Los Angeles County
Metropolitan Transportation
Authority
One Gateway Plaza
3rd Floor Board Room
Los Angeles, CA

Metro

Board Report

File #: 2017-0795, **File Type:** Oral Report / Presentation **Agenda Number:** 25.

SYSTEM SAFETY, SECURITY AND OPERATIONS COMMITTEE
MAY 17, 2018

SUBJECT: SYSTEM SAFETY, SECURITY AND OPERATIONS UPDATES

ACTION: RECEIVE ORAL REPORT

RECOMMENDATION

RECEIVE oral updates on Light Rail Overhead Catenary System.

ITEM 25

Overhead Contact System Update

System Safety, Security & Operations Committee

May 2018

Metro

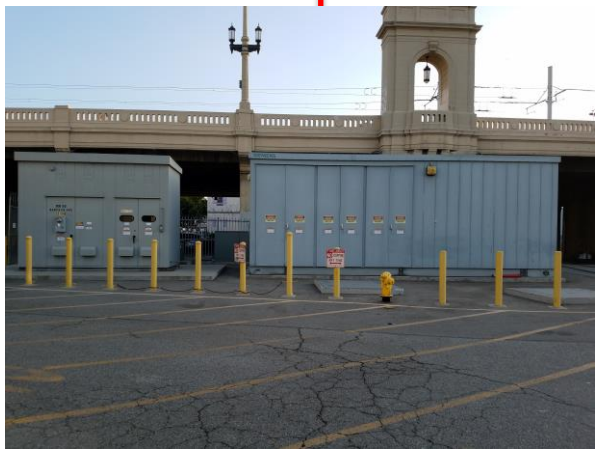
Description

- The **Overhead Contact System** (**OCS**) is the overhead wire that is used to supply electricity from the wayside traction power substation to rail the vehicle.
- The **Pantograph** is the vehicle equipment of the power system that is used to collect electricity for the rail vehicle.
  - During normal operation, the pantograph pushes up against the OCS as the rail vehicle travels along the right of way.
  - When the pantograph is in contact with the OCS, electricity flows from the wayside traction power system to the rail vehicle.

Metro

Power Flow Diagram

Positive power runs from the TPSS to the OCS and collected by the pantograph



TPSS is connected to AC utility power

Metro

Power Flow Diagram

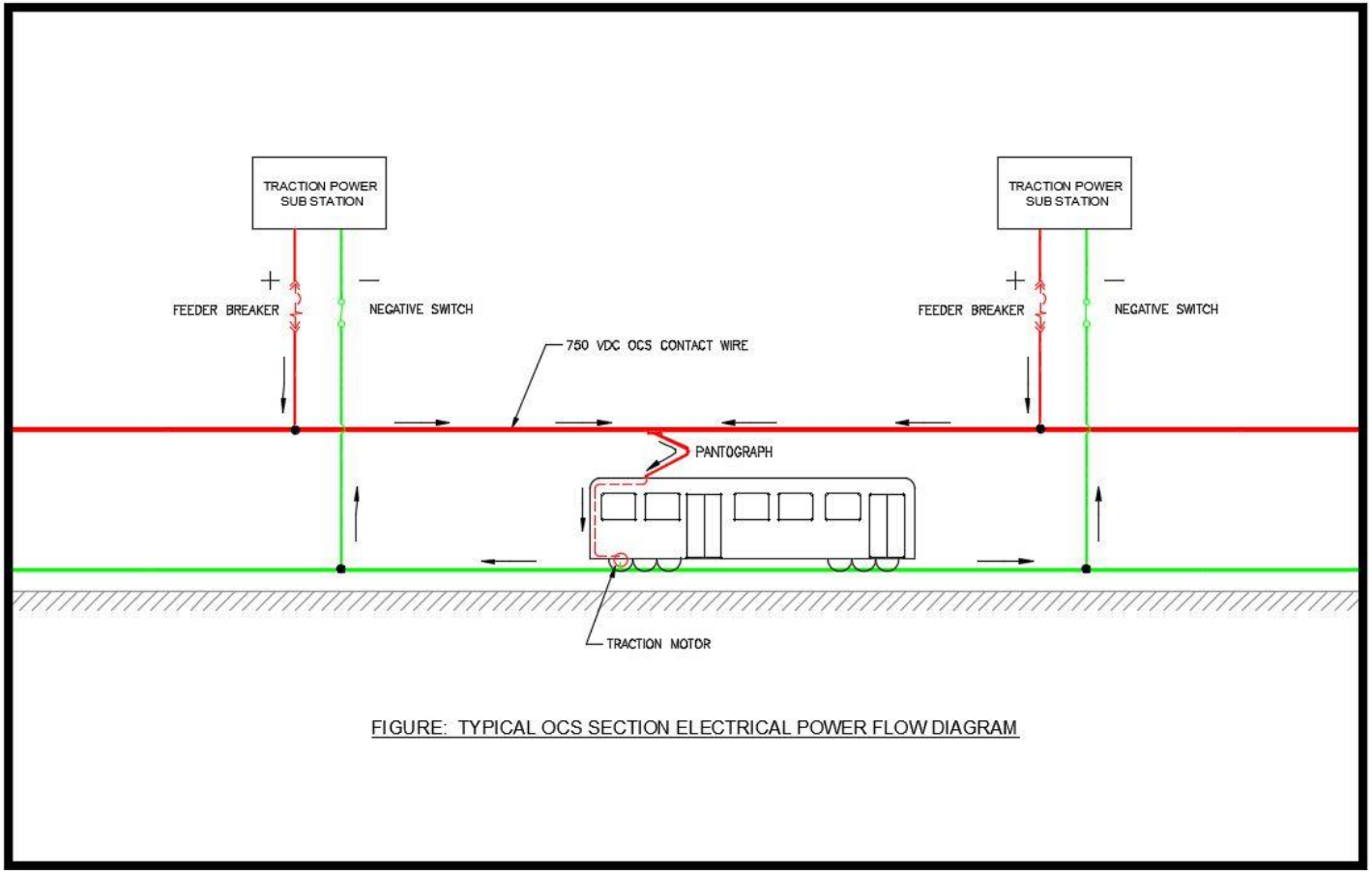
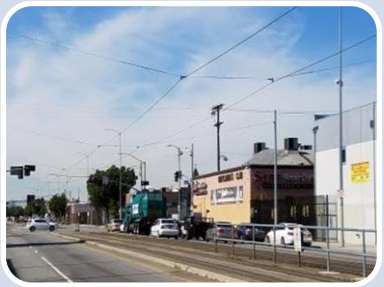


FIGURE: TYPICAL OCS SECTION ELECTRICAL POWER FLOW DIAGRAM

Metro

Types of OCS



Single Wire Fixed Tension

- Street Running
- Slower Speeds

Double Wire Fixed Tension

- Messenger and Contact Wire
- Non-Street Running
- Faster Speeds

Double Wire Auto Tension

- Counterweight/ balanceweight equipment
- Dedicated ROW

Metro

OCS Types by Line

Line	Line Miles	Single Wire Fixed Tension	Double Wire Fixed Tension	Double Wire Auto Tension	Interlockings
Blue	22	7.6	N/A	14.4	14*
Gold	31	N/A	N/A	31	19
Green	20	N/A	N/A	20	17
Expo	15.1	N/A	1.6	13.5	17*
Total	88.1	N/A	N/A	78.9	67

**Blue and Expo Lines share 3 interlockings*

90% of OCS is Double Wire Auto Tension which is the most challenging to maintain

Metro

System Maintenance Challenges

OCS Auto Tension

- Many parts to maintain
- More moving parts
- Affected by temperature (hot/cold) changes

Interface with Car Equipment

- Pantograph
- Carbon contact strip

Track Access

- Mainline
- Interlockings *(most disruptive to service requiring bus bridges or extended headways of 30+ minutes)*

Preventive Maintenance Plan

- Current required Preventive Maintenance frequency for all OCS components is every 12 months

Metro

OCS Incidents – 12 Months

Line	Date	Description
Blue	8/13/2017	OCS & Pantograph damage. Feeder cable single clamp failed.
Blue	12/21/2017	OCS & Pantograph damage. Low hanging section insulator.
Blue	1/2/2018	OCS & Pantograph damage. Low hanging section insulator.
Blue	2/22/2018	Defective section insulator.
Green	10/9/2017	Worn Contact Wire broke at the Paramount Interlocking.
Green	12/17/2017	OCS & Pantograph damage. Broken dropper/hanger wire.
Gold	12/20/2017	OCS & Pantograph damage. Jumper wire hanging below the contact wire.
Gold	4/23/2018	Broken OCS Auto Tension cables at the Indiana Interlocking, track 1.
Expo	-	No events.

Metro

Going Forward

OCS Maintenance

- Increase inspection frequencies based on component/subsystem
- Revise existing Preventive Maintenance procedures

Car Equipment

- Added inspection tasks to existing Preventive Maintenance procedures for pantographs

Interdepartmental Collaboration

- OCS/Pantograph Working Group was established in December 2017

Technology

- Vehicle Mounted OCS Monitoring System – Camera based
- Trackway Pantograph Monitoring System – Yard Exit Tracks

More Track Access

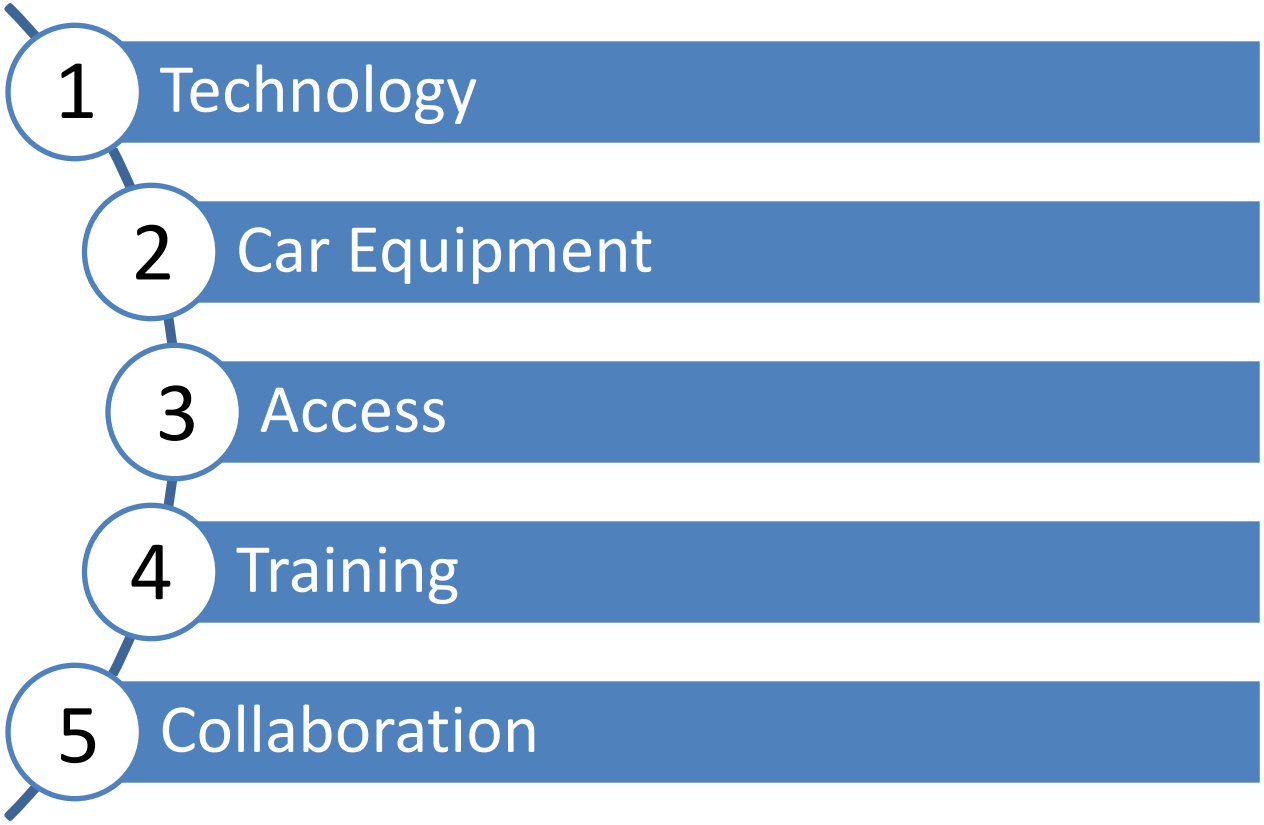
- Long Range Track Access planning
- Short & Long range planning for interlocking maintenance/repair

Increased Training

- Review of program & content
- Increase frequency of regular hands-on training at Baker Storage Track (Division 21)
- Increase training capabilities at Baker Storage Track

Metro

OCS Proactive Initiatives



Metro