Tri-State Oversight Committee

Three-Year Safety and Security Audit

of the Washington Metropolitan Area Transit Authority

Elevator / Escalator Maintenance

Partial Audit of:
Element 14 (Facility and Equipment Inspections)
Element 15 (Maintenance Audits and Inspections)
Element 16 (Training and Certification)

Audit Conducted: April 2017

Final Report: July 25, 2017

Executive Summary

The Federal Transit Administration (FTA) requires a designated State Safety Oversight (SSO) agency to administer safety and security programs for rail transit agencies within their jurisdictions, including an on-site safety review of each element of the agency's System Safety Program Plan (SSPP) at least once every three years. The Federal Transit Administration's (FTA) FTA WMATA Safety Oversight (FWSO) division, which currently provides oversight for the Washington Metropolitan Area Transit Authority, has delegated responsibility for triennial audits of WMATA's compliance with the WMATA SSPP to the Tri-State Oversight Committee (TOC). TOC audits each element of the SSPP by conducting topic-area reviews over the course of a three-year period which consist of interviews, records checks, and field inspections.

The TOC Triennial Audit of Elevator / Escalator Maintenance at WMATA identified 10 findings related to safety practices, quality control, recordkeeping, training, and connectivity between maintenance procedures, plans, and checklists which impact the overall effectiveness of WMATA's elevator and escalator maintenance program. TOC evaluated WMATA's activities in these areas during interviews with frontline and managerial personnel from a range of departments performing maintenance, training, and safety functions.

TOC's observations during this audit regarding the lack of a comprehensive ELES maintenance plan, improper completion of Job Hazard Analyses during preventative maintenance (PM) activities, and ineffective processes for documentation of PMs are consistent with Findings issued by both TOC and the FTA following previous reviews. WMATA has not taken action to implement changes in response to deficiencies previously identified by the TOC. Findings stemming from this audit do not duplicate existing FTA findings, and corrective actions to resolve issues identified during the audit should not be redundant with ongoing WMATA Corrective Action Plans (CAPs) to address existing findings.

Audit Findings:

- Finding 1: A culture of non-compliance with safety rules and departmental processes exists within ELES.
- Finding 2: WMATA operates elevators and escalators with lapsed certificates.
- Finding 3: Some ELES Supervisors are not completing a sufficient number of monthly PM audits (QC) as required under 212-SOP-39, Quality Control Preventative Maintenance and Station Audit.
- Finding 4: Completed PM check sheets are not consistently submitted by mechanics to ELES management in a timely manner.
- Finding 5: Technicians complete portions of PM procedures out-of-sequence and populate the PM check sheet only after many items have been completed, increasing the likelihood that steps could be skipped or omitted.
- Finding 6: There is no signage on elevators or escalators explaining that certificates are stored in station kiosks.

- Finding 7: Some certificates could not be found on file in station kiosks.
- Finding 8: Elevator / Escalator Apprenticeship Employee Performance Review forms are not consistently completed on a quarterly basis by Supervisors.

Introduction

FTA FWSO provides regular oversight of the WMATA Metrorail system. Representatives from the Maryland Department of Transportation (MDOT), the District of Columbia Department of Transportation (DDOT), and the Virginia Department of Rail and Public Transportation (DRPT) comprise the TOC, which has been delegated responsibility for triennial audits and other oversight activities by FWSO under the FWSO Oversight and Surveillance Plan. To comply with State Safety Oversight Final Rule 49 Code of Federal Regulations (CFR) Part 659 (Part 659), the FTA requires states to designate a State Safety Oversight (SSO) agency to administer safety and security programs for rail transit and fixed guideway systems within their jurisdictions. Specifically, 49 CFR Part 659 requires TOC to conduct an on-site safety review of each element of the WMATA System Safety Program Plan (SSPP) at least once every three years. Beginning in 2013, the TOC has split its Three-Year Safety and Security Review topic areas into separately occurring reviews spread out during a three-year period.

The following report documents the observations and Findings of the TOC's review of Maintenance Facility Safety and Equipment Inspections, pertaining to portions of Elements 14, 15, and 16 of the WMATA 2015 SSPP. Generally, this review focused on whether WMATA's practices comply with its own written plans as well as industry standards.

Methodology

In advance of the audit, the TOC requested and reviewed relevant WMATA plans, procedures, records, and reports. The on-site portions of the audit occurred from April 10-12, 2017, with follow-up activities taking place on April 28, 2017. TOC interviewed management personnel from the WMATA Office of Elevators and Escalators (ELES), Technical Skills and Maintenance Training (TSMT), and the Department of Safety and Environmental Management (SAFE) regarding WMATA's inspection and maintenance program for elevators and escalators. In addition, TOC conducted field observations of elevator and escalator PM activities conducted by ELES technicians, as well as roving inspections of elevator and escalator conditions across the Metrorail system. TOC representatives reviewed additional documentation provided by WMATA during the on-site portion of the review.

Findings refer to instances of WMATA operating out of compliance with an applicable internal or external written requirement, plan, policy, rule, standard, or procedure. A Finding may also refer to a condition whereby WMATA may technically be conducting business in compliance with existing WMATA, TOC, or FTA requirements, but there is no relevant written plan, policy, or procedure in place, or the existing plan, policy, or

procedure is not in accordance with industry best practices such as those promulgated in American Public Transportation Association (APTA) standards.

The TOC would like to thank WMATA personnel for their time, cooperation, and forthrightness throughout the review process.

Current Conditions

ELES Maintenance Activities

A total of approximately 285 employees work within the WMATA Department of Elevators and Escalators (ELES). The largest group is the ELES Maintenance Division, with approximately 185 Technicians, 15-16 Supervisors, and 5 Superintendents. ELES maintenance activities are divided across five geographic regions. Union ELES personnel pick a work region once annually and select a shift within that region twice per year. ELES personnel outside of the Maintenance Division manage elevator and escalator engineering, capital projects, and inspections. The ELES engineering group consists of five engineers. ELES has a Jurisdictional Inspection group that conducts annual jurisdictional inspections for Maryland, Virginia, and the District of Columbia. ELES maintains 618 escalators and 315 elevators located throughout the Metro system. The ELES Control Center (EOC) is located at WMATA ROCC.

The majority of elevator and escalator maintenance activities take place during the night shift. Work during the day typically consists of service repair work, routine service calls, and troubleshooting, but may also include major overhaul activities. ELES also maintains an evening shift of approximately 30 personnel, which supports the transition from day shift to night shift and conducts light service work.

ELES personnel generate elevator and escalator PM work orders on a monthly basis using Maximo. All ELES PMs follow a 30-day cycle, with an annual PM conducted once a year; the annual PM includes more extensive cleaning and inspection, and may require between two and four days to complete depending on the size of the unit. Certain steps of monthly PM procedures are completed every other month. At the time of the audit, ELES had developed a single, unified PM procedure for elevators. The PM procedure for escalators was under development. ELES management stated that they do not allocate time for each PM inspection and allow mechanics to spend as much time as it takes to complete a PM inspection. The details of required steps associated with each sub-procedure are outlined in the document associated with the PM checklist, with paper checklists used to record the completion of each sub-procedure. Corrective Maintenance (CM) issues identified during the course of PM inspections are typically resolved during the same shift, though units may be placed out of service until CM can be completed on another shift.

There is currently no single maintenance plan for ELES summarizing all PM activities, schedules, staffing requirements, and training requirements. Because there are no established time limits for completion of ELES PM procedures, it is difficult for ELES to

assess gaps in staffing needs. This issue was previously identified during the 2014 TOC Triennial Audit of Elevator / Escalator Maintenance, and is the subject of an open FWSO CAP under Finding R-4-27-a.

ELES supervisors are tasked with completing a total of 4 quality audits of PMs each month (two for elevators and two for escalators). Supervisor QA/QC activities are tracked on the ELES intranet page. A project coordinator within ELES prepares a monthly summary report describing department-wide QA/QC activities. A review of monthly QA/QC summaries by the audit team indicated that not all supervisors are completing required QA/QC on a monthly basis.

The audit team conducted interviews with two ELES maintenance technicians, who described strengths of the ELES maintenance program and challenges faced by the department. ELES forecasts upcoming PM activities in order to procure specialty parts before they are needed, and parts/equipment are typically available for maintenance with few problems. According to the technicians, challenges in maintenance and training are presented by the large variety of elevators and escalators across the system. Due to staffing constraints, the interviewees indicated that ELES mechanics are sometimes unable to attend training because of pressing maintenance needs. Overall, the technicians reported little pressure to skirt safety requirements in order to keep equipment in service or to rush through completion of PMs.

TOC also conducted a review of PM records for a sample of elevator and escalator units. Paper PM checklists completed by ELES personnel are maintained in hard copy form rather than being uploaded to Maximo to be associated with PM work order numbers. In addition to paper PM checklists, records for each unit include a repair log to document CM activities. Interviews with ELES management and a review of records indicated that PM checklists are not consistently turned in in a timely manner once PMs are completed. PM tickets in Maximo are closed out to indicate that the PM was completed before paper checklists are turned in by mechanics to be filed. TOC observed that a significant proportion of PM checklists were missing technician and supervisor signatures, an issue which was previously identified during the 2014 TOC Triennial Audit of Elevator / Escalator Maintenance.

ELES Inspections

At the time of the audit, there were a total of eight inspectors in the ELES inspections group. ELES inspectors maintain a Qualified Elevator Inspection (QEI) license, and conduct inspections under a MOU with Virginia, Maryland, and the District of Columbia (excluding the city of Alexandria and Fairfax County, VA). Each ELES inspector is assigned approximately one inspection per night, though larger escalator units may require two nights for a complete inspection. Inspectors are accompanied by either one or two ELES technicians during each inspection, who help to complete tasks such as removal of steps, handrails, and panels.

Each elevator or escalator unit must be inspected on an annual basis. Inspections are completed using a checklist which identifies standards for the condition and performance of the unit. Acceptance inspections for new units are more detailed than recurring annual inspections. The Inspections group maintains a schedule for annual inspections outside of Maximo.

When a unit passes inspection, the completed checklist is submitted to the local jurisdiction and an Elevator or Escalator Certificate is issued to demonstrate that the unit is safe for operation. When a unit fails inspection, deficiencies recorded on the checklist are reported to ELES Maintenance; technicians have 30 days, plus a three-day grace period, to correct deficiencies before the unit is reinspected. Deficiencies recorded on ELES inspection checklists include CM items (indicating that corrective maintenance is required) and LM items (indicating that limited maintenance is required).

ELES management stated that ELES may place a unit back into service before the reinspection is completed if any safety-sensitive deficiencies are resolved. According to interviewees, CM issues warrant removal of a unit from service, while LM items may be deferred while the unit is reactivated and addressed later in the 30-day period prior to reinspection. ELES inspects all units which are returned to service following a failed inspection to ensure that maintenance activities have adequately addressed all CM items. Units which have been removed from service are locked out and tagged out so that station managers or other personnel may not reactivate units without approval from the ELES Inspection unit.

According to WMATA interviewees, units which are not inspected within a 12-month timeframe are not consistently removed from service when their certificates lapse. Jurisdictional inspectors have the authority to remove equipment from service if certificates are lapsed, but do not routinely take this action.

Safety Certification of Elevators and Escalators

TOC's audit team conducted an interview with SAFE's Safety Certification and Engineering Manager, who provided general information on WMATA's activities to certify newly installed or rehabilitated elevators and escalators. At the time of the audit, elevator and escalator construction was occurring primarily through two major projects: the Orange/Blue Line Rehab (OB-1) and the Escalator Replacement Project.

The SAFE interviewee expressed concerns regarding escalator units being placed into service without Certificates of Compliance being issued. SAFE is currently issuing Temporary Use Notices (TUNs) for newly installed escalators that should be followed with Certificates of Compliance. SAFE indicated that safety certification paperwork for new units is sometimes completed after jurisdictional inspections have been completed (the last step before units are placed into service). Escalators are placed in service as soon as jurisdictional inspections are completed. However, per the WMATA Safety and Security Certification Plan (SSCP), no equipment should be placed in service until Safety Certification is completed. SAFE reported that some escalators that were placed in

service two years ago still do not have Certificates of Compliance issued by SAFE. Overall, information flow between ELES and SAFE regarding safety certification activities is not robust. Documentation from inspection processes conducted by ELES, including PM inspections and annual jurisdictional inspections, is not routinely shared with SAFE. While the OB-1 project has a project-specific Safety and Security Certification Plan (SSCP), it was unclear to SAFE at the time of the audit whether the Escalator Replacement Project needed a project-specific SSCP. SAFE's interviewee stated that SAFE will evaluate the escalator replacement project to determine if it requires a project-specific SSCP. SAFE expressed a desire to escalate these issues to department leadership for resolution, and indicated that conversations between ELES and SAFE have already taken place to improve coordination and documentation for the elevator/escalator safety certification process.

Training

WMATA Technical Skills and Maintenance Training (TSMT) offers training to ELES personnel based primarily on their status as either apprentice or journeyman technicians. The ELES apprentice program consists of four years of classroom and on-the-job training (OJT), with employees becoming journeymen upon completion of the apprentice program. Apprentices are technically employed by TSMT during the apprentice program, and transitioned to ELES upon graduation. ELES is currently the only rail-side department at WMATA with an active apprenticeship program.

Training requirements for apprentices are established in the Elevator/Escalator Apprenticeship Program Agreement and Elevator/Escalator Repairer Apprenticeship Standards, which were last updated in 2013. The agreement and standards are not updated on a recurring basis. Candidates with no experience seeking to join the WMATA ELES apprenticeship program must complete a series of tests to qualify for placement; other individuals with existing elevator and escalator maintenance certifications may join ELES at the journeyman level. Apprentice training includes a series of 100- and 200-level courses covering mechanical basics and the fundamentals of elevators and escalators. ELES supervisors are expected to complete Elevator / Escalator Apprenticeship Employee Performance Review forms for all apprentices enrolled in OJT on a quarterly basis, but do not appear to be fulfilling this requirement.

Relatively few recurring training activities are required of ELES journeymen and master-level mechanics. These personnel are required to complete Lock Out / Tag Out (LO/TO), CPR, and Roadway Worker Protection (RWP) training on an annual basis. Journeymen may be required to complete additional, ad-hoc training or retraining in response to incident findings, or for familiarization when new equipment is introduced. Classes offered to apprentices are also offered to journeymen on an as-needed basis when recommended by a supervisor. Training records for journeymen showed to the review team indicated that personnel may not consistently complete additional training according to TSMT's desired timelines.

TSMT documents OJT for ELES personnel on forms which list the number of training hours completed alongside a signature from the employee and supervisor. These forms are collected by the TSMT OJT Administrator and recorded. ELES Apprentices must complete a minimum number of OJT hours annually to progress through the apprenticeship program. A sample of OJT tracking forms provided to the review team indicated that employees and supervisors do not consistently sign off on documentation of completed OJT.

In response to an open FTA CAP requiring improvements to WMATA's OJT programs, OJT mentors receive OJT mentor training. ELES mentors, and mentors from other WMATA departments, are gradually being enrolled in OJT mentor training, but at the time of the audit not all ELES mentors had completed the training. TSMT interviewees indicated that TSMT personnel conduct unannounced field visits to observe ELES mentors and mentees, using a checklist to evaluate the quality of their interactions.

SAFE also plays a role in ongoing training for ELES personnel, providing OSHA training, CPR training, and other safety-related offerings. SAFE personnel reviewed the TSMT ELES course curriculum at the time training materials were developed, and also reviewed ELES checklists and associated materials around which training courses are based.

Field Activities

The TOC audit team conducted field observations of elevator and escalator maintenance activities at Benning Road, Capitol South, Federal Triangle, Farragut West, and Pentagon stations. The team observed monthly PMs for escalators and elevators conducted by ELES maintenance technicians, as well as an annual elevator inspection conducted by a member of the ELES Inspections group. The audit team also conducted field inspections of elevator and escalator conditions at a selection of stations in ELES Maintenance Region 4 along WMATA's Orange and Silver Lines, accompanied by an ELES Supervisor. Overall, elevator and escalator conditions observed by the team during field inspections were satisfactory. Minor issues identified were pointed out and discussed with ELES personnel at the time of discovery.

Field Inspection Location	Station	# of Elevators	# of Escalators
East Falls Church	K05	1	3
Metro Center	C01	0	3
Ballston	K04	5	12
Virginia Square	K03	3	7
Clarendon	K02	3	8
Rosslyn	C05	3	8
Farragut West	C03	0	5
Farragut North	A02	0	4
Federal Triangle	D01	1	0
Benning Road	G01	0	4
Pentagon	C07	0	4
Capitol South	D05	0	3

New Carrolton	D13	0	3
Total		15	61

Previously-Issued TOC and FTA Findings

Findings from the 2014 TOC Triennial Audit of Elevator/Escalator Maintenance remained open under the TOC at the time of the transition to FWSO oversight in 2015, and were subsumed and reissued under an FTA finding via Safety Directive 16-2. At the time of the 2017 audit, the FTA CAP associated with TOC findings from the 2014 Elevator/Escalator Maintenance audit remained open, and WMATA had not implemented corrective actions aimed at resolving deficiencies identified by the TOC in 2014.

Any deficiencies observed during the 2017 audit which are consistent with open findings under the FTA CAP will not be reissued as new, duplicate findings. FTA's finding and recommended action, along with the associated TOC Elevator/Escalator Maintenance findings, are listed for reference below. TOC is not reissuing these findings; they are presented here to provide context into deficiencies in WMATA's elevator and escalator maintenance processes which have not been resolved over the previous several years.

FTA Finding R-4-27-A: Documented maintenance procedures and standard operating procedures are not implemented as required.

FTA Required Action: For all major departments with inspection and maintenance responsibilities for critical infrastructure, WMATA must establish and/or update a preventive maintenance and inspection testing quality audit process to ensure compliance with established maintenance and testing practices, and to monitor missed or incomplete preventive maintenance activities and/or inspections.

Associated TOC Findings under FTA Finding R-4-27-A from the 2014 TOC Triennial Audit of Elevator/Escalator Maintenance:

- **Finding of NC 1: QAAW audits of ELES PM indicate a high rate of non-compliance with procedures.**
- **Finding of NC 2: PM Check Sheets are inconsistently completed, with some steps skipped often.**
- **Finding of NC 3: Nearly half of monthly PM inspections are not occurring on time.**
- **Finding of NC 4: Several escalator units were found to have panel gaps exceeding the 1/8 inch requirement.**
- **Finding of NC 5: The required Job Hazard Analysis is frequently not performed by mechanics at the work site.**

- **Finding of NC 6: During the observation of elevator PM, the crew disconnected power at the main breaker and began work by removing the motor cover before a lock was later applied by another mechanic.**

- **Finding of NC 7: During the observation of an elevator PM inspection, mechanics lacked information on calibration requirements and PM procedures.**

- **Finding of CWR 1: The open Limited Maintenance (LM) work order list shows 1,256 being open, some dating back to February 2013.**

- **Finding of CWR 2: ELES does not have a documented maintenance plan describing the organization, schedules, procedures, and inventory for escalators and elevators.**

- **Finding of CWR 3: There are two versions of the ELES Escalator PM Check Sheet in use. One version includes a procedure for Step Run-in (O&K) as item 18 and the other version does not.**

In addition, TOC's observations related to documentation of OJT received by frontline personnel and efforts to evaluate the quality of OJT interactions between ELES mentors and mentees were consistent with an open Required Action developed in response to Finding R-16 from FTA Safety Directive 15-1.

Finding R-16: Technical Training for operations and maintenance departments is under-resourced and fractured, currently provided by five different departments and IT, is insufficiently directed and resourced, and relies significantly on on-the-job-training (OJT) which is informal and lacks oversight.

- FTA Required Action R-2-16-d: WMATA must establish formal guidance for maintenance employees responsible for providing on-the-job training.

<u>Current TOC Findings</u>

Finding 1: A culture of non-compliance with safety rules and departmental processes exists within ELES.

As evidenced by widespread minor issues across ELES, general levels of compliance with procedures and documentation requirements are not satisfactory. Additionally, ELES field personnel have failed to apply safety principles to identify unsafe practices during day-to-day work.

In one example, a technician described modifying an escalator to prevent skirt panels from sliding without reporting the change to department supervision or WMATA Engineering; though TOC did not observe the modified equipment, this practice hints at

poor levels of integration and awareness between ELES personnel, ELES management, and outside departments where safety is concerned. In another instance, an ELES technician described a combplate pull test conducted on certain Fujitech escalators using a cross-bar C-clamped in place over the pit area where a technician is working, presenting a possible hazard if the bar were to break loose and strike the technician. While the TOC team did not observe this test taking place, the procedure described may place ELES technicians at risk of injury.

WMATA should take steps to ensure that all ELES employees remain mindful of the safety-related requirements of their positions, and work with ELES peers and other WMATA employees to effectively carry out these requirements.

Finding 2: WMATA operates elevators and escalators with lapsed certificates.

Elevators and escalators which are overdue for annual inspection have remained in service for prolonged periods with lapsed certificates when the ELES inspection group is unable to complete inspections according to schedule. Staffing constraints and the time-intensive nature of annual elevator and escalator inspections prevent the ELES inspections group from consistently completing inspections for all units within the prescribed one-year window. Elevators and escalators which have not been inspected are allowed to remain in service until the inspection may be scheduled. WMATA should ensure that annual inspections are completed according to defined timelines and that units which have not undergone an annual inspection are removed from service until the inspection is completed.

Finding 3: Some ELES Supervisors are not completing a sufficient number of monthly PM audits (QC) as required under 212-SOP-39, Quality Control Preventative Maintenance and Station Audit.

ELES SOP 212-SOP-39 requires Supervisors to QC PM activities for two elevators and two escalators each month. WMATA should ensure that QA/QC activities for elevator and escalator maintenance are performed regularly according to established timelines.

Finding 4: Completed PM check sheets are not consistently submitted by mechanics to ELES management in a timely manner.

ELES field personnel are required to submit completed PM check sheets for tracking by ELES management promptly after completing each PM, but ELES records show that completed check sheets are often submitted months after the PM is completed. Paper records are inconsistent with Maximo documentation of PMs due to this issue. ELES should take steps to ensure that all PM documentation is submitted by technicians and supervisors in a timely manner to ensure effective tracking of maintenance issues.

Finding 5: Technicians complete portions of PM procedures out-of-sequence and populate the PM check sheet by relying on their by memory after many items have been completed, increasing the likelihood that steps could be skipped or omitted.

Technicians do not complete PM procedures in order, and may not complete all actions required under an individual check sheet step at a single time. Technicians observed by the audit team also did not consult the PM check sheet to complete procedures or fill in the check sheet following every step. WMATA should ensure that technicians complete PMs according to a proper sequence to reduce skipping or omission of steps, and consider re-ordering PM procedures to facilitate this process.

Finding 6: There is no signage on elevators or escalators explaining that certificates are stored in station kiosks.

Elevator and escalator inspection certificates are required to be displayed in a conspicuous location on premises. WMATA must ensure that appropriate signage directs interested parties to the location of the certificates.

Finding 7: Some certificates could not be found on file in station kiosks.

Elevator and escalator inspection certificates are required to be stored on the premises. WMATA must insure that current certificates for all station elevators and escalators are available in the station kiosk

Finding 8: Elevator / Escalator Apprenticeship Employee Performance Review forms are not consistently completed on a quarterly basis by Supervisors.

Individual employee training records show that Supervisors do not routinely complete and document performance reviews for ELES apprentices. WMATA should ensure that all apprentices receive regular performance evaluations from Supervisors according to defined timelines.

Plans, Procedures, and Regulations Cited: 2015 WMATA SSPP, 212-SOP-39: Quality Control Preventative Maintenance and Station Audit, Elevator / Escalator Apprenticeship Employee Performance Review Form

Persons Interviewed

- [redacted] SAFE
- [redacted] SAFE
- [redacted] SAFE
- [redacted] SAFE
- [redacted] SAFE
- [redacted] ELES
- [redacted] ELES
- [redacted] ELES
- [redacted] SSRV/ELES

- [redacted] ELES
- [redacted] TSMT
- [redacted] TSMT

Documents Reviewed

- Hydraulic Elevator Preventative Maintenance Procedures
- Traction Elevator Preventative Maintenance Procedure
- APV Installation and Part Lists Manual, Maintenance and Renewal Parts Manual, Maintenance Procedure, Maintenance Training Manual
- ELES Maintenance Check Sheets (Escalator / Elevator)
- Assorted OEM Operation and Maintenance Manuals for Elevators and Escalators (Kone, Westinghouse, Shindler, Fujitec)
- ELES SOP 212-SOP-39 - Quality Control Preventative Maintenance and Station Audit
- Station Preventative Maintenance QA, Escalator Preventative Maintenance QA, Elevator Preventative Maintenance QA
- Sample Escalator PM Check Sheets
- Sample Elevator PM Check Sheets (Traction, Hydro, Hydro Non-Rev)
- Checklist for Inspection of Escalators (Annual, Reinspection)
- Checklist for Inspection of Traction Elevators (Annual, Reinspection)
- PM Schedule Samples, Feb. 2017
- ELES Training Matrix
- ELES Training Course List
- Training Plan for ELES employees not provided.
- Assorted ELES Job Descriptions
- ELES Organizational Chart as of 2-23-17
- Contract language extracts pertaining to Elevator / Escalator Maintenance
- ELES Training Matrix
- ELES Maintenance Personnel Individual Training Records from January 2014 to December 2016
- Sample of 100-Level Course Summaries / Lesson Plans
- Sample of 200-Level Course Summaries / Lesson Plans
- Sample Course Materials / Instructor and Participant Guides / Powerpoints / Quizzes
- 212-SOP-39, Quality Control Preventative Maintenance and Station Audit