the rail extension or other transit project;
- Analysis of the threats against the assets;
- Identification of vulnerabilities within the proposed system; and
- Summary analysis of security incident consequences.

The Security Risk Assessment identifies the likelihood of specific threats that may endanger WMATA assets (people and property), the potential vulnerabilities associated with the design of a particular project, and allows for mitigation efforts to be "designed into" the project in order to reduce the security risk and to minimize the consequences of the identified criminal and terrorism activities. It also identifies the security training needs of WMATA personnel and necessary security procedures. Security vulnerabilities identified in projects are managed in the certification process similarly to safety hazards, as discussed in Section 4.The Security Risk Assessment process is summarized in Figure 5.

**Figure 5: Security Risk Assessment Process**




### 5.1.1 Asset Identification

Assets are defined as people, information, and property. WMATA assets include:

- People - passengers, employees, visitors, contractors, vendors, community members, and others who come into contact with the transit system; and
- Property – fixed infrastructure and rolling stock.
- The range of transit assets is presented in Table 5.

**Table 5: Typical Transit Assets**

| Typical Transit Assets | |
|---|---|
| • Passenger Stations, Stops, and Shelters | • Alternative Fuel Storage Facilities |
| • Tenant Facilities in Passenger Stations | • Switches, Signals, and Interlockings |
| • Passenger Vehicles | • Grade Crossing & Automatic Warning Devices |
| • Structures (Underground, At-grade, & Elevated) | • Electrification Systems (3rd rail, overhead catenaries) |
| • Customer and Employee Parking Lots | • Revenue Collection Facilities |
| • Vehicle Control Systems | • Vehicle Storage Facilities |
| • Communication Systems | • Operation Control Centers |
| • Heavy Maintenance Facilities | • Wayside Support & Maintenance Facilities |
| • Service and Inspection Facilities | • Ancillary Facilities and Storage |
| • Maintenance Vehicles and Equipment | • Administrative Facilities |
| • Back-up Power Systems | • Fuel Farms and Generators |
| • Emergency Equipment (Fans, Pumps, Fire Suppression) | • Transit Police/Security Facilities & Communications |

### 5.1.2 Asset Criticality Determination

Assets are prioritized in terms of criticality. Most weight is given to those assets that present the greatest threat to life safety or service disruption, if attacked. In making this determination, consideration is given to:

- Impact on passengers, employees, and first responder;
- Impact on transit operations;
- Economic value of the asset, including current and replacement value;
- Intrinsic value of the asset to a potential adversary; and
- Asset location to other critical assets.

### 5.1.3 Identification of Threats against Critical Assets

A threat is any action with the potential to result in death, injury, destruction, interruption of operations, or denial of services. Transit agencies face security threats from three primary classifications of crime: crimes against persons, crimes against property, and other crimes committed on transit property. Other crimes committed on transit property generally are minor crimes that affect quality of life. They degrade the quality of transportation service and interfere with passengers' use of the transportation system. The majority of crimes committed do not pose a physical threat to passengers but may erode passengers' sense of security and make passengers feel intimidated. Table 6 shows possible crimes that may be committed on transit property.

**Table 6: General Crime Categories**

| Crime Category | Crime Types within Category |
|---|---|
| Crimes Against Persons | Pick-pocketing, purse snatching, assault, rape, homicide, robbery, terrorism |
| Crimes Against Property | Arson, vandalism, graffiti, burglary, motor vehicle theft, theft from automobiles, sabotage, terrorism |
| Other Crimes Committed on Transit Property | Drug dealing, drinking, prostitution and sex offenses, disorderly conduct, aggressive panhandling, loitering, fare evasion, trespassing |

Metro Transit Police is the central point for the collection, reporting, and recordkeeping of security data and information involving the WMATA transit system. Analysis of the security data is conducted to identify criminal behavior patterns within the WMATA system. WMATA also receives security threat and crime intelligence through law enforcement sources in the Washington Metropolitan area, the National Joint Terrorism Task Force (JTTF), Transportation Security Administration, and other intelligence sources. The threat analysis defines the level or degree of threats against WMATA.

### 5.1.4 Threat Scenarios

Threat scenarios are developed to identify and evaluate vulnerabilities that may make the asset susceptible to an attack. Scenario development also provides identification of impacts of threats on critical assets and promotes mitigation strategies and capability needs. The scenarios are intended to represent potential real-world events and, as such, have been derived primarily from WMATA and other operating systems' experiences and worldwide security incidents.

### 5.1.5 Vulnerabilities

Vulnerability is the susceptibility of the system to a particular type of security incident or event that can be taken advantage of to carry out a threat. Vulnerabilities may surface as a result of the following:

- Impact on transit operations;
- Design and construction of the stations, guideways, wayside facilities, park and ride lots, aerial structures, tunnel infrastructure, operations and maintenance facility, and operations control center;
- Equipment and technology used;
- Operating procedures; and
- Policing and security practices.

A vulnerability analysis is used to identify specific weaknesses with respect to how the new facility or system may invite and permit a threat to be accomplished.

### 5.1.6 Security Incident Frequency

The likelihood of a security incident or event affecting a system or facility is categorized as follows:

High – Indicates that a **definite** threat exists against the asset and that the adversary has both the capability and intent to attack or commit a criminal act, and that the asset is targeted on a frequently recurring basis;

Frequent – Indicates that a **credible** threat exists against the asset based on knowledge of the adversary's capability and intent to attack or commit a criminal act against the asset, based on related incidents having taken place at similar assets or in similar situations;

Occasional – Indicates that there is a **possible** threat to the asset based on the adversary's desire to compromise similar assets;

Seldom – Indicates that there is a **low** threat against the asset and that few known adversaries would pose a threat to the asset; and

Never – Indicates **no credible** evidence of capability or intent and no history of actual or planned threats against the asset.

Table 7 is used to identify security incident/event probability. The probability categories - Levels A, B, C, D, or E - are used in conjunction with the Severity Categories (Table 8) as an essential part of the Criticality Matrix (Table 9).

**Table 7: Security Event Probability Categories**

| Security Incident Probability Categories | | | |
|---|---|---|---|
| **Description** | **Level** | **Specific Individual Item** | **Fleet or Inventory** |
| **High** | A | Likely to Occur Frequently | Continuously Experienced |
| **Frequent** | B | Will Occur Several Times in Life of an Item | Will Occur Frequently |
| **Occasional** | C | Likely to Occur Sometime in Life of an Item | Will Occur Several Times |
| **Seldom** | D | Unlikely but Possible to Occur in the Life of an Item | Unlikely but can Reasonably be Expected to Occur |
| **Never** | E | So Unlikely, it can be Assumed Occurrence May not be experienced | Unlikely to Occur but Possible |

The threat severity categories are summarized in Table 8.

**Table 8: Threat Severity Categories**

| Threat Severity Categories | | |
|---|---|---|
| ***Category*** | ***Severity*** | ***Characteristics*** |
| *1* | *High* | *Death or System Loss or Extensive Damage* |
| *2* | *Moderate* | *Severe Injury or Moderate System Damage* |
| *3* | *Low* | *Minor Injury or Minor System Damage* |

### 5.1.7 Security Incident Severity

In addition to threats, the worst-case consequences of security incidents are evaluated. Severity is defined as the degree of injury or amount of damage that may be expected from a successful attack or criminal act against an asset. Examples of consequences include; injuries to the public or to transit personnel, loss of equipment causing financial losses, and disruption to transit operations. Severity categories are defined to provide a qualitative measure of the result of a security breach.

I. High – Loss of life and/or extensive damage requiring months to repair; very long term interruption.

II. Moderate – Serious injuries and/or significant damage requiring weeks to repair; long term interruption.

III. Low – Minor injuries and/or minor damage requiring 7 or less days to repair; short term interruption.

### 5.1.8 Security Criticality Matrix

The severity of a threat and the likelihood of occurrence are combined into a risk level (criticality) matrix to show the consequences. The consequences are assessed both in terms of severity of impact and probability of occurrence for a given threat. The criticality matrix organizes the resulting consequences into categories of high, serious, and low. The matrix helps to prioritize consequences and to focus available resources on the most serious threats requiring resolution while effectively managing the available resources. Threats with vulnerabilities identified as high may require further investigation and indicate that the condition cannot remain as is but must be mitigated. A serious consequence in the matrix indicates that the countermeasure should be implemented, if at all possible, within fiscal constraints. A low consequence means that to accept the risk without providing any countermeasures. The matrix is illustrated in Table 9.

## 5.2 Resolution Process

Security issues are resolved similar to the hazard management process. The each security issue is tracked to closure by the SAFE to ensure that they have been adequately addressed.

**Table 9: Criticality Matrix**

| Frequency of Occurrence | Hazard Categories | | |
|---|---|---|---|
| | I<br>High | II<br>Moderate | III<br>Low |
| (A) High | H (IA) | H (IIA) | S (IIIA) |
| (B) Frequent | H (IB) | H (IIB) | S (IIIB) |
| (C) Occasional | H (IC) | S (IIC) | L (IIIC) |
| (D) Seldom | S (ID) | L (IID) | L (IIID) |
| (E) Never | S (IE) | L (IIE) | L (IIIE) |

| Hazard Risk Index | | Risk Decision Criteria | |
|---|---|---|---|
| IA, IB, IC, IIA, IIB | | High (H) | Threat must be mitigated |
| ID, IE, IIC, IIIA, IIIB, | | Serious (S) | Threat should be mitigated if possible within fiscal constraints |
| IID, IIE, IIIC, IIID, IIIE, | | Low (L) | Threat is acceptable with review by management |

Source: Federal Transit Administration *Public Transportation System Security and Emergency Preparedness Planning Guide*

# 6 AUDITS

Each phase of the safety and security certification program, design through pre-revenue testing phase, is periodically audited to assure that the Safety and Security Certification Program is being properly implemented and effective. The audit is performed in accordance with the WMATA Internal Safety Audit Process (see Section 3.3.15 of the System Safety Program Plan).

Audits 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 Safety and Security Certification Program.

The audit 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 Safety and Security Certification Program. Documentation provides a detailed audit 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;
- Original copies of the completed checklists for each certifiable element;
- Support documentation that may not be contained within the project files, such as Visual Inspection Reports;
- Copies of test reports for safety critical systems;
- Copies of integration test reports;
- Original copies of the Temporary Use Notices;
- Original copies of the Certificates of Compliance for each certifiable element; and
- Original copy of the System Safety and Security Certificate 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 reviews 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 safety and security certification program, 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 Program 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 Program audit 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 Safety and Security Certification Program (see Section 3.1.10). Reports for rail projects are transmitted to the TOC.

# ATTACHMENTS

# ATTACHMENT 1
# SAMPLE

## WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
## SAFETY/SECURITY CERTIFICATION PROGRAM COMPLIANCE CHECKLIST (CIL)

| Project:<br>Certifiable Element:<br>Revision:<br>Checklist type:<br>Master:<br>Sub: | | | **Design / Construction / Test**<br>**Compliance**<br>**CIL** | | | | | | SAFE Approval: Date: Page 1 of XX<br>Engineering Approval: Date:<br>Project Manager Date:<br>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.<br>NA: Not applicable<br>OPN: activity or issue is not completed, documentation not identified, or other situation prevents completing the item.<br>CLD: activity has been completed and documentation is identified and formally filed.<br>CEX: 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.<br><br>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**
**SAMPLE**

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

# 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**
**SAMPLE**

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

# TEMPORARY USE NOTICE

**Permit 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**
**SAMPLE**

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

# SAFETY CRITICAL ITEMS LIST

| | | |
|---|---|---|
| **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 |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
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**ATTACHENT 5**
**SAMPLE**

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

# CERTIFIABLE ELEMENT CERTIFICATE OF COMPLIANCE REHABILITATION/MODIFICATION PROJECT

**Certifiable Element/Sub-Element:**

**Restrictions Noted:**

**The Certifiable Element complies with all applicable safety and security requirements and may be placed into service.**

| | | | |
|---|---|---|---|
| **Contractor Project QA/Safety Rep.** | **Date** | **Contractor Project Manager** | **Date** |
| **WMATA Project Manger** | **Date** | **Safety Officer** | **Date** |
| **Assistant Chief Safety Officer** | **Date** | | |

**ATTACHMENT 6**
**SAMPLE**

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

# 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**
**SAMPLE**

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

# 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

## EXAMPLE OF REHABILITATION-MODIFICATION PROJECTS

| SAMPLE CONTRACT Type | DESCRIPTION | SAFETY/SECURITY CRITICAL ELEMENT AND EFFECT ON SYSTEM | SAFETY / SECURITY CERTIFICATION STEPS | | | |
|---|---|---|---|---|---|---|
| | | | Step 3 Design | Step 4 Spec | Step 5 Testing | Step 6 Manuals/Training |
| Category 1 | ROCS System Upgrade | | X | X | X | X |
| Category 3 | Replacement of AC Switchgear | Traction Power – Electrical Equipment Safety | | | X | X |
| Category 2 | DC Traction Power Cable | Traction Power – Electrical Safety | | X | X | X |
| Category 2 | Dry Standpipe Replacement | Facilities-Fire-Life Safety | | X | X | X |
| Category 2 | FIA System Replacement | Facilities-Fire-Life Safety | | X | X | X |
| Category 1 | West Falls Church Yard Processor (New microprocessor) | ATC – Operational Safety | X | X | X | X |
| Category 1 | PROTECT | Security-Detect/Respond Safety | X | X | X | X |
| Category 2 | Bus Vehicle In-Ground Lift Replacement | Facilities-Employee Operational Safety | | X | X | X |
| Category 3 | Replace 6 GL-a Interlocking & NV Processors | ATC – Operational Safety | X | X | X | X |
| Category 3 | Stinger | Facilities - Employee Safety | | | X | X |
| Category 3 | Mainline Switch Machine (M3) | Track – Installation Safety | | | X | X |
| Category 2 | Replacement for UPS/Battery | Electrical Operational Safety | | | X | X |
| Category 2 | TPSS<br>3rd Rail Equipment | Traction Power Operational Safety | | | X | X |

| SAMPLE CONTRACT Type | DESCRIPTION | SAFETY/SECURITY CRITICAL ELEMENT AND EFFECT ON SYSTEM | SAFETY / SECURITY CERTIFICATION STEPS | | | |
|---|---|---|---|---|---|---|
| | | | Step 3 Design | Step 4 Spec | Step 5 Testing | Step 6 Manuals/Training |
| Category 3 | Replace MCC and Voltage Regulators | Electrical Operational Safety | | | X | X |
| Category 3 | Rehab Standpipe System | Facilities – Fire/Life Safety | | | X | X |
| Category 2 | Rehab Station/Tunnel Ventilation | Facilities – Fire/Life Safety | | X | X | X |
| Category 3 | ATC Room Power Supplies | ATC – Operational Safety | | | X | X |
| Category 3 | TPSS Equipment Installation | Traction Power – Electrical (Using WMATA SOPs) | | | X | X |
| Category 2 | TPSS Equipment Installation | Traction Power – Electrical (Not Using WMATA SOPs) | | X | X | X |
| Category 1 | Bladensburg Heavy Equipment/CNG | Facilities/Fire-Life Safety | X | X | X | X |
| Category 2 | Bus Vehicle In-Ground Lift Replacement | Facilities (Not Using WMATA SOPs) | | X | X | X |
| Category 1 | Replacement of AF Track Circuit Systems | ATC – Operational Safety | X | X | X | X |
| Category 1 | RTU Replacements (ATC System) | ATC – Operational Safety | X | X | X | X |
| Category 2 | Public Address System and CCTV Replacement | Facilities – Security and Fire/Life Safety (Not Using WMATA SOPs) | | X | X | X |
| Category 3 | Replacement of Emergency Egress Hatches | Facilities – Fire/Life Safety | | | X | X |
| Category 1 | ATC J-Relays (Door dwell and station stop) | ATC – Operational Safety | X | X | X | X |
| Category 1 | Chemical Sensor | Security/Detect/Respond | X | X | X | X |

# WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

# DULLES CORRIDOR METRORAIL PROJECT

# SAFETY AND SECURITY CERTIFICATION

## APPENDIX – 1

## TO WMATA SAFETY AND SECURITY

## CERTIFICATION PROGRAM PLAN

**March 2012**

# 1 INTRODUCTION

The Dulles Corridor Metrorail Project (Project) is an extension of the existing 106-mile Metrorail system. The Metropolitan Washington Airports Authority (MWAA), the sponsor of the Project, has contracted with Dulles Transit Partners (DTP) to be the Design-Builder for all Project facilities and systems with the exception of the systems and equipment and revenue vehicles listed in figure 1 below. WMATA is not a party to the Design-Build Contract, but will be the eventual owner and operator of the extension. Because WMATA does not have a contractual relationship with DTP, safety and security activities are coordinated through MWAA.

WMATA has a formal Cooperative Agreement with MWAA to support the Project by providing Transit Oversight Services and the WMATA unique systems and equipment described below in Figure 1. WMATA will implement its Safety and Security Certification Program Plan to ensure that the systems and equipment listed in Figure 1 below and the revenue vehicles are safe and secure for passenger service.

**Figure 1: WMATA Systems and Equipment**

| ITEM # | DESCRIPTION | COMPONENTS |
|---|---|---|
| 1 | Rail Vehicles | Heavy Rail Vehicles / Spare Parts – Procure & Commission 64 New Rail Vehicles |
| 2 | Communication Backbone | Communications – Fiber Optic System, Passenger Information Display System (PIDS), Local Area Network / Wide Area Network, Comprehensive Radio System, Telephone System Expansion, Smart Monitoring & Display System & Yard Security System Modification |
| 3 | Non-Revenue Vehicles, Equipment & Furniture | Heavy Maintenance Facility / Yard & Yard Track / Non – Revenue Vehicles – Procure Non – Revenue Vehicles, Portable Yard & Shop Equipment & Station Furniture |
| 4 | ROCS Upgrade, ATC | Train Control & Signals / Central Control – Rail Operations Control System Update (ROCS), OCC Modifications, Automatic Car Identification System & Destination Code Table Revisions |
| 5 | Automatic Fare Collection | Fare Collection System & Equipment – Provide / Install Automatic Fare Collection Equipment, Provide Install Smart Card Equipment for Parking Lots |
| 6 | System Graphics | System Graphics – Prepare System Maps, Customer Information, Schedules & Brochures and Perform System Signage Modifications |
| 7 | Art in Transit | At Grade Stations / Aerial Stations – Purchase Artwork |

The Cooperative Agreement sets forth specific safety and security activities and responsibilities, including the execution of a safety and security certification program for the Project. Consequently, WMATA has a vested interest in assuring that the Project is designed and constructed in accordance with the WMATA design criteria and specifications.

## 2 PROJECT DESCRIPTION

The Project will extend the existing 106-mile Metrorail system from East Falls Church on the Metrorail Orange Line in Fairfax County through Tysons Corner to Washington Dulles International Airport and beyond the airport to Route 772 in Loudoun County in two phases. Most of the extension will be constructed in the median of the Dulles International Airport Access Highway (DIAAH) and Dulles Connector Road, but the alignment will also directly serve Tysons Corner and Dulles Airport. The extension will include 11 new Metrorail stations, a rail yard site on Dulles Airport property, and an expansion of the existing rail yard at West Falls Church.

Phase 1 of the project (*Extension to Wiehle Avenue*) will be the initial 11 miles of the Locally Preferred Alternative (LPA) from East Falls Church on the current Metrorail Orange Line to Wiehle Avenue in Reston. It will include 5 stations, improvements to existing WMATA Service and Inspection Yards, and tail tracks outbound of the interim terminus at Wiehle Avenue. Phased construction may require additional refinements to some facilities. Phase 2 of the project (*Extension to Dulles Airport/Route 772*) will complete construction of the LPA between Wiehle Avenue through Dulles International Airport to Route 772 in Loudoun County, add 6 additional stations, and add a new Service and Inspection Yard.

## 3 MWAA SAFETY AND SECURITY MANAGEMENT PLAN

A Safety and Security Management Plan (SSMP) was developed and implemented by MWAA. The plan sets forth the safety and security activities for the control of safety hazards and security vulnerabilities for the Project. The plan also assigns responsibility for the implementation and administration of these activities, including those required of DTP. MWAA is responsible for the management of the DTP activities. WMATA provides additional oversight, as specified in the MWAA-WMATA Cooperative Agreement.

A requirement of the MWAA SSMP is the development of a System Safety/Security Certification Management Plan (SSCMP) by DTP. DTP has prepared and implemented a Project SSCMP, with support from MWAA and WMATA. The SSCMP addresses the requirements of the WMATA Safety and Security Program Plan (SSPP), WMATA Safety and Security Certification Program Plan (SSCPP) and the Federal Transit Administration (FTA) Handbook for Transit Safety and Security Certification. MWAA is responsible for approving the safety and security certification reports for each Project segment submitted by DTP for approval.

## 4 SAFETY AND SECURITY CERTIFICATION WORKING GROUP

Administration and maintenance of the SSCMP is through the Project Safety and Security Certification Working Group (SCWG), including hazard and vulnerability identification, evaluation, and resolution for the Project. It is also responsible for reviewing hazards and vulnerabilities on the existing Metrorail system for applicability to the Project and recommends resolutions.

## 5 PROJECT INTERFACE

The SSMP designates the SCWG, as the working body that assists the DTP Safety and Security Manager in the performance of safety and security related activities. The SCWG is also the primary interface with WMATA for the safety and security activities. As such, WMATA is an active participant on the SCWG. WMATA representatives to the SCWG include representatives from System Safety and Environmental Management (SAFE), Metro Transit Police (MTPD), and WMATA engineering and construction staffs.

Functional Responsibilities and Lines of Communication

A. The Project SAFE Representative is responsible for:

- Reviewing and monitoring implementation of the Safety and Security Certification Program Plan for the Project;
- Assisting in identifying and defining the certifiable elements, items, and related safety requirements;
- Reviewing compliance checklists to ensure that they address hazardous conditions that may be found in operating the Metrorail system;
- Reviewing verification documentation for each certifiable element to ensure compliance with the identified safety requirements;
- Advising the SCWG of documentation discrepancies or completeness that require resolution;
- Reviewing hazard analyses to determine the completeness of the analyses and of the recommended control measures;
- Reporting progress of the SCWG effort to the Chief Safety Officer;
- Leading audits of the Project safety and security certification process;
- Recommending revisions to the Project Safety and Security Certification Program;
- Reviewing the interim Safety and Security Certification Report prepared by the DTP; and
- Preparing the final Safety and Security Certification Report for the Project.

B. The Project MTPD Representative is responsible for:

- Assisting in identifying and defining the certifiable elements, items, and related security requirements;
- Reviewing compliance checklists to ensure that they address security issues that may be encountered in / on the Metrorail operating system;
- Reviewing verification documentation for each certifiable element to ensure compliance with the identified security requirements;
- Advising the SCWG of documentation discrepancies or completeness that require resolution;

- Reviewing security assessments to determine completeness of the assessments and adequacy of the recommended control measures;
- Reporting progress of the SCWG effort to the Chief of Police;
- Assisting in audits of the Project safety and security certification process;
- Recommending revisions to the Project Safety and Security Certification Program;
- Reviewing the interim Safety and Security Certification Report prepared by the DTP; and
- Assisting in preparing the final Safety and Security Certification Report for the Project.

C. Project Engineering/Construction Representatives are responsible for:

- Monitoring design and construction issues and activities related to the certification effort;
- Assisting in the identification of safety and security certifiable elements, items and requirements;
- Reviewing compliance checklists to ensure that they address safety and security concerns that may be encountered in operating the Metrorail system;
- Reviewing verification documentation for each certifiable element to ensure compliance with the identified safety and security requirements;
- Advising the SCWG of documentation discrepancies or completeness that require resolution;
- Assisting in the review of safety analyses and security assessments to determine completeness of the analyses/assessments and recommended control measures;
- Reporting progress of the SCWG effort to the Director of Construction;
- Assisting in audits of the Project safety and security certification process;
- Recommending revisions to the Project Safety and Security Certification Program;
- Reviewing the interim Safety and Security Certification Report prepared by Dulles Transit Partners; and
- Assisting in preparing the final Safety and Security Certification Report for the Project.

The WMATA SCWG representatives are responsible for overseeing the DTP and WMATA responsibility projects certification efforts on behalf of the WMATA Safety and Security Certification Review Committee (SCRC). The WMATA project representatives report DTP certification progress and SCWG activities to the respective departmental members of the SCRC. The representatives are also responsible for recommending to the SCRC entry into the Pre-Revenue phase of the Project. The SCWG will remain active during the Pre-Revenue phase and will support the activities of the SCRC.

The SCRC is responsible for reviewing the DTP certification report and all related documentation. Upon acceptance of the report findings, the SCRC will initiate the Pre-Revenue phase activities. Once the project is in the Pre-Revenue phase of the Project, the SCRC is responsible for all certification activities. The SCRC is also responsible for overseeing all certification activities illustrated in Figure 1 in accordance with the WMATA Safety and Security Certification Program Plan. Once the appropriate level of

certification is achieved, the SCRC will forward a recommendation to enter revenue service to the Executive Safety Committee (ESC).

The process for SCRC review and evaluation of the SCWG deliberations is described in the SCRC's Procedures for the Dulles Corridor Metrorail Project. Please refer to Procedure Safety and Security 1 (PSS-1) appended to the end of this document. Also see, Figures 2 to 5 located at the end of this document that illustrates the various reporting lines of communication within the project.

## 6 PROJECT DESIGN CRITERIA

The primary resource for safety, fire/life safety, and security requirements is the WMATA Manual of Design Criteria and WMATA Standard Specifications. Requirements are also derived from National Fire Protection Association (NFPA) Standards, International Building Code, Virginia Building Code, and other applicable standards and industry practices. The SCWG assures that all applicable safety, fire/life safety, and security requirements, or an acceptable alternative, are met.

## 7 SAFETY/SECURITY CERTIFIABLE ITEMS LIST AND CONFORMANCE CHECKLISTS

The initial and updated Safety/Security Certifiable Items List (SCIL) and conformance checklists for the project are reviewed by the SCWG. Upon completion of the conformance checklists, appropriate documentation supporting verification of the safety and security requirements are submitted to the SCWG for review.

## 8 START-UP AND INTEGRATION

Start-up and testing is the responsibility of DTP. The start-up and test process will be described in detail in the Testing and Commissioning Plan, which requires WMATA acceptance prior to execution. The plan will describe the requirements for:

- Track access permits, temporary use permits for systems, and occupancy permits.
- Preparation, review, and approval of test procedures and acceptance requirements
- Identification, disposition, and closure of test discrepancies, equipment / material modifications (if needed), and re-inspection / testing.

WMATA will witness all safety/security critical tests.

During Pre-revenue operations, WMATA will conduct any additional tests as deemed necessary prior to start of revenue service.

## 9 CONFORMANCE CHECKLIST REVIEWS AND AUDITS

Each phase of the safety and security certification program (Design, Construction, Start-up and Pre-Revenue Operation) will be periodically reviewed by the WMATA SAFE project representatives through Design Conformance Checklist (DCC), Construction Conformance Checklist (CCC) and Startup and Integrated Testing Conformance Certification (SITCC) reviews to assure that the SSCMP is being properly implemented and effective. The WMATA project SAFE representative will lead the review activities. The review findings will be reported to the SCRC. Additionally, details of the reviews will be provided to the

Tri-State Oversight Committee (TOC), as they are completed, and a summary included in the WMATA Annual Internal Safety Audit Report to TOC.

As the Project nears completion, WMATA will conduct walk-through-inspections of facilities, passenger stations, yard, roadway, traction power substations, and signal systems to determine that safety, security, and fire/life safety requirements have been incorporated in the overall project.

Because of the unique, safety critical nature of the automatic train control system (ATC) and its compatibility with the current operating system, the ATC system will undergo a separate safety certification process performed by the design-builder ATC subcontractor. This certification process will be implemented in accordance with the approved Project Technical Specifications. Please refer to Procedure Safety and Security 2 (PSS-2) appended to this document, which explains the review/audit process of WMATA.

## 10 PRE-REVENUE

The WMATA Dulles Project Office is responsible for all WMATA Pre-Revenue operations for Phase I and II. At the appropriate point in the Project schedule, WMATA will convene a Startup Steering Committee for Phases I and II. Under the direction of the WMATA Dulles Project Director, this executive level committee will provide necessary direction to the Project and to the appropriate WMATA internal departments to ensure that adequate planning and resources are in effect prior to the commencement of DTP Startup activities. The WMATA Startup Steering Committee will meet at least once a month and conduct interim meetings with Managers to ensure that WMATA provides:

- Necessary resources to the Project for startup activities;
- Deliverables noted in Figure 1 as needed;
- Ensure that WMATA is ready to operate the new line when completed.

The WMATA Dulles Project Office is also responsible for constructing and managing a schedule that will indicate critical tasks, and anticipated target dates of completion. This schedule will be provided to the Project and be updated on a timely basis to show progress.

WMATA SAFE will have representation on the WMATA Startup Steering Committee and will be solely responsible for completing the final safety/security certification of the new line for those activities that are the responsibility of WMATA prior to and after the turn-over of the Project at Substantial Completion as describe in the WMATA SSCPP.

The Pre-Revenue phase of the project will be the responsibility of WMATA (This phase will be managed by the WMATA Project Director) with support from both MWAA and DTP. The Pre-Revenue phase will be safety and security certified in accordance with the WMATA Safety and Security Certification Program Plan. Prior to entering the Pre-Revenue phase, MWAA will provide WMATA with a certification report stating that all facilities and systems, for which they are responsible, can be made operationally ready for passenger service. Operational readiness is achieved when all work has been essentially completed, tested, and certification has been received by WMATA. The TOC may also conduct its own independent operational readiness review of the new line segment. WMATA will be responsible for coordinating all TOC activities.

During the Pre-Revenue phase of the Project, operating procedures and plans will be tested for

effectiveness under simulated operating conditions for normal, abnormal, and emergency situations. Emergency drills will also be held at selected sites and coordinated by SAFE, OPER, and MTPD and will involve external emergency response agencies that may respond to an incident on the rail extension. The drills will verify the adequacy of WMATA emergency response plans and procedures and assure that outside emergency response personnel are prepared to adequately respond to emergencies on the new alignment. The drills will be supported by DTP, as requested.

In addition, a final "walk-through inspection" of completed facilities and systems will be performed.

At the conclusion of the Pre-Revenue phase, a Certificate of Compliance for the Pre-Revenue phase will be prepared and submitted to the WMATA Safety and Security Certification Review Committee for approval and recommend that a Certification of System Compliance be issued.

## 11 CERTIFICATION OF SYSTEM-WIDE SYSTEMS AND SEGMENTS

**Dulles Transit Partners**

DTP will be developing SCILs to identify specific Project items requiring certification verification during the design, construction, and testing phases of the Project. The certifiable items will be categorized by line segments (in conformance with Integration Testing and Start-up schedules) for Facilities and Systems elements, with additional requirements for Systems Integration and Start-up Testing Requirements, and Operational Readiness Requirements. When a SCIL conformance checklist for a DTP provided facility or system is substantially complete and the certifiable element or sub-element is ready for certification for that phase, DTP will prepare an Interim Safety and Security Certification report for the system/facility. MWAA will submit the approved reports to WMATA, in accordance with the MWAA Safety and Security Management Plan, for review and acceptance.

**WMATA**

Issuance of Certificates of Compliance for WMATA provided systems will be in accordance with the WMATA Safety and Security Certification Program Plan.

All original, signed Certificates of Compliance will be maintained in the Certification file for the Project.

## 12 SAFETY AND SECURITY CERTIFICATION REPORT

Upon completion of the System Performance Demonstration, a Final Safety and Security Certificate and Certification Report for the System will be prepared by DTP. The report will include a statement that the extension is ready for Pre-Revenue Testing. The report will outline the certification process for each of the segments and system-wide elements for the design, construction, and testing phases of the project. The report will also discuss the disposition of hazards and vulnerabilities identified through the certification process, and the issues on the Open Items List. Upon review and approval by MWAA, the Final Safety and Security Certificate and Certification Report for the System will be sent to WMATA for review and acceptance.

At the conclusion of the Pre-Revenue phase of the project, WMATA will prepare a Final Safety and Security Certification Report and submit it to the ESC for approval. The approved report will be transmitted to the TOC under the signature of the WMATA General Manager.

**Figure 2**

WMATA OVERSIGHT OF THE D/B CONTRACTOR SAFETY AND SECURITY CERTIFICATION PROCESS
(Design Thru Testing)

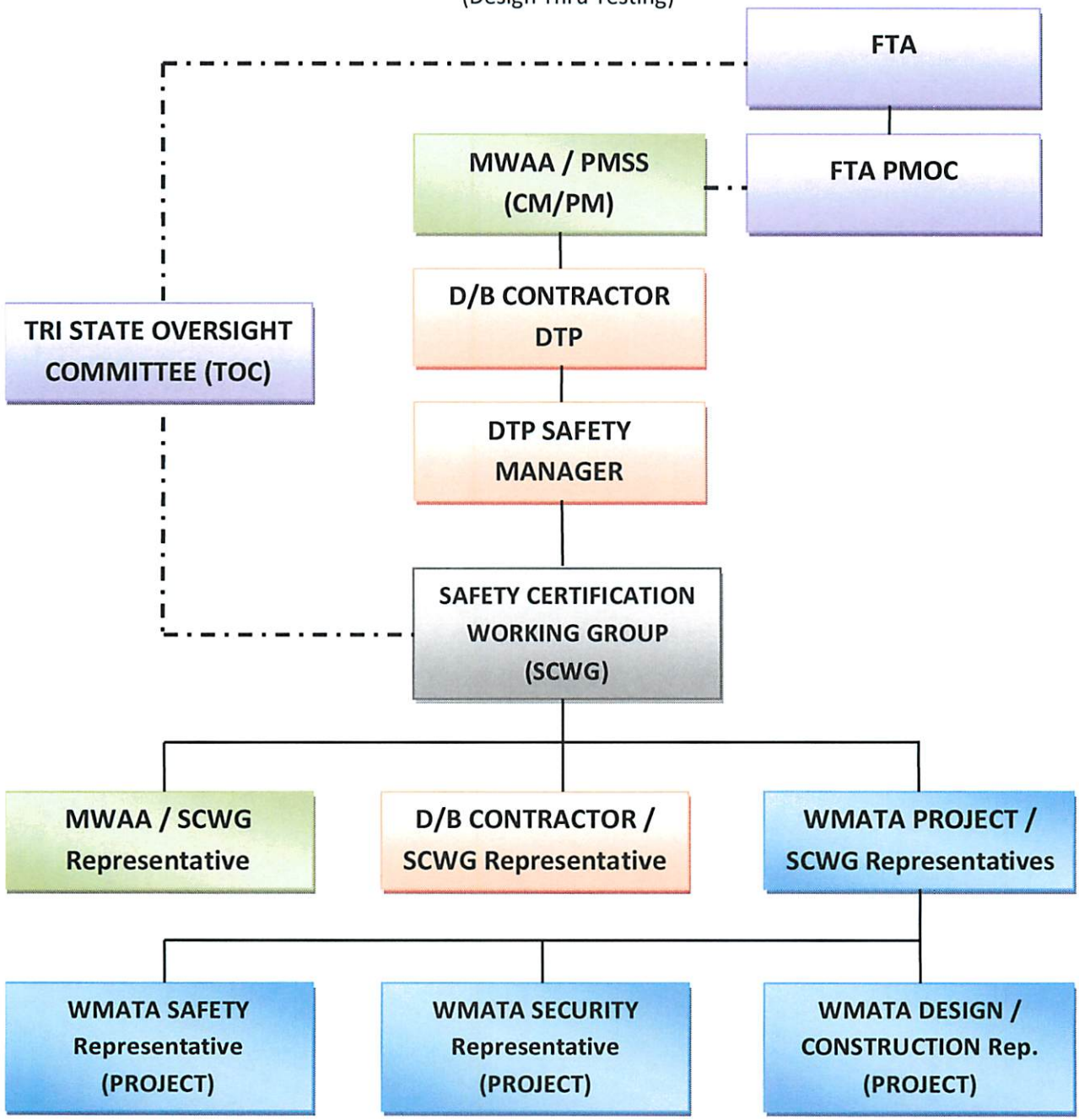


**Figure 3**

WMATA SAFETY AND SECURITY PROCESS FOR THE SCOPE DEPICTED IN FIGURE 1 AND THE PRE-REVENUE SERVICE PHASE

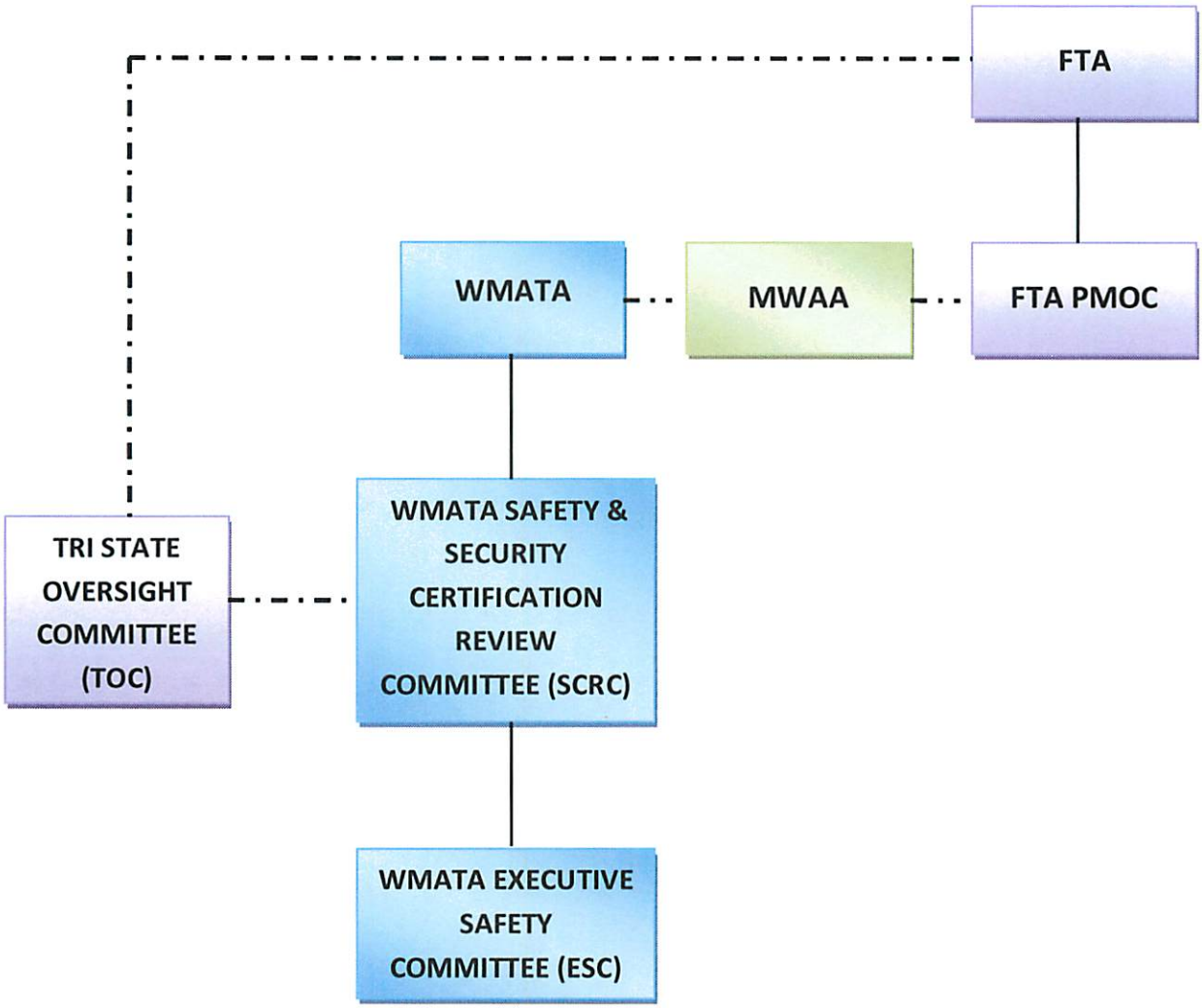


**Figure 4**

FUNCTIONAL AND COMMUNICATION LINES BETWEEN THE DULLES CORRIDOR METRORAIL PROJECT AND WMATA

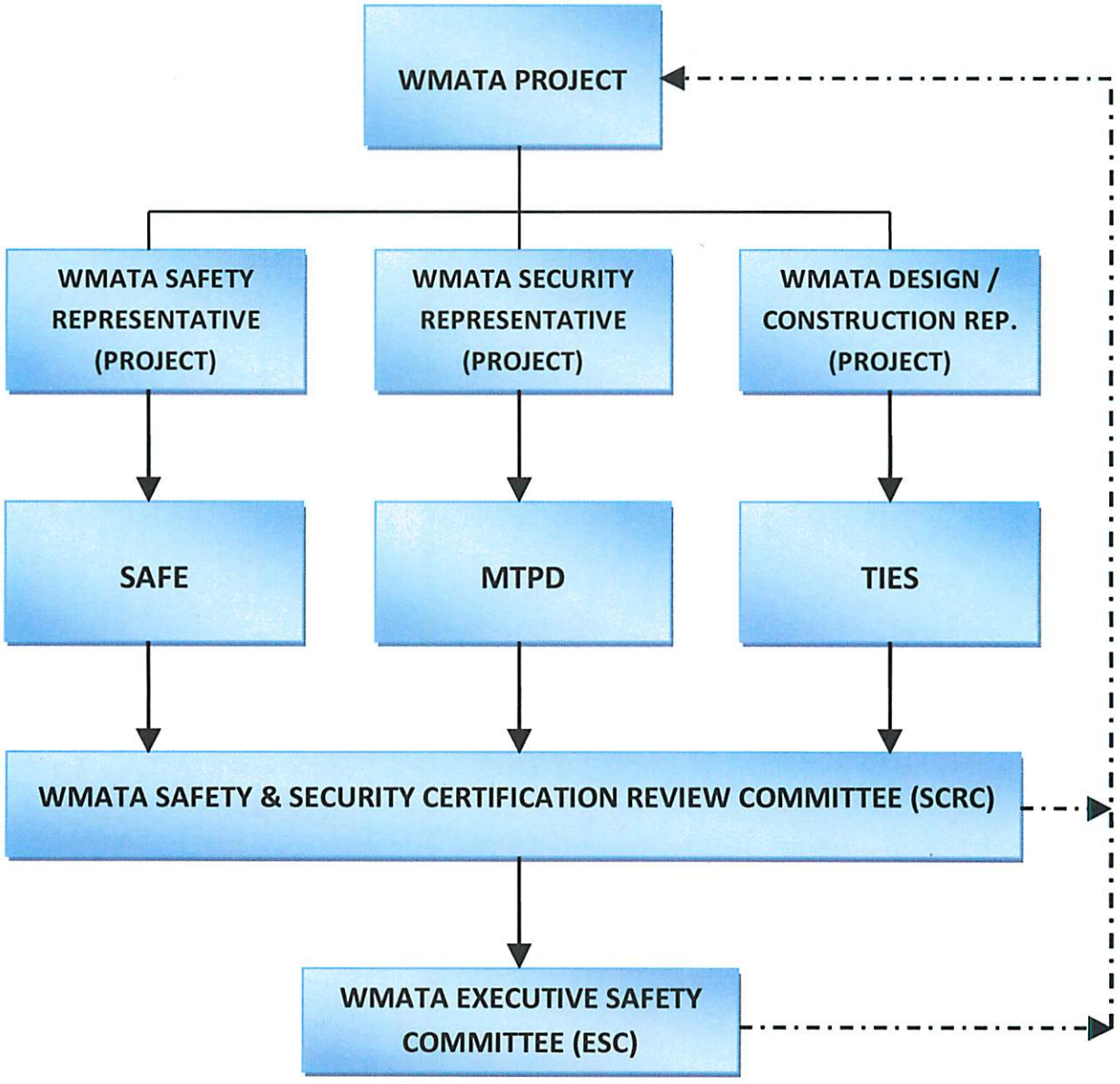
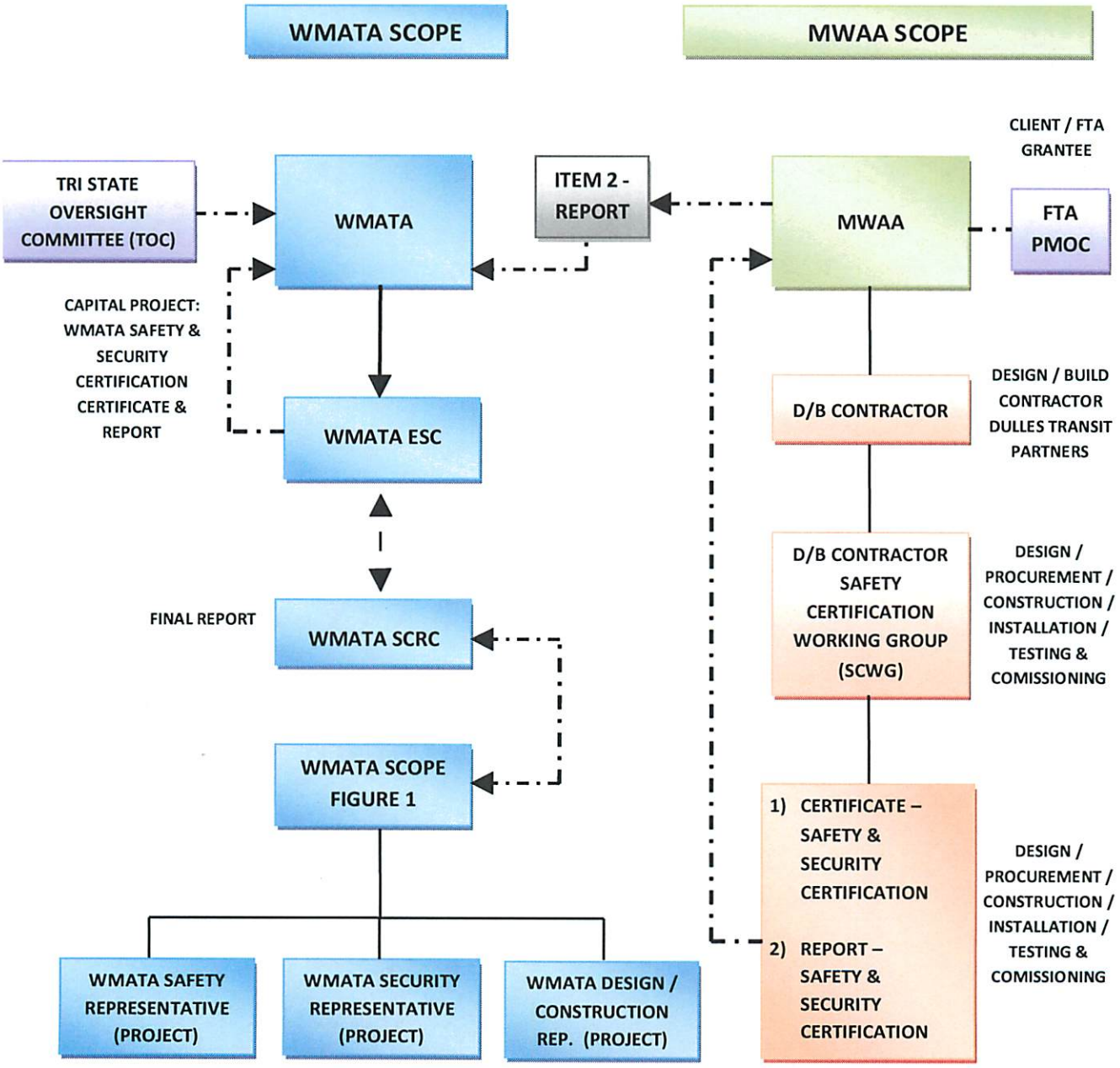


**Figure 5**

DULLES CORRIDOR METRORAIL PROJECT
PROCESS LEADING TO THE ISSUE OF A FINAL PROJECT SAFETY & SECURITY CERTIFICATION CERTIFICATE AND REPORT




NOTE: FINAL REPORT CONTAINS:
- FIGURE 1 CERTIFICATIONS
- PRE-REVENUE CERTIFICATION


# PSS-1 & PSS-2
# APPENDED

**Washington Metropolitan Area Transit Authority**
**Dulles Corridor Metrorail Project**
**Project Procedure**

| TITLE: | PROCEDURE NUMBER: | |
|---|---|---|
| Procedure for Process Leading to Acceptance of MWAA SCIL | PSS - 01 | |
| | REVISION: 0 | DATE: April 7, 2010 |
| PREPARED BY: SCRC | APPROVED BY: | |

## 1 PURPOSE

The Metropolitan Washington Airports Authority (MWAA), the sponsor and FTA grantee for the Dulles Corridor Metrorail Project (Project), has contracted with Dulles Transit Partners (DTP) to design and construct all facilities and systems for the Project with the exception of those systems, equipment, and revenue vehicles listed in Section 2.0 of this procedure. As part of the contract between MWAA and DTP, DTP is required to develop and implement a Safety and Security Certification Program for the Project based on the MWAA Safety and Security Management Plan (SSMP) and the WMATA Safety & Security Certification Program Plan, dated October 2007.

WMATA is not a party to the Design-Build Contract, but will be the eventual owner and operator of the extension. WMATA however, has a formal cooperative agreement with MWAA that outlines specific activities to be completed prior to WMATA's acceptance of the extension for operational readiness testing. Among those requirements is MWAA's satisfactory execution of a Safety and Security Program for the Project.

The purpose of this procedure is to describe the process for reviewing, evaluating, and accepting the safety and security certification program deliverables reviewed and approved by MWAA and transmitted to WMATA for acceptance.

## 2 SCOPE

This procedure applies to all Safety and Security Certifiable Items Lists, Conformance Checklists, Certification Reports, Hazard Analyses, Security Assessments, and test reports for all facilities and systems designed, constructed, and tested by DTP under the direction and oversight by MWAA for the Project.

This procedure is not applicable to those facilities and systems for which WMATA is solely responsible:

- Rail Passenger Vehicles
- Communication Backbone

- Rail Operations Center Upgrades
- Automatic Train Control
- Automatic Fare Collection
- Systems Graphics
- Art in Transit

These facilities and systems will be subject to the certification process as described in the WMATA Safety and Security Certification Program Plan, October 2007 and Appendix – 1 of the Plan.

## 3 DEFINITIONS & ACRONYMS

DTP: Dulles Transit Partners – the design/build contractor for the Dulles Corridor Metrorail Project

MWAA: Metropolitan Washington Airport Authority – the sponsor and FTA grantee for the Dulles Corridor Metrorail Project

Project: The Dulles Corridor Metrorail Project

SCWG: Dulles Corridor Metrorail Project Safety and Security Certification Working Group – The MWAA committee responsible for the administration of the safety and security certification program for the Project.

System Performance Demonstration: A series of tests to demonstrate the integration of the Project with WMATA's Adopted Regional System (ARS)

## 4 RESPONSIBILITIES

### 4.1 MWAA

MWAA has developed and issued a Safety and Security Management Plan for the Project which requires the development and implementation of a safety and security certification program for the Project. MWAA is responsible for approving the deliverables of the DTP Safety and Security Program, including the Safety Certifiable Items List (SCIL), the conformance checklists for the design, construction, testing, and integrated test phases of the Project, and the program certification reports. MWAA is also responsible for assuring that all documentation that demonstrates conformance with the safety and security requirements for the Project is available.

### 4.2 DTP

DTP, as the Design / Build Contractor to MWAA, is responsible for the development and implementation of a Safety and Security Certification Management Plan (SSCMP) for the Project. The SSCMP has been approved by MWAA. The SSCMP requires that a Safety / Security Working Group (SCWG) be convened.

### 4.3 SCWG

MWAA, with DTP as the lead, has established the Dulles Corridor Metrorail Project Safety and Security Certification Working Group (SCWG). The SCWG is composed of representatives from MWAA, DTP, WMATA and a fire/life safety representative from the Commonwealth of Virginia. The SCWG is

responsible for developing and administering the SSCMP, including resolving hazard and vulnerability issues. The SCWG is the primary interface with WMATA for Project safety/security-related issues.

### 4.4 WMATA Representatives to SCWG

WMATA representatives to the SCWG include staff from System Safety and Environmental Management (SAFE), Metro Transit Police (MTPD), and Engineering Services Design and Construction (ESVC). The WMATA SCWG representatives are responsible for overseeing the MWAA certification effort on behalf of the WMATA Safety Certification Review Committee (SCRC). The WMATA project representatives will report MWAA certification progress and SCWG activities to their respective departments and to the SCRC. The representatives are also responsible for notifying the SCRC of any problems or concerns, recommending approval of certification program products, and remedial actions (if any) to resolve certification program issues that arise. The representatives are also responsible for recommending entry into the Pre-Revenue phase of the Project, when formally notified by MWAA that the Project is ready to enter this phase.

### 4.5 WMATA Safety/Security Certification Review Committee (SCRC)

The SCRC is responsible for managing the review, evaluation, and determination of the acceptability of those MWAA approved certification products transmitted to WMATA.

The SCRC is the management policymaking body formed to assure that major bus and rail capital projects are operationally safe for revenue service. The SCRC activities include:

- Facilitating the identification and review of safety and security requirements for major capital projects;
- Ensuring that the identified safety and security requirements for a project have been incorporated into Safety and Security Certifiable Items Lists (SCILs);
- Tracking, evaluating, and resolving hazard and security vulnerabilities issues and concerns identified during the safety and security certification process;
- Resolving issues of verification documentation discrepancies and incompleteness (evidence of compliance with safety and security requirements);
- Issuing Certifications of Compliance for certifiable elements (facilities, systems, and operational elements)
- Reviewing and approving safety and security certification reports
- Providing recommendations to the ESC regarding the certification of projects

For the Dulles Rail Projects the SCRC consists of the following departments:

- Chief Safety Officer (Designee)
- SCWG SAFE Representative
- SCWG MTPD Representative
- SCWG EVSC Representative

- Chief Engineer (Designee)
- Director, Major Capital Projects
- Deputy Chief Metro Transit Police
- Managing Director, Rail Transportation
- General Superintendent – Track Structures & Systems
- General Superintendent – Car Maintenance
- Director, Plant Maintenance
- Director, Elevator and Escalator
- Chief, Network & Communication

The SCRC is led by the Chief Safety Officer (CSO). The CSO is responsible for establishing SCRC agendas, preparing SCRC minutes, and tracking safety and security issues and concerns to closure.

# 5 PROCEDURE

## 5.1 MWAA

After approval by MWAA, the DTP Project Safety and Security Certification Program deliverables will be formally submitted to WMATA for review, evaluation, and acceptance.

## 5.2 SCRC Review and Acceptance

### 5.2.1 Safety/Security Certifiable Items List

The initial SCIL developed by MWAA's D/B Contractor (DTP), will be reviewed for completeness, ensuring all safety and security critical items have been included. As the project progresses, the SCIL will be reviewed at least quarterly to assure it remains current. Newly identified certifiable items will be submitted for consideration to MWAA through the SCWG as applicable.

### 5.2.2 Conformance Checklists

MWAA's D/B Contractor (DTP) is responsible for the development and completion of the conformance checklists, from the design phase through the integrated test phase, for each of the line segments. The WMATA Manual of Design Criteria – Release 6 is being used as the basis for the safety and security requirements.

The Conformance Checklists for each of the line segments will be reviewed for completeness and for continuity as the Project progresses from the design phase, to the construction/installation phase, to the integrated test phase. The SCRC will assure that:

- Relevant safety and security requirements have been incorporated into the checklists
- Verification documentation has been clearly identified
- Certifiable items with the status "open" are tracked to closure

Additional requirements may need to be imposed as new hazards or security vulnerabilities are

identified. In addition, the SCRC will recommend to MWAA additional safety/security requirements, as needed, to adequately control the newly identified hazards/vulnerabilities.

At each SCRC meeting, the WMATA SCWG representatives will provide the SCRC with a status update of each certifiable item on the conformance checklists, including problems or concerns. The SCRC may recommend remedial actions to MWAA, as appropriate.

### 5.2.3 Segment Safety and Security Certification Report

Upon completion of the conformance checklist for a segment, MWAA will forward an approved Safety and Security Certification Report for the segment.

The report will outline the certification process that was implemented throughout the design, construction, testing, and integrated test phases, including:

- Design Conformance
- Construction/Installation Testing and Inspection
- Systems Testing & Integration Testing
- Hazard and Vulnerability Identification and Resolution Verification

The SCRC will consider the evidence provided in the report and information provided by the WMATA SCWG representatives in reviewing the report. The SCRC will not formally accept these interim reports, but will forward comments, as appropriate. Additionally, the SCRC may recommend appropriate work-around or other temporary measures for those certifiable items that have not been closed or completely resolved.

### 5.2.4 Final Safety and Security Certification Report

After all line segments have been completed, MWAA will submit an approved Final Safety and Security Certification Report for review and approval. The report will be a compilation of the segment reports and will include a final Close-out and Follow-up of Safety/Security Certifiable Items List. Acceptance of the final report will be based on the information provided in the report and audits of the MWAA certification program that were conducted throughout the course of the Project.

### 5.2.5 Dispute Resolution

In the event agreement cannot be reached between MWAA and WMATA, the matter will be resolved using the dispute resolution process outlined in the Cooperative Agreement.

## 6 RECORDS

### 6.1 SCRC Minutes

SCRC meeting minutes as they pertain to the Dulles Corridor Metrorail Project will be kept as part of the permanent Project record.

### 6.2 MWAA Safety and Security Certification Report

A Final Project Safety and Security Certification Report, detailing the entire certification effort and safety/security issues for the Project, will be generated by WMATA. The MWAA approved Safety and

Security Certification Report will be included in the Project Final Safety and Security Certification Report.

## 7 REFERENCES

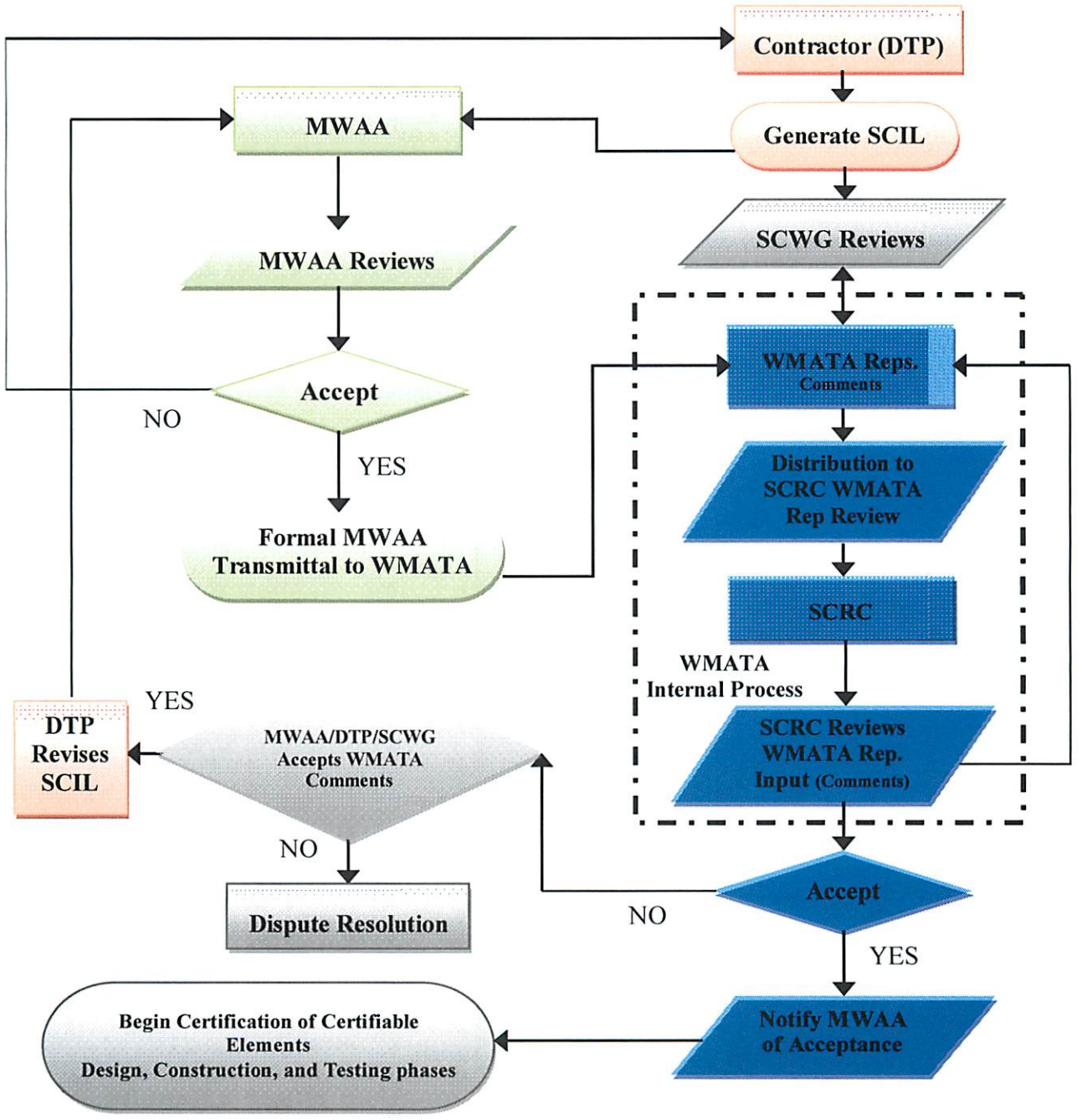
Appendix 1 – Dulles Corridor Metrorail Project, WMATA Safety and Security Certification Program Plan

## 8 ATTACHMENT

### 8.1 Figure 1 - SCIL – Review and Acceptance Process

**PROCESS LEADING TO APPROVAL AND ACCEPTANCE OF SCIL**
**SAFETY CERTIFICATE AND SAFETY & SECURITY REPORT**

**Figure 1**
**SCIL REVIEW AND ACCEPTANCE PROCESS**




**Note: Review and acceptance of the developed SCIL is for each phase of the Project-Design, Construction, Testing**

**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY**
**DULLES CORRIDOR METRORAIL PROJECT**
**PROJECT PROCEDURE**

| **TITLE:** | **PROCEDURE NUMBER:** | |
|---|---|---|
| Procedure for Judgment Sampling (During the Process of Acceptance of Dulles Corridor Project SCILs) | **PSS – 02** | |
| | **REVISION:** 0 | **DATE:** April 7, 2010 |
| **PREPARED BY:** SCRC | **APPROVED BY:** | |

## 1 PURPOSE

The Metropolitan Washington Airports Authority (MWAA), the sponsor and FTA grantee for the Dulles Corridor Metrorail Project (Project), has contracted with Dulles Transit Partners (DTP) to design and construct all facilities and systems for the Project with the exception of those systems, equipment and revenue vehicles listed in Section 2.0 of this procedure. As part of the contract between MWAA and DTP, DTP is required to develop and implement a Safety and Security Certification Program for the Project based on the MWAA Safety and Security Management Plan (SSMP) and the WMATA Safety & Security Certification Program Plan, dated October 2007.

WMATA is not a party to the Design-Build Contract, but will be the eventual owner and operator of the extension. WMATA however, has a formal cooperative agreement with MWAA that outlines specific activities to be completed prior to WMATA's acceptance of the extension for operational readiness testing. Among those requirements is MWAA's satisfactory execution of a Safety and Security Program for the Project.

The purpose of this procedure is to establish a judgmental sampling process; this procedure is not to replace the current practices, but rather to work in conjunction with and complement MWAA's random sampling process. By utilizing a judgmental sampling process, WMATA can be assured that all SCIL items deemed by the SCRC as "safety critical" have been properly verified.

## 2 SCOPE

This procedure applies to all Safety and Security Certifiable Items Lists (SCIL), their Conformance Checklists, and all facilities and systems designed, constructed, and tested by DTP under the direction and oversight of MWAA for the Project.

It is the intention of this procedure to create a selective and judgmental method of sampling on the DTP SCIL's completed items. The goal is to ensure that these selections are based upon the encompassing technical, safety and operational experience of WMATA and our industries best practices. It is important that the sampling method selected must be in compliance with the certification configuration process (See section 6.0).

This procedure is not applicable to those facilities and systems for which WMATA is solely responsible:

- Rail Passenger Vehicles
- Communication Backbone
- Rail Operations Center Upgrades
- Automatic Train Control
- Automatic Fare Collection
- Systems Graphics
- Art in Transit

These facilities and systems will be subject to the certification process as described in the WMATA Safety and Security Certification Program Plan October 2007, Dulles Appendix – 1 of the Plan and the Cooperative Agreement between WMATA / MWAA September 14, 2007.

## 3 DEFINITIONS & ACRONYMS

Safety-critical: a system (device, equipment, procedure) whose failure or malfunction may result in:

- Death or serious injury to people, or
- Loss or severe damage to equipment or
- Environmental harm.
- Risks of this sort are usually managed and mitigated by methods and tools of System Safety Engineering.

System Performance Demonstration: A series of tests to demonstrate the integration of the Project with WMATA's Adopted Regional System (ARS)

DTP: Dulles Transit Partners – the design-build contractor for the Dulles Corridor Metrorail Project

MWAA: Metropolitan Washington Airport Authority – the sponsor and FTA grantee for the Dulles Corridor Metrorail Project

Project: The Dulles Corridor Metrorail Project

SAFE: System Safety and Environmental Management

SCIL: Safety Certifiable Items list.

SCRC: Safety and Security Certification Review Committee; The WMATA committee responsible for overseeing the implementation of the WMATA Safety and Security Certification Program Plan.

SCWG: Dulles Corridor Metrorail Project Safety and Security Certification Working Group – The MWAA committee responsible for the administration of the safety and security certification program for the Project.

ESC: Executive Safety Committee

# 4 RESPONSIBILITIES

## 4.1 MWAA

MWAA has developed and issued a Safety and Security Management Plan for the Project, which requires the development and implementation of a safety and security certification program for the Project. MWAA is responsible for approving the deliverables of the DTP Safety and Security Program, including the Safety Certifiable Items List (SCIL), the conformance checklists for the design, construction, testing, and integrated test phases of the Project, and the program certification reports. MWAA is also responsible for assuring that all documentation that demonstrates conformance with the safety and security requirements for the Project is available. To facilitate the verification of the SCIL Items, MWAA has established a random sampling process. MWAA will approve or decline the SCIL's verified samples. If approved, the approved batch of verified items will be submitted to WMATA for review and determination of acceptability. If WMATA decides after the review of the submitted MWAA sample, that it does not include safety items that are deemed important to WMATA safety/staff, then by using this random sampling procedure WMATA will select additional proposed items of that batch to be verified separately or incorporate them into MWAA's existing verification process.

## 4.2 WMATA Safety/Security Certification Review Committee (SCRC)

The SCRC is a management and policy making body, it assures that the major bus and rail capital projects are operationally safe for revenue service. The SCRC is responsible for managing the review, evaluation, and determination of the acceptability of those MWAA approved certification products transmitted to WMATA. The SCRC other activities include:

- Facilitating the identification and review of safety and security requirements for major capital projects;
- Ensuring that the identified safety and security requirements for a project have been incorporated into Safety and Security Certifiable Items Lists (SCIL);
- Tracking, evaluating, and resolving hazard and security vulnerability issues and concerns identified during the safety and security certification process
- Resolving issues of verification documentation discrepancies and incompleteness (evidence of compliance with safety and security requirements);

- Issuing Certificates of Compliance for certifiable elements (facilities, systems, and operational elements)
- Reviewing and approving safety and security certification reports
- Providing recommendations to the ESC regarding the certification of projects

For the Dulles Corridor Metrorail Projects the SCRC consists of the following representatives:

- Chief Safety Officer or designee
- SCWG SAFE Representative
- SCWG MTPD Representative
- SCWG ESVC Representative
- Chief Engineer ESVC
- Director, Major Capital Projects
- Deputy Chief Metro Transit Police
- Managing Director, Rail Transportation
- Managing Director, ESVC
- General Superintendent – Track Structures & Systems
- General Superintendent – Car Maintenance
- Director, Plant Maintenance
- Director, Elevator and Escalator
- Chief, Network & Communication

The SCRC is chaired by the Chief Safety Officer (CSO). The CSO is responsible for establishing SCRC agendas, preparing SCRC minutes, and tracking safety and security issues and concerns to closure.

The SCRC will review and evaluate submitted verified SCIL items from MWAA. This includes their randomly selected completed items and items that have not been selected by MWAA for verification (unselected items). SCIL unselected items will be evaluated to determine level of safety criticality. If the safety critical level of the completed items in the submitted batch has been determined to be significant, the WMATA selected items will be returned to MWAA to be properly verified.

# 5 PROCEDURE

## 5.1 MWAA

MWAA receives verified SCIL items in batches from DTP. MWAA samples a batch of verified items in accordance with their random sampling procedure. All SCIL verified items will then be formally submitted to WMATA for review, evaluation, and acceptance. (Refer to figure 1 on page 10 Of this document)

## 5.2 SCRC Review and Acceptance

### 5.2.1 Safety/Security Certifiable Items List

The initial SCIL developed by DTP is reviewed for completeness, ensuring all safety and security critical items have been included. As the project progresses, the SCIL is reviewed at least quarterly to assure it remains current. Additional WMATA- identified items for sampling will be submitted to MWAA for consideration as applicable.

### 5.2.2 Items Sampled

The SCRC will review and evaluate both MWAA's randomly selected and unselected SCIL Items (batch). Unselected items will be evaluated by the SCRC to determine their level of safety importance/criticality. WMATA will use a Judgment Sampling method, in which the selection of items is based on the auditor's (WMATA Safety Officer or SAFE designee) sound and seasoned judgment. The following steps are the three (3) basic criteria to determine which items are selected:

1. Value of items - A sufficient number of safety and security Items should be included to provide adequate audit coverage.
2. Relative risk - Items prone to error due to their nature or WMATA's operating experience, should be given special attention.
3. Representativeness - Besides value and risk considerations, the auditor should be satisfied that the sample provides breadth and coverage over all types of items in the population. If the safety critical level of any item reviewed has been determined to be significant, the SCRC members will submit the item to WMATA's assigned Safety Officer in charge of certification. From there, item/items will be returned to MWAA to be properly verified. WMATA has the option of further verification if deemed necessary by the SCRC.

# 6 Certification Configuration

The final completion date for Phase 1 of the Dulles Corridor Extension Project contract is on or about 07/31/2013. WMATA will request that the last submittal of items for safety and security certification be timed to allow WMATA to provide notification of acceptance of the Safety Certifiable Items List (SCIL) on or about 07/31/13.

The Final Dulles Safety and Security Certification will take the form of a book made up of the following chapters:

1. SCIL approved and accepted by WMATA for work designed and constructed by DTP. This chapter will include records of WMATA's SCIL samples, SCWG/SCRC meeting minutes and all related correspondence to the SCIL;
2. DTP's Safety/Security Certificate and Final Safety/Security Certification Report
3. MWAA'S acceptance of the DTP Certificate and Report and completed SCIL
4. Safety and Security Certification Review Committee (SCRC) approved SCIL for rail cars and non-revenue vehicles;
5. SCRC approved SCIL for the Communication Backbone;
6. SCRC approved SCIL for the Rail Operations Center (ROCS) Upgrade;
7. SCRC approved SCIL for Automatic Fare Collection (AFC); and
8. SCRC approved SCIL for start-up planning and preparation during the 90 days prior to expected start of revenue operations.

Items 4 thru 7 are for contracts under WMATA control. Item 8 includes, but is not limited to, start-up training, emergency responder training and operational testing.

**6.1 WMATA's Process:**

1. Submittals of Safety and Security Certification packages will be distributed by Major Capital Projects (MCAP) personnel to the following WMATA offices (including non-members of the Safety Certification Review Committee (SCRC):
   - Safety (SAFE)
   - Major Capital Projects (MCAP)
   - Metro Transit Police Department (MTPD)
   - Elevator/Escalator (ELES)
   - Plant Maintenance (PLNT)
   - Rail Operations Delivery (RAIL)
   - Transit Infrastructure and Engineering Services (TIES)
   - Track Structures Systems Maintenance (TSSM)
   - Information Technology (IT)
   - Engineering Services (ESVC)
2. Members of the SCRC and WMATA designated offices that received System Safety Certification packages for review and comment, will submit their comments to Safety Officer in charge of certification prior to the next SCRC meeting. The Safety Officer in charge of certification will collect and consolidate comments from all internal departments and offices.

3. At a monthly SCRC meeting, comments generated on the submittal will be discussed and any differences will attempt to be reconciled.
4. If consensus cannot be reached, the disputed item(s) are referred to the Executive Safety Committee (ESC) for resolution.
5. After consensus is attained on the comments for any submittal, MCAP will transmit the comments to MWAA as a single consolidated list of WMATA comments (i.e. a unified front).

## 7 REFERENCES

Procedure for Process Leading to Acceptance of MWAA SCIL PSS-01

Appendix 1 – Dulles Corridor Metrorail Project, WMATA Safety and Security Certification Program Plan

WMATA / MWAA Cooperative Agreement

September 14. 2007

## 8 ATTACHMENT

### 8.1 Figure 1 –SCIL- WMATA Judgment Sampling Review Process

**Figure 1. SCIL-WMATA Judgment Sampling Review Process**