

**THREE YEAR SAFETY AND SECURITY AUDIT SUMMARY OF THE
METRO DENVER AREA REGIONAL TRANSPORTATION DISTRICT (RTD)
LIGHT RAIL OPERATION
2008 THROUGH 2010**

03/9/2011

**PREPARED BY
THE COLORADO PUBLIC UTILITIES COMMISSION**

INTRODUCTION

The State of Colorado designated the Colorado Public Utilities Commission (Commission) as the State Safety Oversight agency (SSO) for rail fixed guideway systems pursuant to 49 Code of Federal Regulations (CFR) Part 659 – “Rail Fixed Guideway Systems; State Safety Oversight”. The Commission’s SSO responsibilities are outlined in Title 40, Article 18 of the Colorado Revised Statutes (CRS) and the Commission’s Rules Regulating Railroads, Rail Fixed Guideways, Transportation By Rail, and Rail Crossings outlined in 4 *Code of Colorado Regulations* (CCR) 723-7. Pursuant to Federal and State regulations, the Commission is required to conduct a complete review of each affected transit agency’s implementation of its System Safety Program Plan (SSPP) and System Security Plan (SSP) within a three-year period.

PROCEDURE

Commission Rule 4 CCR 723-7-7350 outlines a process whereby six semi-annual safety and security review audits are performed during the three-year review process. This three-year review process allows the transit agency to conduct its internal safety and security reviews in conjunction with the Commission’s safety and security review audit. Each of the first five semi-annual audits focuses on five to nine checklists such that the entire SSPP and SSP are fully examined during these five audits. The sixth semi-annual audit consists of a review of the auditing process including procedures and checklists used during the first five semi-annual audits, and prepares the Commission and transit agency for the next three-year review process. At the conclusion of the three-year review cycle, the Commission is required to prepare and issue a report containing findings and recommendations resulting from that review, which, at a minimum, must include an analysis of the effectiveness of the SSPP and SSP and provide a determination of whether either should be updated. The three-year report is then filed with the Federal Transit Administration (FTA) as part of the required Commission annual report to FTA. The Commission annual report to FTA summarizes the Commission’s oversight activities during the previous twelve months, status of corrective actions, updates and modifications to transit agency program documentation, and the level of effort used by the Commission to carry out its oversight activities. This report and the attached six semi-annual audit reports fulfill the Commission’s requirement.

All audits are conducted pursuant to the Procedures Manual for State Safety Oversight of Rail Fixed Guideway Systems prepared and used by the Staff of the Rail/Transit Safety section of the Commission. During this three-year audit cycle, six to nine checklist items covering various departmental system safety and security responsibilities were reviewed during each of the first five semi-annual audits. The SSPP, SSP, and Procedures Manual for State Safety Oversight of Rail Fixed Guideway Systems were reviewed.

RESULTS AND RECOMMENDATIONS

This report represents the results of the fourth three-year review cycle performed by the Commission and the third three-year audit cycle performed jointly by the Commission and RTD Audit Team. Table 1 below briefly summarizes the results of the six semiannual audits. Copies of each of the six semi-annual audit reports are attached to this summary report.

Table 1: Semi-annual Audit Report Summary

Audit Cycle	Number of Checklists	Number of Findings	Number of Recommendations	CAP's Completed	Final Report Date
1	9	0	2	None Required	5/30/2008
2	6	0	2	None Required	12/4/2008
3	8	0	1	None Required	5/29/2009
4	9	0	0	None Required	11/17/2009
5	8	0	0	None Required	6/10/2010
6	Review of all Audit Checklists and Procedures	0	3	None Required	12/9/2010
Totals		0	8		

Zero findings, eight recommendations, and zero suggestions were made during this three-year review period. All findings, recommendations and suggestions are documented under the FINDINGS/RECOMMENDATIONS/SUGGESTIONS section in each semi-annual audit report and on the affected checklist included with the semi-annual audit reports. All findings, recommendations and suggestions were discussed in detail with either a person listed under the “Persons Contacted” section of the audit checklist, or with a member of the RTD Management team. In cases where findings, recommendations or suggestions were made by the Joint Audit Team, they were summarized at the post audit meeting or during the thirty-day comment period. No corrective action plans (CAP) were issued as a result of the semi-annual audits. One CAP was issued as a result of an incident investigation involving the derailment of a BNSF freight train onto the RTD tracks. This was the second freight train derailment in the same general area of a shared corridor in a 13 month period. RTD is currently working to install a seismic intrusion detection system with in-cab controls that will stop the light rail vehicle if the system is activated. The in-ground intrusion detection is complete and the in-cab control system is

in the process of being installed. This CAP will be tracked for one year after the full system is operational.

The eight recommendations noted below do not signify noncompliance with the SSPP or SSP. Rather, the recommendations were provided as guidance to improve currently compliant programs or procedures. Action has been taken by RTD on all five audit recommendations and the Commission has acted on the remaining three recommendations through approval of the sixth semi-annual audit report. An index of the checklists, audit in which the checklist was reviewed, and recommendations made is provided in Table 2 below.

Table 2: Checklist Index and Finding/Recommendation/Suggestion Summary

Checklist No.	Semi-Annual Audit No.	Element/Characteristic	Finding/Recommendation/Suggestion
4-12-OP-01	1	Training and Certification for Train Operators and Control/Supervisor Personnel	None
4-13-OP-03	1	Hours of Service	None
4-20-RTD-05	1	Calibration of Measuring and Test Equipment	None
4-25-SAF-02	1	Incident Reports	Recommendation – Update SOP’s to show changed PUC information and Rules, review security SOP’s to determine if any should be marked SSI and mark as necessary.
4-26-SAF-07	1	System Safety Program Plan Administrative Requirements Relating to Authority, Purpose, Goals, Objective, Description, Control, and Update Procedures	None
4-27-SAF-08	1	Hazard Identification and Resolution	Recommendation – update SOP to include changed PUC information and Rules.
4-35-VM-04	1	Preventative Maintenance Program for Transit Vehicles	None

**Table 2: Checklist Index and Finding/Recommendation/Suggestion Summary
Continued**

4-36-VM-06	1	Training and Certification of Transit Vehicle and Equipment Maintenance Personnel	None
Previous Audit Checklist 36	1	Facilities and Equipment Inspection and Maintenance	None
4-03-MOW-11	2	Track Inspections	None
4-04-MOW-15	2	Inspection of Mainline Switches and Turnouts	None
4-14-OP-12	2	Train Orders and Special Instructions	Recommendation – follow-up this checklist in a future audit during Cycle 4 to review results of the grievance and determine if changes need to occur with the associated processes.
4-15-OP-13	2	Process/Procedure to Modify Rules and Issue Bulletins and Special Instructions	Recommendation – remove checklist item 5 from future audits.
4-16-OP-14	2	Train Operator Performance Evaluations by Supervisors	None
4-28-SAF-10	2	Hazardous Materials Program	None
4-05-MOW-17	3	Grade Crossings/Warning Devices	None
4-06-MOW-18	3	Vital Relays-Wayside	None
4-07-MOW-19	3	Overhead Catenary System	None
4-37-VM-20	3	LRT Brake Inspections	None
4-08-MOW-21	3	Traction Power Substation (TPS) Maintenance and Inspections	None
4-08-MOW-22	3	Track Maintainer and Signal/Power Maintainer Training and Qualifications	None

**Table 2: Checklist Index and Finding/Recommendation/Suggestion Summary
Continued**

4-23-RTD-NA-1	3	Safety and Security Certification and Review Process	None
4-29-SAF-25	3	Light Rail System Configuration Management	Recommendation – better document control process be developed for tracking approval of system changes through the established process.
4-10-MOW-23	4	Station Facility	None
4-11-MOW-37	4	Bridge Inspections	None
4-17-OP-26	4	Train Operations and Performance in the Yards	None
4-18-OP-29	4	Train Operator Performance--Mainline	None
4-19-OP-34	4	Operations Controller/Supervisor Performance	None
4-31-SAF-30	4	Executive Safety and Security Committee (ESSC) and Safety Functions	None
4-32-SAF-31	4	Employee and Contractor Safety Program	None
4-34-SAF-39	4	Procurement Process, Procedures and Controls	None
4-38-OP	4	Light Rail Employee Rule Book (LRERB)	None
4-21-RTD-27	5	Right-of-Way Access Permit Procedures	None
4-30-SAF-28	5	Emergency Response and Preparedness	None
4-01-D&A-33	5	Drug and Alcohol Testing Program	None
4-33-SAF-35	5	Security Plan – Implementation and Practices	None
4-02-FM-36	5	Facilities and Equipment Inspection and Maintenance	None

**Table 2: Checklist Index and Finding/Recommendation/Suggestion Summary
Continued**

4-24-RTD-NA-2	5	Review of SOPs, Rules, and Emergency Drills	None
4-22-RTD-38	5	Radio Communications System, MMS (Maintenance Management System), CAD/AVL System & Emergency Telephone System	None
4-39-OP	5	Stop Signals and Indicators	None
Audit of the Audit	6	Checklist Review	Recommendation – alter checklists to ensure consistency, combine redundant checklists, eliminate specific redundant and obsolete checklist items, and add new security checklists.
Audit of the Audit	6	Checklist Numbering	Recommendation – simplify checklist numbering procedure to show audit cycle, department, and checklist number.
Audit of the Audit	6	New and Revised Checklists during Audit Cycle	Recommendation – allow Joint Audit Team flexibility to alter existing checklists and add new checklists during audit cycle.

CONCLUSION

The results of the six semi-annual audits for the fourth three-year review cycle from 2008 through 2010 show that RTD is effectively implementing its SSPP and SSP, and that RTD management has a clear understanding of the policies and procedures important to the safety and security of its system. RTD staff has shown willingness over the first four three-year review cycles to improve their safety and security programs. RTD has demonstrated an understanding of their duties and responsibilities relative to carrying out policies and procedures important to the safety and security of their rail fixed guideway system. RTD has shown motivation to make programs, processes, policies and procedures that are currently compliant even better by implementing Audit Team recommendations and suggestions. Additionally, RTD is required to annually review and

update its SSPP and SSP and submit those documents to the Commission for review and approval on or before November 1st of each year. RTD submitted its latest SSPP and SSP for Commission review and approval on October 28, 2010. The Commission approved the SSP in Docket No. 10A-781R by Decision No. C10-1292 and the SSPP in Docket No. 10A-779R by Decision No. R10-1335. Copies of the Commission's decisions plus the Certification of Compliance for FTA recipients were filed with FTA on January 12, 2011.

**Joint Report Of
The Colorado Public Utilities Commission (PUC)
Rail/Transit Safety and Water Section
And
The Regional Transportation District (RTD)
Department of Safety, Security and Facilities**

DATE: 5/30/2008

**SEMI-ANNUAL ON-SITE SAFETY AUDIT 1
OF RTD LIGHT RAIL OPERATION**

March 26, 2008 – April 23, 2008

AUDIT RESULTS

Eight checklists were reviewed during this semi-annual audit. Additionally, one checklist from a prior audit was included for a follow-up review. The Audit Team made zero findings, two recommendations, and zero suggestions from the checklists reviewed as outlined in Table 1:

Table 1 – Audit Checklists

Checklist No.	Element/Characteristic
4-12-OP-01	Training and Certification for Train Operators and Control/Supervisor Personnel No recommendations
4-13-OP-03	Hours of Service No recommendations
4-20-RTD-05	Calibration of Measuring and Test Equipment No recommendations
4-25-SAF-02	Incident Reports Recommendation
4-26-SAF-07	System Safety Program Plan Administrative Requirements Relating to Authority, Purpose, Goals, Objective, Description, Control, and Update Procedures No recommendations
4-27-SAF-08	Hazard Identification and Resolution Recommendation
4-35-VM-04	Preventative Maintenance Program for Transit Vehicles No recommendations
4-36-VM-06	Training and Certification of Transit Vehicle and Equipment Maintenance Personnel No recommendations
Previous Audit 36	Facilities and Equipment Inspection and Maintenance No recommendations

FINDINGS/RECOMMENDATIONS/SUGGESTIONS FOR SEMI-ANNUAL AUDIT 1

The Audit Team recommended for checklist 4-25-SAF-02 that RTD update Standard Operating Procedures (SOP's) 103.3, 103.15 and 101.18 to include recent changes in PUC information and Rules.

RTD Response:

SOPs 103.3, 103.15 and 101.18 have been updated to reflect the recent changes in PUC information and rules.

However, prior to implementation, these must be submitted to the Executive Safety Committee for review and acceptance. This action is on the agenda for the July meeting.

The Audit Team also recommended for checklist 4-25-SAF-02 that RTD review its security SOP's to determine if any should be marked as Security Sensitive Information (SSI). Should any of the SOP's need to be marked as SSI, the Audit Team requested that RTD follow-up with information regarding which SOP's were marked as SSI, or that SSI designation was not necessary for any security SOP's.

RTD Response:

This item was submitted to the Security Division to determine if checklist 4-25-SAF-02 should be labeled as SSI. Also, a determination was made that the security SOP's do not need to be marked as SSI because they are general policies and do not provide tactical or specific security information.

The Audit Team recommended for checklist 4-27-SAF-08 that RTD to update SOP 101.18 to include recent changes in PUC information and Rules.

RTD Response:

This checklist has been updated to include recent changes in PUC information and rules. However, the SOP must be submitted to the Executive Safety Committee for review and acceptance. This will be discussed at the July meeting.

With the audit of checklist 4-12-OP-01, copies of CDL licenses were missing from two of the files. The RTD rail operations section obtained copies of the licenses and provided them to the Audit Team. Additionally, the RTD rail operations section performed an audit of all driver files to ensure that all files were up to date. Although the Audit Team made no recommendation for checklist 4-12-OP-01, the RTD rail operations section has developed a checklist of documents needed for all new employees that will be completed within one week of the employee's transfer to light rail to improve their program by ensuring that all required information is gathered.

RTD Response:

The two missing licenses were located and placed in the appropriate files. Additionally, RTD rail operations audited the driver files for all operators to ensure that all files were current. A checklist for documents needed for all new employees will be completed within one week of the employee's transfer to the light rail.

ITEMS REVISITED FROM LAST AUDIT PERIOD--FOLLOW-UP

Checklist Number 36 – Facilities and Equipment Inspection and Maintenance:

On April 23, 2008, the Audit Team met with Bill Ferares of on-site Facilities Maintenance to follow-up with an assessment of five issues identified in the April 26, 2007 audit of this area. The follow-up audit of Checklist No. 36 shows that RTD has implemented the required five elements. As a result, the Audit Team has no further recommendations regarding this checklist.

CONCLUSIONS

The Audit Team reviewed eight checklists in four areas of RTD operations. No findings were made during this audit session requiring the issuance of a Corrective Action Plan. Recommendations were made for two checklists requesting an update of standard operating procedures. No suggestions were made during this audit session.

The RTD and PUC Audit Team members are in agreement with all findings, recommendations and suggestions made during this audit session. *RTD has timely responded and followed-up to all findings, recommendations and suggestions made during this audit session.*

Attachments to Audit Report

AUDIT CHECKLISTS:

Checklist No.	Element/Characteristic
4-12-OP-01	Training and Certification for Train Operators and Control/Supervisor Personnel No recommendations
4-13-OP-03	Hours of Service No recommendations
4-20-RTD-05	Calibration of Measuring and Test Equipment No recommendations
4-25-SAF-02	Incident Reports Recommendation
4-26-SAF-07	System Safety Program Plan Administrative Requirements Relating to Authority, Purpose, Goals, Objective, Description, Control, and Update Procedures No recommendations
4-27-SAF-08	Hazard Identification and Resolution Recommendation
4-35-VM-04	Preventative Maintenance Program for Transit Vehicles No recommendations
4-36-VM-06	Training and Certification of Transit Vehicle and Equipment Maintenance Personnel No recommendations
Previous Audit 36	Facilities and Equipment Inspection and Maintenance No recommendations

CORRESPONDENCE AND OTHER ITEMS:

5/15/2008 email from Shirley Bennett regarding RTD rail operations checklist creation
 5/28/2008 email from Shirley Bennett regarding security SSI review
 5/29/2008 email from Shirley Bennett regarding security SSI and SOP's being reviewed in July RTD Executive Safety Committee for approval

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-12-OP-01	Date of Audit: 4/16/2008	Persons Contacted: Bill Bell Hal Fabricius
Department: Rail Operations	Auditors: P. Fischhaber S. Bennett	
49 CFR Requirement: 659.19(m & p)		

REFERENCE CRITERIA

SOP's -101.4, 101.9, and 101.10.
Rule Book-104.7.
Hours of Service records, Sick/Leave Log, Personnel Files

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRAINING AND CERTIFICATION RECORDS FOR TRAIN OPERATORS, AND CONTROL/SUPERVISOR PERSONNEL
Randomly select operator rulebook, training, and certification records of approximately 15% of active train operators and approximately 25% of active controller/supervisor personnel for the past two years to determine whether:

1. Each individual successfully completed the required initial and/or refresher training program
2. Training, qualification and re-qualification records are in compliance (including current CDL and physical exam).
3. The current training lessons plans and testing for qualification / re-qualification reflects the persons assigned duties.
4. Verify that training programs were evaluated on a regular basis for effectiveness, relevance and comprehensiveness.
5. Verify that training on emergency procedures was performed as required.

RESULTS/COMMENTS

The Audit Team randomly selected and reviewed the training and certification records for seventeen rail operators and six Controller/Supervisors. Currently, there are 114 rail operators in service and eleven trainees.

The initial and annual recertification documents for the Controller/Supervisors and operators were reviewed. The written tests and documentation records were in the files.

Operator records were reviewed to check recertification, ride checks performed by supervisors, door and brake checks, CDL's, written exams and results. Two of the operators did not have a copy of their commercial driver's license in the file. The hard copy files were checked, but copies of the license were not located. Mr. Bell has since obtained copies of the licenses and they have been placed in both the hard copy file and laserfiche.

The training program is evaluated on an on-going basis and adjustments and updates are made as needed.

The Audit Team does not have any recommendations for this audit.

RESULTS/COMMENTS
(Checklist # 4-12-OP-01 continued)

Controllers/ Supervisors		Initial Certification	Recertification	CDL Expires
1	Arnold Blake	Initial certification occurred prior to two year period	02/24/2008	05/17/2011
2	Hal Fabricius	Initial certification occurred prior to the two year period	02/20/2008	09/14/2011
3	Charles Langlois	01/09/2007	09/11/2007	12/11/2010
4	Rolando Medina	04/25/2005	04/18/2006	03/08/2009
5	Brian Sapp	Initial certification occurred prior to the two year time period	11/09/2007	09/03/2009
6	Roderick Whalen	Initial certification occurred prior to the two year time period	04/22/2006	12/15/2009
Rail Operators		Initial Certification	Biennial Recertification	
1	Nate Sharp	01/17/2006	01/05/2009	
2	Richard Nelson	02/10/2005	02/10/2009	
3	Dennis Roberts	12/10/2006	12/18/2008	
4	Dexter Burke	05/19/2006	05/19/2008	
5	Sylvia Reyes	08/16/2007	08/16/2009	
6	Thomas Adams	Initial certification occurred prior to two year period	11/29/2006	
7	Kim Baker	02/09/2007	02/09/2009	
8	Steve Ackard	Initial certification occurred prior to two year period	09/14/2007	
9	Andrew Heitman	04/25/2005	04/08/2008	
10	Lasonya Jenkins	08/29/2006	08/30/2007	
11	Lisa Holloway	02/15/2006	02/07/2007	
12	Dennis Hall	07/25/2005	07/24/2006	
13	Steve Iron Wing	11/14/2005	11/13/2006	
14	Michael Demong	03/14/2006	03/13/2007	
15	Vaughn Griffin	10/09/2008	09/26/2007	
16	Christopher Baker	06/24/2005	07/05/2007	
17	Michael Anglen	Initial certification occurred prior to two year period	02/09/2007	
After the one year certification, operators are recertified every two years.				

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-13-OP-03	Date of Audit: 4/23/2008	Persons Contacted: Bill Bell Hal Fabricius
Department: Rail Operations	Auditors: P. Fischhaber, S. Bennett, R. Lobato	
49 CFR Requirement: 659.19(m)		

REFERENCE CRITERIA

1. SOP 101.6
2. 49 CFR Part 395, "Hours of Service of Drivers"

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

HOURS OF SERVICE

1. Randomly select the names of at least 25% of qualified train operators and review the appropriate work records for two 8-day-periods which fell within the last 12 months, to determine whether or not they abided by the hours of service rules as required by the referenced criteria.

RESULTS/COMMENTS

Mr. Bell described the hours of service rules to the audit team. Operators are allowed to be on duty for 12 hours per day. Operators cannot exceed 70 hours over an eight day period.

The Audit Team randomly selected and reviewed the May 28, 2007 and January 3, 2008 records for 31 operators. The work records were for two eight day periods which occurred within the last 12 months. The Light Rail division currently has 125 full time operators.

The selected records were reviewed and all information verified. Hours of service records are now maintained on a computerized system. The system indicates operators who are approaching 65 hours per week. This allows their hours to be adjusted and/or monitored closely by the supervisors to prevent operators from exceeding their hours of service limit.

All of the selected records were reviewed and information verified. The records reviewed indicated that the hours worked are in compliance with SOP 101.6 and 49 CFR Part 395. Initially, one report reflected that an operator had exceeded the hours of service. However, further investigation indicated that this was an error based on a computer adjustment. The adjustment of hours occurred at midnight. Therefore, there was not a violation.

The Audit Team has no recommendations for this checklist.

RESULTS/COMMENTS
(Checklist # 4-13-OP-03 continued)

Operator Name	Date checked January 03, 2008	Date checked May 23, 2007
	Amount of Time Shown on DOT 8-day Report	Amount of Time Shown on DOT 8-day Report
J. Castaneda	62:03	52:46
R. Vialpondo	20:27	44:20
R. Nelson	43:30	0:00
S. Jones	41:10	0:00
D. Holderman	19:46	50:50
K. Lucero	49:05	53:17
B. Maxwell	52:51	46:54
C. Baker	19:00	47:20
J. Gonzales	10:07	39:55
T. Adams	27:32	47:41
C. Chavez	14:27	46:04
K. Stafford	69:37	56:52
S. Acker	53:42	54:18
R. Parker	48:22	44:56
B. Roff	56:20	45:22
J. Petty	53:43	52:54
A. Boettcher	52:48	53:46
G. Storm	16:21	41:07
A. Riggins	48:52	57:41
J. Haberkorn	24:45	60:37
L. Holloway	62:37	55:26
N. Williams	61:12	63:12
R. Gonzales	60:47	51:54
E. Chavez-Dominguez	51:50	50:11
M. Kuper	53:54	45:42
C. Lawson	50:01	49:12
R. Lucero	25:26	66:16
J. Munson	41:37	43:40
V. Griffin	68:40	61:28
D. Chavez	34:24	50:52
R. Gallegos	49:03	0:00

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-20-RTD-05	Date of Audit: 4/2/2008	Persons Contacted: Cal Shankster Phil Eberl Lou Cripps
Department: MOW and Vehicle Maintenance	Auditor: P. Fischhaber S. Bennett, R. Lobato	
49 CFR Requirement: 659.19(n)		

REFERENCE CRITERIA

Previous audit report/findings
RTD SOP 105.23.
Applicable Maintenance Procedures
System Safety Program Plan 2.1.6

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

CALIBRATION OF MEASURING AND TEST EQUIPMENT

1. Obtain a copy of the list of the measuring and test equipment subject to calibration control in the vehicle maintenance shop. Randomly select (if possible) two each of RTD's micrometers, dial calipers, torque wrenches, and multi-meters. From a combination of procedure and record reviews as well as visual inspections, determine whether or not:
 - a) The selected items are properly inventoried, controlled, calibrated at prescribed intervals, and marked, tagged or otherwise identified to show their current calibration status.
 - b) The next scheduled testing/calibration is shown on the item or tag.
2. Verify that any personal tools, which are used for safety critical measurements, are included on the list or otherwise controlled.

RESULTS/COMMENTS

- 1) Phil Eberl, Manager LRV Maintenance, Cal Shankster, Light Rail Maintenance of Way Manager, and Lou Cripps, LRV Maintenance Supervisor described the process for tracking tools and equipment. The list of tools was previously kept on the maintenance system computer and printed out on greenbar (GB) showing the calibration due date. RTD has since gone to a new system called Maximus. This new system is used to ensure that the tools requiring calibration are inventoried properly, controlled, and calibrated in a timely manner. The Audit Team obtained a copy of the Light Rail Instrument Calibration List and randomly selected eight items from that list. There are 10 active items that require calibration. RTD has no calipers or micrometers on the calibrated tool list. The Audit Team reviewed the Calibration List and visited the tool room to visually inspect the tools that were randomly selected for review. Two of the items randomly selected were not in the tool room because one was at the Mariposa Light Rail Facility and the other was on a Maintenance of Way truck. Cal Shankster had the Maintenance of Way staff bring those tools to the Elati Facility for inspection.
 - a) An inspection of items in the shop turned up the following:
 - i. Items had proper due date on cal tag.
 - ii. Items had cal dates that matched.
 - iii. No items out of calibration (past the due date).
 - b) Next scheduled calibration date was shown on tag.

RESULTS/COMMENTS
(Checklist # 4-20-RTD-05 continued)

Results of shop tool audit:

Equip ID #	Ser #	Calibrated Tool	Tag Due Date	Tag Last Cal
19EQ5	95750836	Digital Multi-meter	12-22-2008	12-22-2007
19EQ13	05950100513	Torque wrench 3/8" drive	05-15-2008	05-15-2007
19EQ18	94040002	Digital Multi-meter	05-21-2008	05-21-2007
19EQ22	81590070	Digital Multi-meter	12-27-2008	12-27-2007
19EQ28	1204201083	Flexhead torque wrench 1/2" drive	03-19-2009	03-19-2008
19EQ33	1104605422	Torque wrench 3/8" ft/lb	11-13-2008	11-13-2007
19EQ38	MOEE05029495	Milli-ohm Meter	08-16-2008	08-16-2007
19EQ43	0510006	UTE Cab Signal Master	12-14-2008	12-14-2007

2) Personal tools are not permitted to be used for safety critical PM procedures.

The Audit Team has no recommendations for this checklist.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-25-SAF-02	Date of Audit: 4/4/2008	Persons Contacted: J. Tarbert S. Bennett R. Lobato J. Gladden M. Sinclair
Department: Public Safety	Auditor: P. Fischhaber	
49 CFR Requirement: 659.19(f, i, j, m, n, & o), & 659.23		

REFERENCE CRITERIA

SOP's 101.18, 103.2, 103.3, 103.4, 103.5, 103.6, and 103.15.
Rule Book-249,1401, 1403
SOP's 100.1 and 140.2
SSPP sections 3.2 and 3.3.7

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

INCIDENT REPORTS

Review at least five each of safety-related accident reports and security incident reports prepared within the past two years to determine if :

1. The following required information, if applicable, is included:
 - a Date
 - b Time of incident
 - c Train #/LRV #
 - d Operator identification number
 - e Location
 - f Description of problem
 - g RTD case # or Accident #

2. Review the accident investigation procedures, reports, and corrective action plans and schedules utilized by RTD for the selected accidents to determine whether or not:
 - a. The report is complete and the procedure was followed with all information being contained in the procedure as per SOP 103.2.
 - b. The incident appears to have been correctly classified.
 - c. Corrective actions if noted are implemented in a timely manner.
 - d. Data from incidents is subjected to any analysis so that possible mitigation for future related events might be implemented.
 - e. Consideration was given to possible primary and secondary causes of events.
 - f. Records are complete and readily available.

RESULTS/COMMENTS

1) Under the new reporting criteria of 49 CFR Part 659 and the PUC's rules at 4 *Code of Colorado Regulations* 723-7-7340 through 7354, reports that would have previously been shown as incident reports are now reportable to the PUC as accident reports. As a result, review of incident reports was removed from this checklist item.

RESULTS/COMMENTS
(Checklist # 4-25-SAF-02 continued)

Accident Reports

Date	Time of Incident	Train #/ LRV #	Operator ID #	Location	Description of Problem	RTD Case #/ Accident #
4/28/2006	1:06PM	LRV #'s 146 and 139	14387	21st & Welton	Car drove in pathway and was struck by LRV	A1-042806
11/28/2006	6:50 PM	LRV # 133	12754	17th & California	Truck encroached on trackway and was struck by LRV	A1-112806
1/30/2007	5:56 PM	LRV # 123	17105	Speer Blvd NB at Stout Street	LRV 123 SB when a truck encroached on the ROW and was struck by the train	A1-013007
5/30/2007	2:16 PM	LRV # 109, 145, and 124	12600	Speer Blvd. SB at Stout Street	Van drove into the side of LRV 109	A1-05302007
12/9/2007	1:42 PM	LRV 114 and 149	13953	Speer Blvd. SB	NB train was struck by a car	A1-12092007

Security Incident Reports

Date	Time of Incident	Train #/ LRV #	Operator ID Name	Location	Description of Problem	RTD Case #/ Accident #
7/17/2007	6:00 PM	N/A	D. Rea	DUS Platform	Illness on the platform at DUS, took to St. Joseph Hospital	2007-2145
8/8/2007	9:39 PM	Unknown	R. Smith	10th & Osage	Use of fake ID on train, suspicious person	2007-2564
8/21/2007	11:15 AM	Train # 63	A. Lopez	10th & Osage	Counterfeit ID, suspended, received ticket, arrested for open warrant by DPD	2007-2661
9/1/2007	2:10 AM	Train # 63	D. Campos	Broadway Station on Train	Intoxication, transported to detox, suspended	2007-2965
9/22/2007	6:19 AM	Train #91	A. Johnson	Littleton Station Downtown	Theft, suspension	2007-3113

RESULTS/COMMENTS

(Checklist #4-25-SAF-08 continued)

- 2) The five accident reports reviewed under Section 1 of this audit were reviewed for the criteria in Section 2.

Accident Reports

Date	Report Complete and Procedure Followed per SOP 103.2?	Correctly Classified?	Corrective Actions noted and implemented in timely manner?	Data analyzed for possible mitigation for future related events?	Primary and Secondary Causes of Events?	Records Complete and Readily Available?
4/28/2006	Yes	Yes. Failure to obey traffic device	No corrective action required	Yes. RTD reviews accidents monthly and looks at cumulative accident trends every month over the course of the year	1° - drove into path of oncoming LRV 2° - Failure to look both ways	Yes.
11/28/2006	Driver information not available due to driver fleeing the scene	Yes. Failure to obey traffic device, and hit and run	No corrective action required		1° - drive into pathway of oncoming LVR 2° - snow and ice on street	Yes.
1/30/2007	Yes	Yes. Failure to clear track	No corrective action required		1° - truck too close to trackway, did not clear pathway 2° - traffic	Yes.
5/30/2007	Yes	Yes. Failure to yield ROW	No corrective action required		1° - van failed to yield ROW 2° - No contributing factors	Yes.
12/9/2007	Yes	Yes. Careless driving	No corrective action required		1° - car drove into pathway of train 2° - No contributing factors	Yes.

The Audit Team recommends that SOP's 103.3, 103.15, 101.18 be updated to show changed PUC information and Rules. The Audit Team also recommends that RTD review its security SOP's to determine if any should be marked as SSI, and to mark any SOP's as SSI as necessary with follow-up to the Audit Team as to which security SOP's were marked SSI, or that it was not necessary to mark any security SOP's as SSI.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-26-SAF-07	Date of Audit: 3/26/2008	Persons Contacted: David Genova Shirley Bennett
Department: Public Safety	Auditors: P. Fischhaber, R. Lobato	
49 CFR Requirement: 659.19(a, b, c, d, e, j, & r)		

REFERENCE CRITERIA

SSPP Policy Statement, SSPP Sections 1.1, 1.2, 1.3, 1.4,1.5, 1.6, 1.7, 2.0, and 5.2

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

SYSTEM SAFETY PROGRAM PLAN ADMINISTRATIVE REQUIREMENTS RELATING TO AUTHORITY, PURPOSE, GOALS, OBJECTIVE, DESCRIPTION, CONTROL AND UPDATE PROCEDURES

Obtain a copy of RTD's System Safety Program Plan, review and determine whether or not:

1. The SSPP contains a policy statement and authority for the document.
2. The SSPP contains a description of purpose for the Plan.
3. The SSPP contains clearly stated goals that are reasonable and attainable.
4. The SSPP identifies attainable objectives.
5. The SSPP contains a description of the transit system and the organizations structure for the transit system.
6. The SSPP contains control and update procedures.

RESULTS/COMMENTS

- 1) The SSPP contains a policy statement and authority for the document signed by RTD General Manager Clarence Marsella. The SSPP policy statement authorizes the Assistant General Manager of Safety, Security, and Facilities to develop, distribute, implement, and administrate a comprehensive, integrated and coordinated System Safety Program Plan and System Security Plan. Section 1.1 of the SSPP outlines the authority.
- 2) Section 1.2 of the SSPP contains a description of the purpose of the SSPP.
- 3) Section 1.4 of the SSPP outlines the goals of the SSPP. The goals that RTD has described are reasonable and attainable. RTD uses patron feedback, a review of other transit agency statistics, knowledge of what other transit properties do, peer review of other properties, conferences, participation in working groups, and practices and procedures to determine if the goals are being met. A General Managers Report (GMR) is created that provides feedback to the General Manager and the RTD board. The GMR comes from the customer center where customer complaints are taken. All complaints have to be answered, and all departments have to answer to the RTD board. SSPP goals may change from year to year based on issues that may arise during the previous year and based on contemporary issues that are identified.
- 4) Section 1.5 of the SSPP identifies the objectives of the SSPP. The current objectives in the RTD SSPP are reasonable and attainable.
- 5) Section 2.0 of the SSPP contains a description of the transit system. Section 2.1.3 was changed in 2007 to reflect the addition of the Southeast Corridor. Section 2.1.3 outlines the RTD organization structure for the transit system with organization charts included in Exhibit III.

RESULTS/COMMENTS

(Checklist # 4-26-SAF-07 continued)

- 6) Section 1.7 of the SSPP describes the SSPP update procedures. Exhibit IV contains the controlled distribution list.

The Audit Team has no recommendations for improvements in this area.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-27-SAF-08	Date of Audit: 3/26/2008	Persons Contacted: David Genova Shirley Bennett
Department: Public Safety	Auditors: P. Fischhaber, R. Lobato	
49 CFR Requirement: 659.19(f & i)		

REFERENCE CRITERIA

SSPP 3.3.2, 3.3.3, 3.3.4, 3.3.5, 3.3.7, 3.3.9, 3.3.11 and 3.3.13
Southeast Corridor Safety Certification Program
Southeast Corridor Contract Specifications
West Corridor Preliminary Hazard Analysis and Hazard Identification, Assessment, and Resolution Process
SOP 101.18

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

HAZARD IDENTIFICATION AND RESOLUTION PROCESS

Obtain a copy of RTD's System Safety Program Plan, SOP 101.18, and copies of the Safety and Security Certification Review Program and Corridor Contract Specifications from a current corridor or expansion under construction, and determine whether or not:

1. The organization has an established hazard identification and resolution process.
2. That the process applies to system operations.
3. That the process is applied during design and engineering.
4. That the process is applied during construction and start-up.

RESULTS/COMMENTS

- 1) RTD has an established hazard identification and resolution process outlined in the SSPP in Sections 1.8 and 3.3.2 through 3.3.4. The hazard resolution process follows the Mil. Standard 882D. Unacceptable hazards, those defined with a risk index of 1A, 1B, 1C, 2A, 2B, and 3A, are reportable to the PUC. RTD has established a formal and an informal hazard analysis process. The informal process is handled by the safety committees in each department. Input/suggestion boxes are available for RTD employees to provide input, identify potential safety hazards, and provide safety input. Any identified hazards are handled directly by the department safety committee, unless the required correction will require higher management level decisions (e.g. capital investment). For those hazards that require higher level management decisions, the hazard in question is sent to the Executive Safety and Security Committee. The Executive Safety and Security Committee consists of mid- and senior level managers and technical individuals. The Executive Safety and Security Committee operates on a consensus basis, meaning that if one person objects to a proposal being voted on, the committee is required to work on the matter until all members of the committee agree with the solution. Agendas and minutes are prepared for each Executive Safety and Security Committee meeting. Committee members are listed in the SSPP in Table 1.2. The formal hazard analysis procedure is outlined in Sections 1.8 and 3.3.2 through 3.3.4.
- 2) Standard Operating Procedure (SOP) 101.18 is the procedure that RTD uses to identify and report hazards within the system and system operations.
- 3) The West Corridor Preliminary Hazard Analysis and Hazard Identification, Assessment, and Resolution Process document and the West Corridor Preliminary Hazard Analysis document show that RTD uses the hazard identification and resolution process during design and engineering.

RESULTS/COMMENTS

(Checklist #4-27-SAF-08 continued)

Additionally, section 14 of RTD's Design Criteria provides standards and includes the hazard identification and resolution process as part of that document. The same standards are used for design and operations. A preliminary hazard analysis is performed during preliminary design stages as well as during the final design stage. If a contractor is working on the design of a corridor, the contractor is responsible for performing the various preliminary hazard analyses. RTD staff members, including staff from the safety and security areas, review and comment on the plans and RTD works with the contractor to identify any necessary resolutions and solutions.

- 4) The Southeast Corridor Safety Certification Plan was reviewed and shows that the hazard identification and resolution process is part of the safety certification plan.

The Audit Team recommends that SOP 101.18 be updated to include changed PUC information and Rules.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-35-VM-04	Date of Audit: 03-31-2008	Persons Contacted: Phil Eberl
Department: Vehicle Maintenance	Auditors: P. Fischhaber, S. Bennett, R. Lobato	
49 CFR Requirement: 659.19(f, g, i, m, n, o, & p)		

REFERENCE CRITERIA

1. SOP's 102.7 and 105.5.
2. Preventative Maintenance Inspection Checklists A through F.
3. SSPP sections 2.1.6 and 2.2.6

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

PREVENTATIVE MAINTENANCE PROGRAM FOR TRANSIT VEHICLES

- A) Randomly select a minimum of 5 cars (maximum of 25% of the fleet) and for each selected car, review the completed Preventative Maintenance Inspection (PMI) reports for the six different types of inspections and other applicable records to determine whether or not:
1. The required PMI's were performed during the required time and mileage limits.
 2. The responsible maintenance workers properly documented the inspection and maintenance activities.
 3. Maintenance defects that were noted during the inspections and which required unscheduled repairs were properly documented and closed out in a timely manner.
- B) Select a minimum of 2 procedures and perform a spot check on the performance of the PM activities taking place to determine whether or not:
1. The PM activities are being performed in accordance with the applicable PM procedures.
 2. The required inspections are being properly documented.
 3. Noted defects are being either corrected or recorded for further attention.
- Perform follow-up on the correction of any noted defects if applicable.
- C)
1. Through interview and review of records verify that tests are performed on LRVs involved in accidents, prior to their return to revenue service.
 2. Verify that management employs techniques, such as performance testing, to assess the implementation of maintenance rules and procedures which may have a safety impact.

RESULTS/COMMENTS

The Audit Team met with Phil Eberl and Lou Cripps to select 5 light rail vehicles to review the completed Preventative Maintenance Inspection (PMI) reports. The chart below shows the RTD mileage intervals for the different PM inspections.

Colorado PUC E-Filings System

RESULTS/COMMENTS

(Checklist # 4-35-VM-04 continued)

P M	PM Interval Miles	Overdue Limits %	Overdue Limits (miles)	In the 2005 Audit it was noted that RTD has no mid-life review for the light rail fleet and would consider this inspection process at the 15 year point for vehicles. The vehicles have aged and continue to age very well putting off the need for a mid-life review of the light rail fleet.
A	5,000	20-1000	6,000	
B	10,000	15-1500	11,500	
C	30,000	10-3000	33,000	
D	40,000	10-4000	44,000	
E	60,000	10-6000	66,000	
F	120,000	5-6000	126,000	

A) The team randomly selected 5 cars, one from each of the Denver series of Light Rail Vehicles I-V. The first four series of vehicles are the SD100 model vehicles and the next two series of vehicles are the SD160 models. The Audit team only selected from the first V series because the number VI series has not yet been commissioned by RTD.

The vehicle series is as follows:

- Denver I series are vehicles numbered 101-111 SD100
- Denver II series are vehicles numbered 112-117 SD100
- Denver III series are vehicles numbered 118-131 SD100
- Denver IV series are vehicles numbered 132-149 SD100
- Denver V series are vehicles numbered 201-234 SD160
- Denver VI series are vehicles numbered 235-243 SD160.

One car from each if the five active fleets was randomly selected for review of maintenance records. The Denver VI series of light rail vehicles are not commissioned yet. The team selected for review LRV#107 from series I (101-111), LRV#115 from series II (112-117), LRV#120 from series III (118-131), LRV#140 from series IV (132-149), and LRV#233 from series V.

The Audit Team reviewed the completed Preventative Maintenance Inspection (PMI) reports for the selected vehicles from each series and found that:

1. The required PMI's were performed during the required time and mileage limits.
2. The responsible maintenance workers did properly documented the inspection and maintenance activities.
3. Maintenance defects that were noted during the inspections and which required unscheduled repairs were properly documented and closed out in a timely manner.

The RTD continues to maintain a schedule that is approximately twice as aggressive as the recommended schedule of the manufacturer with PM A schedule at approximately two weeks instead of one month as recommended by Siemens, the vehicle manufacturer. This has resulted in extended life of the vehicles and major components and may extend the expected half life as well. This aggressive schedule may over time adjust to the monthly recommendation as the fleet continues to expand.

B) A random review of maintenance records for these LRV's was completed with no anomalies noted.

C) 1. A new maintenance management system known as Maximus was put into place in August of 2007 and has been successfully used to track the PMI schedule, generate and complete work orders, and provide records for review of vehicles that have been involved in accidents.

2. The records and performance tests for each vehicle involved in an accident can be used by supervisors to ensure that vehicles are inspected and tests are performed prior to train being released into revenue service.

The Audit Team has no recommendations for this checklist.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-36-VM-06	Date of Audit: 03-31-2008	Persons Contacted: Phil Eberl Doug Davis
Department: Vehicle Maintenance	Auditors: P. Fischhaber, S. Bennett, R. Lobato	
49 CFR Requirement: 659.19(m & p)		

REFERENCE CRITERIA

SOP's – 105.12, 105.13, 105.20,
SSPP Sections 3.3.8, 6.7.1.3 and 6.7.1.4
Other – RTD LRV Maintenance and Certification Check-Off List, Operational Readiness Inspection sign-off sheets, LRV Preventative Maintenance Inspection Task sign-off sheets, Wheel True Training Certification sheets and Maintenance Training Verification sheets.

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRAINING AND CERTIFICATION OF TRANSIT VEHICLE AND EQUIPMENT MAINTENANCE PERSONNEL

Obtain a copy of RTD's list of qualified transit vehicle electro-mechanics. Randomly select at least five training and certification records and review to determine whether or not:

1. Training, certification and re-certification records are in compliance with the referenced criteria.
2. The current training lessons plans and testing for certification / re-certification reflects the persons assigned duties.
3. Were training programs evaluated on a regular basis for effectiveness, relevance and comprehensiveness (i.e., changes incorporated to reflect differences in Denver 1, 2, 3, & 4 cars)?

RESULTS/COMMENTS

Phil Eberl provided the Audit Team with a list of qualified transit vehicle electro-mechanics. The list was a complete list of all 35 electro-mechanics of which 24 are certified and 11 have not yet completed the certification program for all equipment used at light rail. Doug Davis provided the employee training log book which new employees use as they go through training. Employees must complete the essential functions of the job tasks that are in their log book within a one year period of their training. Mechanics must go through the practical program within one year and take a written test in order to become certified. A re-certification test is required within two years of initial certification (30 day grace period before due date).

1. The Audit Team randomly selected five electro-mechanics to review their files for compliance with certification criteria. The results are as follows:

RESULTS/COMMENTS

(Checklist # 4-36-VM-06 continued)

Name:	Start Date:	Completion of Essential Functions:	Certification Date: (1 year)	Re-Certification Date: (2 year)
Joseph Ocansey	04/29/2005	Yes	05/10/2006	Next scheduled 05/08/2008
Quentin Smith	07/11/2005	Yes	11/06/2006	Next scheduled 11/11/2008
George Sweeney	05/11/2000	Yes	04/24/2001	04/2003,04/30/2005,06/30/2007, next scheduled 04/28/2009
Andy Ho	12/05/2005	Yes	12/06/2006	Next scheduled 12/05/2008
David Johnson	6/18/2007	Yes	06/18/2008 *1	On-going *2

Note: *1 David Johnson is a new electro-mechanic who is in the process of certification. He is scheduled for a one year annual certification date in June of 2008. *2 Re-certification for David Johnson is not applicable during this audit cycle. Certification records were reviewed for each employee and found to be in order with no exceptions noted.

2. Training and lesson plans for duties as assigned are comprehensive and reflective of the skill level necessary to complete job tasks. Doug Davis detailed structural procedures for management/supervisor training for new employees as well as on-going training for sub-systems. Employees receive one week of in class training during their first month, then move on to on-the-job training with classroom and manual training included for specific tasks.

3. Light rail management staff and supervisors have evaluated procedures to make training programs more comprehensive to follow the Preventative Maintenance Inspection (PMI) program and include changes or adjustments required to maintain compatibility between each of the Denver series of vehicles which currently includes the Denver I-V cars. There is no current system in place to specifically track certification and re-certification of electro-mechanics.

The Audit Team has no recommendations for this checklist.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Form For Review of Past Audit Recommendations	Date of Audit: 4/23/2008	Persons Contacted: David Genova, Bill Ferares
Department: Facilities Maintenance	Auditor: P. Fischhaber, R. Lobato, S. Bennett	
Cycle 4, Audit 1, Review Checklist 1 Review of Cycle 3, audit 5, Checklist 36		

REFERENCE CRITERIA

1 Checklist # 36 from 4/26/07

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION AND HISTORY

As a result of the 4-07 audit, the Audit Team had the following unresolved recommendations for this checklist area:

The audit team recommends that:

- 1) *A log sheet should be placed by each generator that would include the date and time of the inspection and name and the signature of the inspector.*
- 2) *Tasks should be placed on the new computerized system so that the maintenance schedule can be maintained more effectively.*
- 3) *Better records with procedures included are needed.*
- 4) *Each facility (and each generator), should have an individual work orders to drive its inspection. In the review of records it was noted by the Audit Team that the work orders were compiled with inspections for several different facilities throughout the District on the same order with no way to discern if an individual generator was inspected.*

RTD's answer to this recommendation was as follows:

RTD responded to these recommendations via email to Commission Staff on June 20, 2007. The email included copies of: a generator inspection log sheet to be placed with each generator; a draft copy of the above log sheet titled "generator PM log"; and a Support Vehicle Inspection Workorder Form. The email stated; "Attached are the logs and work order sheets that will be used by Facilities Maintenance and Vehicle Support to improve record keeping for each of the generators. Facilities Maintenance will check the generators monthly and Vehicle Support will implement the log and work order procedures to improve record keeping. Take a look at the forms and provide comments. The Generator PM Log is in rough draft form."

During the audit session, RTD had stated that their computer support (IT) department would soon be converting their inspection system to a computerized one and that the Facilities Maintenance (FM) department would insure that generator inspections were included in this effort. They did not have a date certain for the completion of this task by the IT department, but thought it would occur in the next few months.

The Audit Team met on July 24, 2007, and reviewed the progress of the FM Department toward implementation of changes as a result of the above recommendations. The Audit Team found that the new inspection sheets have been in use since May of 2007 and that training would be starting on the use of the new computerized system by mid August 2007 with implementation of the system to start soon after. The Audit Team finds these actions to be satisfactory progress toward this issue. The issue will be closed with follow-up to be performed during the Spring 2008 audit. A follow-up checklist will be created for that audit session.

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION AND HISTORY

The follow-up will include assessment of the following elements.

- 1) The new computer based inspection system for generators has been implemented.
- 2) Generator inspection log sheets are available, being used and are accurately filled out. Log sheets at the generators show the date and time of the inspection as well as the identity of the inspector.
- 3) Inspections have been occurring on a monthly basis since August of 2007.
- 4) There is a standard procedure for the testing and inspection of the generator sets.
- 5) Each generator has an individual work order to drive its inspection each month.

RESULTS/COMMENTS

- 1) RTD has implemented the Maximus system, which includes codes for generators.
- 2) Generator inspection log sheets are available. The generator inspection log sheets have changed to better outline what work is being performed for the various generator inspections. During fluid check inspections, the inspection log sheet shows that the following items are checked: oil pressure, engine temperature, coolant level, battery check, oil check, hour reading, date/time, and a signature place for employee number and initials.
- 3) Inspections of varying levels have been occurring on a monthly basis since August 2007. On-site facilities maintenance employees perform a visual inspection inside the generator every two to three weeks to check for fluid leaks. On-site facilities maintenance employees, along with other RTD employees also listen for the weekly automatic generation cycle and report to the facilities maintenance employees if the automatic cycle does not happen. Every one to three months, RTD facilities maintenance checks the fluid levels and kicks on the generator to see that it is working properly. An annual inspection of the generators is performed by the facilities maintenance department and a load test is performed on the generator every three years.
- 4) While there is no written procedure for the testing and inspection of the generator sets, the diesel mechanics have a checklist of the standard maintenance of diesel engines, and they have converted this checklist to the generator inspection log sheet to track the various items they check (fluids and battery) as they perform the tasks.
- 5) The new Maximus system is used to generate work orders for each generator for the fluids/battery check (every one to three months), annual, and load-test inspections. Work orders are not generated for the visual inspection every two to three weeks. However, if something is found during the visual inspection, a work order would be generated for facilities maintenance to perform the necessary inspections and repairs for any fluid leaks.

The Audit Team has no further recommendations regarding this checklist.

Fischhaber, Pamela

From: Bennett, Shirley [Shirley.Bennett@rtd-denver.com]
Sent: Thursday, May 15, 2008 9:45 AM
To: Fischhaber, Pamela
Cc: Genova, David; Bell, Bill; Lobato, Richard
Subject: FW: PUC Audit

Pam,

The Rail staff is very conscientious when it comes to safety. As a result of the two operators not having a copy of the CDL in their file, all of the files were audited and a checklist developed.

From: Bell, Bill
Sent: Wednesday, May 14, 2008 12:20 PM
To: Lobato, Richard
Cc: Bennett, Shirley; Mack, Lloyd
Subject: PUC Audit

During the recent PUC audit of Checklist #4-12-OP-01 it was discovered that we did not have copies of the CDL for two operators. As a result, we have audited all files and developed a checklist of documents needed for all new employees that will be completed within one week of their transfer to Light Rail.

Bill

Fischhaber, Pamela

From: Bennett, Shirley [Shirley.Bennett@rtd-denver.com]
Sent: Wednesday, May 28, 2008 12:37 PM
To: Fischhaber, Pamela
Cc: Genova, David; Lobato, Richard
Subject: Audit Recommendations - 4-25-SAF-02

Pam,
During the audit, the Audit Team wanted clarification for checklist 4-25-SAF-02 to determine if it should be marked as Security Sensitive Information (SSI). Also, should any of the SOPs be marked as SSI?

Checklist 4-25-SAF-02 and the SOPs were reviewed by John Tarbert, Senior Manager, Security and Emergency Management. He stated that none of the documents need to be labeled as SSI. These are general policies, not tactical on specifics.

Shirley Bennett
Senior Manager, Safety and Environmental Compliance
Regional Transportation District
Phone: 303-299-3323
Mail Code: DS-Sfty
Shirley.Bennett@rtd-denver.com

Colorado PUC E-Filings System

Fischhaber, Pamela

From: Bennett, Shirley [Shirley.Bennett@rtd-denver.com]
Sent: Thursday, May 29, 2008 11:34 AM
To: Fischhaber, Pamela
Subject: Audit Report

Pam,
The appropriate staff at RTD has reviewed the draft audit report and we are in agreement with all findings, recommendations and suggestions made during this audit session.

Two recommendations were made and corrective action is being taken: (1) John Tarbert, Senior Manager, Security and Emergency Management has reviewed Checklist 4-25-SAF-02. He stated that this does not need to be marked as Safety Sensitive Information (SSI) because these are general policies, not tactical or specifics. (2) Per recommendation 4-27-SAF-08 (Hazard Identification and Resolution), the Safety Division will conduct a formal hazard analysis on the rail insulators. This process will begin in mid June.

SOP number: 103.3, 103.15, 101.18 have been updated to include recent changes in PUC information and rules. The SOPs must be reviewed by the RTD Executive Safety Committee for approval. This has been placed on the July meeting agenda.

Shirley Bennett
Senior Manager, Safety and Environmental Compliance
Regional Transportation District
Phone: 303-299-3323
Mail Code: DS-Sfty
Shirley.Bennett@rtd-denver.com

Colorado PUC E-Filings System

**Joint Report Of
The Colorado Public Utilities Commission (PUC)
Rail/Transit Safety and Water Section
And
The Regional Transportation District (RTD)
Department of Safety, Security and Facilities**

DATE: 12/4/2008

**SEMI-ANNUAL ON-SITE SAFETY AUDIT 2
OF RTD LIGHT RAIL OPERATION**

September 16, 2008 – September 25, 2008

AUDIT RESULTS

Six checklists were reviewed during this semi-annual audit. The Audit Team made zero findings, two recommendations, and zero suggestions from the checklists reviewed as outlined in Table 1:

Table 1 – Audit Checklists

Checklist No.	Element/Characteristic
4-03-MOW-11	Track Inspections No recommendations
4-04-MOW-15	Inspection of Mainline Switches and Turnouts No recommendations
4-14-OP-12	Train Orders and Special Instructions Recommendation
4-15-OP-13	Process/Procedure to Modify Rules and Issue Bulletins and Special Instructions Recommendation
4-16-OP-14	Train Operator Performance Evaluations by Supervisors No recommendations
4-28-SAF-10	Hazardous Materials Program No recommendations

**FINDINGS/RECOMMENDATIONS/SUGGESTIONS FOR SEMI-ANNUAL
AUDIT 2**

The Audit Team had no recommendations for checklist 4-04-MOW-15. However, the Audit Team was not able to perform an in-field review of the RTD switch inspection process during this audit period due to staffing changes. The Audit Team will schedule a date and time with RTD MOW to review switch inspections.

RTD Response: The RTD will schedule a field audit with PUC staff during the spring of 2009 to inspect switches.

The Audit Team recommended for checklist 4-14-OP-12 that item #1 be reviewed once again during this audit cycle, following an RTD internal resolution concerning a grievance on this matter.

RTD Response: The grievance issue has not been resolved via the Union/Management process. In the interim, the Manager of Transportation has taken action to resolve the issue of employees not signing in for duty. To rectify this, a memo was sent to operators informing them to sign up daily for work assignments. Operators who violate the procedure will face disciplinary action up to and including termination. This procedure will be reviewed during the Spring 2009 audit.

The Audit Team recommended for checklist 4-15-OP-13 that checklist item #5 be removed from future audits. Given that the Audit Team performed a complete review of RTD's 2001 rewrite of SOP's and Rules and verified conformance to RTD's process, the Audit Team believes that future review of this complete SOP and rule rewrite is unnecessary.

RTD Response: RTD concurs with the PUC that this checklist should be removed from future audits because it is no longer necessary.

CONCLUSIONS

The Audit Team reviewed six checklists in three areas of RTD operations, two areas of RTD maintenance of way, and one area of RTD safety. No findings were made during this audit session requiring the issuance of a Corrective Action Plan. Recommendations were made for two checklists requesting further review of one checklist during a later audit session and recommending removal of one item from a checklist. No suggestions were made during this audit session.

The RTD and PUC Audit Team members are in agreement with all findings, recommendations and suggestions made during this audit session.

Attachments to Audit Report

AUDIT CHECKLISTS:

Checklist No.	Element/Characteristic
4-03-MOW-11	Track Inspections No recommendations
4-04-MOW-15	Inspection of Mainline Switches and Turnouts No recommendations
4-14-OP-12	Train Orders and Special Instructions Recommendation
4-15-OP-13	Process/Procedure to Modify Rules and Issue Bulletins and Special Instructions Recommendation
4-16-OP-14	Train Operator Performance Evaluations by Supervisors No recommendations
4-28-SAF-10	Hazardous Materials Program No recommendations

CORRESPONDENCE AND OTHER ITEMS:

None.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-03-MOW-11	Date of Audit: 09-16-2008	Persons Contacted: Cal Shankster, Terry Emmons, and Greg Boysen
Department: Way, Power and Signal	Auditor: P. Fischhaber, A. Lovato, S. Bennett, R. Lobato	
49 CFR Requirement: 659.19(f, i, m, n, & o)		

REFERENCE CRITERIA

SOP's- 102.1, 102.2, and 104.10 .
Rule Book-102.7, 118.2
SSPP- 2.1.6
RTD Track Maintenance Standards—"U.S. DOT Track Safety Standards, Title 49, Part 213" (unofficially adopted by RTD)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRACK INSPECTIONS

1. Arbitrarily select and inspect not less than eight consecutive monthly track inspection reports to determine whether or not:
 - A. All mainline track (including turnouts) was visually inspected as required by the referenced criteria.
 - B. The required inspections were properly documented on the RTD track inspection report.
 - C. Any noted defects were posted on the maintenance log sheet and corrected in a timely manner.
2. Inspect not less than two years of annual track ultra-sound reports to determine whether or not:
 - A. All mainline track was inspected as required.
 - B. Any noted defects were corrected in a timely manner.
3. Through a combination of interview and review of records:
 - A. Verify that management employs techniques, such as performance testing, to assess the implementation of maintenance rules which may have a safety impact.
 - B. The hazard management and safety data acquisition processes are being followed and there is coordination with upper management on faulty equipment and recurring maintenance issues and trends.

RESULTS/COMMENTS

1. The Audit Team Selected the Central Corridor from the I-25 at Broadway Station to the Downing Station starting December 2007 through July 2008.
 - A. Mainline track inspections were completed and logged into the Maximus system. Eight consecutive months were selected for review and verification that visual inspections were completed as required by the referenced criteria. Track inspections are completed once per month. Both track and switch turnouts were inspected and all inspections were performed as required.
 - B. The required inspections were completed and documented in a timely manner. All reports were scanned by Laserfische into the RTD document control system. Review of the monthly track inspection reports indicated the track inspection procedure is being followed and that inspections were properly documented in the Maximus system. As the checklists are now in the Maximus system or scanned into Laserfische, inspectors have hand-held PC's that they use to complete the checklists in the field. They will upload the information into the main system once they return from the field.

RESULTS/COMMENTS

(Checklist # 4-03-MOW-11 continued)

- C. Seven defects in the inspections were noted during the review. All noted defects were corrected in a timely manner. Some defects required parts to be ordered or welding to happen. Safety measures were taken between the time of the noted defect and the time of the repair to make sure the system ran safely until the repair was completed.
2. The Audit Team reviewed the annual inspections for two years of annual track ultra-sound reports, which are completed by an independent contractor.
- A. The June 2008 ultrasound inspections were reviewed in the Maximus system. The remaining ultrasound inspections were verified in Laserfische for the two year period from August 2007 to August 2008.
- B. No defects were noted in the two years of ultrasound data reviewed. Track ultrasound testing continues to be preformed annually.
3. The Audit Team interviewed Terry Emmons, Acting Manager, Light Rail Maintenance of Way and Greg Boysen, Maintenance of Way Supervisor and reviewed track inspection records.
- A. Terry and Greg described the certification and recertification process for track inspectors. Recertification occurs every two years after initial certification. Recertification has to occur within 30 days of expiration. One failure is allowed before retesting (within 10 days of expiration.) on SOP's, rule book, specifications, and procedures. They are allowed to use their reference material that they would have available in the field to take the test. Safety concerns are addressed in the Safety Committee Meetings, or employees can leave comments in a safety suggestion box. Systems are in place to ensure that the track inspectors are working safely and can be provided with assistance if necessary. RTD is in the process of tracking the certifications and recertification's in the Oracle Database system (available to the entire company – part of the learning center.) The database allows tracking of certifications company-wide. Personnel files are kept for each employee, which contain their training records.
- B. Safety issues or concerns that are brought to the supervisor by employees are addressed in either a tool-box/crew meeting, or in the monthly Safety Committee Meeting. As issues regarding safety concerns are noted such as track alignment, accidents, proper procedures, etc, supervisors address the issues in these crew meetings, or refer them to the Safety Committee. Maintenance of Way holds one or two Safety Committee meetings, or as needed on specific issues. Crew meetings involve assignments for the day and discussions among the crew about issues. Supervisors keep daily journals for each shift to mark what is happening on the alignment and to document communications between shift changes. RTD stresses communication and keeps issues fresh in employee's minds to avoid complacency.

The Audit Team has no recommendations for this checklist.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-04-MOW-15	Date of Audit: 9-16-2008	Persons Contacted: Terry Emmons, and Greg Boysen
Department: Way, Power and Signal	Auditor: P. Fischhaber, A. Lovato, S. Bennett, R. Lobato	
49 CFR Requirement: 659.19(f, i, m, n, & o)		

REFERENCE CRITERIA

1. SOP's-102.1, 102.2, 104.2, 104.10 and 104.22.
2. Rule book- 102.7, 118.2
3. Maintenance Procedures, 49 CFR Part 236, Monthly Manual and Power Switch Inspection
4. SSPP- Section 2.1.6

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

INSPECTION OF MAINLINE SWITCHES AND TURNOUTS

1. Review RTD's file of completed mainline switch and crossover inspection reports for at least one of each type of switch/turnouts inspections reports completed during the past twelve months. An inspection review should be performed on each of the main types of switches currently in use by RTD. For each switch inspection review determine whether or not:
 1. The mainline switches were inspected at the required frequency as required by the reference criteria (49 CFR Part 237).
 2. The required inspections were properly documented on the inspection report.
 3. Any noted defects or discrepancies were corrected in a timely manner.
 4. If possible, accompany the inspector on review of the inspection of two recently inspected switches/crossovers and discuss the procedure and assess its effectiveness.
2. Through a combination of interview and review of records:
 - A. Verify that management employs techniques, such as performance testing, to assess the implementation of operating and maintenance rules which may have a safety impact.
 - B. The hazard management and safety data acquisition processes are being followed and there is coordination with upper management on faulty equipment and recurring maintenance issues and trends.

RESULTS/COMMENTS

1. The Audit Team reviewed RTD's file of completed mainline switch and crossover inspection reports for at least one of each type of switch/turnout inspection report completed during the past twelve months.
 1. Each switch type was reviewed and verified that the proper inspections were performed (some are monthly and some are quarterly).
 2. Inspections were properly documented on the inspection reports. Inspection reports are currently stored in Laserfische. RTD intends to move the switch inspection information checklists into the Maximus system at a later date.
 3. One random defect from the twelve month time period was reviewed and found that the discrepancy was corrected in a timely manner. The tracking of the repair was reviewed through the Maximus system.

RESULTS/COMMENTS

(Checklist # 4-04-MOW-15 continued)

4. Due to recent staff changes, it was not possible to accompany an inspector as part of the formal audit at this time. The Audit Team will schedule a time with RTD MOW staff to review switch inspections in the field at a later date.

2. Interview and review of records:
 - A. RTD employee's safety certification/recertification techniques to assess the implementation of operating and maintenance rules. Recertification occurs every two years after initial certification. Recertification has to occur within 30 days of expiration. One failure is allowed before retesting (within 10 days of expiration). The certification covers RTD's SOP's, rule book, specifications, and procedures. Those obtaining certification are allowed to use the reference material that they would normally have available to them in the field, while taking the test. Safety meetings will continue to cover rules and safety concerns. Richard Lobato with RTD Safety checks to see if the inspectors are at their reported locations performing their required duties. Supervisors are available to those needing help. Richard spot checks locations as well. RTD is working towards tracking the certifications and recertifications in its Oracle database (available to the entire company and is part of its learning center). This will allow tracking of certifications company-wide. This tracking is in progress and will take time to get information into the new system. Booklets are also kept on each employee in regards to training.

 - B. Safety issues are brought to supervisors by employees. If everybody needs to be informed, a safety meeting is held to disseminate to all. Monthly safety meetings are held with all rail employees, which cover issues with workers, track alignments, accidents, proper procedures, etc. Richard Lobato with RTD Safety oversees the monthly safety meeting. MOW holds safety meetings as well once or twice a month, or as needed to cover specific issues. Crew meetings involve not only assignments for the day, but also discussions among the crew about safety issues. Some of the issues are brought to safety meetings for everyone to hear. Supervisors keep daily journals for each shift to mark what is happening and to document communications. RTD stresses communication and keeps issues fresh in employees' minds to avoid complacency.

The Audit Team has no recommendations for this checklist. The Audit Team will schedule time at a later date to meet with MOW staff to review switch inspections in the field.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-14-OP-12	Date of Audit: 09-25-2008	Persons Contacted: Bill Bell and Hal Fabricius
Department: Rail Operations	Auditor: P. Fischhaber, A. Lovato, S. Bennett, R. Lobato	
49 CFR Requirement: 659.19(m & o)		

REFERENCE CRITERIA

1. SOP's 104.11 and 104.21.
2. Light Rail Employee Rule Book (LRERB) Rule #'s 204, 205, 217.2, and 402.

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRAIN ORDERS AND SPECIAL INSTRUCTIONS

Randomly select and review ten Train Orders which were issued within the last two years, to determine whether or not:

1. The train orders were issued, and the log initialed by all on-duty operators indicating pick-up by the operator; and orders were then filed in the division supervisors' daily file.
2. The train orders were rewritten as special instructions if lasting longer than one day in duration as per LRERB # 217.2(c)
3. By interview with at least four on-duty operators, verify that current train orders are kept on display in the cab of the train as required by SOP 104.11.
4. Through observation of at least two trains (if possible) determine that Train orders and Special Instructions are being adhered to and observed by train operators.

RESULTS/COMMENTS

1. The Audit Team reviewed the sign-in sheets for light rail operators for the two year period from November 2006 to August 2008.

By random selection the team selected the following dates for review.

	Log initialed	Train orders filed	Comments
November 28, 2006	Yes	Yes	
December 29, 2006	Four unsigned	Yes	06 Blizzard
February 25, 2007	Yes	Yes	
June 20, 2007	One unsigned	Yes	
October 09, 2007	Yes	Yes	
December 04, 2007	No sign in sheet	Yes	Supervisor checked in operators
April 13, 2008	Yes	Yes	
April 27, 2008	Two unsigned	Yes	
June 20, 2008	One unsigned	Yes	Employee late report due to FMLA
August 21, 2008	One unsigned	Yes	

The train orders were filed by the supervisors in the daily file. However, of the ten selected train order sign-in logs, there were nine instances where one or more operators failed to initial the sign-in log. According to Bill Bell the operators who failed to initial the log were extra board or relief operators who for various reasons did not initial the log.

RESULTS/COMMENTS

(Checklist # 4-14-OP-12 continued)

2. The train orders are kept current, and as necessary; they were revised during the review period based on updated information. Train orders were rewritten as special instructions if they lasted longer than one day.

3. The Audit Team along with Bill Bell and Hal Fabricius met with four different train operators at the Mineral Station to verify whether or not the operators had current train orders with them on the train. Each of the operators interviewed did have available the current train orders as required by SOP 104.11.

4. Following the verification of train orders, the Audit Team relocated to a location north of the Mineral Station that requires train operators to pass a slow zone (25 MPH restriction), which is a special instruction noted on the train orders. The Audit Team observed two different trains as they passed through the slow zone. Each train slowed down through the slow zone and followed the special instructions as required.

Given the current grievance process that RTD is involved in regarding points involved in this checklist, the Audit Team recommends that this checklist be followed-up in a future audit during Cycle 4 to review the results of the grievance and determine if any changes need to occur with the associated processes.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-15-OP-13	Date of Audit: 9/19/2008	Persons Contacted: Cal Shankster, Shirley Bennett, Phil Eberl
Department: Rail Operations	Auditor: P. Fischhaber, A. Lovato, R. Lobato	
49 CFR Requirement: 659.19 (g & m)		

REFERENCE CRITERIA

1. SOP's 101.8, 101.11, 104.11 and 104.21.
2. SSPP 2.1.7 "System Modifications" & 3.3 "System Safety Unit Tasks"

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

PROCESS/PROCEDURE TO MODIFY RULES AND ISSUE BULLETINS AND SPECIAL INSTRUCTIONS

By a combination of interview(s) with the AGM of Rail Operations and review of appropriate documents, determine whether or not:

1. Procedures are in place for controlling the modification of rules, and for issuing Bulletins and Special Instructions.
2. Controls are in place to ensure that responsibilities for drafting modifications to rules, and issuing bulletins and notices, are clearly understood and practiced.
3. Proposed modifications are distributed to departments that have a need-to-know, for departmental review and comment
4. Select four maintenance bulletins, which were issued within the previous two years and verify conformance to the process/procedures.
5. Perform a review/audit of the modification/review/update of RTD SOPs and Rules, which took place in 2001, to verify conformance to the process.
6. Verify that procedures were reviewed/modified to reflect changes in facilities and operations, which have occurred since the previous audit of this area.

RESULTS/COMMENTS

1. Procedures are in place for controlling the modification of rules and the issuance of bulletins and special instructions to employees. SOP 101.11 regarding System change and modification was reviewed by the Audit Team. To assure compliance, all changes and modifications must be submitted to the RTD Executive Safety and Security Committee for review and approval. SOP 104.11 outlines the proper procedure for issuing train orders. This procedure states the process for making modification to any existing rules and the issuance of bulletins and special instructions such as train orders and maintenance bulletins. SOP 104.10 outlines temporary restriction limits. Bulletins are issued to the shop employees and train orders are provided to the train crews. SOP 104.10 also outlines the procedure for accessing a right of way permit, which must be obtained and used by all contractors and internal personnel. An example on elevators was shown to demonstrate how the process works. The change, while not specific to rail operations, will be applicable should this elevator be used.

The Executive Safety and Security Committee is a concurrence committee, not a majority rules committee. This allows all areas of RTD to have input and all issues are addressed and the appropriate action taken.

RESULTS/COMMENTS

(Checklist # 4-15-OP-13 continued)

2. Controls are in place to ensure that responsibilities for drafting modifications to rules and issuing bulletins and notices are clearly understood and practiced. The SOPs previously reviewed provided information regarding the controls plus the verification in item number four that employees sign that they have received and read the bulletins.
3. Proposed modifications are distributed to RTD departments that have a need-to-know for departmental review and comment. The RTD Executive Safety and Security Committee provides this function. Once an item is approved by this committee it is provided to the Departments for dissemination to the appropriate staff. Prototypes are sometimes used to verify that the process works, prior to submitting recommendations to the Executive Safety and Security Committee for review. Also, the suggestion may be tested in the field to ensure that it will work, before submission.
4. Four maintenance bulletins, within the previous two years were selected and verified to ensure conformance to SOP 101.8. First Bulletin No. B8-92-2 was “New Mobile Time Lapse Video Recorder Installation”, dated 05/23/07 and approved by Phil Eberl has not been revised. A new procedure has been developed and a new bulletin on installation of the new recorders has been issued. RTD now uses an employee sign-off list to ensure that all employees that need to know the information have received the information, even though this is not required per the SOP. First Bulletin No. A3-04-1 entitled “Coupler Shift Linkage Operating Gear Lubrication”, dated 04/27/07 and approved by Phil Eberl has not been revised. The manufacturer’s recommendations were not working for RTD, so a more frequent schedule for lubricating the gears has been implemented. First Bulletin No. Z8-40-2 entitled, “AW2 Load Simulation – Substation Load Testing and LRV Commissioning Purposes” dated 04/07/08 and approved by Phil Eberl has not been revised. Bulletin A9-40-1 was revised from the original bulletin dated 10/05/99 entitled “Traction Motor Receiving Inspection and Commissioning” and approved by Phil Eberl. All maintenance bulletins conformed to the procedures.
5. A review and audit of the modifications of the RTD SOPs and Rules, which took place in 2001 were reviewed to verify conformance to the process. In 2001, RTD performed a complete review of the SOP manual. An audit was done in 2005 to review that everything been signed off. This checklist item is not necessary given it was performed in a previous audit. RTD reviews SOPs and will update the information as necessary.
6. The Audit Team verified that procedures were reviewed/modified to reflect changes in facilities and operations, which have occurred since the previous audit in this area. RTD provided a copy of the yard operations SOP. This procedure is currently being revised to include the Elati facility as well as the Mariposa facility. The SOP has been through a first review with the Executive Safety and Security Committee. RTD initiates this process when employees bring issues to the safety committee or staff becomes aware of safety issues. For example, Mariposa has a speed limit of 5 MPH with 800 ft. of track. At 5MPH with a mile of track at Elati, trains can travel faster if there are not cars on the adjacent tracks. Other issues on other properties, such as the September 2008 Metrolink rail crash will also be an opportunity for RTD to review their procedures to determine if RTD rules and procedures cover such procedures. The APTA peer review recently conducted an audit on the system. One suggestion was to have a monthly operator safety meeting. RTD has a monthly safety meeting with representatives from rail operators, maintenance, safety staff and rail operations. Minutes and bulletins are generated to make employees aware of safety issues and concerns, what issues are being reviewed, information, cautions and items to be aware of. There is also a safety suggestion box where employees may submit information for the safety committee to follow-up on.

The Audit Team recommends removing checklist item 5 from future audits

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-16-OP-14	Date of Audit: 10-25-2008	Persons Contacted: Bill Bell and Hal Fabricius
Department: Rail Operations	Auditor: P. Fischhaber, A. Lovato, S. Bennett, R. Lobato	
49 CFR Requirement: 659.19(m & p)		

REFERENCE CRITERIA

- SOP's 101.4
- SSPP Sections 3.3.8, 6.7.1.1 and 6.7.1.2

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRAIN OPERATOR PERFORMANCE EVALUATIONS BY SUPERVISORS

Randomly select train operator ride check reports for ten different train operators who have been in service for at least the last two years, to determine whether or not:

- Each train operator was evaluated on a biennial basis (once every two years).
- Ride check reports were appropriately filled in and signed by the supervisor.
- The testing and re-certification occurred prior to the expiration of the previous certification.
- Re-certification was given or other follow-up action taken in cases of substandard performance which was shown during normal evaluations.
- Participate in at least two ride-along evaluations to assess the adequacy of the evaluation.
- Through a combination of interview and review of records verify that management employs techniques, such as performance testing, to assess the implementation of operating rules which may have a safety impact.

RESULTS/COMMENTS

1-4

	Item 1	Item 3	Item 2	Item 4	
Name	Biennial Evaluation?	Certificate Expiration	Certificate Completion	Signed	Ride Check Performance
Mike Backes	Yes	December 13, 2007	March 16, 2007	Yes	Acceptable
Dexter Burk	Yes	May 21, 2008	May, 13, 2008	Yes	Acceptable
Michael Demong	Yes	March 13, 2007	March 07, 2007	Yes	Acceptable
Lydia Gibbs	Yes	February 18, 2008	February 15, 2008	Yes	Acceptable
John Haberkorn	Yes	December 07, 2007	November 27, 2007	Yes	Acceptable
Andy Heitman	Yes	April 18, 2008	April 05, 2008	Yes	Acceptable
Michael Hulbert	Yes	January 15, 2007	January 12, 2007	Yes	Acceptable
Jean Johnson	Yes	October 01, 2006	September 27, 2006	Yes	Acceptable
Kevin Lucero	Yes	October 08, 2006	October 04, 2006	Yes	Acceptable
Phillip McCallister	Yes	April 14, 2006	April 14, 2008	Yes	Acceptable

RESULTS/COMMENTS

(Checklist # 4-16-OP-14 continued)

5. The Audit Team participated in two ride-check evaluations with Hal Fabricius and Supervisor Dan Menter who conducted the ride checks. The first ride check began southbound from the I-25 at Broadway Station and concluded at the Lincoln Station along the most recently completed Southeast Corridor. The second ride check began northbound from the Lincoln Station and concluded at the I-25 at Broadway Station. Supervisor Menter explained the evaluation process to the Audit Team and completed the evaluation forms for each ride check. Copies of both ride checks are attached with no deficiencies noted.

6. Ride checks are performed routinely by Supervisors, when there are customer complaints, or reasonable cause. The train orders contain a “Rule of the Week” to highlight different rules, or issues that are brought to a supervisor or managers attention.

The Audit Team has no recommendations for this checklist.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-28-SAF-10	Date of Audit: 9/17/2008	Persons Contacted: Shirley Bennett, Richard Lobato, Walter Pierce, Bruce Rabe
Department: Public Safety	Auditor: P. Fischhaber, A. Lovato	
49 CFR Requirement: 659.19(s)		

REFERENCE CRITERIA

SOP's -101.11, 102.9 and 102.15.
Rule Book-107.3
SSPP- 3.3.12, 3.3.13 and 6.9
4 (CCR) 723-7-7343(c)(VIII)
OSHA Hazard Communications Program
RTD Procurement Standards Manual, (latest revision)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

HAZARDOUS MATERIALS PROGRAM

Inspect the vehicle maintenance shop to determine whether or not:

1. Hazardous materials discharge incident reports (if any incidents have occurred) are kept on file at the facility and a review of Controller Log entry confirms any reportable incidents and/or responses.
2. Material Safety Data Sheets (MSDS) are available and current at the facility for all materials kept at the facility.
3. Health and safety related chemicals and other materials are adequately labeled and stored.
4. Procedures and training are in place and documented, for employee use of hazardous materials and chemicals where appropriate.
5. Hazmat spill equipment and training is provided if needed.
6. Verify the existence of a procurement procedure that precludes the introduction of unauthorized hazardous materials into the system and verify that Safety is involved in this process.
7. Verify the existence of a program that is used to verify and mitigate hazardous material usage.
8. Protective equipment training is provided to personnel as needed.
9. Supervisor spot checks are conducted (and documented) to ensure quality control and compliance.
10. Verify that monthly safety and environmental inspections are completed and documented.
11. Verify that Rail managers and supervisors have received spill response training and annual refresher training.
12. Observe hazardous waste satellite accumulation points for proper signage and labeling.

RESULTS/COMMENTS

1. To date, there have been no hazardous materials discharged at either the Elati or the Mariposa LRV maintenance facilities. Therefore, no reportable incidents or responses have been documented to date.
2. The Material Safety Data Sheets (MSDS) are available and current at the Elati and Mariposa facilities and at the RTD safety offices. The MSDS information is available on an RTD intranet site, which uses SAFETEC software. They are also available on a CD-ROM drive.
3. RTD has check lists for each facility. RTD's internal policy is to check each LRV facility once a month (at a minimum). RTD also performs storm water inspections once a month. RTD's environmental group tries to get out more often and works with safety staff to make sure necessary labels and information are in the areas required. The Elati and Mariposa facilities are exempt from RICRA. There is limited hazardous waste generated at Elati, such as OH batteries, solvent, and paint.

RESULTS/COMMENTS

(Checklist # 4-28-SAF-10 continued)

The hazardous waste generated at Mariposa includes wash cleaner, paint, solvent, and paint filters. There are no OH batteries (they have been moved to Elati). Everything else is considered universal waste and disposed of in the universal waste containers located at both facilities.

4. RTD conducts an annual 24-hour training program on hazardous materials, as well as, annual training on MSDS use. Storm water and sanitary sewer training is included under the permits. Integrated Contingency Plan training is included. RTD uses a contractor for Level II (floor workers) and Level V (supervisors) training (Rocky Mountain Education Center). RTD uses an outside contractor because of internal staff issues and the time intensity of this type of training.
5. Hazmat spill training is performed with the training mentioned in number 4. The contractor ensures all training materials are current.
6. A procurement procedure was verified. Safety approves or denies all chemicals prior to entering any facilities. Forms for approval are available on RTD's intranet. Taken into consideration are the chemical's use, who will be using it, in which facility will it be used, whether or not it's being tested, and whether or not it's replacing another chemical. RTD checks for trouble with existing chemicals and other environmental laws. RTD receives about one request a week, rejecting about one request a year. Requests have to come directly from an RTD employee. RTD does not accept unsolicited requests from vendors. Safety knows the type and quantity of all chemicals on site. Information is scanned into the SafeTec system. All supervisors have been trained on these procedures. RTD has control over all chemicals from dish soap to aspirin. RTD safety staff performs yearly formal walkthroughs (SERRA Title walkthrough and Denver Fire walkthrough), as well as additional walkthroughs and site checks throughout the year. The city of Englewood performs a sanitary walkthrough every two years at the Elati facility.
7. MSDS information and training is used. Safety staff works at keeping hazardous materials usage to a minimum. RTD has changed procedures and solvents, due to a previous solvent being classified as hazardous material. The new solvent is not a hazardous material. RTD is proactive in its hazardous material mitigation. Bruce Rabe issued a memorandum explaining the MSDS environmental and safety review process to all RTD employees.
8. Training on PPE is discussed in hazmat training, on-track safety training, and other areas of training. PPE training is also covered in safety meetings on a regular basis.
9. Environmental staff conduct and document spot checks on a monthly basis including safety and housekeeping items. Safety performs daily walkthroughs. If there happens to be a safety issue, it is brought up in safety meetings. Safety staff informs supervisors of safety or housekeeping issues, so that the supervisors can disseminate this information at their safety meetings. Although daily walkthroughs may go undocumented, reports are written on a monthly basis. Documented information will be scanned into the Laserfiche system in the future.
10. RTD safety staff provided copies of monthly safety and environmental inspections for the last two years.
11. RTD safety staff provided documentation showing that rail supervisors and managers participated in hazmat training, including spill response training. This training is provided on an annual basis.
12. Hazardous waste satellite accumulation points were observed at the Elati and Mariposa facilities with the proper signage and labeling.

The Audit Team has no recommendations for this checklist.

**Joint Report Of
The Colorado Public Utilities Commission (PUC)
Rail/Transit Safety and Water Section
And
The Regional Transportation District (RTD)
Department of Safety, Security and Facilities**

DATE: 5/29/2009

**SEMI-ANNUAL ON-SITE SAFETY AUDIT 3
OF RTD LIGHT RAIL OPERATION**

March 18, 2009 – April 1, 2009

AUDIT RESULTS

Eight checklists were reviewed during this semi-annual audit. The Audit Team made zero findings, one recommendation, and zero suggestions from the checklists reviewed as outlined in Table 1:

Table 1 – Audit Checklists

Checklist No.	Element/Characteristic
4-05-MOW-17	Grade Crossings/Warning Devices No recommendations
4-06-MOW-18	Vital Relays-Wayside No recommendations
4-07-MOW-19	Overhead Catenary System No recommendations
4-37-VM-20	LRT Brake Inspections No recommendations
4-08-MOW-21	Traction Power Substation (TPS) Maintenance and Inspections No recommendations
4-09-MOW-22	Track Maintainer and Signal/Power Maintainer Training and Qualifications No recommendations
4-23-RTD-NA-1	Safety and Security Certification and Review Process No recommendations
4-29-SAF-25	Light Rail System Configuration Management Recommendation

FINDINGS/RECOMMENDATIONS/SUGGESTIONS FOR SEMI-ANNUAL AUDIT 3

The Audit Team recommended for checklist 4-29-SAF-25 that a better document control process be developed for tracking approval of system changes through the established process.

RTD Response: Please see Memorandum from David Genova regarding Checklist 4-29-SAF-25.

CONCLUSIONS

The Audit Team reviewed eight checklists in five areas of RTD maintenance of way, one area of RTD safety, one area of RTD vehicle maintenance, and one area of general RTD operations. No findings were made during this audit session requiring the issuance of a Corrective Action Plan. Recommendations were made for one checklist requesting better document control for tracking approval of system changes. No suggestions were made during this audit session.

The RTD and PUC Audit Team members are in agreement with all findings, recommendations and suggestions made during this audit session.

Attachments to Audit Report

AUDIT CHECKLISTS:

Checklist No.	Element/Characteristic
4-05-MOW-17	Grade Crossings/Warning Devices No recommendations
4-06-MOW-18	Vital Relays-Wayside No recommendations
4-07-MOW-19	Overhead Catenary System No recommendations
4-37-VM-20	LRT Brake Inspections No recommendations
4-08-MOW-21	Traction Power Substation (TPS) Maintenance and Inspections No recommendations
4-09-MOW-22	Track Maintainer and Signal/Power Maintainer Training and Qualifications No recommendations
4-23-RTD-NA-1	Safety and Security Certification and Review Process No recommendations
4-29-SAF-25	Light Rail System Configuration Management Recommendation

CORRESPONDENCE AND OTHER ITEMS:

Memorandum from David Genova regarding Checklist 4-29-SAF-25.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-05-MOW-17	Date of Audit: 3/30/2009	Persons Contacted: Terry Emmons Greg Boysen
Department: Way, Power and Signal	Auditor: P. Fischhaber, A. Lovato, S. Bennett, R. Lobato	
49 CFR Requirement: 659.19 (f, g, i, m, n, o, p, & r)		

REFERENCE CRITERIA

1. SOP's (crossing protection and signal inspection procedure)
2. SSPP sections 2.1.6.1 and 2.1.6.2
3. MUTCD 2003
4. 49 CFR Parts 234 & 236

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

GRADE CROSSINGS / WARNING DEVICES

Review RTD's file of completed grade crossing protection inspection reports for at least four randomly selected grade crossings for the past twelve months. From a combination of procedure and record reviews as well as visual inspections of the selected items, determine whether or not:

1. The grade crossings were inspected at the specified frequency as required by the referenced criteria.
2. All of the required inspections were satisfactorily completed and results were properly documented.
3. Any noted defects were corrected in a timely manner.
4. Assess the adequacy of the inspection program:
 - A) Have checklists been established and are they being used?
 - B) Are inspections and maintenance scheduled on a regular basis?
 - C) Is document control established for inspection and maintenance records?
 - D) Are the hazard management process and safety data acquisition processes being followed and is there coordination with the safety department on grade crossing issues?
5. Assess the overall effectiveness of changes to the program, which were enacted as a result of the last audit of this area (if any).
6. Verify that management employs techniques, such as performance testing, to assess the implementation of maintenance rules and procedures which may have a safety impact.

RESULTS/COMMENTS

1. Currently, RTD has five grade crossings. Inspection reports for the past 12 months were reviewed for all five grade crossings. Grade crossing inspections include monthly, quarterly, and semi-annual. The monthly, quarterly, and semi-annual grade crossing inspection reports were reviewed for RTD. All five grade crossings were inspected at the specified frequency as required and were inspected as required by the reference criteria. RTD also performs daily grade crossing inspections, for which they have a checklist. Daily inspections are not required by FRA. Four of the five crossings are shared light-rail and heavy-rail crossings with UP.
2. A review of the records in the Laserfische system shows that all required inspections were satisfactorily completed and the results were properly documented.

Colorado PUC E-Filings System

RESULTS/COMMENTS

(Checklist # 4-05-MOW-17 continued)

3. All noted defects were reviewed for timely correction. Some were corrected in the field that day of the inspection, and others required work orders and equipment to be ordered.
- 4A. RTD has prepared checklists for each of the monthly, quarterly, and semi-annual inspections.
- 4B. The inspections and maintenance are scheduled on a regular basis. Dates of the quarterly and semi-annual were reviewed and they are being performed at the proper intervals.
- 4C. Document control has been established for inspection and maintenance records. RTD is using the Laserfische system to record grade crossing maintenance. All of the monthly, quarterly, and semi-annual documents were able to be recalled and reviewed for the five grade crossings in a very short time period because of the efficient document control procedures that RTD has established with its Laserfische system.
- 4D. RTD is following its hazard management process and safety data acquisition process, and there is coordination with the safety department on grade crossing issues. The Maintenance-of-Way group has to fill out a report anytime someone has to respond to an incident, which would be coordinated with the safety department. The Manager's monthly report includes the number of incidents. There is also documentation that has to be filled out per FRA rules for the four crossings that are shared with Union Pacific Railroad. Training is also provided on the hazard management process and safety data acquisition process.
5. The major changes to the program since the last audit are to the document control process. The document control process used with the Laserfische allows RTD to quickly access historical records with simple queries.
6. RTD management employs a number of techniques to assess the implementation of maintenance rules and procedures that may have a safety impact. RTD conducts a thorough orientation of new hires. Maintenance-of-Way employees must take a certification test within one year of hire, and must take a recertification test every two years after that. The tests involve both written questions on all of their job responsibilities plus a practical, hands-on proficiency in one of their areas of responsibility. The hands-on proficiency test changes for each recertification test the employee takes. RTD Maintenance-of-Way management and employees also hold safety meetings and discuss safety issues. Employees are also encouraged to bring safety issues to management's attention and can also discuss safety issues with the RTD safety compliance officer.

The Audit Team has no recommendations for improvement.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-06-MOW-18	Date of Audit: 3/30/2009	Persons Contacted: Terry Emmons Greg Boysen
Department: Way, Power and Signal	Auditor: R. Lobato, P. Fischhaber, A. Lovato, S. Bennett	
49 CFR Requirement: 659.19(f, g, i, m, n, o, & p)		

REFERENCE CRITERIA

1. SOP's (Vital Relays Inspection Procedures: PV 250, Relay Test Stand; GRS Relay Test Unit)
2. SSPP sections 2.1.6.1 and 2.1.6.2
3. CFR 49 Part 236

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

VITAL RELAYS-WAYSIDE

Randomly select at least six vital relays (3 AC type and 3 DC type). From a combination of procedure and record reviews as well as visual inspections of the selected items, determine whether or not:

1. The vital relays are properly controlled and calibrated against certified standards at prescribed intervals as required by applicable procedures.
2. The vital relays calibration status is on file and can be verified.
3. Any defects were noted and either corrected or logged for tracking.
4. Verify that the equipment used to check the relays is subject to calibration or has been considered for entry into the calibration program.
5. The hazard management and safety data acquisition processes are followed and there is coordination with upper management on faulty equipment issues and trends.
6. Is document control established and properly implemented for inspection and maintenance records?
7. Assess the overall effectiveness of changes to the program, which were enacted as a result of the last audit of this area (if any).
8. Verify that management employs techniques, such as performance testing, to assess the implementation of maintenance rules and procedures which may have a safety impact.

RESULTS/COMMENTS

1. - 4. The Audit Team randomly selected three AC type and three DC type Vital Relays for review. Terry Emmons and Greg Boysen provided electronic documentation of the AC and DC vital relay test and Preventative Maintenance procedures for the six selected vital relays. The results of the review are shown on the table below. Terry Emmons described the testing process for both AC and DC vital Relays. The Audit Team visited the MOW testing area to verify that the testing equipment was labeled and calibrated against certified standards (FRA requirements). RTD exceeds the prescribed intervals that are required by applicable procedures. Equipment was calibrated every two years until 2007 at which time MOW transitioned to calibrating equipment annually. Jim Speck, a Signal and Power maintainer walked the Audit Team through the visual inspection process in the shop as referenced in the previously reviewed documentation. Defects were noted, tracked or repaired as required by procedure.

RESULTS/COMMENTS

(Checklist # 4-06-MOW-18 continued)

1-4 continued) - A new UTE tester is being used. The tester will give a pass/fail reading, and the information is downloaded from the tester to the data files in a laptop computer. The new tester eliminates human error in that testers no longer have to write down information; the tester captures all information.

DC and AC Relay name and location

DC relay type	Date	Calibration	Pass/Fail	Noted Defects
RH1203SE –interlock	01-03-2008, 02-27-2009	Verified	P	
RH1900SE-tail track	01-22-2008, 03-06-2009	Verified	P	
RH1255PR-Y-junction	01-04-2008, 03-09-2009	Verified	P	
RH13XCC-13 th ave. crossing	03-07-2008	Verified	F	Relay sent for repair
AC relay type	Date	Calibration	Pass/Fail	Noted defects
RH270CC-central platte valley switch	09-14-2007, 11-14-2008	Verified	P	
RH540CC- cc southeast switch	11-07-2007, 11-07-2008	Verified	P	
RH1592PR-cross over 9 mile	11-09-2007, 11-11-2008	Verified	P	
RH583SE-crossover Broadway bridge	11-06-2007	Verified	F	Relay replaced, old one destroyed. Replacement relay passed on the same day.

5. The Manager of Maintenance of Way has the authority to correct and handle problems regarding faulty vital relay equipment. Issues or concerns that are noted by the supervisory staff are reviewed to determine the disposition of the vital relays and if a problem or trend arises, then it is addressed as required.

6. The Maximus and Laserfische document control system is in place to allow Maintenance of Way to track and control maintenance and inspection processes for vital relays in a more efficient manner.

7. With the implementation and transition to the Maximus system MOWs recordkeeping is moving toward all electronic files which are easier to follow and retrieve.

8. Through the certification and testing program Maintenance of Way employs the required techniques to ensure a safe work environment.

The Audit Team has no suggestions or recommendations for this audit item.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-07-MOW-19	Date of Audit: 3/23/2009	Persons Contacted: Terry Emmons Greg Boysen
Department: Way, Power and Signal	Auditor: S. Bennett, P. Fischhaber, A. Lovato, R. Lobato	
49 CFR Requirement: 659.19(f, g, i, m, n, o, & p)		

REFERENCE CRITERIA

1. SOP's (Overhead Catenary System Inspection Procedure)
2. SSPP sections 2.1.6.1 and 2.1.6.2

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

OVERHEAD CATENARY SYSTEM

Review the RTD's file of completed Overhead Catenary System (OCS) inspection reports prepared during the past two years to determine whether or not:

1. The OCS was inspected and adjusted at the specified frequency as required by the referenced criteria.
2. The required inspections were properly documented (checklists?).
3. Any defects were noted and either corrected or logged for tracking.
4. The hazard management and safety data acquisition processes are being followed and there is coordination with upper management on faulty equipment and recurring maintenance issues and trends.
5. Document control is established and properly implemented for inspection and maintenance records?
6. Assess the overall effectiveness of changes to the program, which were enacted as a result of the last audit of this area.
7. Training programs are in place and being carried out for the safety related aspects of this program.
8. Verify that management employs techniques, such as performance testing, to assess the implementation of maintenance rules and procedures which may have a safety impact.

RESULTS/COMMENTS

The Audit Team met with Terry Emmons and Greg Boysen to review inspection records for the OCS (overhead catenary system) for the past two years. SOPs 105.9, 105.10 and 104.10 were reviewed to assure checklists were in compliance.

1. The OCS is inspected and adjusted as required by the reference criteria. Aerial wire inspections are conducted on a quarterly basis. The inspections are divided into segments and completed on a schedule to assure that all monthly inspections are completed on time. All checklists were reviewed by the Audit Team. Inspections were properly documented. The Audit Team was provided with a demonstration of how OCS is inspected.

RESULTS/COMMENTS

(Checklist # 4-07-MOW-19 continued)

2. A review of the documentation confirmed that monthly walking inspections are conducted as required. A checklist is utilized as part of this process to record and track any defects noted during the inspection. Balance weight inspections are also performed on a monthly basis. A checklist is also used to record and track defects. A review of these records indicates that the checklists are an efficient tracking mechanism. Wire tension inspections are conducted bi-annually. Door bridge and disconnect inspections are completed quarterly. All checklists were verified and the inspections are being performed as required. The Maintenance of Way group also utilizes a master inspection schedule for those employees who conduct inspections.
3. Defects were noted and logged on the checklists. These were placed in the Laserfiche and Maximus programs which showed that all required inspections were satisfactorily completed and the results properly documented. The Maximus program was implemented in September, 2007. This system tracks all work performed, defects and repairs.
4. During the crew meetings, mechanical and safety issues are discussed to determine repair or needed corrective action. Also, any issue found during a repair or inspections will be discussed with MOW or the immediate supervisor. One example is the system wide hazard analysis that was performed on insulators. All insulators on the Southeast Corridor, Broadway Station area, Parker Line extension, and Elati north and south leads were replaced to manage this hazard.
5. Major changes have been made to the document control system for inspection and maintenance records. The Laserfiche and Maximus systems allow RTD to quickly access data and reports. The new system also provides a history on the vehicle, tracks or equipment being worked on.
6. Changes enacted to the system as a result of the last audit have resulted in significant improvements. The use of Laserfiche and the implementation of the Maximus program have increased productivity, made scheduling of work easier and standardized procedures.
7. Training is conducted by the Maintenance-of-Way (MOW) staff for all newly hired employees. These employees complete a two week period of classroom and field work to familiarize them with the required job task. After the initial two week training is completed, the employee is paired with an experience MOW employee for continued hands-on training. The MOW instructors and supervisors monitor and instruct the employees on safety-related issue. Additional safety training is conducted when new procedures are introduced or new equipment is put into service.
8. RTD has techniques in place to assess the implementation of maintenance rules and procedures. Some of these include the re-certification program, which occurs two years after the initial certification; monthly safety meetings; crew meetings and on-going safety training and review.

The Audit Team has no recommendations for improvement.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-37-VM-20	Date of Audit: 4/1/2009	Persons Contacted: Phil Eberl Lou Cripps
Department: Vehicle Maintenance	Auditor: P. Fischhaber, A. Lovato, S. Bennett, R. Lobato	
49 CFR Requirement: 659.15 (19)(f, g, i, m, n, o, & p)		

REFERENCE CRITERIA

1. PMI # A-21, Track Brake; A-22, Friction Brake; A-23, Brake Caliper and Support; & A-24, Brake Disc.

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

LRT BRAKE INSPECTIONS

Randomly select 12 wheel set on 12 different transit vehicles and examine inspection records for the previous year to determine that:

1. The required inspections were properly documented (checklists?).
2. Any defects were noted and either corrected or logged for tracking.
3. The hazard management and safety data acquisition processes are being followed and there is coordination with upper management on faulty equipment and recurring maintenance issues and trends.
4. Document control is established and properly implemented for inspection and maintenance records.
5. Assess the overall effectiveness of changes to the program, which were enacted as a result of the last audit of this area (if any).
6. Training programs are in place and being carried out for the safety related aspects of this program.
7. Supervision program is in place to observe compliance and understanding of training and procedures.
8. Verify that management employs techniques, such as performance testing, to assess the implementation of maintenance rules and procedures which may have a safety impact.

RESULTS/COMMENTS

1. The Audit Team randomly selected 12 different light rail vehicles; 6 from the first series and 6 from the second series. Inspection records were reviewed the each vehicle for a one year period. Preventative Maintenance Schedules A, C, E, and F were reviewed as they contain specific areas of inspection components or elements related to the brake systems. Schedule A is completed on each vehicle at 4,000 service miles and focuses on checking brakes to ensure they work properly. Schedule C is completed on each vehicle at 24,000 service miles and focuses on checking brake thickness. Schedule E is completed on each vehicle at 48,000 service miles and focuses on checking brake mountings and disc torque. Schedule F is completed on each vehicle at 96,000 service miles and performs a complete flush of the brake system.

The inspection for all wheel sets on all of the selected vehicles was performed. Inspections are documented in the Maximus system and must be performed on all wheel sets before the item can be checked off electronically as completed. The Maximus system contains all of the different checklists and will pull up the checklists for the inspection. All items on the checklist have to be signed off by a mechanic before the work order can be closed.

Results of audit items 1 and 2 are documented in the table.

RESULTS/COMMENTS
(Checklist # 4-37-OP-20 continued)

Vehicle	Light Rail Vehicle #	1). Required Inspection Properly Documented?	2.) Defects Noted and Either Corrected or Logged for Tracking?
1	139	Yes	Yes
2	145	Yes	Yes
3	108	Yes	Yes
4	104	Yes	Yes
5	148	Yes	Yes
6	134	Yes	Yes
7	229	Yes	Yes
8	261	Yes	Yes
9	213	Yes	Yes
10	202	Yes	Yes
11	267	Yes	Yes
12	233	Yes	Yes

3. The hazard management and safety data acquisition processes are being followed and there is coordination with upper management on faulty equipment and recurring maintenance issues and trends. Any brakes that are on warranty are turned over to the warranty personnel to handle those issues. If RTD finds a high rate of road calls, they look into using different manufactures. Most of the brake issues that RTD personnel have worked on are not safety related. RTD does perform testing on products from different manufacturers. Vendors will bring in new parts which RTD will try with an engineer monitoring the results. If the part is approved for use by RTD, it is then added to the list. These items are handled at the manager level and do not need Assistant General Manager approval.

4. Document control has been established and properly implemented for inspection and maintenance records. All of the maintenance schedules are documented in the Maximus system. RTD staff was able to easily query the specific vehicles the Audit Team requested and the specific maintenance schedules to review electronic signatures of completion and notes written by the mechanics.

5. The Maximus system has been an excellent addition for RTD. This system provides an ease of querying substantial data, and the RTD staff has developed effective reports and methods of reviewing the data. As a result of this audit, RTD plans on preparing another type of report that will allow a report to be generated based on the Audit Team's provision of vehicle numbers and dates of data to review.

6. RTD conducts 4 safety meeting per month. All of the mechanics use the preventative maintenance books to perform the inspections and use the reminder checklists to know what tasks to perform. A new trainer has recently been added to the vehicle maintenance group to assist with monitoring and training employees. Brake inspection is one of the items included in the training and recertification tests.

RESULTS/COMMENTS

(Checklist # 4-37-OP-20 continued)

7. The training group monitors the mechanics to assess and review how the training meetings are used. RTD holds daily crew meetings to discuss any issues that may have come up and new issues that need to be looked at. Doug Davis, the trainer, is included and is part of the daily review and crew meetings. Supervisors watch the floor to see if employees are complying with the requirements and performing as they should. Mechanics bring information to the supervisors on issues or ideas that could be implemented. For example, the speed sensors on the SD 160 model LRV were gathering more debris than the SD 100 model. Because of this identified difference, RTD is reviewing the checklists of the SD 160 model to clean the debris more often than on the SD 100 model vehicles.

8. RTD employs bi-annual recertification of its mechanics once they have received their initial certification. This recertification includes written tests and performance testing. Maintenance bulletins, which are controlled documents that apply to new procedures, are provided to mechanics. The vehicle manual contains descriptions and checklists for all of the vehicle procedures, and mechanics have access to these manuals at all times. The maintenance bulletins also cover additional procedures that are added or changed.

The Audit Team has no recommendations for improvements.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-08-MOW-21	Date of Audit: 3/30/2009	Persons Contacted: Terry Emmons Greg Boysen
Department: Way, Power and Signal	Auditor: R. Lobato, P. Fischhaber, A. Lovato, S. Bennett	
49 CFR Requirement: 659.19(f, g, i, m, n, o, & p)		

REFERENCE CRITERIA

1. SOP's 105.1, 105.2, and 105.25
2. SSPP Table 2-1.
3. Maintenance Procedure (unknown).

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRACTION POWER SUBSTATION (TPS) MAINTENANCE AND INSPECTIONS

Randomly select a sample of two substations each from the SW, SE, CPV, and Central corridor lines and review RTD's file of completed PM inspection and test reports for the sampled TPS's for the previous 18 months to determine whether or not:

1. The required inspections were performed as required by the associated SOP or maintenance procedure.
2. The inspections were properly documented on a standardized report form.
3. Repairs to correct noted defects and deficiencies were carried out and properly documented in a timely manner.
4. The hazard management and safety data acquisition processes are being followed and there is coordination with upper management on faulty equipment and recurring maintenance issues and trends.
5. Document control is established and properly implemented for inspection and maintenance records.
6. Assess the overall effectiveness of changes to the program, which were enacted as a result of the last audit of this area (if any).
7. Training programs are in place and being carried out for the safety related aspects of this program.
8. Issues related to stray current and power isolation are addressed to ensure worker safety and public protection and safety.
9. Verify that management employs techniques, such as performance testing, to assess the implementation of maintenance rules and procedures which may have a safety impact.

RESULTS/COMMENTS

- 1 & 2. Inspections were performed as required and inspections were properly documented. (See table next on next page.
3. Repairs and noted defects were corrected as required. During this audit cycle it was noted that the semi-annual inspection for December 08, 2007 was missing. A later search of records did produce the inspection checklist.

RESULTS/COMMENTS
(Checklist # 4-08-MOW-21 continued)

Traction Power Substation location		Monthly Inspection	Semi-Annual Inspection	Annual Inspection	Defects noted
Central Line	Sub 4	X	X	X	
	Sub 7	X	Dec 08,2007 is missing	X	Dec 07,2007 defect noted, corrected
Central Platte Valley	Sub 15	January and February 2008 missing*	X	X	Aug 08, 2008 defect noted, corrected
	Sub 16	January 2008 missing*	X	X	
Southwest Corridor	Sub 11	X	X	X	
	Sub 13	X	X	X	
Southeast Corridor	Sub 18	X	X	X	
	Sub 23	X	X	X	

* During this time period, there was a manpower shortage due to the December 15, 2007 derailment on the Southwest Corridor. MOW crews were attending to the necessary construction after the derailment.

4. Employee inspections are reviewed by Supervisors to ensure that any problems or issues regarding faulty equipment are immediately addressed. Issues or concerns that are noted by the supervisory staff are reviewed by upper management to determine the disposition of the equipment and Traction Power Substations. An example of an issue found through hazard management involved stray current at certain substations in combination with magnesium chloride deicer used that was shocking the paws of dogs at the station. A filter has been installed (as approved through the system configuration management – See Checklist 4-29-SAF-25) that handles the stray current and no longer shocks the dogs through their paws.

5. Substation monthly, semi- annual & annual reports are completed and work orders can be tracked through the Maximus document control system.

6. The new document control systems (Laserfische and Maximus) are very effective and allow checklists to be queried quickly and deficiencies to be spotted easily.

7. Training programs are in place, documented and can be verified with audit checklist #4-09-MOW-22.

8 Through the monthly, semi-annual and annual inspections as well as Supervisor review, MOW staff, including the manager, is able to track and identify any trends or concerns related to stray current and power isolation.

9. Through the certification and testing program Maintenance of Way employs the required techniques to ensure a safe work environment.

The Audit Team has no Suggestions or recommendations for this area.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-09-MOW-22	Date of Audit: 3/30/2009	Persons Contacted: Terry Emmons Greg Boysen
Department: Way, Power and Signal	Auditor: S. Bennett, P. Fischhaber, A. Lovato, R. Lobato	
49 CFR Requirement: 659.19(m & p)		

REFERENCE CRITERIA

SOP's RTD Track Inspector and Signal/Power Inspector Training Program
SSPP Sections 6.7.1.3 and 6.7.1.4

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRACK MAINTAINER AND SIGNAL/POWER MAINTAINER TRAINING AND QUALIFICATIONS

Obtain a copy of the RTD's list of qualified Track Maintainers and Signal And Power Maintainers. If possible, randomly select at least three technicians from each category and then review the training and examination records of those selected, for the previous two years, to determine whether or not:

1. The current training lessons plans and testing for qualification and re-qualification reflect the person's assigned duties.
2. Training, qualification and re-qualification records are in compliance with the referenced criteria.
3. Document control is established and properly implemented for training records.
4. Assess the overall effectiveness of changes to the program, which were enacted as a result of the last audit of this area (if any).
5. Supervision program is in place to observe compliance and understanding of training and procedures.

RESULTS/COMMENTS

The Audit Team randomly selected the training and examination records of two Track Maintainers and two Signal/Power Maintainers for the past two years. There are currently 12 Signal/Power Maintainers and 9 Track Maintainers.

1. The Track Maintainers and Signal/Power Maintainers are qualified during the hiring process by a written qualifying exam and interview. During the first year, the individual learns the skills, duties and responsibilities of their perspective position. Certification and recertification is provided for employees. Employees also take written tests and hands-on assessments. There are three different versions of each test. After completion, the tests are reviewed and a printout is made, which shows the next certification date. Certification covers all areas of rail. However, the hands-on aspect is job specific. Certification is done between 10 days and 30 days prior to one year of employment. Employees must be certified. If they fail the test, they can be terminated. In, 2006 the certification rules changed. After the initial certification, certification is done every two years.

RESULTS/COMMENTS

(Checklist # 4-09-MOW-22 continued)

2. The Signal and Power Maintainers undergo a two week orientation and the Track Maintainers attend a one week orientation after they are hired. They spend two months with another experienced people, as they gain hands-on experience about the job. Most training is done in accordance with the contractor/vendor training program. Training is also provided when new alignments are constructed. All training classes are placed on video for employees to watch. Self-study manuals, with tests are also available to employees. Training records and classes were documented.

3. Specialized training is also provided by the instructors. There are current lesson plans and tests. The training is based on job tasks and function. Track maintainers must meet a certain criteria, because all track maintainers have the same job duties. Employee training records were completed and classes were satisfactorily documented.

4. Document control is established and properly implemented for training records. Each employee has a hard copy training file, consisting of original copies of all tests and training materials. Another set of files is on the computer "N" drive and in Laserfische.

5. A supervisory program is in place to observe compliance and understanding of training and procedures. A new training supervisor was recently hired to fill the position that has been vacant for an extended period of time. One of the goals for this person is to conduct a record's check update.

The Audit Team has no recommendations for improvement.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-23-RTD-NA-1	Date of Audit: 3/18/09	Persons Contacted: Shirley Bennett Richard Lobato
Department: Public Safety and Other Departments as Appropriate	Auditor: A. Lovato, P. Fischhaber	
49 CFR Requirement: 659.19(h)		

REFERENCE CRITERIA

1. Reference material as particular to the corridor, modification or extension being audited.

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

SAFETY AND SECURITY CERTIFICATION AND REVIEW PROCESS

Obtain a copy of RTD's Southwest Corridor Safety Certification Program – Derailment Safety Certification Program.

1. Review previous checklists and follow-up on recommendations made.
2. Review progress and follow-up on the Restoration Certification process.
3. Verify that the process was applied to the restoration/turnover of the Southwest Corridor Restoration – Derailment project.

Review supporting documentation of certification requirements.

Determine that the documentation exists and is appropriate for the certifiable items list (CIL).

1. Checklists were reviewed with proper follow-up on recommendations.
2. Initially, there is conditional acceptance with restrictions. Then, the MOW manager signs off, followed by the Manager of Safety and LRT Operations, leading to final acceptance.
Certifiable Element: Work of January 17-February 01, 2009, Trackwork construction/repair—01 Clearance – Fences, 03 Clearance – OCS Poles, 04 Grounding of Catenary Poles & Foundations, 05 Grounding of Structure Fencing, 06 Clearance – Vehicle to Vehicle; Restrictions Noted: Fencing to be repaired on ROW (top of MSE wall).
Final Acceptance for Work of January 16-February 01, 2009—added 02 ROW Security Fencing to Certifiable Element (removed from Restrictions).
3. This process was applied to the restoration/turnover of the Southwest Corridor Restoration Derailment project.

The supporting documentation of certification requirements was reviewed, and it was determined that the documentation exists and is appropriate for the CIL.

The Audit Team has no suggestions or recommendations for improvement.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-29-SAF-25	Date of Audit: 3/18/09	Persons Contacted: David Genova Cal Shankster
Department: Public Safety	Auditor: A. Lovato, P. Fischhaber, S. Bennett, R. Lobato	
49 CFR Requirement: 659.19 (g & q)		

REFERENCE CRITERIA

1. 1. SOP 101.11
2. 4 (CCR) 723-7-7343(c)(XIII)
3. RTD System Safety Program Plan
4. RTD Light Rail Design Criteria

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

LIGHT RAIL SYSTEM CONFIGURATION MANAGEMENT

Review the Safety Departments file of "Proposal For LRT System Change" forms, and for not less than six completed requests involving LRT System changes, determine to as close an extent as possible, whether or not:

1. An appropriate method to track the changes (i.e. change # logged in a data base) exists and is being followed.
2. The referenced procedure was followed.
3. The Executive Safety and Security Committee approved the change.
4. As built drawings and other applicable documentation was up-dated with the change and were distributed to the Operating Division and the Records Management Departments.
5. Verify that procurement procedures are in place, which preclude the introduction of defective or deficient equipment into the RFG system.
6. Perform a review of SOP 101.11 to check for enforcement of as-built plan updates as required during the last audit of this area.
7. Modifications to applicable procedures were made if needed either due to system changes or to mitigate safety concerns resulting from changes.
8. Review the process and procedure of the review and acceptance of exceptions to the RTD light rail design criteria on the West corridor project.

RESULTS/COMMENTS

1. RTD has an "LRT System Change / Modification Log" that is maintained in a Word document by David Genova. Below are the six log numbers that were reviewed during this audit.

2. SOP 101.11 was followed.

Questions 3, 4, and 6 are answered within each document reviewed.

RESULTS/COMMENTS

(Checklist # 4-29-SAF-25 continued)

Log No. 81: A change/modification was submitted on 5/3/04 to remove bollards on the Cherry Creek Bridge along Speer Blvd. north and south. (3) This change/modification was approved by the Executive Safety and Security Committee (ESSC), recorded in the meeting minutes dated 7/2/04. (4) A preliminary hazard analysis (PHA) and As-built drawings were not required. (6) There were no as-builts.

Log No. 83: A change/modification was submitted on 4/28/05 for the emergency push button traction power substation #3 at the Convention Center. (3) This change/modification was approved by the ESSC on 6/3/05; however, this approval was not recorded in the ESSC meeting minutes. (4) As-built drawings were up-dated and distributed. No PHA was required. (6) SOP 101.11 was reviewed and as-built plan updates are enforced.

Log No. 84: A change/modification was submitted on 3/29/05 to extend a concrete apron and move a stop bar at 7th & Colfax. (3) This change/modification was approved by the ESSC, recorded in the meeting minutes dated 7/7/06. (4) As-built drawings were up-dated, but not required. No PHA was required. (6) No as-builts were required

Log No. 85: A change/modification was submitted on 4/10/07 for the Southeast Corridor information signs. (3) This change/modification was approved by the ESSC on 4/19/07; however, this approval was not recorded in the ESSC meeting minutes. (4) As-built drawings and a PHA were not required. (6) No as-builts were required.

Log No. 86: A change/modification was submitted on 4/23/07 to add switched RC circuit TPSS10-13. (3) This change/modification was approved by the ESSC on 5/2/07; however, this approval was not recorded in the ESSC meeting minutes. (4) As-built drawings and a PHA were not required. (6) No as-builts were required.

Log No. 87: A change/modification was submitted on 3/10/07 for a 4 car traction power upgrade. (3) During this audit, the approval was still pending. However, it was approved on 3/23/09. (4) As-built drawings were up-dated and distributed. No PHA was required. (6) SOP 101.11 was reviewed and as-built plan updates are enforced.

5. RTD follows its "Procurement Standards Manual". Specifications are given to the procurement department. The procurement department then delivers the equipment to its appropriate destination.

7. SOP 101.11 was updated and approved on 3/27/09. This is recorded in the ESSC meeting minutes of 4/3/09. The changes had to do with administration.

8. Described in "RTD Light Rail design Criteria", Chapter 14, 14.16.0, Configuration Management. RTD has a document where technical disciplines sign off, and then it goes through Level 1 Recommendation → Level 2 Approval → Level 3 Approval → and then Level 4 Approval, which is signed by the ESSC Chairperson.

The Audit Team recommends that a better document control process be developed for tracking approval of system changes through the established process.

Regional Transportation District

Our mission:

To meet our constituents' present and future public transit needs by offering safe, clean, reliable, courteous, accessible and cost-effective service throughout the District.



To: RTD/PUC Audit Team

From: David Genova, Assistant General Manager, Safety, Security & Facilities

Date: April 3, 2009

Subject: Joint PUC/RTD ISAP Audit, Checklist No. 4-29-SAF-25 Follow-Up

There were three issues for resolution regarding this checklist: revision, review and approval of RTD SOP 101.11; approval documentation in the ESSC meeting minutes of modifications #85 and #86; and pending approval of modification #87.

SOP 101.11 was revised, submitted to the ESSC for review and approved on March 27, 2009. This approval is reflected in the ESSC meeting minutes of April 3, 2009 (SOP and meeting minutes attached).

ESSC meeting minute files were reviewed for May and June 2007. There was no mention of approval of modifications #85 and #86 in the referenced minutes. The LRT System Change/Modification Log shows both of these modifications approved on April 19, 2007 and May 2, 2007 (log attached). During this time frame the safety function was part of the Public Safety Division and had limited administrative support for completing meeting minutes. In May 2007, RTD reorganized and the safety function is now incorporated into the Safety, Security and Facilities department (SS&F). The SS&F department is supported by a Senior Administrative Assistant and this position is now the responsible party for completing meeting minutes. Since this change, the meeting minutes along with overall document control for the SS&F department has greatly improved including electronic recordkeeping.

Modification #87 was approved on March 23, 2009 and is reflected on the log and meeting minutes (modification, log and minutes attached).

Please contact me with any questions.

STANDARD OPERATING PROCEDURE 101.11

LIGHT RAIL SYSTEM CHANGE/MODIFICATION PROCEDURE

Issued to: Departments of:
Safety, Security, and Facilities – Public Safety
Planning and Development – Engineering, Systems Planning
Operations - Light Rail Operations
Administration – Contracts and Procurement

Current Issue: TBD
Supersedes: 11/11/02, 01/01/01, 03/23/93



Assistant General Manager, Rail Operations

I. PURPOSE

This procedure is intended to assure affected Regional Transportation District Departments are afforded the opportunity and given due consideration for any proposed change or modification to the light rail system after acceptance for "system start-up" and/or "revenue operation".

Included are the standard forms, formats and procedures to be followed in seeking design changes after acceptance for system start-up and/or revenue operations in order to execute any future changes to all aspects of the light rail system.

II. DEFINITIONS

System start-up and/or revenue operation - Any part of the Light Rail System that has been accepted for initial limited or revenue service operations after completion of construction.

Design acceptance/rejection - The formal act by signature of the Assistant General Manager of Rail Operations indicating approval/rejection of plans, specifications, and construction of any system change relating to the Light Rail System.

System change/modification - Modifications, alterations, additions or deletions to contracts, specifications, components, vehicles, equipment or facilities affecting any part of the Light Rail Operating System.

Executive Safety and Security Committee (ESSC) - A committee comprised of representatives of Safety, Planning and Development, Operations, Security and other departments deemed necessary by the Committee or the General Manager.

III. PROCEDURE

- The "Proposal for LRT System Change/Modification" forms may be submitted by any RTD employee. Forms are available from the Public Safety Division.
- All submittals must be made using the standard forms, formats and procedures. Incomplete forms will be sent back to the originator.
- System change/modification form shall include the following information:
 - Brief description of proposed change/modification including support data and drawings.
 - Reason for proposed change/modification.
 - Description of benefits expected.
 - Resources required - manpower, material, funding, time, engineering and development etc.
 - Operation implications.
 - Safety considerations (Safety Unit will determine if preliminary hazard analysis (PHA) is warranted and will perform PHA, if necessary. Any ESSC member may request a PHA on proposed change/modification).
- Forms shall be forwarded through the following steps for signature:
 - Initiator's Supervisor.
 - Initiator's AGM.
 - Executive Safety and Security Committee (ESSC) Chairman.

Review Process

- All proposals with attached documentation will be submitted electronically to the ESSC Chairman for initial review. Incomplete proposals will be sent back to the originator. Proposals will be distributed to the ESSC members for review and comment. Typical review time will vary depending on the proposal and will be determined at the discretion of the ESSC Chairman.
- Comments must be returned to the ESSC Chairman within the designated review and comment period. If no comments are received, the Chairman will assume the proposal is acceptable as described.
- The ESSC Chairman may expedite review by polling Committee members without distributing a formal notification. Polling may take place by telephone, in person, or by e-mail.

- Unacceptable forms shall be returned to the initiators with comment and/or recommendation for modification or change as applicable.
- The ESSC Chairman shall be responsible for the timely distribution of submittals.
- The ESSC Chairman shall be responsible for seeking required final approval.

Final Approval

Proposals recommended for action by the ESSC will be submitted to the Assistant General Manager of Rail Operations for final approval and signature.

Tracking

Changes and modifications will be tracked on the "LRT System Change/Modification Log" by the ESSC Chairman and maintained in the Public Safety Division central files (laser fiche). Each proposal will be identified by a unique number. The log will include columns for: Log #; Date Submitted; Submitted By; Description; Approval Date; and As-builts Received.

As-Builts

As-builts will be required for changes/modifications where all elements of the change are not visible, e.g., a change that affects wiring in a vehicle or underground utilities. This determination will be made at time of proposal submittal and will be identified on the system change/modification form. Location of as-built documentation for each change/modification will be tracked on the LRT System Change/Modification Log. As-builts shall be completed and filed within 45 days of completion of work.

Meeting Minutes

Purpose: Executive Safety and Security Committee

Date Held: Friday, April 3, 2009

Location: RTD Blake Street – Room B

Attendees: Kevin Baldwin, Martha Bembry, Shirley Bennett, David Genova, Mike Gil, Martha Hecox, Jim Hernandez, Richard Lobato, Robin McIntosh, Bob Medina, Dean Shaklee, Cal Shankster, Mike Smith, John Tarbert, Greg Yates

Copies: Bruce Abel, Rick Clarke, Ron Dodsworth, Marla Lien, John Shonsey, Cheri Sprague

I. Bus System Safety Program

- **Bus Procurements and Acceptance**
 - Accepting the last 7 Longmonsters
- **Bus Accident Investigation**
 - No majors to report
 - 44 liability claims were filed in March 2009 for \$133.8K
 - In March 2008 there were 25 claims for \$86.9K
 - Cost and number of claims for March 2009 are higher due to snow storm claims
 - Nothing serious, mainly a couple of parked cars that were hit
 - For 2009, we are equal with the amount of claims filed in 2008
 - Claims Stats are attached
- **NTD Reporting**
 - Director Kemp signed the 2008 NTD Safety & Security Annual Summary Report and it was submitted this week
 - Bob Medina will begin entering bus data directly into NTD system
 - Richard Lobato will meet with Bob to train and give access to the report to him
 - This will be a more efficient and accurate way of reporting data to NTD

- **2009 APTA Bus Safety Awards – submitted to APTA on March 31, 2009 via e-mail**
 - The awards will be announced during the May APTA Bus Safety Conference
 - Two awards will be given – the Gold Award and a Certificate of Achievement

II. Joint Bus/Rail Issues

- **Workers Comp & OJI –**
 - Bob Medina covered the March claims for Workers Comp.
 - In March 2009 there were 13 claims for \$54.5K
 - In March 2008 there were 15 claims for \$79K
 - For 2009 YTD we are at 43 claims which is 2 claims higher than last year
 - For 2009 YTD we are at \$195.5K
 - Costs were driven up due to fractures on elbows and ankles that require surgery
 - Nothing major or serious, just costly
 - Please see attached Claims Stats for more information
 - Robin McIntosh and Bob Medina will discuss the results of the meeting about physical therapy to answer Robin's question about physical therapy
- **Facilities Maintenance Issues**
 - The 2009 Spring Storm was handled very well by all departments
 - Safety, Security and Facilities developed an Incident Action Plan
 - At the debriefing all issues were discussed and an After Action Report was created
 - If you would like an electronic version of the IAP, please contact Mike Smith
 - This is an internal document and has sensitive information in it so please keep it confidential
 - Robin McIntosh addressed the issue of the Boulder snow trucks
 - Robin said that the trucks were out and clearing snow but the sand trucks were not used
 - The parties had a miscommunication going on and has been resolved
- **Security Issues**
 - John Tarbert discussed the February Security Crime Stats and pnR Crime Stats.
 - For the Security Crime Stats overall we are down 4% over last year.
 - There was a spike in park-n-Ride crimes – 36 in 2009 compared to 23 in 2008
 - See the park-n-Ride stats for a breakdown – not all crimes were RTD property crimes
 - The good news is 95% of the perpetrators were identified and apprehended

- Monthly Security NTD stats are coming soon and will become a regular attachment to the minutes
- John Tarbert sent out updated procedures on Security On-Call and Video Pulls
 - An updated SOP, 2009 On-Call Schedule, and Transit Related Laws were included in the update
 - Security now has a monthly rotating pager
 - The person on call for that month will have the pager and will respond, their cell phone number is also listed
 - If there is not a response to a page within 20 minutes, John Tarbert will be contacted and he will contact the on-call person to respond
 - Worst case scenario, Tarbert will respond
 - The On-Call Security Pager number is 303-461-2019
- Bus IPOD Theft
 - A couple of months ago an armed robbery occurred on the 83L and the perpetrators de-boarded the bus and ran into George Washington High School
 - After a reward poster was posted, students identified the female accomplice and she was arrested
 - She is currently being asked to identify the male who had the gun
 - An excellent example of how video pays off, we were able to identify and catch one of the perpetrators
- Video at LRT Stations
 - Light Rail Stations from Welton to stations along the southwest corridor are being retrofitted for video
 - The grant that is funding the video project has been extended for one year
 - Video is scheduled to be live and active by the end of April or beginning of May
- **Facilities Engineering**
 - Parking Management Update – Phase III was launched on Wednesday, April 1, 2009.
 - Launched on 6 additional Light Rail Stations and one park-n-Ride
 - Including Littleton/Mineral Station, Littleton/Downtown Station, Evans Station, I-25 and Broadway, Alameda Station, 30th & Downing Station
 - Launch had some challenges that have since been fixed
 - For example, there was a miscommunication on reserved parking sign-ups at Mineral

- Since the launch of Parking Management the Oxford Station and Englewood Station may have experienced an increase in parking at their facilities
- Aerial photos were taken of each park-n-Ride in the Parking Management program in 2008 to do a comparison of the effect the program will have in 2009
- RTD staff tested the first payment machine
 - A couple of changes in the menu for the machine were submitted
 - The payment machines are scheduled to be in and installed by May 30, 2009

III. Rail System Safety Program

- **Rail Modifications**
 - Modification #87 for the 4-Car Power Upgrade was approved via vote by the committee on March 23, 2009 and signed on March 26, 2009
- **Design Criteria Variances – West Corridor**
 - WCL40026 – WCL40043 for West Corridor Fencing Design Criteria Variances will be reviewed by the Rail Subcommittee and will discuss at the committee meeting in May
 - These variances are regarding fencing along the West Corridor
 - The variances are doing a blanket fencing approach along the alignment that could have ramifications for day-to-day MOW work
 - There were 9 MOW fatalities reported last year by the FRA
 - WCL40004 status – received more information from the West Corridor Civil Engineering and will be reviewed by the Rail Subcommittee and discussed at the committee meeting in May
- **Design Criteria Variances – Other**
 - 4-Car Platform Extension Phase II Variances – 4CPL4001 – 4CPL4008 - were introduced and will be reviewed by the Rail Subcommittee
 - I-225 Corridor Variance – 25L40001 was introduced and will be reviewed by the Rail Subcommittee
- **SOP 101.11 – Light Rail System Change/Modification Procedure**
 - Updated and sent to the committee for vote on March 19, 2009
 - Approved by committee vote on March 27, 2009
 - Signed by Cal Shankster – Acting AGM of Rail Operations at this meeting

IV. Safety and Security Certification Program

- **TREX Open Items**
 - Bob Pitts – Systems Safety Project Manager pulled the remaining open items for TREX

- A meeting will be set with David Genova, Bob Pitts, Cal Shankster, and Pranaya Shrestha to determine how to close out the remaining items

V. Rail Accident Investigation

- **Four incidents occurred in March**
 - Three were collisions
 - Two of the collisions were hit-and-run by the automobile involved
 - One was an injury incident on March 29, 2009
 - Information on the injured party is being secured due to HIPPA regulations but last update was they are still in critical condition
 - The DVD copy of the video was hard to see what exactly happened with the pedestrian
 - Video showed that signals and gates were functioning fine
 - The original video tape is easier to see
 - Suggested putting a DVR in the bungalow but there could be an issue with heat
 - Another idea is to tie the camera into the SCC directly so it will be monitored 24 hours a day
- **Accident Notification Form**
 - Martha Hecox introduced a draft version of the above form for Claims
 - Bob Medina reviewed the form and indicated that it is a great tool but the main issue is that he is not receiving reports from rail in a timely manner and some reports not at all
 - Discussion was held as to how to resolve the matter
 - Cal agreed to review their current procedure on distributing incident reports and see if they can get the reports to Claims before an estimate of damage is obtained to speed up the process
 - Bob Medina also requested to get the Supervisor and Operator reports as quickly as possible after an incident so they can conduct interviews right away
 - The form will be a good way to notify Claims that there has been an incident
 - Another benefit to the form is that if Bob does not receive reports within a couple of days of the incident he will know who to contact to get the information he needs
 - Cal will work with his department on faster response times for getting reports to Claims
 - In addition, FIT call out list will be distributed and updated
- **NTD reporting**
 - Up and running for 2009 reporting
 - NTD sent a notification e-mail to Richard Lobato
 - Monthly reporting is due by the 25th of every month

VI. Hazard Management Program

- N/A

VII. State Safety Oversight

- **Current Audit Cycle**
 - Follow-up session this afternoon with the PUC
 - Close-out meeting will be in 2 weeks
 - Everything else has been completed
- **PUC will be audited by FTA in June on the SSO program**
 - Scheduled for June 15-17, 2009 at RTD
 - The audit will be conducted by contractors for FTA
 - Rail Operations will be invited to the opening and closing meetings
 - FTA may want to see some RTD data
 - FTA may also want a tour

VIII. Corridor Updates

- N/A

IX. New Business

- **CERT Classes**
 - RTD will be hosting 5 CERT classes beginning April 18th
 - CERT is a FEMA sponsored program that prepares volunteer citizens on how to respond to emergencies on transit and in every day life until emergency responders arrive and take over
 - The classes are free to RTD employees and citizens that register
 - Must pass a Department of Homeland Security background check to register
 - Individuals that complete the class will be required to volunteer twice a year for exercises or other activities of their choice
 - Once a class is completed the individuals receive a backpack with equipment to assist in responding to an emergency including a hard hat, vest, flashlight, first-aid kit, and more
 - Must carry the backpack everywhere they go on transit so if something happens they can respond
 - The first two days will be conducted by State Certified Trainers, the third day is conducted by RTD Security staff
 - Will conduct an exercise using an RTD bus on the last day
 - Communication to staff is coming soon
 - Cal and Senior Staff will be briefed
 - Advertising in the Monday Morning Q and other media will be conducted soon

X. Old Business

- None

XI. Next Meeting

- May 1, 2009, 8:00 AM, Blake Street, Conference Room B.

LRT SYSTEM CHANGE / MODIFICATION LOG

Colorado PUC E- Filings System

LOG #	DATE	SUBMITTED BY	DESCRIPTION	APPROVAL DATE	AS-BUILTS RECEIVED
001	04-17-96	Ronald Benson	Retaining wall at 13 th Avenue Crossing, west side of case	11-15-96	NR
002	04-18-96	Ronald Benson	Provide retaining wall at SW54 and SW 50A with handrail	11-15-96	NR
003	04-18-96	Ronald Benson	Add a strobe light on the eastside grade crossing mast that with flash if the east crossing gate is knocked down or is in the horizontal position	11-15-96	At Grade Crossing
004	04-18-96	Ronald Benson	Remove section isolators on A and B mainline track just north of I/25 and Broadway Station. Remove section isolators on A and B mainline track in the south yard interlock area.	11-15-96	NR
005	04-18-96	Ronald Benson	Change SW 21 from a powered T-3 to a reverse point spring switch and change software to reflect this change.	11-15-96	Modification approved, but work not completed
006	04-18-96	Ronald Benson	Install stairs from to of hill at Sub-Station Four, down to signal 326 and mainline track.	11-15-96	NR
007	06-21-96	Bob Mora	Shed located at south end of platform between A and B tracks at I-25/Broadway Station.	11-15-96	NR
008	06-21-96	Bob Mora	Wood walkway between A and B tracks at southern most area of alignment, just north of signals 550 and 551 approximately 180 feet in length.	11-15-96	NR
009	07-19-96	Lloyd Mack	Installation of VCR, Video Camera, and Power Supply Module into cab walls at both ends of LRV's	11-15-96	On File, Light Rail Operations
010	07-19-96	Lloyd Mack	Six traction adhesive strips have been applied to the floor of each cab in all LRV's	11-15-96	NR
011	07-19-96	Lloyd Mack	Reflective yellow tape has been applied to the leading edges of all four ADA ramps in each LRV.	11-15-96	NR
012	07-19-96	Lloyd Mack	3" diameter spot mirrors have been applied to the lower outside corners of all LRV side view mirrors.	11-15-96	NR
013	07-19-96	Lloyd Mack	The existing Pushbuttons and Warning Lights on the LRV Dash Assemblies have been rearranged. The modification affects both Cabs in all LRV's.	11-15-96	On File, Light Rail Operations
014	07-19-96	Lloyd Mack	"Glass Guards" have been installed to cover interior surfaces of all large passenger windows on all LRVs.	11-15-96	NR
015	07-19-96	Lloyd Mack	A circuit has been added to provide electricity to the two speedometer light sockets in all LRVs.	11-15-96	On File, Light Rail Operations

LRT SYSTEM CHANGE / MODIFICATION LOG

LOG #	DATE	SUBMITTED BY	DESCRIPTION	APPROVAL DATE	AS-BUILTS RECEIVED
016	07-19-96	Lloyd Mack	The audible alarm to the "HVAC Fault" circuit in the LRV cabs has been disconnected.	11-15-96	NR
017	07-19-96	Ronald Benson	Extend grade-crossing at Bayaud approximately 10 feet to the north on A track.	11-15-96	NR
018	07-19-96	Lloyd Mack	Installed Caps to cover the "MCB Off" , "Pantograph Down" and "Battery Off" Pushbuttons on the LRV Dash Assemblies. This affects both cabs in all LRVs.	11-15-96	NR
019	07-19-96	Lloyd Mack	Install snow plows to each end of all LRVs.	11-15-96	NR
020	07-19-96	Lloyd Mack	Installation of headlight Wig/Wag circuit to control the headlights for each cab.	11-15-96	On File, Light Rail Operations
021	07-19-96	Lloyd Mack	Small crew light inside all LRVs above the doors 1 & 14 step wells.	11-15-96	On File, Light Rail Operations
022	07-19-96	Lloyd Mack	Installation of switch to allow for continuous ringing of the active cab's bell on all LRV dash assemblies.	11-15-96	On File, Light Rail Operations
023	08-01-96	Bill Bell	A set of three bike lockers have been installed at the north end of the 10 th & Osage Station near the high block on the east side of the platform.	11-15-96	NR
024	11-21-96	Phil Eberl	Any time the Panic Brake is depressed, the horn will sound.	12-15-96	On File, Light Rail Operations
025	08-10-99	Frank Buczkowski	Ticket Vending Machines (TVM's) on the Central Corridor stations will be replaced with the TVM's purchased for the South West Corridor.	09-10-99	NR
026	08-10-99	Frank Buczkowski	The City & County of Denver and RTD wish to provide light rail vehicles with traffic signal priority in the Denver "Central Business District" (CBD) and along Welton to 30 th and Downing.	09-10-99	NR
027	09-22-99	Andy Leong	Construction Phasing at I-25/Broadway	10-08-99	NR
028	12-01-99	Lloyd Mack	Add overhead power to the north yard for expansion.	12-03-99	On File, Light Rail Operations
029	12-03-99	Cal Shankster	Add track circuits to 30 th & Downing, electra-code on Welton	12-03-99	On File, Light Rail Operations
030	06-23-00	Cal Shankster	TPSS Auxiliary Transformer Relocation	07.06.00	On File, Light Rail Operations
031	10-06-00	Frank Staley	27 th & Welton High Block	11-10-00	NR

NR - NOT REQUIRED

LRT SYSTEM CHANGE / MODIFICATION LOG

LOG #	DATE	SUBMITTED BY	DESCRIPTION	APPROVAL DATE	AS-BUILTS RECEIVED
32	01.22.01	Dave Genova	Fencing Downtown Littleton Station	01.24.01	NR
33	03.02.01	John Shonsey	Lengthen Littleton Station Center Platform	03.27.01	On File, P&D
34	03.02.01	John Shonsey	Widen Mineral Station Platform: Relocate KIOSK	03.27.01	NR
35	03.02.01	John Shonsey	Additional Stair Access, Littleton Station	06.25.01	On File, P&D
36	03.02.01	John Shonsey	Billboard foundation @ Evans Station	03.27.01	NR
37	03.02.01	John Shonsey	CPV fencing, Design Criteria Deviation	03.27.01	With CPV Project AS Builts
38	06.30.01	Phil Eberl	Additional Mezzanine Cat Walks	04.16.01	NR
39	08.03.01	Cal Shankster	Relocate insulated joints, north yard track	09.04.01	NR
40	08.08.01	Cal Shankster	Relocate ADA ramp, 27 th & Welton	09.04.01	NR
41	10.15.01	Jim Starling	CC/CPV Junction-Special Trackwork, Signals, OCS (Managed as Safety Cert.)	10.19.01	With CPV Project AS Builts
42	10.26.01	Phil Eberl	LRV Emergency Exit Lock Lever (voided request temporarily)	11.02.01	NR
43	12.07.01	Keith Hopkins	Security Video Building & cameras (Resent 2-13-02)	03.04.02	On File, SCC
44	02.13.02	Lloyd Mack	Replace Switch Machines, Switch #'s 11 & 21	03.04.02	NR
45	02.13.02	Lloyd Mack	Replace Switch Machines, Switch #115	03.04.02	NR
46	06.07.02	Cal Shankster	Relocate Signal 344	07.09.02	NR
47	06.07.02	Cal Shankster	Reprogram & Rewire signal / Switch circuits switch 115	07.09.02	NR
48	06.07.02	Cal Shankster	Route selection on Welton Single Track	07.09.02	NR
49	07.02.02	John Shonsey	Pepsi Center Art	07.11.02	NR
50	07.02.02	John Shonsey	Fencing at Ahec North & 30 TH and Downing	07.23.02	NR
51	07.02.02	John Shonsey	Denver Convention Center Track and Station	07.23.02	On File, P&D
52	07.02.02	John Shonsey	SW Corridor Track Extension	07.23.02	On File, P&D
53	07.29.02	John Shonsey	Tufts Flyover Art	08.30.02	NR
54	10.14.02	Cal Shankster	Bayaud Crossing	10.21.02	NR

NR – NOT REQUIRED

LRT SYSTEM CHANGE / MODIFICATION LOG

LOG #	DATE	SUBMITTED BY	DESCRIPTION	APPROVAL DATE	AS-BUILTS RECEIVED
55	10.28.02	Ken Moss	Electrical Outlet, DUS	11.07.03	NR
56	10.28.02	Ken Moss	Electrical outlet, Invesco	11.07.03	NR
57	10.28.02	Don Young	Ticket Validators, DUS, Invesco & Mineral (Mineral and Invesco approved 06.06.03)	11.17.03	P&D
58	11.15.02	Tim Johnson	CPV Station & Landscape Improvements	01.06.03	NR
59	12.04.02	Jonnie Thomas / T-Rex	T-Rex, I-25 / Broadway 3 rd Platform Civic	12.20.02	W/T-REX
60	11.06.03	Cal Shankster	Replace switch heat on indicator lamp to yellow bulb	01.014.03	NR
61	11.13.03	Cal Shankster	Remove traffic loop NB track @ 7 th Street, Provide input from track circuit.	01.21.03	NR
62	02.05.03	Cal Shankster	Extend approach circuit @ 6 th Street SB	02.11.03	NR
63	02.24.03	Cal Shankster	Install red boards at protected crossing	02.27.03	NR
64	02.25.03	Cal Shankster	Modify existing SW & CC ABS Signal System	02.27.03	T-REX DOC.
65	03.24.03	Jonnie Thomas / T-Rex	T-Rex I-25 / Broadway Track Tie In	03.28.03	T-REX DOC
66	02.05.03	Jerry Eddy	Ticket Booths	02.07.03	W/Mod. Package
67	04.25.03	Cal Shankster	Voltage sensing monitor to emergency battery sensor	05.05.03	NR
68	06.02.03	Brenda Tierney	Addition of historic markers to 25 th /Welton and 29 th /Welton	Withdrawn	NR
69	06.20.03	Brenda Tierney	Artwork, 10 th and Osage Station	06.26.03	NR
70	09.03.03	Cal Shankster	Replace flasher relays at 6 th Street and Bayaud crossings with electronic flasher (same as CPV crossings)	09.11.03	NR
71	09.03.03	Cal Shankster	Replace GRS switch machine with a Western Cullen Hayes electro-hydraulic machine at switch 48B – CPV junction SB	09.11.03	NR
72	09.05.03	Dennis Cole	Relocate trees at Invesco Station	09.11.03	NR
73	09.26.03	Frank Buczkowski	Elati, OCS foundations and wire shift	10.06.03	T-REX, Elati
74	10.16.03	Jim Starling	Elati, mainline-yard trackwork (*Conditional approval on 10.17.03, **approval without restriction 10.23.03)	10.17.03* 10.23.03**	T-REX, Elati
75	12.11.03	Svetlana Grechka	ADA ramp modification, Colfax and Auraria	12.12.03	NR
76	12.11.03	Svetlana Grechka	ADA ramp modification, 30 th and Downing	12.12.03	NR
77	12.12.03	Kevin Baldwin	Equipment sheds at Oxford, Littleton, Evans, Alameda & Invesco	03.04.05	NR
78	02.26.04	Tim Johnson	ADA paver replacement, 10 th and Osage	04.02.04	NR

LRT SYSTEM CHANGE / MODIFICATION LOG

LOG #	DATE	SUBMITTED BY	DESCRIPTION	APPROVAL DATE	AS-BUILTS RECEIVED
79	04.02.04	Phil Eberl	Track 4 catwalk	05.07.04	NR
80	04.02.04	Phil Eberl	Track 8 catwalk	05.07.04	NR
81	05.13.04	Cal Shankster	Remove bollards on Cherry Creek Bridge	05.20.04	NR
82	12.01.04	Jerry Eddy	RFID project, Mineral and DUS	Canceled	NA
83	04.28.05	Cal Shankster	EPB TPSS#3 Convention Center	06.03.05	On File, Light Rail Operations
84	05.05.06	Svetlana Grechka	Extend concrete apron and move stop bar 7 th and Colfax	05.05.06	NR
85	04.10.07	Chris Hinton	SEC Information Signs	04.19.07	NR
86	04.23.07	Cal Shankster	Add switched RC circuit TPSS10-13	05.02.07	NR
87	03.16.09	Altagracia Jager	4 car traction power upgrade	03.23.09	Pending

PROPOSAL FOR LRT SYSTEM CHANGE/MODIFICATION

No. 87
(assigned by Safety)

INITIATOR

Submitted by: Altares Jager Date: 3/10/09

Phone No: 303-299-2977 Department: Planning & Development

Approved by: Rungo Smith Date: 3/11/09
Division Manager

Richard F. Chle Date: 3/11/09
Department AGM

This form, along with the following format, is to be used for all proposed system changes or modifications. Attach all required information including applicable drawings.

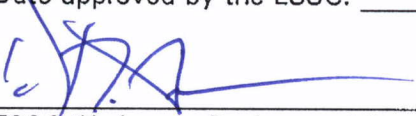
1. Description of change/modification including support data and drawings.
RTD is in the process of upgrading the existing Traction Electrification System TES to allow operation of 4car trains on the existing light rail system. The work consists of modification to the existing system to support a four car traction power upgrade an option for Programmable Logic Controller PLC upgrade of existing Traction Power Substations TPSS Controller System and an option to include the element work related to the expansion of the Elati North Yard See attached Specifications and drawings dated October 31 2008
2. Reason for change/modification.
RTD is in the process of upgrading the existing Traction Electrification System TES to allow operation of 4car trains on the existing light rail system
3. Benefits expected.
Operation of 4car trains on the existing light rail system
4. Resources required.
Contractor forces will provide construction services to perform installation. RTD will provide resources to shutdown LRT system when schedule requires.
5. Operating implications.
There will be no effect to existing services
6. Safety implications.
There will be no safety implications during installation due to strict adherence to lock-out/tag-out procedures being followed.

Colorado PUC E-Filings System

7. The following shall be Safety Certified prior to returning the tracks to revenue service:

ITEM	TYPE OF VERIFICATION
System wide Electrical <ul style="list-style-type: none"> • Lighting • Metal objects within 15' of Centerline of nearest rail shall be grounded 	Visual Ground tests
Communications	Testing per Specification
Traction Power	Testing per Specification
Signal system	Testing per Specification
OCS	Testing per Specification
Civil <ul style="list-style-type: none"> • Fencing • Access road 	Visual and Ground test Visual

EXECUTIVE SAFETY AND SECURITY COMMITTEE (ESSC)

Date submitted to the ESSC: 3-16-09 PHA required NO
 Date approved by the ESSC: 3-23-09 As-builts required YES

 ESSC Chairman, Review and Approval Signature Date 3-23-09

FINAL APPROVAL


 Assistant General Manager, Rail Operations Date 3/26/09

**Joint Report Of
The Colorado Public Utilities Commission (PUC)
Rail/Transit Safety and Water Section
And
The Regional Transportation District (RTD)
Department of Safety, Security and Facilities**

DATE: 11/17/2009

**SEMI-ANNUAL ON-SITE SAFETY AUDIT 4
OF RTD LIGHT RAIL OPERATION**

September 14, 2009 – September 28, 2009

AUDIT RESULTS

Nine checklists were reviewed during this semi-annual audit. The Audit Team made zero findings, zero recommendations, and zero suggestions from the checklists reviewed as outlined in Table 1:

Colorado PUC E-Filings System

Table 1 – Audit Checklists

Checklist No.	Element/Characteristic
4-10-MOW-23	Station Facility No recommendations
4-11-MOW-37	Bridge Inspections No recommendations
4-17-OP-26	Train Operations and Performance in the Yards No recommendations
4-18-OP-29	Train Operator Performance--Mainline No recommendations
4-19-OP-34	Operations Controller/Supervisor Performance No recommendations
4-31-SAF-30	Executive Safety and Security Committee (ESSC) and Safety Functions No recommendations
4-32-SAF-31	Employee and Contractor Safety Program No recommendations
4-34-SAF-39	Procurement Process, Procedures and Controls No recommendations
4-38-OP	Light Rail Employee Rule Book (LRERB) No recommendations

FINDINGS/RECOMMENDATIONS/SUGGESTIONS FOR SEMI-ANNUAL AUDIT 4

The Audit Team had no findings, recommendations, or suggestions.

RTD Response: The RTD reviewed this report and had no comments.

UPDATES

The Audit Team updated checklist 4-14-OP-12 (“Train Orders and Special Instructions”), which was an element of the Semi-Annual On-Site Safety Audit 2:

RTD has completed its grievance process regarding sign-in sheets for light rail operators and operators obtaining current train orders. RTD has placed locked boxes at specific stations where extra board or relief operators will be starting their work. These locked boxes contain sign-in sheets and copies of the day’s current train orders. The Audit Team inspected the locked box including the sign-in sheet and the current train orders. RTD has just implemented this system, and it seems to be working well so far. The Audit Team will review this item again during the next audit to determine the effectiveness of this solution.

The Audit Team has no further recommendations for this checklist.

CONCLUSIONS

The Audit Team reviewed nine checklists in two areas of RTD maintenance of way, three areas of RTD safety, and four areas of RTD operations. No findings were made during this audit session requiring the issuance of a Corrective Action Plan. No recommendations or suggestions were made during this audit session.

The RTD and PUC Audit Team members are in agreement with all findings, recommendations and suggestions made during this audit session.

Attachments to Audit Report

AUDIT CHECKLISTS:

Checklist No.	Element/Characteristic
4-10-MOW-23	Station Facility No recommendations
4-11-MOW-37	Bridge Inspections No recommendations
4-17-OP-26	Train Operations and Performance in the Yards No recommendations
4-18-OP-29	Train Operator Performance--Mainline No recommendations
4-19-OP-34	Operations Controller/Supervisor Performance No recommendations
4-31-SAF-30	Executive Safety and Security Committee (ESSC) and Safety Functions No recommendations
4-32-SAF-31	Employee and Contractor Safety Program No recommendations
4-34-SAF-39	Procurement Process, Procedures and Controls No recommendations
4-38-OP	Light Rail Employee Rule Book (LRERB) No recommendations
4-14-OP-12	Train Orders and Special Instructions (Updated) No recommendations

CORRESPONDENCE AND OTHER ITEMS:

None.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-10-MOW-23	Date of Audit: 9/28/09	Persons Contacted: Terry Emmons Greg Pennington Brian Farris
Department: Way, Power and Signal	Auditor: R. Lobato, P. Fischhaber, A. Lovato, S. Bennett	
49 CFR Requirement: 659.19(19)(f, g, i, m, n, o, & p)		

REFERENCE CRITERIA

1. SOP 103.14, Emergency Passenger Evacuation
RTD Lightrail Emergency Plan

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

STATION FACILITY

Review station facility maintenance records for eight stations for the past year to determine whether or not:

1. Monthly inspections were completed
2. The required inspections were properly documented (checklists?).
3. Any noted defects were either corrected or logged for tracking.
4. Noted defects were corrected in a timely manner
5. Document control is established and properly implemented for inspection and maintenance records.
6. The hazard management and safety data acquisition processes are being followed and there is coordination with upper management on faulty equipment and recurring maintenance issues and trends.
7. Review the emergency plan to determine if there is an evacuation plan in place for the stations
8. Inspect a minimum of three stations during the evening hours to determine whether lights are functioning and whether there are any noted safety or security hazards present in the station areas.
9. Assess the overall effectiveness of changes to the program, which were enacted as a result of the last audit of this area (if any).

RESULTS/COMMENTS

1. RTD has created a single checklist for the inspection of all stations. The form is a 2 page form and will note if there are defects or if everything is ok. Monthly inspections were completed for September 2008 through August 2009. Reports are filled out correctly (only a couple of missed checks, but employee number and/or date is filled out.). Defects are noted in Maximus and the proper service requests and/or work orders were created to handle the defects.

2. Required inspections were properly documented and logged in the Laserfiche system. Checklists are used so that multiple employees can review stations and know where the previous employee left off. Handheld units are used to run the various tests at the stations in the field and are recorded in the Maximus system. Service request or work orders can be generated from the review of the list. Test results do not automatically generate service requests or work orders. These are generated by a review of the results in Maximum and generation of the necessary request.

RESULTS/COMMENTS

(Checklist # 4-10-MOW-23 continued)

3. Noted defects were marked on the checklists and defects were checked in the Maximus system for tracking and completion of work. Service requests and/or work orders are created as the station test results are reviewed.
4. Review of the service requests and/or work orders shows that noted defects were corrected in a timely manner.
5. Document control is established through the Laserfiche and Maximus systems. Inspection checklists are scanned into the Laserfiche system and were easily retrieved through the query process. The April 2009 checklist was originally miscoded. Through the check system that RTD has established for knowing when documents are scanned, the miscoded document was easily found and correctly coded.
6. Yes, the processes are being followed. Safety issues are brought before safety committees and the Executive Safety and Security as necessary. Issues are also brought up in the daily meetings. Issues are discussed in the assignment meetings and sign-up sheets are used to verify that employees have received the information. Some issues may require training. This information was covered in a previous checklist for training. CPO's will also let MOW know if they see any issues as well as any supervisors and Facilities Maintenance individuals.
7. All stations checked except for 30th and Downing and the Convention Center stations have emergency evacuation plans. 30th and Downing and Convention Center are in non-exclusive rights-of-way and have general public access to the stations as opposed to restricted access as would be found in the semi-exclusive rights-of-way such as 10th and Osage, Broadway, or Alameda. The remaining stations are exclusive rights-of-way with restricted access points to the station and have specific emergency egress plans shown in the Light Rail Emergency Response Plan.
8. The Audit Team selected four stations to check lighting and for safety hazards. Shirley Bennett checked the Nine Mile Station, Anthony Lovato checked the Dayton Station, Richard Lobato checked the Mile High Station and Pam Fischhaber checked the Auraria Station. Lights were working properly at all stations. Pam noted two misplaced tree grates that are a potential tripping hazard on the southbound station side of the tracks. No other safety issues were noted.
9. The use of Maximus and Laserfiche systems and computerization of the systems and effectiveness of the documents make it very easy. Added a requirement to note "New Defect" in the notes as a result of the last audit. Every order that was reviewed had the "New Defect" noted on the Maximus notes.

The Audit Team has no suggestions or recommendations for this audit item.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-11-MOW-37	Date of Audit: 9/28/09	Persons Contacted: Terry Emmons Greg Pennington Brian Farris
Department: MOW	Auditor: S. Bennett , P. Fischhaber, A. Lovato, R. Lobato	
49 CFR Requirement 659.19 (f, i, n & o)		

REFERENCE CRITERIA

1. RTD Bridge Inspection Procedure.
2. Previous Bridge Inspection Reports.
3. Bridge design criteria and construction documentation.

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

BRIDGE INSPECTIONS

1. Does the bridge inspection program include the following elements:
 - A) A records system for the keeping of records (including design, construction, inspection, and maintenance records).
 - B) Are records readily accessible?
 - C) Comprehensive written documentation that outlines the inspection procedure?
 - D) Complete and comprehensive inspection reports?
 - E) A schedule, which allows for regular inspection of all bridges?
 - F) Were/are bridges inspected and are records kept?
2. Were any discrepancies noted in inspection reports, and if so, was corrective action taken if warranted?

RESULTS/COMMENTS

1A. The bridge inspection program has a records system for maintaining design, construction, inspection and maintenance of bridges. The following forms were viewed by the Audit Team: Light Rail Station Inspection/ Checklist Defect Sheet, RTD Light Rain Inspection Schedule, Monthly Mainline Bridge PM Inspection/Checklist, Annual Mainline Bridge PM Inspection/Checklist and the 3 Year Mainline Bridge PM Inspection/Checklist. Monthly inspections are conducted by Track employees. Every three years Lonco, a private contractor, conducts a full inspection of all bridges. The 2000 and 2003 Lonco, Inc. Bridge Evaluation Reports were reviewed. This report consists of a maintenance report, structure inventory and appraisal report, electronically prepared sketches, photos, and a channel cross section. Each bridge report is coded by guidelines set forth by the FHWA and CDOT. During the Lonco inspection, a Track employee is sent out with the Lonco team to monitor and provide access.

1B. During the audit interview process with Terry Emmons, Greg Pennington and Greg Boysen all requested records were readily accessible and supplied to the Audit Team. The records appear to be in excellent order.

RESULTS/COMMENTS

(Checklist # 4-11-MOW-37 continued)

1C. RTD has specific written procedures and checklists in place for monthly, baseline and three year bridge inspections. RTD has a monthly Mainline Bridge PM Inspection/Checklist which contains the procedural elements that the Maintenance of Way (MOW) personnel use while inspecting the bridges. During the monthly inspection MOW personnel check each bridge and repair minor deficiencies. RTD also contracts with an outside agency, Lonco to perform a comprehensive inspection and associated report on a triennial basis. Lonco is also "on call" to inspect bridges during an emergency or when critical problems occur.

1D. The procedures and checklist were reviewed by the Audit Team. There were complete and comprehensive inspection reports by both RTD personnel and Lonco. Monthly inspection reports dated August 2008 - August 2009 were reviewed. One item stated that there was a bridge defect at the Iowa fly-over on 2/5/09. However, further investigation noted that this was a track defect, not a bridge defect. No other defects were noted.

1E. & 1F. Detailed bridge inspections are conducted by Lonco on a contract basis. Bridges are inspected on a monthly basis by RTD MOW personnel. The Audit Team reviewed these records. The inspection/checklist reports are laserfished for electronic filing.

2. There were no discrepancies noted in the inspection reports.

The Audit Team has no suggestions or recommendations for this audit item.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-17-OP-26	Date of Audit: 9/16/09	Persons Contacted: Bill Bell Hal Fabricius
Department: Rail Operations	Auditor: S. Bennett, P. Fischhaber, A. Lovato, R. Lobato	
49 CFR Requirement: 659.19 (m)		

REFERENCE CRITERIA

1. SOP's 102.3, 104.4, and 105.6.
2. LRERB rule # 600 through 613, and 309.
3. 4 (CCR) 723-7-7343(c)(VI)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRAIN OPERATIONS AND PERFORMANCE IN THE YARDS

1. Observe train operations in the yard for a period of not less than one hour to determine whether or not train operators are following appropriate rules and procedures.
2. Verify that management employs techniques, such as performance testing, to assess the implementation of Operations rules and procedures which may have a safety impact.

RESULTS/COMMENTS

1. The Audit Team observed rail operators in the yard conduct pre-trip inspection of their vehicles. This process included inspection and a walkthrough of the rail vehicle, checking of brakes, interior lights, dash lights, announcements, wigwags, bells, lights over the doors, windshield wipers and other features of the vehicle. All of the operators observed performed these tasks, prior to leaving the yard. They also performed this inspection on both ends of the vehicle. Operators do not use a checklist for this process.
2. Operators are observed on an on-going basis by Supervisors, Street Supervisors and Safety staff to reinforce safety rules and procedures. Issues that could impact safety are also discussed in the monthly safety meetings.

The Audit Team has no suggestions or recommendations for this audit item.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-18-OP-29	Date of Audit: 9/15/09	Persons Contacted: Bill Bell Hal Fabricius
Department: Rail Operations	Auditor: R. Lobato, P. Fischhaber, A. Lovato, S. Bennett	
49 CFR Requirement: 659.19 (m)		

REFERENCE CRITERIA

1. SOP's 101.1, 102.3, 104.1, 104.4, 104.11, 104.13, 104.21, and all "Abnormal Operations" SOPs
2. LRERB rule #s 309, 403 and 902 through 1010
3. Latest "Train Orders" and "Special Instructions"
4. 4 (CCR) 723-7-7343(c)(VI)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRAIN OPERATOR PERFORMANCE--MAINLINE

1. Through a combination of monitoring of conversations via radio and on board observation of operations, of not less than four trains between not less than four stations each, determine whether or not:
 - Each train operator performs in compliance with the governing rules and procedures.
 - Each operator possesses the proper equipment in the cab including a functional portable radio, copies of any Train Orders and/or Special Instructions.
2. By interview of not less than three randomly selected train operators from the current roster, test their understanding of rules, procedures, and policies related to train operations.
3. Check that the above interviewed operators (or any three randomly chosen operators) are in compliance with Light Rail Employee Rule Book (LRERB) # 403.
4. Verify that management employs techniques, such as performance testing, to assess the implementation of Operations rules and procedures which may have a safety impact.

RESULTS/COMMENTS

1. The Audit Team met with Bill Bell, LRT Manager of Transportation to monitor and observe train operator performance. The Audit Team boarded a southbound train at the Broadway Station to observe train movement through the Evans, Englewood, Oxford, Littleton, and Mineral Stations. Below is table 1 listing the trains that were randomly selected to determine if the train operators performed was in compliance with the governing rules and procedures.

LRV Number	Performed in Compliance	Direction of Travel	Notes
132/102	Yes	Southbound	
234/230	Yes	Southbound	
244/268	Yes	Southbound	
252/204	Yes	Southbound	
211/227	Yes	Southbound	

RESULTS/COMMENTS

(Checklist # 4-18-OP-29 continued)

2&3. The Audit Team conducted interviews with four train operators to determine whether or not they were in compliance with and could demonstrate understanding of the rules and procedures required for train operations. Below is table 2 listing the operators that were interviewed to test their understanding of rules, procedures, and policies relating to train operations.

	Employee #	11123	13984	15485	18372
CDL (Colorado drivers license)		ok	ok	ok	ok
flashlight		ok	xx	ok	ok
qualification card		ok	ok	ok	ok
keys		ok	ok	ok	ok
employee identification		ok	ok	ok	ok
rule book		ok	xx	ok	ok
train orders		ok	ok	ok	ok

Each train operator was able demonstrate understanding of rules, procedures and policy. Each operator with the exception of operator 13984 was able to produce the required items listed in Light Rail Rule Book #403.

4. Maximus and Laserfiche systems are the computerized systems that are used to document and track changes to rules and procedures that may have a safety impact.

The Audit Team has no suggestions or recommendations for this audit item.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-19-OP-34	Date of Audit: 9/15/09	Persons Contacted: Bill Bell Hal Fabricius
Department: Rail Operations	Auditor: A. Lovato, P. Fischhaber, S. Bennett, R. Lobato	
49 CFR Requirement: 659.19 (m & p)		

REFERENCE CRITERIA

1. RTD Light Rail Operations Standard Operating Procedures: 101.1, 101.10, 101.15
2. RTD Light Rail Employee Rule Book
3. RTD Light Rail Operations Division Bulletins, Train Orders and Inspections

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

OPERATIONS CONTROLLER/SUPERVISOR PERFORMANCE

Through a combination of first hand observations, documentation review, and interviews, determine whether or not the operations controller/supervisors:

1. Perform their duties in accord with governing rules, procedures, bulletins, notices, etc.
2. Have on file the applicable reports and logs that they are required to prepare and maintain.
3. Are knowledgeable and understand the procedures for dealing with incidents, emergencies and disasters.
4. Are effectively exchanging information during the relief transition period (from one controller/supervisor to another) for peak operations.
5. Verify that management employs techniques, such as performance testing, to assess the implementation of Operations rules and procedures which may have a safety impact.

RESULTS/COMMENTS

1. The Audit Team reviewed documents, such as Daily Train Orders, RTD Light Rail Right of Way Access Request / Permit, Controllers Daily Turn Over log, and Light Rail Incident Report. The Audit Team also conducted interviews and observed controller operations in the control center at the Mariposa maintenance facility. The Audit Team observed that procedures are being followed.
2. The Audit Team observed that applicable reports and logs are on file. Daily train orders are provided to the controllers via access permits. Log entries are related to any incident that can and will affect service outside of normal operations, and are visible in the controller's workstation and stored in RTD's Maximus database. The following documents and logs were reviewed: the day's train orders for 9/15/09; controller's daily turnover log for 9/14/09; right of way access permits; and SOPs 101.1, 101.10 and 101.15.
3. The operations controller and supervisors are knowledgeable and understand the procedures for dealing with incidents, emergencies and disasters. They go through six weeks of training and are re-certified once a year. They are involved in post accident debriefing, and have completed a training course for accident response, as well as other TSI training courses. Most of their training is on the job.

RESULTS/COMMENTS

(Checklist # 4-19-OP-34 continued)

4. A turnover tracking log was provided to the Audit Team, showing an effective method of exchanging information during the relief transition period for peak operations.

5. The Audit Team verified that management employs techniques to assess the implementation of Operations rules and procedures which have a safety impact. Performance testing is conducted through six weeks of on the job training. Daily evaluations are made by listening in on radio communications. Also, annual certification is required, which involves passing a test that covers technical terminology and general overall alignment questions—the S.C.A.D.A. Controllers Re-certification Test.

The Audit Team has no suggestions or recommendations for this audit item.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-31-SAF-30	Date of Audit: 9/14/09	Persons Contacted: David Genova
Department: Public Safety	Auditor: P. Fischhaber, R. Lobato, A. Lovato, S. Bennett	
49 CFR Requirement: 659.19 (e ,f, g, h, i, j, k & q))		

REFERENCE CRITERIA

- SOP's 101.11, 101.13
- SSPP Sections 1.6, 2.1.7, 3.2 and Table 1-2
- 4 (CCR) 723-7-7343(c, d & f)
- Light Rail Employee Rule Book (LRERB) rule # 101
Light Rail Design Criteria

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

EXECUTIVE SAFETY AND SECURITY COMMITTEE (ESSC) AND SAFETY FUNCTIONS

By interview of the Assistant General Manager of Safety, Security and Facilities of RTD and review of records, determine whether or not:

- The ESSC is composed of a designated group of members representing labor and management from all disciplines and departments within RTD.
- The ESSC has met monthly during the past twelve months.
- Meeting minutes are prepared and posted.
- An appropriate form has been developed and made readily available to all employees to report potential safety hazards in the workplace.
- The ESSC has addressed all employee identified potential safety hazards and issues reported during the previous twelve months by evaluating the concern and implementing appropriate corrective action measures as needed.
- The ESSC has reviewed and if need be, taken action, on all accident investigation reports where potential hazards were noted.
- Formal or informal hazard analysis was performed on real and potential hazards at the request of the ESSC.

RESULTS/COMMENTS

- Table 1-2 of the SSPP lists the designated group of members representing labor and management from all disciplines and departments within RTD. Labor is not represented by a specific labor person, but rather by the Senior Manager of HR, who represents the issues of labor. This committee specifically is a senior management committee. There are general safety committees among the various departments that consist of labor. Any issues not resolved in the general safety committees would come before the ESSC. The Public Affairs department is not represented on the committee. Ad hoc members are brought in as needed for various items (e.g. variances of design standards)

RESULTS/COMMENTS
(Checklist # 4-31-SAF-30 continued)

2. Meeting minutes were reviewed for the past 12 months and noted for the past 21 months. No meeting was held in July 2009 due to the holiday and vacations. All members of the committee were informed and agreed to the meeting cancelation. Meetings were held for all months of 2008 and January through September 2009 with the exception of July 2009.
3. Meeting minutes are prepared and sent via email to all of the committee members. Meeting agendas and meeting minutes are also sent to the PUC.
4. Forms have been developed and are available at all of the divisions for employees to fill out. The Audit Team reviewed a copy of the form available for employees to report safety hazards in the workplace. RTD is currently looking at creating an RTD intranet site for reporting hazards under the Safety, Security and Facilities tab of their internal website. There will be a link to report a safety or security or hazard. This intranet tracking will now be possible with the PC kiosks that are available to all individuals working at RTD that would need to have access to the intranet system. The general concept is to use the intranet electronic reporting as a way to report safety hazards and automatically populate a safety hazard database with the information. The filing of the electronic report would also generate an email to the safety staff that will respond to the reported hazard. The Safety staff will finish populating the database once the hazard has been addressed. This will move RTD into tracking both informal and formal hazards. The RTD IT department is currently working on this feature. RTD will work with their IT department to provide an estimate of time for this project to be implemented. Suggestion boxes at the divisions will continue to be used as well as the intranet application.
5. Most of the safety and hazard issues that are reported are dealt with directly at the division safety committees. Anything that can not be dealt with at the division safety committee level would come to the ESSC. No issues have come to the ESSC in the past 12 months. A review of the issues that came up would be included in the division safety committee. See Checklist 4-27-SAF-08 for the review of the division safety meeting minutes and process. Workers typically take any safety matters to the division level committee or to the Safety Compliance Officer during shop inspections. RTD works very hard to handle safety and hazard issues in a very pro-active manner.
6. The derailments that interfered with operations and generated two accident reports. The last accident report generated the recommendation for a CAP. The ESSC discussed the CAP for the Southwest Corridor during the September meeting. Modifications for the proposed intrusion detection were discussed with the ESSC and will be sent for ESSC members for review and a vote prior to being submitted to the PUC for approval. The CAP process with the PUC was also discussed with the ESSC. In general, rail accident investigations are reviewed at every ESSC meeting. Richard Lobato prepares a report that is provided to the ESSC. Each accident is discussed at the ESSC and accidents are reviewed for trends.

RESULTS/COMMENTS

(Checklist # 4-31-SAF-30 continued)

7. A formal hazard analysis was performed at the request of the ESSC for the shearing insulators on the Southeast Corridor. The formal hazard analysis determined that the hazard was not reportable. The accident that occurred as a result of some of the shearing insulators was reported and the ESSC requested a formal hazard analysis be performed as a result. RTD is looking at performing a hazard analysis for those submitted by the new intranet submittals. The analysis results will be included in the database of information collected with the new proposed intranet forms. The ESSC would likely only request formal hazard analyses, but could request informal hazard analyses as well. Formal hazard analyses generate reports whereas informal hazard analyses generate a ranking that would be recorded in the hazard database. Formal analysis would be written in the case of issues that may be reportable to the PUC.

The Audit Team has no suggestions or recommendations for this audit item and encourages RTD to implement its intranet based hazard tracking database.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-32-SAF-31	Date of Audit: 9/17/09	Persons Contacted: Richard Lobato Phil Eberl Doug Davis Dave Johnson Linda DeHerrera Edin Memic
Department: Public Safety	Auditor: A. Lovato, P. Fischhaber, S. Bennett	
49 CFR Requirement: 659.19 (i, m, p, & r)		

REFERENCE CRITERIA

1. SSPP sections 3.2 and 3.3, 4.0, Table 3-2
2. 4 (CCR) 723-7-7343(c)(V & XI)
3. Safety Policies and Procedures Manual, Hazard Communication Program
4. SOPs 101.2, 101.13, 102.6 through 102.8, 102.10 through 102.17, 104.10

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

EMPLOYEE AND CONTRACTOR SAFETY PROGRAM

Through a combination of interview and review of documentation determine whether or not a contractor/employee safety program exists and whether or not it includes the following for both contractors and employees:

1. A process to assess compliance with training and certification requirements.
2. A description of the categories of safety-related work requiring training and certification.
3. A description of the training and certification program for employees and contractors in safety-related positions including a description of the training material used.
4. A process to maintain and access employee and contractor records including documentation of training test scores and dates.
5. Drug and alcohol testing as well as information and training about drug and alcohol abuse.

RESULTS/COMMENTS

1. RTD has a process in place, which assesses compliance with training and certification requirements for employees and contractors. For RTD personnel, there is a safety items checklist, which employees sign off when completed. Employee files are also maintained, which contain records of training and certification dates. Also, a monthly report is distributed to LRV supervisors, which provides information concerning training/certification requirements for employees. Trainers are sent copies of this report as well.

For contractors, the on-track safety training program is required prior to issuance of an access permit to work near or on RTD rail property. Compliance with this program is verified through in-field observation and examination of contractors' training cards. RTD employees must also complete this program.

2. The categories of safety-related work requiring training and certification are rail operators and maintainers (electromotive mechanics, general repair mechanics, track maintainers, and signal and power maintainers). With the exception of on-track safety, RTD does not train or certify contractors.

RESULTS/COMMENTS
(Checklist # 4-32-SAF-31 continued)

3. RTD's training and certification program begins with a new hire safety orientation. In the safety orientation, training dates and times are scheduled for new hires. RTD employees receive formal training and certification for the work they perform according to job classification. The training and certification program contains classroom (which includes reading, audio, and visual material) and hands-on training, and written exams (which includes lock out/tag out and electrical safety). LRV operators must complete a six-week course and pass examination on RTD Light Rail Rules and Standard Operating Procedures before being certified. Maintenance personnel undergo a one-year apprenticeship program (which includes a syllabus), and are certified after passing examination. LRV operators and maintenance personnel are re-certified every two years.

As previously mentioned, contractors must complete the on-track safety program, which is usually instructed in a train-the-trainer format allowing contractors to train their own personnel. Reading, audio, and visual materials are used to complete this program. Contractors sign forms stating they received critical safety information.

RTD performs a walk-through/talk-through with outside vendors.

Mr. Lobato was observed during an on-track safety training by one of the Audit Team members. Mr. Lobato performed his training as described to the Audit Team and within the time period he stated the training would last.

4. Doug Davis maintains employee training and certification records. Certification documentation, including tests and test scores, are maintained in employee files. These records are audited during the three year on-site safety review of RTD's SSPP & SSP. Doug Davis files hard copies of test scores and dates—for RTD and non-RTD personnel (contractors).

5. RTD performs random and post accident drug and alcohol testing through its contractor (Concentra), following FTA regulations. FTA found zero deficiencies with RTD's drug and alcohol testing program. RTD provides information and training about drug and alcohol abuse, which includes an awareness video ("Clean, Sober & Safe"), one hour of drug and alcohol orientation, an FTA fact sheet, and RTD's drug and alcohol policy. An acknowledgement of receipt is signed by the employee and filed; a database is maintained of all employees who have been trained and tested.

The Audit Team has no suggestions or recommendations for this audit item.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-34-SAF-39	Date of Audit: 9-14-09	Persons Contacted: David Genova
Department: Safety	Auditor: P. Fischhaber, R. Lobato, A. Lovato, S. Bennett	
49 CFR Requirement: 659.19 (g, q & u)		

REFERENCE CRITERIA

1. SSPP sections 2.1.6, 2.1.7, 2.2.6.2, 2.2.7.1, & 6.9
2. 4 CCR 723-7-7343(c)(VI & XII).

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

PROCUREMENT PROCESS, PROCEDURES AND CONTROLS

Perform a review of the procurement process and procedure to determine that it meets the requirements of the above referenced documents, specifically:

1. Safety concerns are addressed in modifications to existing systems, vehicles and equipment which do not require formal safety certification but may have safety impacts.
2. Measures, controls, and assurances are in place and are being implemented to ensure that safety principles, requirements and representatives are included in the agency's procurement process.

RESULTS/COMMENTS

1. The procurement process has strict rules and the procurement manual must be followed. Specifications have to be put together to go to the purchasing department. The purchasing department is not allowed to buy something that has not had a written specification prepared for the purchase. The written specification requirement ensures that the purchasing department is buying the correct supply or part.

On existing systems, SOP 101.11 addresses modifications. Specifications for existing systems are written by rail operations. For example, the specifications for the station modifications being made to accommodate four car trains versus the existing three car trains and platform extensions for the Central, CPV and Southwest Corridors were written by rail operations. Both the rail operations and Safety departments were involved in reviewing the plans. A modification package and specifications were put together for these changes. Some of the design variances have already been reviewed and approved by the Executive Safety and Security Committee (ESSC). There will be a couple of safety certification items such as the clearances and new high block locations. There were also certifications within the modifications made. Any modifications driven by the SOP and are required to be approved by the ESSC.

RESULTS/COMMENTS

(Checklist # 4-34-SAF-39 continued)

2. Modifications are required to go through the ESSC. RTD has design criteria that must be followed, or a variance has to be reviewed and approved by the ESSC. Design criteria applies to both existing and new systems. For new systems, there is a complete section regarding system safety and security that is part of the contracts. Preliminary engineering has a standard system safety and security requirements for a preliminary hazard analysis (PHA), a threat and vulnerability analysis (TVA), and a general list of certifiable elements. For final design, there is a standard system safety and security requirements including a PHA, TVA, and formal written safety certification and plan review. Once in construction, there is construction verification for safety certification unless the project is a design-build project where the construction verification and safety certification would be combined. The Safety and Security Management Plan (SSMP) process also occurs for FTA New Starts projects that receive funding. This process requires that an SSMP be prepared for any project that is receiving Federal Funding.

The Audit Team has no suggestions or recommendations for this audit item.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-38-OP	Date of Audit: 9/28/09	Persons Contacted: Bill Bell Phil Eberl Terry Emmons
Department: Rail Operations	Auditor: A. Lovato, P. Fischhaber, S. Bennett, R. Lobato	
49 CFR Requirement: 659.19 (m)		

REFERENCE CRITERIA

Light Rail Employee Rule Book (current edition)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Light Rail Employee Rule Book (LRERB)

Review the most current edition of the LRERB to determine whether or not modifications have been made since the last audit cycle.

RESULTS/COMMENTS

The first LRERB was written in 1998.
The LRERB was revised in September 2000.

RTD began working on another revision in August 2009 and should have it completed before the end of 2009.

The 2009 revision will consist of general “clean up” and clarification that pertains to term usage. Elements such as train speed in the yard will also be revised. There will be no major operational changes.

This revision process includes the Assistant General Manager of Rail Operations, and will go through the Executive Safety and Security Committee for approval. Once approved, the employees will be required to exchange their 2000 LRERB for the 2009 version—they will need to sign for their copy.

RTD noted that another change to the LRERB may be necessary once ATS for the system is turned on.

Future changes/modifications to the LRERB, if any, will continue to be made on a discretionary basis.

The Audit Team has no suggestions or recommendations for this audit item.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-14-OP-12	Date of Audit: 09-25-2008 Updated 9-15-2009	Persons Contacted: Bill Bell and Hal Fabricius
Department: Rail Operations	Auditor: P. Fischhaber, A. Lovato, S. Bennett, R. Lobato	
49 CFR Requirement: 659.19(m & o)		

REFERENCE CRITERIA

1. SOP's 104.11 and 104.21.
2. Light Rail Employee Rule Book (LRERB) Rule #'s 204, 205, 217.2, and 402.

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRAIN ORDERS AND SPECIAL INSTRUCTIONS

Randomly select and review ten Train Orders which were issued within the last two years, to determine whether or not:

1. The train orders were issued, and the log initialed by all on-duty operators indicating pick-up by the operator; and orders were then filed in the division supervisors' daily file.
2. The train orders were rewritten as special instructions if lasting longer than one day in duration as per LRERB # 217.2(c)
3. By interview with at least four on-duty operators, verify that current train orders are kept on display in the cab of the train as required by SOP 104.11.
4. Through observation of at least two trains (if possible) determine that Train orders and Special Instructions are being adhered to and observed by train operators.

RESULTS/COMMENTS

1. The Audit Team reviewed the sign-in sheets for light rail operators for the two year period from November 2006 to August 2008.

By random selection the team selected the following dates for review.

	Log initialed	Train orders filed	Comments
November 28, 2006	Yes	Yes	
December 29, 2006	Four unsigned	Yes	06 Blizzard
February 25, 2007	Yes	Yes	
June 20, 2007	One unsigned	Yes	
October 09, 2007	Yes	Yes	
December 04, 2007	No sign in sheet	Yes	Supervisor checked in operators
April 13, 2008	Yes	Yes	
April 27, 2008	Two unsigned	Yes	
June 20, 2008	One unsigned	Yes	Employee late report due to FMLA
August 21, 2008	One unsigned	Yes	

The train orders were filed by the supervisors in the daily file. However, of the ten selected train order sign-in logs, there were nine instances where one or more operators failed to initial the sign-in log. According to Bill Bell the operators who failed to initial the log were extra board or relief operators who for various reasons did not initial the log.

RESULTS/COMMENTS
(Checklist # 4-14-OP-12 continued)

2. The train orders are kept current, and as necessary; they were revised during the review period based on updated information. Train orders were rewritten as special instructions if they lasted longer than one day.

3. The Audit Team along with Bill Bell and Hal Fabricius met with four different train operators at the Mineral Station to verify whether or not the operators had current train orders with them on the train. Each of the operators interviewed did have available the current train orders as required by SOP 104.11.

4. Following the verification of train orders, the Audit Team relocated to a location north of the Mineral Station that requires train operators to pass a slow zone (25 MPH restriction), which is a special instruction noted on the train orders. The Audit Team observed two different trains as they passed through the slow zone. Each train slowed down through the slow zone and followed the special instructions as required.

Given the current grievance process that RTD is involved in regarding points involved in this checklist, the Audit Team recommends that this checklist be followed-up in a future audit during Cycle 4 to review the results of the grievance and determine if any changes need to occur with the associated processes.

Updated Audit

RTD has completed its grievance process regarding sign-in sheets for light rail operators and operators obtaining current train orders. RTD has placed locked boxes at specific stations where extra board or relief operators will be starting their work. These locked boxes contain sign-in sheets and copies of the day's current train orders. The Audit Team inspected the locked box including the sign-in sheet and the current train orders. RTD has just implemented this system, and it seems to be working well so far. The Audit Team will review this item again during the next audit to determine the effectiveness of this solution.

The Audit Team has no further recommendations for this checklist.

**Joint Report Of
The Colorado Public Utilities Commission (PUC)
Rail and Transit Safety Section
And
The Regional Transportation District (RTD)
Department of Safety, Security and Facilities**

DATE: 6/10/2010

**SEMI-ANNUAL ON-SITE SAFETY AUDIT 5
OF RTD LIGHT RAIL OPERATION**

April 6, 2010 – April 20, 2010

AUDIT RESULTS

Eight checklists were reviewed during this semi-annual audit. The Audit Team made zero findings, zero recommendations, and zero suggestions from the checklists reviewed as outlined in Table 1:

Table 1 – Audit Checklists

Checklist No.	Element/Characteristic
4-01-D&A-33	Drug and Alcohol Testing Program No recommendations
4-02-FM-36	Facilities and Equipment Inspection and Maintenance No recommendations
4-21-RTD-27	Right-of-Way Access Permit Procedures No recommendations
4-22-RTD-38	Radio Communications System, MMS (Maintenance Management System), CAD/AVL System & Emergency Telephone System No recommendations
4-24-RTD-NA-2	Review of SOPs, Rules, and Emergency Drills No recommendations
4-30-SAF-28	Emergency Response and Preparedness No recommendations
4-33-SAF-35	Security Plan—Implementation and Practices No recommendations
4-39-OP	Stop Signals and Indicators No recommendations

Colorado PUC E-Filings System

FINDINGS/RECOMMENDATIONS/SUGGESTIONS FOR SEMI-ANNUAL AUDIT 5

The Audit Team had no findings, recommendations, or suggestions.

RTD Response: The RTD reviewed this report and had no comments.

CONCLUSIONS

The Audit Team reviewed eight checklists in two areas of RTD safety, one area of RTD drug and alcohol testing, one area of RTD operations, one area of RTD facilities maintenance, and three general areas of RTD operations. No findings were made during this audit session requiring the issuance of a Corrective Action Plan. No recommendations or suggestions were made during this audit session.

The RTD and PUC Audit Team members are in agreement with all findings, recommendations and suggestions made during this audit session.

Attachments to Audit Report

AUDIT CHECKLISTS:

Checklist No.	Element/Characteristic
4-01-D&A-33	Drug and Alcohol Testing Program No recommendations
4-02-FM-36	Facilities and Equipment Inspection and Maintenance No recommendations
4-21-RTD-27	Right-of-Way Access Permit Procedures No recommendations
4-22-RTD-38	Radio Communications System, MMS (Maintenance Management System), CAD/AVL System & Emergency Telephone System No recommendations
4-24-RTD-NA-2	Review of SOPs, Rules, and Emergency Drills No recommendations
4-30-SAF-28	Emergency Response and Preparedness No recommendations
4-33-SAF-35	Security Plan—Implementation and Practices No recommendations
4-39-OP	Stop Signals and Indicators No recommendations

CORRESPONDENCE AND OTHER ITEMS:

Within RTD’s 30-day review period of the draft audit report, the PUC received an email from Shirley Bennett regarding a name correction that needed to be made to checklist 4-02-FM-36. The last name of Bill Ferares was misspelled.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-01-D&A-33	Date of Audit: 4/9/10	Persons Contacted: Linda DeHerrera
Department: RTD Administrative Department	Auditor: S. Bennett, P. Fischhaber, A. Lovato, R. Lobato, M. Cross	
49 CFR Requirement 659.19 (t)		

REFERENCE CRITERIA

1. SSPP sections 6.8.
2. RTD Drug and Alcohol Policy (9/16/98).
3. 4 CCR 723-7-7343(c)(XV).
4. 49 CFR 655.
5. Previous FTA Audit Reports of their audit of the RTD Drug and Alcohol Program.

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

DRUG AND ALCOHOL TESTING PROGRAM

1. Does the training portion of the program include a description of the training material, and documentation of training test scores and dates?
2. Review the company policy on the use of non-controlled substances which may impair an employee's ability.
3. Are supervisors trained to recognize impaired employees (Impairment Training) and are safety sensitive employees required to be seen by supervisors prior to assuming job duties (to check-in for work)?
For each rail transit employee that tested positive for drugs or alcohol over the past two years and who is currently employed in a safety sensitive position, review the records to determine whether or not:
 4. The individual was evaluated and released to work by a Substance Abuse Professional.
 5. The individual was administered a return to duty test with verified negative results.
 6. The follow-up testing was performed as directed by the Substance Abuse Professional, with not less than six follow-up tests performed with negative results during the first twelve months after returning to duty.

RESULTS/COMMENTS

The Audit Team met with Linda Deherrera, Manager, Substance Abuse/Office Services and Edin Menic, Assistant Supervisor/Office Services. The RTD Drug and Alcohol program extends to all employees, not just to safety sensitive, as required by FTA.

1. All newly hired employees receive a minimum of one hour of instruction on the RTD Drug and Alcohol Policy, which is in accordance with FTA guidelines. Each employee is given a copy of the written policy. Employees are required to sign and date a statement that they have received this information. The acknowledgement forms are filed and secured in the Manager of Substance Abuse Office. Written tests are not administered to employees. This is not required by FTA. Therefore, there is no documentation of training scores and dates. All supervisors are given an additional two hours of "Reasonable Suspicion" training. In addition to training, all employees must undergo and pass a drug and alcohol tests as a condition of employment. The Audit Team reviewed the information packet and training materials for compliance.

RESULTS/COMMENTS

(Checklist # 4-01-D&A-33 continued)

2. The RTD policy is in compliance with the FTA policy and requirements. Information on the use of non-controlled and over-the-counter drugs is included in the RTD policy and training. RTD does not test for OTC medications. However, it does have a strong awareness program to address this issue.
3. All RTD Supervisors, including Light Rail Controller Supervisors and other safety sensitive managers receive a two-hour "Reasonable Suspicion" training course. The class consists of drug and alcohol awareness information, based on the FTA model. All safety sensitive employees are seen by a supervisor prior to the start of their shift. This is done when a train operator picks up supplies and materials from the supervisor's station. Maintenance of Way and other maintenance employees attend a daily safety or shift turnover meeting with their supervisor prior to the start of their shift. Training records were checked, verified and found to be in compliance.
4. In accordance with FTA regulations, at least 25% of RTD employees must be randomly tested for controlled drugs and a minimum of 10% for alcohol. RTD tests 35-40% of its employees for drugs and 15% for alcohol, which exceeds the FTA standard. During the previous 24 months, there has been one positive return as a random drug test and another employee tested positive during a post-accident follow-up. These individuals were evaluated and released to work by a Substance Abuse Professional (SAP).
5. In compliance with the FTA policy, the employees met with a SAP and received a prescription for a recovery plan, return to work testing, and follow-up testing. The individuals were administered a return to duty test with verified negative results.
6. Records were reviewed and checked by the Audit Team and it was determined that follow-up was performed as directed by the SAP, with not less than six follow-up tests performed with negative results during the first twelve months, after returning to duty.

The Audit Team has no findings for this audit checklist.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-02-FM-36	Date of Audit: 4/6/10	Persons Contacted: Bill Ferares Richard Lobato Marty Chavez
Department: Facilities Maintenance	Auditor: A. Lovato, P. Fischhaber, S. Bennett, M. Cross	
49 CFR Requirement: 659.19 (f, m, n & o)		

REFERENCE CRITERIA

1. SSPP sections 2.1.6, 2.1.7.
2. 4 CCR 723-7-7343(c)(VI & XII).

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

FACILITIES AND EQUIPMENT INSPECTION AND MAINTENANCE

Perform a review of the following areas to determine if regular safety inspections and assessments are being performed and follow-up action taken if discrepancies found:

1. Emergency lighting testing and maintenance.
2. Fire extinguishers inspections and performance of fire drills.
3. Emergency Generator testing and maintenance.
4. Do checklists exist (or another similar format) and are they being used for the documentation of inspections and testing of emergency generator and emergency lights?
5. Verify that management employs techniques, such as performance testing, to assess the implementation of maintenance and operating rules and procedures which may have a safety impact.

RESULTS/COMMENTS

1. RTD tests emergency lighting every six months, and performs maintenance when necessary. RTD inspects a light fixture for any damages/defects, and notes any findings in a work order via its Maximus system. RTD also tests an emergency light by pressing the test button, noting the light's status and replacing any lamps that aren't working. Finally, RTD tests the light's battery strength and replaces the battery if necessary. Richard Lobato also performs a monthly walkthrough of RTD facilities. If he finds issues with emergency lighting, he brings those to the attention of Bill Ferares for maintenance.

2. RTD provided invoices for the past 14 months from Integrated Safety Services, a contractor that inspects and certifies RTD's fire extinguishers. Integrated Safety Services visually inspects fire extinguishers once a month, while providing physical inspections once a year. The last physical inspection was on 5/5/09. Fire extinguishers are replaced once every six years. A fire extinguisher in the Elati maintenance facility was randomly selected, and it proved to be properly inspected and maintained.

Fire drills are performed once a year on a random basis. Richard Lobato performs his fire drills in conjunction with Bill Ferares' group.

RESULTS/COMMENTS

(Checklist # 4-02-FM-36 continued)

3. There are two emergency generators: Generator 07 is located at the Mariposa maintenance facility and Generator 10 is located at the Elati maintenance facility. Both generators are automatically tested every Monday—they are turned on, run for a half hour, and then turned off. Routine maintenance checks occur on a monthly basis, while full inspections occur on an annual basis. Annual inspections involve changing oil, batteries, fuel filters, etc. Work orders for routine checks and annual inspections are written and distributed via RTD's Maximus system. The most recent annual inspections for Gen07 and Gen10 were completed on 3/23/10 and 3/31/10, respectively.

4. Checklists and work orders are used for the documentation of inspections and testing of emergency lights, while work orders are used for the documentation of inspections and testing of emergency generators.

5. It was verified that management employs techniques, such as performance testing, to assess the implementation of maintenance and operating rules and procedures which may have a safety impact.

The Audit Team has no findings for this audit checklist.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-21-RTD-27	Date of Audit: 4/6/10	Persons Contacted: Greg Pennington Terry Emmons Bill Bell Richard Lobato Mathew Cross
Department: Public Safety, Rail Operations	Auditor: A. Lovato, P. Fischhaber, S. Bennett	
49 CFR Requirement: 659.19 (m)		

REFERENCE CRITERIA

1. RTD Standard Operating Procedures 104.10 and 105.2
2. 4 (CCR) 723-7-7343(c)(V, IX, & XI)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

RIGHT-OF-WAY ACCESS PERMIT PROCEDURES

1. Randomly select no fewer than six ROW permits from the Master Access Permit Log (if possible, two of which require taking power down and two of which were issued to contractors) to verify the following:
 - a) Required signatures are present on each permit
 - b) Requestor acknowledgement signature is present
 - c) If contractor permit, verify training has been completed
 - d) If taking power down, verify that OCS power removal and restoration permit/checklist was completed.
2. Verify that SOP 104.10 and SOP 105.2 are consistent.
3. If possible-visit the work site of two work crews (one RTD and one contractor) and request a copy of their work permit and quiz them on the contents and restrictions of the permit.

RESULTS/COMMENTS

1. RTD has a new electronic permitting process which has streamlined RTD's reviews, ensuring reviews and approvals/disapprovals are completed in a timely manner. In addition, safety functions are in place to prohibit permit alterations without approval. That is, if any element in the permit is altered during the review process, the permit must be re-signed by all reviewers prior to being approved. MOW supervisors and Controllers are trained to look up permit information on Laserfiche and Outlook.

Company:	RTD/UPRR	Xcel Energy	RTD	Balfour Beatty Rail	MEC	Sturgeon Electric
Permit No.:	08-202	08-270	09-234	10-122	08-335	10-056
a)	Yes	Yes	Yes	Yes	Yes	Yes
b)	Yes	Yes	Yes	Yes	Yes	Yes
c)	Yes	Yes	NA	Yes	Yes	Yes
d)	Yes	Yes	Yes	NA	Yes	Yes

2. The Audit Team verified that SOP 104.10 and SOP 105.2 are consistent.

RESULTS/COMMENTS

(Checklist # 4-21-RTD-27 continued)

3. On 4/20/10 the Audit Team visited with two work crews and requested a copy of their work permit. An RTD work crew was quizzed on their permit for walking wire inspection (Permit No. 10-100). A contractor, Balfour Beatty Rail, was also quizzed on their permit for installing OCS, signals and TPSS (Permit No. 10-122). Both work crews were knowledgeable about the contents and restrictions of their respective permits.

The Audit Team has no findings for this audit checklist.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-22-RTD-38	Date of Audit: 04-08-2010	Persons Contacted: Tom Hughes and Ben Martinez
Department: Bus Operations, Vehicle Maintenance, IT	Auditor: R. Lobato, P. Fischhaber, A. Lovato, S. Bennett, M. Cross	
49 CFR Requirement: 659.19 (n & o)		

REFERENCE CRITERIA

1. SSPP sections 2.1.6, 2.1.7, 2.2.6.2, & 2.2.7.1
2. 4 CCR 723-7-7343(c)(VI & XII)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

RADIO COMMUNICATIONS SYSTEM, MMS (Maintenance Management System), CAD/AVL SYSTEM & EMERGENCY TELEPHONE SYSTEM.

Perform a review of the following areas to determine if regular safety inspections and assessments are being performed and follow-up action taken if discrepancies found:

1. Radio communications equipment.
2. CAD/AVL system integrity and accuracy.
3. Maintenance Management System.
4. Emergency Telephones on the rail system.

RESULTS/COMMENTS

The Audit Team met with Tom Hughes, Manger of Technical Communications and Ben Martinez, SCADA Network Administrator to review the radio communications systems, Maintenance Management System, CAD/AVL System and Emergency Telephone System.

1. Radio communications equipment including bi-directional antennas are serviced and maintained by the Technical Communications group managed by Tom Hughes. Radio equipment for light rail operations is limited to the handheld radio and mobile units in trains.
2. Computer Aided Dispatch/ Automated Vehicle Locator (CAD/AVL) System is not the primary system used for light rail communications; it is used for incident reports only and tracked through the Maximus program which is tied to the Maintenance Management System. Microwave units and repeaters are checked daily as a part of the CAD/AVL system to ensure that they are functioning properly. Supervisory Control Administration Data Acquisition (SCADA) is the primary system used to track train movement as well as communicate track and over head catenary conditions.
3. Maximus is the Maintenance Management System in use as the database for documenting work orders, service requests and equipment inspections for light rail. There are very few issues that arise with radio equipment, so very few work orders are generated for light rail.

RESULTS/COMMENTS
(Checklist # 4-22-RTD-38 continued)

4. Emergency Telephones have been in place system-wide on all light rail platforms for three years. Security has responsibility for the maintenance of the telephones and pedestals. Light Rail Communications is responsible for the phone line and service. The telephones are a handset on a cradle with a push button requirement to talk.

The Audit Team has no findings for this audit checklist.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-24-RTD-NA-2	Date of Audit: 4/7/10	Persons Contacted: David Genova John Tarbert
Department: SAF, VM, OP, MOW, ADM	Auditor: M. Cross, P. Fischhaber, A. Lovato, S. Bennett, R. Lobato	
49 CFR Requirement: 659.19 (k & m)		

REFERENCE CRITERIA

1. SSPP sections 2.1.5.1, 2.1.5.2, 3.3.6 and 6.2
2. 4 (CCR) 723-7-7343(c)(VII)(D&E) and 7343(c)(XI)(C)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

REVIEW OF SOPs, RULES, AND EMERGENCY DRILLS

Through a combination of interview and review of records, and in accord with the above referenced SSPP and CCR sections, determine whether or not

- 1) Emergency drill after action reports are prepared and reviewed by the Executive Safety and Security Committee (ESSC).
- 2) SOPs are annually reviewed by applicable departments and approved by the ESSC if changed.
- 3) Rules are annually reviewed by applicable departments and approved by the ESSC if changed.

RESULTS/COMMENTS

*Supporting documentation including copies of Executive Safety and Security Committee meeting minutes were provided to the Public Utilities Commission for their review and inclusion into this 2010 audit report. In cases involving security sensitive materials, documents were provided for review but not retained by the audit team.

1. Mr. Genova deferred this item to Mr. Tarbert. Mr. Tarbert and an assistant security official prepare action reports following security emergency drills. These drills may include various law enforcement agencies from local jurisdictions to federal agencies. The drills may include table-top exercises up to a full-scale field exercise encompassing multiple days. Mr. Tarbert provided an exercise log that covered a time frame from 1999 to 2009; the information was reviewed and the log returned since it was SSI in nature. The records show that RTD is involved in one to two SWAT or similar law enforcement agency drill per month.
2. Sections 2.1.5.1 and 3.3.6 of the SSPP outline the procedures that RTD follow regarding reviews of SOP's. Mr. Genova indicated that the last full review was when the South-East Corridor was commissioned; this would be consistent with policies and procedures outlined in the above referenced SSPP sub-sections. On September 21, 2009, the Executive Safety and Security Committee reviewed an SOP*.
3. The Public Utilities Commission/RTD Joint Audit-Fall 2009 performed a full in review of the Light Rail Employee Rulebook with checklist 4-38-OP. The new rulebook was approved November 6, 2009.

The Audit Team has no findings for this audit checklist.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-30-SAF-28	Date of Audit: 4/7/10	Persons Contacted: David Genova John Tarbert
Department: Public Safety	Auditor: P. Fischhaber, A. Lovato, S. Bennett, R. Lobato, M. Cross	
49 CFR Requirement: 659.19 (e & k)		

REFERENCE CRITERIA

1. RTD Light Rail Emergency Response Plan
2. SSPP Sections 2.1.5.2, 3.3.15 and 4.1
3. 4 (CCR) 723-7-7343(c)(VII & X)
4. SOPs: 103.6, 103.8, 103.11-103.27, 104.8, and 105.2

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

EMERGENCY RESPONSE AND PREPAREDNESS

By interview of the AGM of Safety, Security, and Facilities Maintenance review of records, determine whether or not:

1. Fire/life safety goals and standards have been developed as described in the reference documentation.
2. Scenarios of possible fire, derailment, hazardous waste spill, or other emergency conditions, have been defined, and appropriate responses determined for employees and responders (including both emergency and security responders).
3. During the previous three year period, drills have been conducted with applicable local emergency response units for areas through which RTD operates and after action reports have been written.
4. Planning sessions have been conducted with outside agencies to discuss fire/life safety strategies and to implement findings from "After Action Reports" resulting from drills and exercises.
5. Familiarization training has been given to public agencies to aid them in their response to light rail incidents.
6. The Emergency Plan has been reviewed at least annually.
7. The program/procedure includes regularly scheduled reviews of the plan, (and updates and redistribution if needed).
8. The plan appears to be effective and easy to use and follow.
9. Lines of communication and information exchange between the RFGS and applicable outside agencies are active and well documented.
10. Training of employees on emergency procedures and response is performed and documented in accord with SSPP Section 3.3.15.
11. Emergency management procedures have been developed and implemented both in safety and security related areas.

RESULTS/COMMENTS

1. Fire/life safety goals and standards have been developed. Fire Life Safety Committees have been established and are currently active for the West Corridor, North Metro Corridor, I-225 Corridor, and Eagle P3 projects for FasTracks. Parameters are in contract specifications for the various projects. Section 2.1.5.2 of the SSPP discusses the Fire Life Safety Committees with respect to emergency and contingency planning.

RESULTS/COMMENTS

(Checklist # 4-30-SAF-28 continued)

2. RTD has prepared an emergency response plan that gives the basic information about the light rail system, station locations, emergency notification contacts, emergency management, and emergency planning, coordination, training and drills. Specific information on certain types of emergencies are covered in SOP's, and other types of scenarios are covered specifically in drills. A recent derailment scenario was conducted at the Mariposa Yard in conjunction with the TSI Rail Incident investigation course. Additionally, tabletop exercises involving both safety and security matters that involve law enforcement and emergency management are conducted.
3. RTD's Light Rail Emergency Response Plan and SSPP both contain lists of previous drills conducted with applicable local emergency response providers. Five separate tabletop exercises were conducted in 2008 in conjunction with the Democratic National Convention. From the period of 2007 through 2009, 31 separate exercises, including full scale exercises, tabletop exercises, and tabletop exercises for Continuity of Operations Planning, were conducted.
4. Planning sessions have been conducted with outside agencies to discuss fire/life safety strategies. RTD's exercise committee is a part of private entity assistance. Fire Life Safety Committees also meet to discuss various matters and strategies associated with specific light rail corridors.
5. The list of drills conducted with local emergency response units provides familiarization training for the public agencies to aid them in their response to light rail incidents.
6. Annual reviews of the Light Rail Emergency Response Plan were showing that yearly updates are no longer necessary. RTD has moved to review and update the Light Rail Emergency Response Plan as necessary based on the criteria listed in the plan. The last update of the Light Rail Emergency Response Plan was sent out May 2009 to updated tables.
7. Section 2.1.5.2 of the SSPP provides a list of criteria for when the Light Rail Emergency Response Plan is reviewed and updated.
8. The plan appears to be effective and easy to use and follow. RTD has been involved in two separate freight train derailments that fouled and damaged RTD tracks. Debriefings of both derailments were held with RTD and the Class 1 railroads. In the first derailment, the plan was generally followed with the exception of discussion between the RTD and railroad dispatchers. With the quick response by everyone to that derailment, forces on site were in direct contact early, and each kept their respective dispatcher informed of activities. With the second derailment, the plan was followed as written with no issues.
9. Lines of communication and information exchange between RTD and applicable outside agencies are active and well documented. Example documentation for the accident report for the 2008 derailment of UPRR was reviewed.
10. Training of employees on emergency procedures and response is performed and documented per Section 3.3.15 of the SSPP. Checklist 4-33-SAF-35 provides a detailed discussion of the documentation.
11. Emergency management procedures in the Safety SOP's, Security SOP's and Public transit officer SOP's were reviewed to see the procedures developed.

The Audit Team has no findings for this audit checklist.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-33-SAF-35	Date of Audit: 4/7/10	Persons Contacted: John Tarbert
Department: Public Safety	Auditor: P. Fischhaber, A. Lovato, S. Bennett, R. Lobato, M. Cross	
49 CFR Requirement 659.21, 23, 25, 27, & 29		

REFERENCE CRITERIA

1. RTD System Security Program (SSP)
2. NTI security awareness training for employees.
3. Transit Watch- public awareness program.
4. Security SOP's.
5. DHS/TSA Security Audit Report.
6. State of Colorado Audit Report (security portion).
7. 4 (CCR) 723-7-77344

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

SECURITY PLAN--IMPLEMENTATION AND PRACTICES

Interview the manager of security, inspect records, and review any recent DHS/TSA security report and/or security portion of any recently completed state audit report, to determine the following.

1. Is the security plan being implemented and carried out in accordance with the referenced criteria?
2. Is a program of security data acquisition and analysis in place and is it being maintained and used to aid in the analysis of security threats and the identification of trends?
3. Are there programs in place in the areas of proactive and reactive response, threat and vulnerability identification, assessment, and resolution, for new corridors, modifications, or additions?
4. Are there programs in place in the areas of emergency response training, coordination, and management, for new corridors, modifications, or additions?
5. Is there a security-training program in place for employees?
6. Through review and interview, determine whether CPTED is actively practiced by the agency.
7. Has RTD implemented a security certification review program for all new corridors, facilities and major expansions to assure that these expansions meet security design criteria and contract specifications?
8. Has RTD instituted access control, and perimeter gates and fencing at all facilities?
9. Has RTD implemented a systematic, District-wide threat assessment program?
10. Does RTD conduct an annual assessment to examine and report on the implementation of the SSP?
11. Through review and interview, assess the adequacy of security SOP's.

RESULTS/COMMENTS

1. The security plan is being implemented and carried out in accordance with the referenced criteria. The Security plan discuss general procedures and processes performed by the security department, measurements used, and provides an organization chart. Other checklists verify that SSP procedures are being followed.
2. Yes. The specific information is SSI in nature and can not be discussed specifically in this document. However data, analyses and trends were reviewed and trends are discussed in the Executive Safety and Security committee meetings.

RESULTS/COMMENTS

(Checklist # 4-33-SAF-35 continued)

3. Yes. Threat and vulnerability assessments (preliminary and modified) are performed at the start of design for all new corridors. RTD meets with fire and police agencies involved in each of these corridors as part of the process. Fire life safety committees also look at the results of the analysis.
4. Yes. SWAT training, emergency response for fire agencies, and typically at least one scale drill are conducted prior to the opening of a new corridor, modification of an existing corridor or corridor extension.
5. Yes. There are multiple training programs. The Nuclear Threat Initiative program is required for all employees (terrorism, observe and report anything you see (e.g. crime)). This is a 4 hour class with scenario based training. With the increase in terrorism over the years, the class provides examples of packages, letters, etc. The class has been extended to the bus operators and new train operators to provide 2 hours of class on the last day. Handouts of information for observe and report pamphlets that are provided to drivers in training were provided to the Audit Team.
6. Yes. All employees are allowed to provide information. The safety and security website for the intranet is being designed to allow employees to provide information on any safety and security issues. RTD's IT department is working on this website. CPTED is also discussed at the various committees for the new corridors.
7. Yes. Security works with all new corridors by working with designers to ensure that security items are included in the corridor design. Security certification items are part of contracts for new corridors and expansion. The Executive Safety and Security Committee approves the certification contracts, and contractors will have a third party review. Any changes made to the existing system is certified by RTD security staff.
8. Yes. Access control is being increased with a 2009 grant. Access control and perimeter gates have been reviewed and observed in conjunction with other audit checklists. Access control will be monitored by the security command control center.
9. Yes. RTD has implemented Transit-Watch as part of its district-wide threat assessment program. The Community Emergency Response Teams has been implemented as the other major part of the district-wide treat assessment program. Texting and emailing capability have been added to the Transit Watch program. Hotline/texting number: 303-434-9100. Email: transitwatch@rtd-denver.com
10. Yes. RTD reviews the SSP annually and updates and files with the Commission for approval.
11. SOP's for transit police incorporate the Security SOP's. Transit Police SOP's are in police speak and incorporate the requirements of POST. The last state audit and most previous BASE (Baseline Assessment and Security Enhancement Review) were reviewed. These documents show that RTD's Security SOP's are adequate.

The Audit Team has no findings for this audit checklist.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 4-39-OP	Date of Audit: 4/6/10	Persons Contacted: Cal Shankster Bill Bell Hal Fabricius Mathew Cross
Department: Rail Operations	Auditor: A. Lovato, P. Fischhaber, S. Bennett, R. Lobato	
49 CFR Requirement: 659.19 (m)		

REFERENCE CRITERIA

SOP 104.6

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

STOP SIGNALS AND INDICATORS

1. Review records within the past 12 months to determine the frequency of red signal violations and reasons for said violations.
2. Review RTD's detailed analysis on signal violations to determine if there is a systematic problem or reportable hazard.
3. Review records of any changes made to the signal system to address possible problem areas.
4. Ride at least one train to determine operator compliance with SOP 104.6.

RESULTS/COMMENTS

1) A database used to track red signal violations was started in Laserfische in 2006, using the Supervisory Control and Data Acquisition (SCADA) system. (Prior to 2006, operators were relied upon to report red signal violations.) Wherever there are ABS signals, SCADA can indicate an overrun. The Downtown Denver area (from Colfax to Welton) is run off of traffic signals, which are controlled by the City and County of Denver. The traffic signal timing can be reviewed to determine when the signal was red and overrun by a light rail vehicle. The only red signal violations that are logged are those run without authorization. RTD provided a spreadsheet with all signal violations since 2006. There were 21 red signal violations in 2009 (with 6.2 million signals being passed in that year). An analysis shows that more red signal violations occur in July, but the reason has not been determined. A few of these violations occurred adjacent to stations (e.g. Yale, Auraria West, and Union). When operators realized they had violated a red signal, they quickly brought the train to a stop. Of the red signal violations which were reviewed, none resulted in collisions or near misses. Two operators were fired earlier this year due to violating red signals twice within a period of one year. If an operator in training violates a red signal, s/he is disqualified and sent back to the bus division.

When a potential unauthorized red light violation occurs, the operator is relieved and sent for drug and alcohol testing. Information is then retrieved from the SCADA system. A supervisor will use judgment to determine if it is an unauthorized red signal violation. Most red signal violations occur due to operator error. The most common red signal violation occurs when an operator runs a signal anticipating that the signal will change, given two-minute headways (e.g. the signal may be yellow when an operator moves through the signal while anticipating a change to green, which may not occur as anticipated, resulting in a violation. The standard process for a clear signal is red, yellow, and then green.) A violation such as this usually happens for a brief moment—10 - 15 seconds. When it does happen, the operator is relieved as quickly as possible. Controllers will immediately look to see if there is a train occupying the next block after an overrun.

RESULTS/COMMENTS

(Checklist # 4-39-OP continued)

Signals are on demand; that is, they are not on if there is no train approaching. However, there are seven signals in the system that are always red when approached by an operator: five home signals to determine route and two signals that have gate protection. Operators will always have to stop at these signals.

2. Mathew Cross drafted a report detailing RTD's analysis of previous red signal violations. This report is awaiting review and approval from the Executive Safety and Security Committee, and will be attached to the joint audit report once it is finalized. If Mr. Cross' report isn't finalized during this audit cycle, then his report will be attached to the next joint audit report which will be submitted in the fall of this year.

RTD specifically has looked for patterns within their system and has made corrections to areas where any patterns have been spotted. Additionally, the installation of the cab breaking system will help with the human factors. Issues with false cab signal indications in areas where the operator is given permission to bypass a red signal are being worked out. New trains will have the cab signals in place and operable.

RTD has compared their red signal violation numbers to other properties throughout the nation, and its numbers seem to fall within the same range of other properties. However, not all properties have a SCADA system, and other comparable issues, such as line of sight, are unknown.

3. RTD has ridden trains to determine if there are signal visibility issues. As a result, RTD has changed out signal luminaries at some locations from incandescent bulbs to LED signal faces, improving the visibility of these signals. Signal 423, which had eight signal violations in a four-year period, was changed from an incandescent bulb to an LED signal face in August of 2009, and there have been no violations at that signal since. At other locations, such as the Bayaud crossing, ARRA II funds have been applied to make similar changes. It is possible that the new LED lights are now standing out more, so RTD may leave others as incandescent while installing LEDs at specific locations. Some of the LED changes have been made at the request of operators, due to the sun washing out the signal and making it hard to see. RTD modified Signal 1032, which has been violated a few times, by adding extension wings to the signal (in order to block out opposing vehicle lights coming from I-25 near the Yale station).

4. On 4/20/10 the Audit Team rode the F-line (LRV 137) from Broadway station to Lincoln station, as well as, the E-line (LRV 215) from Lincoln station to Broadway station. It was determined that the operators of both trains complied with SOP 104.6. However, the Audit Team notices that some of the wayside signals can be difficult to see or seem to approach quickly as vehicles come around curves at higher speeds.

RTD continues to monitor red signal violations and is taking steps to make changes at locations where patterns and issues are found.

The Audit Team has no findings for this audit checklist.

**Joint Report Of
The Colorado Public Utilities Commission (PUC)
Rail and Transit Safety Section
And
The Regional Transportation District (RTD)
Department of Safety, Security and Facilities**

DATE: 12/9/2010

**SEMI-ANNUAL ON-SITE SAFETY AUDIT 6
OF RTD LIGHT RAIL OPERATION**

October 12, 2010 – October 22, 2010

AUDIT RESULTS

Semi-Annual Audit 6 is the review of the audit process required by rule 4 CCR 723-7-7350(a). All of the checklists referenced for the current audit cycle (Cycle 4) were reviewed during this semi-annual audit. A total of 38 checklists were reviewed to determine which checklists will be referenced for the next audit cycle (Cycle 5), beginning in 2011. The Joint Audit Team eliminated two checklists, which were determined to be redundant, as we currently perform annual review already. Not taking into account format changes to the checklists, the Joint Audit Team modified 25 checklists and added two checklists. The checklists to be referenced during Cycle 5 are attached to this report.

**FINDINGS/RECOMMENDATIONS/SUGGESTIONS FOR SEMI-ANNUAL
AUDIT 6**

Due to the changing environment in the transit industry, the Joint Audit Team recommends that the Commission allow the Joint Audit Team the flexibility to modify or add checklists during the audit cycle without seeking prior Commission approval. This would allow the Joint Audit Team to respond to issues that may be occurring in the industry in a timely manner.

Also, the Joint Audit Team recommends the following nomenclature to be associated with each checklist:

“C-A-NN” where:

C = Audit Cycle

A = Area being audited

NN = Checklist Number

The areas being audited are classified as follows:

“D&A”	for the Drug and Alcohol Testing Program
“FM”	for the Facilities Maintenance Department
“MOW”	for the Maintenance of Way Department
“OP”	for the Operations Department
“RTD”	for other general areas
“SAF”	for the Safety Department
“SEC”	for the Security Department
“VM”	for the Vehicle Maintenance Department

For example, 5-OP-03 indicates the third checklist in Audit Cycle 5 for Operations.

CONCLUSIONS

The Joint Audit Team reviewed 38 checklists and added two more in areas consisting of RTD safety, security, drug and alcohol testing, operations, facilities maintenance, vehicle maintenance, maintenance of way, and other general areas. The Joint Audit Team recommends the Commission allow the Joint Audit Team the flexibility to modify or add checklists as may be required to respond to industry issues. The RTD and PUC Audit Team members are in agreement with all findings, recommendations and suggestions made during this audit session.

Attachments to Audit Report

AUDIT CHECKLISTS FOR CYCLE 5:

Checklist No.	Element/Characteristic
5-OP-01	Training and Certification Records for Train Operators, and Control/Supervisor Personnel
5-SAF-02	Incident Reports
5-OP-03	Hours of Service
5-VM-04	Preventative Maintenance Program for Transit Vehicles
5-RTD-05	Calibration of Measuring and Test Equipment
5-VM-06	Training and Certification of Transit Vehicle and Equipment Maintenance Personnel
5-SAF-07	Hazard Identification and Resolution Process
5-SAF-08	Hazardous Materials Program
5-MOW-09	Track Inspections
5-OP-10	Train Orders and Special Instructions
5-OP-11	Process/Procedure to Modify Rules and Issue Bulletins and Special Instructions
5-OP-12	Train Operator Performance Evaluations by Supervisors
5-MOW-13	Inspection of Mainline Switches and Turnouts
5-MOW-14	Grade Crossings / Warning Devices
5-MOW-15	Vital Relays-Wayside
5-MOW-16	Overhead Catenary System
5-VM-17	LRT Brake Inspections
5-MOW-18	Traction Power Substation (TPS) Maintenance and Inspections
5-MOW-19	Track Maintainer and Signal/Power Maintainer Training and Qualifications
5-MOW-20	Station Facility
5-RTD-21	Safety and Security Certification and Review Process
5-SAF-22	Light Rail System Configuration Management
5-OP-23	Train Operations and Performance in the Yards
5-RTD-24	Right-of-Way Access Permit Procedures
5-SAF-25	Emergency Response and Preparedness
5-OP-26	Train Operator Performance—Mainline
5-SAF-27	Executive Safety and Security Committee (ESSC) and Safety Functions
5-SAF-28	Employee and Contractor Safety Program
5-D&A-29	Drug and Alcohol Testing Program
5-OP-30	Operations Controller/Supervisor Performance
5-SEC-31	Security Plan—Implementation and Practices
5-FM-32	Facilities and Equipment Inspection and Maintenance
5-MOW-33	Bridge Inspections
5-RTD-34	Radio Communications System, Maximus Records Management System, CAD/AVL System & Emergency Telephone System
5-SAF-35	Procurement Process, Procedures and Controls
5-OP-36	Stop Signals and Indicators
5-SEC-37	Training and Certification Records for Security Personnel, and Privatized Security
5-SEC-38	Threat & Vulnerability Identification and Resolution Process

CORRESPONDENCE AND OTHER ITEMS:

None.

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-OP-01	Date of Audit:	Persons Contacted:
Department: Rail Operations	Auditors:	
49 CFR Requirement: 659.19(m & p)		

REFERENCE CRITERIA

1. SOP's: 101.4, 101.9, and 101.10
2. Hours of Service records, Sick/Leave Log, and Personnel Files

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

**TRAINING AND CERTIFICATION RECORDS FOR TRAIN OPERATORS, AND
CONTROL/SUPERVISOR PERSONNEL**

Randomly select operator rulebook, training, and certification records of 15% of active train operators and 25% of active controller/supervisor personnel for the past two years to determine whether:

1. Each individual successfully completed the required initial and/or refresher training program.
2. Training, qualification and re-qualification records are in compliance (including current CDL and physical exam).
3. The current training lessons plans and testing for qualification / re-qualification reflects the persons assigned duties.
4. Verify that training programs were evaluated on a regular basis for effectiveness, relevance and comprehensiveness.
5. Verify that training on emergency procedures was performed as required.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-SAF-02	Date of Audit:	Persons Contacted:
Department: Public Safety	Auditor:	
49 CFR Requirement: 659.19(f, i, j, m, n, & o), & 659.23		

REFERENCE CRITERIA

1. SOP's: 101.18, 103.2, 103.3, 103.4, 103.5, 103.6, and 103.15
2. Rule Book: 249,1401, and 1403
3. Security SOP's: 100.1 and 140.2
4. SSPP sections 3.2 and 3.3.7

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

INCIDENT REPORTS

Review at least five each of safety-related accident reports and security incident reports prepared within the past two years to determine if :

1. The following required information, if applicable, is included:
 - i. Date.
 - ii. Time of incident.
 - iii. Train #/LRV #.
 - iv. Operator identification number.
 - v. Location.
 - vi. Description of problem.
 - vii. RTD case # or Accident #.
2. Review the accident investigation procedures, reports, and corrective action plans and schedules utilized by RTD for the selected accidents to determine whether or not:
 - i. The report is complete and the procedure was followed with all information being contained in the procedure as per SOP 103.2.
 - ii. The incident appears to have been correctly classified.
 - iii. Corrective actions if noted are implemented in a timely manner.
 - iv. Data from incidents is subjected to any analysis so that possible mitigation for future related events might be implemented.
 - v. Consideration was given to possible primary and secondary causes of events.
 - vi. Records are complete and readily available.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-OP-03	Date of Audit:	Persons Contacted:
Department: Rail Operations	Auditors:	
49 CFR Requirement: 659.19(m)		

REFERENCE CRITERIA

1. 49 CFR Part 395, "Hours of Service of Drivers"

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

HOURS OF SERVICE

1. Randomly select the names of 25% of qualified train operators and review the appropriate work records for two 8-day-periods which fell within the last 12 months, to determine whether or not they abided by the hours of service rules as required by the referenced criteria.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-VM-04	Date of Audit:	Persons Contacted:
Department: Vehicle Maintenance	Auditors:	
49 CFR Requirement: 659.19(f, g, i, m, n, o, & p)		

REFERENCE CRITERIA

1. SOP's: 102.7 and 105.5
2. Preventative Maintenance Inspection Checklists A through F
3. SSPP section 2.1.6

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

PREVENTATIVE MAINTENANCE PROGRAM FOR TRANSIT VEHICLES

1. Randomly select 25% of the fleet and for each selected car, review the completed Preventative Maintenance Inspection (PMI) reports for the six different types of inspections and other applicable records to determine whether or not:
 - i. The required PMI's were performed during the required time and mileage limits.
 - ii. The responsible maintenance workers properly documented the inspection and maintenance activities.
 - iii. Maintenance defects that were noted during the inspections and which required unscheduled repairs were properly documented and closed out in a timely manner.
2. Select a minimum of 2 procedures and perform a spot check on the performance of the PM activities taking place to determine whether or not:
 - i. The PM activities are being performed in accordance with the applicable PM procedures.
 - ii. The required inspections are being properly documented.
 - iii. Noted defects are being either corrected or recorded for further attention.
 - iv. Perform follow-up on the correction of any noted defects if applicable.
3. Randomly select 25% of vehicles within the past 2 years. Through interview and review of records verify that tests are performed on LRVs involved in accidents, prior to their return to revenue service.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-RTD-05	Date of Audit:	Persons Contacted:
Department: MOW and Vehicle Maintenance	Auditor:	
49 CFR Requirement: 659.19(n)		

REFERENCE CRITERIA

1. SOP: 105.23
2. Instrument Calibration List
3. System Safety Program Plan section 2.1.6

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

CALIBRATION OF MEASURING AND TEST EQUIPMENT

1. Obtain a copy of the list of the measuring and test equipment subject to calibration control in the vehicle maintenance shop. Randomly select (if possible) two each of RTD's micrometers, dial calipers, torque wrenches, and multi-meters. From a combination of procedure and record reviews as well as visual inspections, determine whether or not:
 - i. The selected items are properly inventoried, controlled, calibrated at prescribed intervals, and marked, tagged or otherwise identified to show their current calibration status.
 - ii. The next scheduled testing/calibration is shown on the item or tag.
2. Verify that any personal tools, which are used for safety critical measurements, are included on the list or otherwise controlled.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-VM-06	Date of Audit:	Persons Contacted:
Department: Vehicle Maintenance	Auditors	
49 CFR Requirement: 659.19(m & p)		

REFERENCE CRITERIA

- SOP's: 105.7, 105.9, 105.10, 105.11, 105.12, 105.20, 105.21, 105.22, and 105.23
- LRM 043
- SSPP sections 3.3.8, 6.7.1.3 and 6.7.1.4
- Other – RTD LRV Maintenance and Certification Check-Off List, Operational Readiness Inspection sign-off sheets, LRV Preventative Maintenance Inspection Task sign-off sheets, Wheel True Training Certification sheets and Maintenance Training Verification sheets.

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRAINING AND CERTIFICATION OF TRANSIT VEHICLE AND EQUIPMENT MAINTENANCE PERSONNEL

Obtain a copy of RTD's list of qualified transit vehicle electro-mechanics. Randomly select 25% of training and certification records and review to determine whether or not:

- Training, certification and re-certification records are in compliance with the referenced criteria.
- The current training lessons plans and testing for certification / re-certification reflects the persons assigned duties.
- Were training programs evaluated on a regular basis for effectiveness, relevance and comprehensiveness (i.e., changes incorporated to reflect differences in Denver 1, 2, 3, & 4 cars)?

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-SAF-07	Date of Audit:	Persons Contacted:
Department: Public Safety	Auditors	
49 CFR Requirement: 659.19(f & i)		

REFERENCE CRITERIA

1. SSPP sections 3.3.2, 3.3.3, 3.3.4, 3.3.5, 3.3.7, 3.3.9, 3.3.11 and 3.3.13
2. Relevant corridor Safety Certification Program
3. Contract Specifications
4. Preliminary Hazard Analysis and Hazard Identification, Assessment, and Resolution Process
5. SOP 101.18

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

HAZARD IDENTIFICATION AND RESOLUTION PROCESS

Obtain a copy of RTD's System Safety Program Plan, SOP 101.18, and copies of the Safety and Security Certification Review Program and Corridor Contract Specifications from a current corridor or expansion under construction, and determine whether or not:

1. The organization has an established hazard identification and resolution process.
2. That the process applies to system operations.
3. That the process is applied during design and engineering.
4. That the process is applied during construction and start-up.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-SAF-08	Date of Audit:	Persons Contacted:
Department: Public Safety	Auditor:	
49 CFR Requirement: 659.19(s)		

REFERENCE CRITERIA

1. SOP's: 101.11 and 102.9
2. Rule Book: 107.3
3. SSPP sections 3.3.12, 3.3.13 and 6.9
4. 4 (CCR) 723-7-7343(c)(VIII)
5. OSHA Hazard Communications Program
6. RTD Procurement Standards Manual (latest revision)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

HAZARDOUS MATERIALS PROGRAM

Inspect the vehicle maintenance shop to determine whether or not:

1. Hazardous materials discharge incident reports (if any incidents have occurred) are kept on file at the facility and a review of Controller Log entry confirms any reportable incidents and/or responses.
2. Material Safety Data Sheets (MSDS) are available and current at the facility for all materials kept at the facility.
3. Health and safety related chemicals and other materials are adequately labeled and stored.
4. Procedures and training are in place and documented, for employee use of hazardous materials and chemicals where appropriate.
5. Hazmat spill equipment and training is provided if needed.
6. Verify the existence of a procurement procedure that precludes the introduction of unauthorized hazardous materials into the system and verify that Safety is involved in this process.
7. Verify the existence of a program that is used to verify and mitigate hazardous material usage.
8. Protective equipment training is provided to personnel as needed.
9. Supervisor spot checks are conducted (and documented) to ensure quality control and compliance.
10. Verify that monthly safety and environmental inspections are completed and documented.
11. Verify that Rail managers and supervisors have received spill response training and annual refresher training.
12. Observe hazardous waste satellite accumulation points for proper signage and labeling.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-MOW-09	Date of Audit:	Persons Contacted:
Department: Way, Power and Signal	Auditor:	
49 CFR Requirement: 659.19(f, i, m, n, & o)		

REFERENCE CRITERIA

1. SOP's: 102.1, 102.2, and 104.10
2. Rule Book: 102.7 and 118.2
3. SSPP section 2.1.6
4. RTD Track Maintenance Standards: "U.S. DOT Track Safety Standards, Title 49, Part 213"
(unofficially adopted by RTD)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRACK INSPECTIONS

1. Arbitrarily select and inspect eight consecutive monthly track inspection reports to determine whether or not:
 - i. All mainline track (including turnouts) was visually inspected as required by the referenced criteria.
 - ii. The required inspections were properly documented on the RTD track inspection report.
 - iii. Any noted defects were posted on the maintenance log sheet and corrected in a timely manner.
 - iv. If possible, accompany the inspector on a visual inspection; discuss the procedure and assess its effectiveness.
2. Inspect not less than two years of annual track ultra-sound reports to determine whether or not:
 - i. All mainline track was inspected as required.
 - ii. Any noted defects were corrected in a timely manner.
3. Through a combination of interview and review of records:
 - i. The hazard management and safety data acquisition processes are being followed and there is always coordination with upper management on faulty equipment and recurring maintenance issues and trends.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-OP-10	Date of Audit:	Persons Contacted:
Department: Rail Operations	Auditor:	
49 CFR Requirement: 659.19(m & o)		

REFERENCE CRITERIA

1. SOP's: 104.11 and 104.21
2. Light Rail Employee Rule Book (LRERB) Rule #'s 204, 205, 217.2, and 402

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRAIN ORDERS AND SPECIAL INSTRUCTIONS

Randomly select and review ten Train Orders which were issued within the last two years, to determine whether or not:

1. The train orders were issued, and the log initialed by all on-duty operators indicating pick-up by the operator; and orders were then filed in the division supervisors' daily file.
2. The train orders were rewritten as special instructions if lasting longer than one day in duration as per LRERB # 217.2(c).
3. By interview with at least four on-duty operators, verify that current train orders are kept on display in the cab of the train as required by SOP 104.11.
4. Through observation of at least two trains (if possible) determine that Train orders and Special Instructions are being adhered to and observed by train operators.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-OP-11	Date of Audit:	Persons Contacted:
Department: Rail Operations	Auditor:	
49 CFR Requirement: 659.19 (g & m)		

REFERENCE CRITERIA

1. SOP's: 101.8, 101.11, 104.11, 104.21, 2.1.5.1, 3.3.6, and 6.2
2. SSPP section 2.1.7, "System Modifications" and section 3.3, "System Safety Unit Tasks"
3. 4 (CCR) 723-7-7343(c)(XI)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

PROCESS/PROCEDURE TO MODIFY RULES AND ISSUE BULLETINS AND SPECIAL INSTRUCTIONS

By a combination of interview(s) with the AGM of Rail Operations and review of appropriate documents, determine whether or not:

1. Procedures are in place for controlling the modification of rules, and for issuing Bulletins and Special Instructions.
2. SOPs are annually reviewed by applicable departments and approved by the Executive Safety & Security Committee (ESSC) if changed.
3. Rules are annually reviewed by applicable departments and approved by the ESSC if changed.
4. Controls are in place to ensure that responsibilities for drafting modifications to rules, and issuing bulletins and notices, are clearly understood and practiced.
5. Proposed modifications are distributed to departments that have a need-to-know, for departmental review and comment.
6. Select four maintenance bulletins, which were issued within the previous two years and verify conformance to the process/procedures.
7. Perform a review/audit of the modification/review/update of RTD SOPs and Light Rail Employee Rule Book taking place to verify conformance to the process.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-OP-12	Date of Audit:	Persons Contacted:
Department: Rail Operations	Auditor:	
49 CFR Requirement: 659.19(m & p)		

REFERENCE CRITERIA

1. SOP's 101.4
2. SSPP sections 3.3.8, 6.7.1.1 and 6.7.1.2

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRAIN OPERATOR PERFORMANCE EVALUATIONS BY SUPERVISORS

Randomly select train operator ride check reports for 10% of train operators who have been in service for at least the last two years, to determine whether or not:

1. Each train operator was evaluated on a biennial basis (once every two years).
2. Ride check reports were appropriately filled in and signed by the supervisor.
3. The testing and re-certification occurred prior to the expiration of the previous certification.
4. Re-certification was given or other follow-up action taken in cases of substandard performance which was shown during normal evaluations.
5. Participate in at least two ride-along evaluations to assess the adequacy of the evaluation.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-MOW-13	Date of Audit:	Persons Contacted:
Department: Way, Power and Signal	Auditor:	
49 CFR Requirement: 659.19(f, i, m, n, & o)		

REFERENCE CRITERIA

1. SOP's: 102.1, 102.2, 104.2, 104.10 and 104.22
2. Rule Book: 102.7 and 118.2
3. Maintenance Procedures, 49 CFR Part 236, Monthly Manual and Power Switch Inspection
4. SSPP section 2.1.6

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

INSPECTION OF MAINLINE SWITCHES AND TURNOUTS

1. Review RTD's file of completed mainline switch and crossover inspection reports for one of each type of switch/turnouts inspections reports completed during the past twelve months. An inspection review should be performed on each of the main types of switches currently in use by RTD. For each switch inspection review determine whether or not:
 - i. The mainline switches were inspected at the required frequency as required by the reference criteria (49 CFR Part 237).
 - ii. The required inspections were properly documented on the inspection report.
 - iii. Any noted defects or discrepancies were corrected in a timely manner.
 - iv. If possible, accompany the inspector on review of the inspection of two recently inspected switches/crossovers; discuss the procedure and assess its effectiveness.
2. Through a combination of interview and review of records:
 - i. The hazard management and safety data acquisition processes are being followed and there is coordination with upper management on faulty equipment and recurring maintenance issues and trends.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-MOW-14	Date of Audit:	Persons Contacted:
Department: Way, Power and Signal	Auditor:	
49 CFR Requirement: 659.19 (f, g, i, m, n, o, p, & r)		

REFERENCE CRITERIA

1. SOP's: 104.6, 104.7, and 104.18
2. SSPP sections 2.1.6.1 and 2.1.6.2
3. MUTCD 2003 or 2009 (when adopted by the Transportation Commission)
4. 49 CFR Parts 222.25, 234, and 236

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

GRADE CROSSINGS / WARNING DEVICES

Review RTD's file of completed grade crossing protection inspection reports for four randomly selected grade crossings for the past twelve months. From a combination of procedure and record reviews as well as visual inspections of the selected items, determine whether or not:

1. The grade crossings were inspected at the specified frequency as required by the referenced criteria.
 - i. RTD only crossings.
 - ii. Shared RTD/freight rail crossings.
2. All of the required inspections were satisfactorily completed and results were properly documented.
3. Any noted defects were corrected in a timely manner.
4. Assess the adequacy of the inspection program:
 - i. Have checklists been established and are they being used?
 - ii. Are inspections and maintenance scheduled on a regular basis?
 - iii. Is document control established for inspection and maintenance records?
 - iv. Are the hazard management process and safety data acquisition processes being followed and is there coordination with the safety department on grade crossing issues?

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-MOW-15	Date of Audit:	Persons Contacted:
Department: Way, Power and Signal	Auditor:	
49 CFR Requirement: 659.19(f, g, i, m, n, o, & p)		

REFERENCE CRITERIA

1. Vital Relays Inspection Procedures: PV 250, Relay Test Stand; GRS Relay Test Unit
2. PM Inspection Checklists: RC-I-S-02 and RC-I-S-03
3. SSPP sections 2.1.6.1 and 2.1.6.2
4. CFR 49 Part 236

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

VITAL RELAYS-WAYSIDE

Randomly select six vital relays (3 AC type and 3 DC type). From a combination of procedure and record reviews as well as visual inspections of the selected items, determine whether or not:

1. The vital relays are properly controlled and calibrated against certified standards at prescribed intervals as required by applicable procedures.
2. The vital relays calibration status is on file and can be verified.
3. Any defects were noted and either corrected or logged for tracking.
4. Verify that the equipment used to check the relays is subject to calibration or has been considered for entry into the calibration program.
5. The hazard management and safety data acquisition processes are followed and there is coordination with upper management on faulty equipment issues and trends.
6. Is document control established and properly implemented for inspection and maintenance records?

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-MOW-16	Date of Audit:	Persons Contacted:
Department: Way, Power and Signal	Auditor:	
49 CFR Requirement: 659.19(f, g, i, m, n, o, & p)		

REFERENCE CRITERIA

1. SOP's: 105.1, 105.2, and 105.21
2. SSPP sections 2.1.6.1 and 2.1.6.2

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

OVERHEAD CATENARY SYSTEM

Review the RTD's file of completed Overhead Catenary System (OCS) inspection reports prepared during the past two years to determine whether or not:

1. The OCS was inspected and adjusted at the specified frequency as required by the referenced criteria.
 - i. If possible, accompany the inspector on a visual inspection; discuss the procedure and assess its effectiveness.
2. The required inspections were properly documented (checklists?).
3. Any defects were noted and either corrected or logged for tracking.
4. The hazard management and safety data acquisition processes are being followed and there is coordination with upper management on faulty equipment and recurring maintenance issues and trends.
5. Document control is established and properly implemented for inspection and maintenance records?
6. Assess the overall effectiveness of changes to the program, which were enacted as a result of the last audit of this area.
7. Training programs are in place and being carried out for the safety related aspects of this program.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-VM-17	Date of Audit:	Persons Contacted:
Department: Vehicle Maintenance	Auditor:	
49 CFR Requirement: 659.15 (19)(f, g, i, m, n, o, & p)		

REFERENCE CRITERIA

1. Preventative Maintenance Inspections (PMI): A-21, Track Brake; A-22, Friction Brake; A-23, Brake Caliper and Support; & A-24, Brake Disc
2. SSPP sections 2.1.6.1 and 2.1.6.2

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

LRT BRAKE INSPECTIONS

Randomly select 10% of transit vehicles and examine inspection records for the previous year to determine that:

1. The required inspections were properly documented (checklists?).
2. Any defects were noted and either corrected or logged for tracking.
3. The hazard management and safety data acquisition processes are being followed and there is coordination with upper management on faulty equipment and recurring maintenance issues and trends.
4. Document control is established and properly implemented for inspection and maintenance records.
5. Training programs are in place and being carried out for the safety related aspects of this program.
6. Supervision program is in place to observe compliance and understanding of training and procedures.
7. If possible, accompany the inspector on a break inspection; discuss the procedure and assess its effectiveness.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-MOW-18	Date of Audit:	Persons Contacted:
Department: Way, Power and Signal	Auditor:	
49 CFR Requirement: 659.19(f, g, i, m, n, o, & p)		

REFERENCE CRITERIA

1. SOP's: 105.1, 105.2, and 105.2
2. PM Inspection Checklists: SB-I-S-0, SB-I-S-01, SB-I-S-02, SB-I-S-03, and SB-I-S-04
3. SSPP Table 2-1

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRACTION POWER SUBSTATION (TPS) MAINTENANCE AND INSPECTIONS

Randomly select a sample of two substations each from the SW, SE, CPV, and Central corridor lines and review RTD's file of completed PM inspection and test reports for the sampled TPS's for the previous 18 months to determine whether or not:

1. The required inspections were performed as required by the associated SOP or maintenance procedure.
2. The inspections were properly documented on a standardized report form.
3. Repairs to correct noted defects and deficiencies were carried out and properly documented in a timely manner.
4. The hazard management and safety data acquisition processes are being followed and there is coordination with upper management on faulty equipment and recurring maintenance issues and trends.
5. Document control is established and properly implemented for inspection and maintenance records.
6. Training programs are in place and being carried out for the safety related aspects of this program.
7. Issues related to stray current and power isolation are addressed to ensure worker safety and public protection and safety.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-MOW-19	Date of Audit:	Persons Contacted:
Department: Way, Power and Signal	Auditor:	
49 CFR Requirement: 659.19(m & p)		

REFERENCE CRITERIA

1. RTD Track Inspector and Signal/Power Inspector Training Program
2. SSPP Sections 6.7.1.3 and 6.7.1.4

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRACK MAINTAINER AND SIGNAL/POWER MAINTAINER TRAINING AND QUALIFICATIONS

Obtain a copy of the RTD's list of qualified Track Maintainers and Signal And Power Maintainers. If possible, randomly select 25% of the technicians from each category and then review the training and examination records of those selected, for the previous two years, to determine whether or not:

1. The current training lessons plans and testing for qualification and re-qualification reflect the person's assigned duties.
2. Training, qualification and re-qualification records are in compliance with the referenced criteria.
3. Document control is established and properly implemented for training records.
4. Supervision program is in place to observe compliance and understanding of training and procedures.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-MOW-20	Date of Audit:	Persons Contacted:
Department: Way, Power and Signal	Auditor:	
49 CFR Requirement: 659.19(19)(f, g, i, m, n, o, & p)		

REFERENCE CRITERIA

1. SOP 103.14, Emergency Passenger Evacuation
2. RTD Lightrail Emergency Plan

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

STATION FACILITY

Review station facility maintenance records for eight stations for the past year to determine whether or not:

1. Monthly inspections were completed
2. The required inspections were properly documented (checklists?).
3. Any noted defects were either corrected or logged for tracking.
4. Noted defects were corrected in a timely manner
5. Document control is established and properly implemented for inspection and maintenance records.
6. The hazard management and safety data acquisition processes are being followed and there is coordination with upper management on faulty equipment and recurring maintenance issues and trends.
7. Review the emergency plan to determine if there is an evacuation plan in place for the stations
8. Each audit team member will choose a station to inspect during the evening or early morning hours to determine whether lights are functioning and whether there are any noted safety or security hazards present in the station areas.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-RTD-21	Date of Audit:	Persons Contacted:
Department: Public Safety and Other Departments as Appropriate	Auditor:	
49 CFR Requirement: <p align="center">659.19(h)</p>		

REFERENCE CRITERIA

1. Reference material as particular to the corridor, modification or extension being audited

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

SAFETY AND SECURITY CERTIFICATION AND REVIEW PROCESS

Obtain a copy of RTD's relevant Certification Program.

1. Identify project being reviewed.
2. Review progress and follow-up on the Restoration Certification process.
3. Verify that the process was applied to the certifiable project.
4. Discuss how the hazard management and safety data acquisition processes are being followed and determine whether or not there is coordination with upper management on faulty equipment and recurring maintenance issues and trends.
5. Review supporting documentation of certification requirements.
 - i. Determine that the documentation exists and is appropriate for the certifiable items list (CIL).

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-SAF-22	Date of Audit:	Persons Contacted:
Department: Public Safety	Auditor:	
49 CFR Requirement: 659.19 (g & q)		

REFERENCE CRITERIA

1. SOP 101.11
2. 4 (CCR) 723-7-7343(c)(XIII)
3. RTD System Safety Program Plan 2.1.7
4. RTD Light Rail Design Criteria

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

LIGHT RAIL SYSTEM CONFIGURATION MANAGEMENT

Review the Safety Departments file of "Proposal For LRT System Change" forms, and for not less than six completed requests involving LRT System changes, determine to as close an extent as possible, whether or not:

1. An appropriate method to track the changes (i.e. change # logged in a data base) exists and is being followed.
2. The referenced procedure was followed.
3. The Executive Safety and Security Committee approved the change.
4. As built drawings and other applicable documentation was up-dated with the change and were distributed to the Operating Division and the Records Management Departments.
5. Verify that procurement procedures are in place, which preclude the introduction of defective or deficient equipment into the RFG system.
6. Perform a review of SOP 101.11 to check for enforcement of as-built plan updates as required during the last audit of this area.
7. Modifications to applicable procedures were made if needed either due to system changes or to mitigate safety concerns resulting from changes.
8. Perform a review of SOP 101.11 to check for enforcement of as-built plan updates as required during the last audit of this area.
9. Modifications to applicable procedures were made if needed either due to system changes or to mitigate safety concerns resulting from changes.
10. Review the process and procedure of the review and acceptance of exceptions to the RTD light rail design criteria.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-OP-23	Date of Audit:	Persons Contacted:
Department: Rail Operations	Auditor:	
49 CFR Requirement: 659.19 (m)		

REFERENCE CRITERIA

1. SOP's: 102.3, 104.4, and 105.6
2. LRERB rule # 600 through 612, and 309
3. 4 (CCR) 723-7-7343(c)(VI)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRAIN OPERATIONS AND PERFORMANCE IN THE YARDS

1. Observe train operations in the yard for a period of one hour to determine whether or not train operators are following appropriate rules and procedures.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-RTD-24	Date of Audit:	Persons Contacted:
Department: Public Safety, Rail Operations	Auditor:	
49 CFR Requirement: 659.19 (m)		

REFERENCE CRITERIA

1. SOP's: 104.10 and 105.2
2. 4 (CCR) 723-7-7343(c)(V, IX, & XI)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

RIGHT-OF-WAY ACCESS PERMIT PROCEDURES

1. Randomly select no fewer than six ROW permits from the Master Access Permit Log (if possible, two of which require taking power down and two of which were issued to contractors) to verify the following:
 - i. Required signatures are present on each permit.
 - ii. Requester acknowledgement signature is present.
 - iii. If contractor permit, verify training has been completed.
 - iv. If taking power down, verify that OCS power removal and restoration permit/checklist was completed.
2. Verify that SOP 104.10 and SOP 105.2 are consistent.
3. If possible-visit the work site of two work crews (one RTD and one contractor) and request a copy of their work permit and quiz them on the contents and restrictions of the permit.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-SAF-25	Date of Audit:	Persons Contacted:
Department: Public Safety	Auditor:	
49 CFR Requirement: 659.19 (e & k)		

REFERENCE CRITERIA

1. RTD Light Rail Emergency Response Plan
2. SSPP sections 2.1.5.2, 3.3.15 and 4.1
3. 4 (CCR) 723-7-7343(c)(VII & X)
4. SOP's: 103.6, 103.8, 103.11-103.27, 104.8, and 105.2

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

EMERGENCY RESPONSE AND PREPAREDNESS

By interview of the AGM of Safety, Security, and Facilities Maintenance review of records, determine whether or not:

1. Fire/life safety goals and standards have been developed as described in the reference documentation.
2. Scenarios of possible fire, derailment, hazardous waste spill, or other emergency conditions, have been defined, and appropriate responses determined for employees and responders (including both emergency and security responders).
3. During the previous three year period, drills have been conducted with applicable local emergency response units for areas through which RTD operates and after action reports have been written.
4. Planning sessions have been conducted with outside agencies to discuss fire/life safety strategies and to implement findings from "After Action Reports" resulting from drills and exercises.
5. Familiarization training has been given to public agencies to aid them in their response to light rail incidents.
6. The Emergency Plan has been reviewed at least annually.
7. The program/procedure includes regularly scheduled reviews of the plan, (and updates and redistribution if needed).
8. The plan appears to be effective and easy to use and follow.
9. Lines of communication and information exchange between the RFGS and applicable outside agencies are active and well documented.
10. Training of employees on emergency procedures and response is performed and documented in accord with SSPP Section 3.3.15.
11. Emergency management procedures have been developed and implemented both in safety and security related areas.
12. Are there programs in place in the areas of emergency response training, coordination, and management, for new corridors, vehicle models, modifications, or additions?
13. Emergency drill after action reports are prepared and reviewed by the Executive Safety and Security Committee (ESSC).

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-OP-26	Date of Audit:	Persons Contacted:
Department: Rail Operations	Auditor:	
49 CFR Requirement: 659.19 (m)		

REFERENCE CRITERIA

1. SOP's: 101.1, 102.3, 104.4, 104.11, 104.13, 104.21, and all "Abnormal Operations" SOPs
2. LRERB rule # 309, 403, and 902 through 1010
3. Latest "Train Orders" and "Special Instructions"
4. 4 (CCR) 723-7-7343(c)(VI)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRAIN OPERATOR PERFORMANCE--MAINLINE

1. Through a combination of monitoring of conversations via radio and on board observation of operations, of not less than four trains between not less than four stations each, determine whether or not:
 - i. Each train operator performs in compliance with the governing rules and procedures.
 - ii. Each operator possesses the proper equipment in the cab including a functional portable radio, copies of any Train Orders and/or Special Instructions.
2. By interview of not less than three randomly selected train operators from the current roster, test their understanding of rules, procedures, and policies related to train operations.
3. Check that the above interviewed operators (or any three randomly chosen operators) are in compliance with Light Rail Employee Rule Book (LRERB) # 403.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-SAF-27	Date of Audit:	Persons Contacted:
Department: Public Safety	Auditor:	
49 CFR Requirement: 659.19 (e ,f, g, h, i, j, k & q))		

REFERENCE CRITERIA

1. SOP's: 101.11 and 101.13
2. SSPP sections 1.6, 2.1.7, 3.2 and Table 1-2
3. 4 (CCR) 723-7-7343(c, d & f)
4. Rule Book: #101

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

EXECUTIVE SAFETY AND SECURITY COMMITTEE (ESSC) AND SAFETY FUNCTIONS

By interview of the Assistant General Manager of Safety, Security and Facilities of RTD and review of records, determine whether or not:

1. The ESSC is composed of a designated group of members representing labor and management from all disciplines and departments within RTD.
2. The ESSC has met monthly during the past twelve months.
3. Meeting minutes are prepared and posted.
4. An appropriate form has been developed and made readily available to all employees to report potential safety hazards in the workplace.
5. The ESSC has addressed all employee identified potential safety hazards and issues reported during the previous twelve months by evaluating the concern and implementing appropriate corrective action measures as needed.
6. The ESSC has reviewed and if need be, taken action, on all accident investigation reports where potential hazards were noted.
7. Formal or informal hazard analysis was performed on real and potential hazards at the request of the ESSC.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-SAF-28	Date of Audit:	Persons Contacted:
Department: Public Safety	Auditor:	
49 CFR Requirement: 659.19 (i, m, p, & r)		

REFERENCE CRITERIA

1. SSPP sections 3.2, 3.3, 4.0, and Table 3-2
2. 4 (CCR) 723-7-7343(c)(V & XI)
3. Safety Policies and Procedures Manual, Hazard Communication Program
4. SOP's: 101.2, 101.13, 102.6 through 102.8, 102.10 through 102.17, and 104.10

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

EMPLOYEE AND CONTRACTOR SAFETY PROGRAM

Through a combination of interview and review of documentation determine whether or not a contractor/employee safety program exists and whether or not it includes the following for both contractors and employees:

1. A process to assess compliance with training and certification requirements.
2. A description of the categories of safety-related work requiring training and certification.
3. A description of the training and certification program for employees and contractors in safety-related positions including a description of the training material used.
4. A process to maintain and access employee and contractor records including documentation of training test scores and dates.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-D&A-29	Date of Audit:	Persons Contacted:
Department: RTD Administrative Department	Auditor:	
49 CFR Requirement 659.19 (t)		

REFERENCE CRITERIA

1. SSPP section 6.8
2. RTD Drug and Alcohol Policy (9/16/98)
3. 4 CCR 723-7-7343(c)(V & XV)
4. 49 CFR 655
5. Previous FTA Audit Reports of their audit of the RTD Drug and Alcohol Program

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

DRUG AND ALCOHOL TESTING PROGRAM

1. Does the training portion of the program include a description of the training material, and documentation of training test scores and dates for:
 - i. RTD employees?
 - ii. Contractors?
2. Review the company policy on the use of non-controlled substances which may impair an employee's ability.
3. Are supervisors trained to recognize impaired employees (Impairment Training) and are safety sensitive employees required to be seen by supervisors prior to assuming job duties (to check-in for work)?

For each rail transit employee that tested positive for drugs or alcohol over the past two years and who is currently employed in a safety sensitive position, review the records to determine whether or not:

4. The individual was evaluated and released to work by a Substance Abuse Professional.
5. The individual was administered a return to duty test with verified negative results.
6. The follow-up testing was performed as directed by the Substance Abuse Professional, with not less than six follow-up tests performed with negative results during the first twelve months after returning to duty.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-OP-30	Date of Audit:	Persons Contacted:
Department: Rail Operations	Auditor:	
49 CFR Requirement: 659.19 (m & p)		

REFERENCE CRITERIA

1. SOP's: 101.1, 101.10, and 101.15
2. LRERB
3. Bulletins, Train Orders and Inspections

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

OPERATIONS CONTROLLER/SUPERVISOR PERFORMANCE

Through a combination of first hand observations, documentation review, and interviews, determine whether or not the operations controller/supervisors:

1. Perform their duties in accord with governing rules, procedures, bulletins, notices, etc.
2. Have on file the applicable reports and logs that they are required to prepare and maintain.
3. Are knowledgeable and understand the procedures for dealing with incidents, emergencies and disasters.
4. Are effectively exchanging information during the relief transition period (from one controller/supervisor to another) for peak operations.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-SEC-31	Date of Audit:	Persons Contacted:
Department: Public Safety	Auditor:	
49 CFR Requirement 659.21, 23, 25, 27, & 29		

REFERENCE CRITERIA

1. RTD System Security Plan (SSP)
2. NTI security awareness training for employees
3. Transit Watch- public awareness program
4. Security SOP's
5. DHS/TSA Security Audit Report--BASE
6. 4 (CCR) 723-7-7344

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

SECURITY PLAN--IMPLEMENTATION AND PRACTICES

Interview the Senior Manager of Security & Emergency Management, inspect records, and review any recent DHS/TSA security report and/or security portion of any recently completed state audit report, to determine the following.

1. Is the security plan being implemented and carried out in accordance with the referenced criteria?
2. Is a program of security data acquisition and analysis in place and is it being maintained and used to aid in the analysis of security threats and the identification of trends?
3. Are there programs in place in the areas of proactive and reactive response, threat and vulnerability identification, assessment, and resolution, for new corridors, modifications, or additions?
4. Is there a security-training program in place for employees?
5. Through review and interview, determine whether CPTED is actively practiced by the agency.
6. Has RTD implemented a security certification review program for all new corridors, facilities and major expansions to assure that these expansions meet security design criteria and contract specifications?
7. Has RTD instituted access control, and perimeter gates and fencing at all facilities?
8. Has RTD implemented a systematic, District-wide threat assessment program?
9. Does RTD conduct an annual assessment to examine and report on the implementation of the SSP?
10. Through review and interview, assess the adequacy of security SOP's.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-FM-32	Date of Audit:	Persons Contacted:
Department: Facilities Maintenance	Auditor:	
49 CFR Requirement: 659.19 (f, m, n & o)		

REFERENCE CRITERIA

1. SSPP sections 2.1.6 and 2.1.7
2. 4 CCR 723-7-7343(c)(VI & XII)
3. SOP's: 105.20, 105.21, and 105.22

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

FACILITIES AND EQUIPMENT INSPECTION AND MAINTENANCE

Perform a review of the following areas to determine if regular safety inspections and assessments are being performed and follow-up action taken if discrepancies found:

1. Emergency lighting testing and maintenance.
2. Fire extinguishers inspections and performance of fire drills.
3. Emergency Generator testing and maintenance.
4. Equipment SOP.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-MOW-33	Date of Audit:	Persons Contacted:
Department: MOW	Auditor:	
49 CFR Requirement 659.19 (f, i, n & o)		

REFERENCE CRITERIA

1. RTD Bridge Inspection Procedure
2. Previous Bridge Inspection Reports
3. Bridge design criteria and construction documentation

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

BRIDGE INSPECTIONS

1. Does the bridge inspection program include the following elements:
 - i. A records system for the keeping of records (including design, construction, inspection, and maintenance records).
 - ii. Are records readily accessible?
 - iii. Comprehensive written documentation that outlines the inspection procedure?
 - iv. Complete and comprehensive inspection reports?
 - v. A schedule, which allows for regular inspection of all bridges?
 - vi. Were/are bridges inspected and are records kept?
2. Were any discrepancies noted in inspection reports, and if so, was corrective action taken if warranted?

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-RTD-34	Date of Audit:	Persons Contacted:
Department: Bus Operations, Vehicle Maintenance, IT	Auditor:	
49 CFR Requirement: <p align="center">659.19 (n & o)</p>		

REFERENCE CRITERIA

1. SSPP sections 2.1.6 and 2.1.7
2. 4 CCR 723-7-7343(c)(VI & XII)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

RADIO COMMUNICATIONS SYSTEM, MAXIMUS RECORDS MANAGEMENT SYSTEM,
CAD/AVL SYSTEM & EMERGENCY TELEPHONE SYSTEM.

Perform a review of the following areas to determine if regular safety inspections and assessments are being performed and follow-up action taken if discrepancies found:

1. Radio communications equipment.
2. SCADA and CAD/AVL system integrity and accuracy as it pertains to incident reporting.
3. Maximus Maintenance Management System.
4. Emergency Telephones on the rail system.
5. Hazard Management Process.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-SAF-35	Date of Audit:	Persons Contacted:
Department: Safety	Auditor:	
49 CFR Requirement: 659.19 (g, q & u)		
REFERENCE CRITERIA		
<ol style="list-style-type: none"> 1. SSPP sections 2.1.6, 2.1.7, and 6.9 2. 4 CCR 723-7-7343(c)(VI & XII) 		
ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION		
<p><u>PROCUREMENT PROCESS, PROCEDURES AND CONTROLS</u></p> <p>Perform a review of the procurement process and procedure to determine that it meets the requirements of the above referenced documents, specifically:</p> <ol style="list-style-type: none"> 1. Safety concerns are addressed in modifications to existing systems, vehicles and equipment which do not require formal safety certification but may have safety impacts. 2. Measures, controls, and assurances are in place and are being implemented to ensure that safety principles, hazard management requirements and representatives are included in the agency's procurement process. 		

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-OP-36	Date of Audit:	Persons Contacted:
Department: Rail Operations	Auditor:	
49 CFR Requirement: 659.19 (m)		

REFERENCE CRITERIA

1. SOP 104.6

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

STOP SIGNALS AND INDICATORS

1. Review records within the past 12 months to determine the frequency of red signal violations and reasons for said violations.
2. Review records since RTD's detailed analysis on signal violations to determine if there is a systematic problem or reportable hazard.
3. Review records of any changes made to the signal system to address possible problem areas.
4. Ride two trains along the SE, SW, and CPV corridors to determine operator compliance with SOP 104.6.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-SEC-37	Date of Audit:	Persons Contacted:
Department: Safety, Security & Facilities	Auditors:	
49 CFR Requirement: 659.21, 23, 25, 27, 29		

REFERENCE CRITERIA

1. RTD System Security Program (SSP)
2. Security SOP's: 10.4 "Use of Force", 10.3 "Reporting Use of Force", 10.5 "Firearms and Ammunition", 10.6 "Post Shooting Incident", and 30.1 "In-Service Training"
3. DHS/TSA Security Audit Report
4. 4 (CCR) 723-7-7344

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRAINING AND CERTIFICATION RECORDS FOR SECURITY PERSONNEL, AND PRIVATIZED SECURITY

Select training, and certification records of all the internal security department employees and approximately 20% of the active contract security group for the past two years to determine whether:

1. Each individual successfully completed the required initial and/or refresher training program
2. Training, quarterly firearms qualification, and re-qualification records are in compliance (including current initial POST certification and annual POST qualifications).
3. Verify that training on emergency procedures was performed as required.
4. RTD employees receive initial security awareness training, and refresher training every three years.

RESULTS/COMMENTS

**COLORADO PUBLIC UTILITIES COMMISSION
SYSTEM SAFETY AUDIT CHECKLIST FOR
THE RTD LIGHT RAIL TRANSIT SYSTEM**

Checklist No. 5-SEC-38	Date of Audit:	Persons Contacted:
Department: Safety, Security, & Facilities	Auditors	
49 CFR Requirement: 659.21, 23, 25, 27, & 29		

REFERENCE CRITERIA

1. System Security Plan (SSP)
2. West Corridor Preliminary Hazard Analysis and Hazard Identification, Assessment, and Resolution Process
3. Security SOP: 180.1

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

THREAT & VULNERABILITY IDENTIFICATION AND RESOLUTION PROCESS

Obtain a copy of RTD's System Security Plan, SOP 180.1, and copies of the Safety and Security Certification Review Program and Corridor Contract Specifications from a current corridor or expansion under construction, and determine whether or not:

1. The organization has an established and completed a threat and vulnerability assessment.
2. Programs are in place in the areas of proactive and reactive response, threat and vulnerability identification, assessment, and resolution for new corridors, modifications, or additions.
3. That the process applies to system operations.
4. That the process is applied during design and engineering.
5. That the process is applied during construction and start-up.
6. ID Badges and Access Control System are evaluated for effectiveness annually, including a review of access control, and perimeter gates and fencing at all facilities?

RESULTS/COMMENTS