

Monday, October 30, 2017

ACCRS HO Scale Electrical Improvement Group

Evaluation and Identification of HO Scale Lay Out Electrical Issues

On 9/23/17 the HO Scale Electrical Improvement Group (Jere, Wayne, Tony, and Joel) met and reviewed current electrical issues associated with the HO Scale lay out. The following is an outline of electrical issues identified by this group.

Issues Identified.

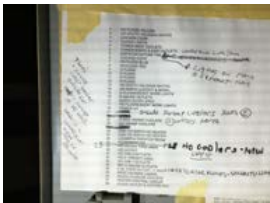
1. Feature/Accessory Wiring

- a. Building lighting, Miller engineering animated signs, Street lights, Crossing/Signals lighting, special effect lighting. Currently 12v and 5v DC voltages are used. In the city area plastic boxes have been used to enclose computer power supplies. These supply 12 v DC to power lighting and accessories in the city area. Periodically these supplies blow fuses. This indicates that they are not rated correctly for the current draw placed on them. The use of the used equipment is suspect with respect to design and operation. There is no inventory of what is used and what the power requirements are.



2. 110 v- 120v Usage/Systems

- a. Conduit circuit documentation - Outlet circuit number documentation. With respect to the entire lay out there is no documentation of how the 110 V system is laid out or installed. (one line diagram) Outlets are not identified and with the correct circuit breaker on the main panel.



- b. Understand current loads. There is a need to understand the current and future current loads for the lay out. When O scale, other AC electrical demands are employed, are we over driving the AC voltage provided to the building?
- c. Examine power area for correct ground and polarity wiring. In the port area there are 110 V outlets that lack a ground wire. It is unclear how many have this issue. It is unclear if this is occurring elsewhere. One member stated that he received a shock while working on this system.

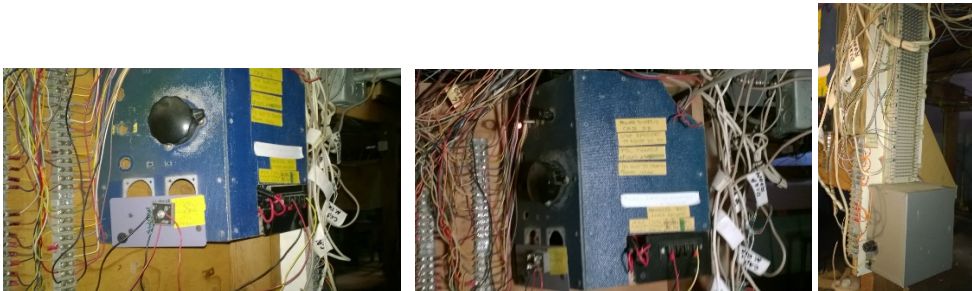
- d. 110v - 120v usage will not pass inspection (extension cords). Extension cords have been used rather than provide conduit and receptacles to provide power to TV monitors and the exterior wig wag signal. This practice is illegal.



- e. 110v - 120v fans. The exhaust fan above dispatch is not working. It is unclear why it has stopped.
- f. Heating elements. Some heat tubes above lay out are burned out and need to be replaced.
- g. Swamp Coolers. The exterior swamp coolers GFI (ground fault interrupters) will periodically trip requiring a reset. It is not understood why this is occurring.

2. DCC – DC System

- a. Block power supply wiring. With respect to the entire lay out It is unclear if DCC voltage is maintained consistently (should be 14 V +/- 1 V) throughout the entire freight and passenger main tracks. It is unclear if all frogs on turnouts are powered. There is no consistent labeling of track bus or turnout control bus or accessory bus. There are numerous instances of wiring that has been disconnected but not removed from lay out.
- b. Turnout power supply wiring. In the city area it is unclear if the designated turnout power bus has been used to power accessory lighting. This may cause turnouts to not work correctly.
- c. DCC system power supply. We have no backups for the existing command station or boosters. Back up units should be considered for purchase.
- d. DCC Jack Labeling. In the city area DCC throttle jacks on the front of the lay out lack labeling "DCC"
- e. Cab 3 Wiring DC Power Supply. It unclear how this system is installed and what various components are used for. This supply needs to be examined and upgraded.



Recommendations

1. Halt any further electrical installations, features, or make changes until existing issues identified have been resolved
2. Form team and priority plan (need more help to work under layout to document, chase wires, etc.)

3. Create logical zones in the layout for feature/accessory wiring and provide structured wiring.
4. Purchase quality power supplies, distribution blocks and for feature/accessory wiring.
5. Use electrical contractors when needed for 110v - 120v wiring.
6. Implement a change control policy for all electrical work.
7. Update existing electrical and wiring documentation.
8. Leverage Wiki software tools to enable collaboration with web based access.
9. Purchase spares for NCE DCC system. Currently being considered.