Heavy Rail Vehicle Procurement
Orange Line and Red Line

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Project Summary

- Carbuilder – CRRC MA, formerly CNR
  - 152 Orange Line Cars
  - 252 Red Line Cars
- Orange Line Expected Revenue Service – Fall 2018
- Red Line Expected Revenue Service – Fall 2019
Orange Line Pilot Cars
Project Goals

- Replace Orange Line #12 Fleet and Red Line #1 and #2 Fleets
  - #1 Fleet – 1969 – 1970
  - #2 Fleet - 1988
- Subsequent Contract Amendment added 120 Red Line Cars to replace the #3 Fleet
  - #3 Fleet – 1993 - 1994
Project Justification

- Orange Line Fleet
  - End of expected service life
  - Necessary Carbody Repairs
  - No mid-life Overhaul

- Red Line Fleets
  - #1 – Beyond expected Service Life
  - #2 – End of expected service life
  - #3 – Standardization of Fleet and cost/benefit “New vs. Overhaul”
Specification Development

- Concept Report
- Specification Development
- Reviews at each phase
  - Stake Holder
  - Industry Review
Design Highlights

- Accessibility
  - 4 Accessible Locations
  - Wider Doors (64 in, each leaf 32 in)
  - Gap Mitigation Device
  - Audio (PA), Visual (LED) and PEI (6 locations)

- Functionality
  - ASME RT-2 2014 Compliance
  - Remote Diagnostics
  - LED Lighting (APTA-RT-S-VIM-020-10)
  - LLEPM (APTA-RT-S-VIM-022-10)
  - CCTV / Video Recording
  - LCD Monitors (6/8)
Evaluation Process

- Sequestered Evaluation Team
- All affected MBTA Departments Represented
- Consultant Support
  - Procurement Management Team
  - Technical Consultant
  - Financial Capability Consultant
  - Technical Peer Consultants
Design Process

• Collaborative Design Process
  • PDR
  • IDR
  • FDR
• Local and Remote Meetings
• Informal (Interim) Parallel Reviews
• Active Involvement of Stakeholders
  • Team Oriented Approach
• 18 Different APTA Standards & Recommended Practices (RPs) were cited in the procurement
  – 2 Electrical Standards, 5 Electrical RPs
  – 4 Rail Transit Systems Standards
  – 5 Construction & Structural Standards
  – 2 Mechanical Standards
  – 1 Passenger Systems Standard
Standards In Action

- APTA’s Rail Transit Emergency Systems Standard Suite
- 4 standards (now 5) that describe industry-consensus requirements for various aspects of Rail Transit Vehicle Emergency Systems
- Subjects covered include Emergency Lighting, Emergency Signage, Low-Location Emergency Path Markings, and Emergency Egress/Access
2018 Rail Conference

Orange Line Mock-Up
Laser Welded Skin

- Aesthetically Pleasing
- Stainless Steel (PR-CS-S-004-98)
- Collaborative Structural Review with CRRC and their consultants
ASME RT-2 Compliance

• Minimum strength requirements for coupler pockets, collision & corner posts, and buff load
• Now requires the builder understand how the trainset behaves through two specific collision scenarios. The areas of interest for the scenarios are vehicle deceleration rate, operator & passenger space, and remaining on the rail.
• Requires a minimum series of tests be performed to validate the vehicles strength.
ASME RT-2 Compliance
ASME RT-2 Compliance
2018 Rail Conference

Red Line Mock-Up
Passenger Information Screens

- Screen size, quantity and locations revised during Orange Line Mock-Up review
- 24” LCD Monitors
- 6 / 8 screens on the Orange and Red Line cars
- On-Board Controller with ability to push messages from Wayside.
Current Status

- Orange Line
  - Four Pilot Cars in test in Boston
  - Four Pilot Cars in test in Changchun
  - Four Production Cars in Final Assembly in Springfield, MA (December 2018 delivery)

- Red Line
  - Mock-Up constructed and inspected in Changchun (arrives in Boston in July)
  - Structural Test Shell Under Construction
Final Assembly Facility

- 100% State Funding allowed a Massachusetts Final Assembly Requirement
- CRRC MA designed and constructed a 204,000 square foot facility with a 2,240 foot dynamic test track in Springfield Massachusetts.
- Currently, 86 employees at the Springfield Facility, with a goal of 150 at full occupancy
- The facility will assemble not only MBTA vehicles, but vehicles for LA METRO and SEPTA
Orange Line Pilot Car
Thank You