Riding the Rails is Rough

Railroads offer a multitude of possible applications for rugged industrial computer systems. The railroad environment can also be amongst the harshest possible environments for computers. There can be extremes of both high and low temperatures, high and low humidity, high dust and dirt loading in the air, and continuous vibrations. In some cases, these conditions can be improved but not always or it may not be economical to do so.

Applications include both fixed environment and rolling stock.

Fixed or station applications can include:
- Turnstile control
- Fare collection systems
- Ticketing systems
- Message sign systems
- Station annunciation systems

Rolling stock applications can include:
- Driver console
- Mobility control unit
- Vehicle control unit
- Network video play-back
- Network video recorder
- Passenger information system
- Engine data logging and predictive maintenance

An example of a fixed installation with a tough environment is the station annunciation system. In larger metropolitan areas, these signs serve two functions. One function is normal information for the riders on train arrival, train destination, and so forth. Another function is mandated by Homeland Security to provide notification to people in the station in the event there is a terrorist attack or other emergency directing them to the nearest safe exit. Homeland Security became particularly concerned with safety in the rail transportation system after the Sarin attack in Tokyo in 1995. This attack was unsophisticated yet still managed to kill 12 people, severely injure 50 and cause temporary vision problems in nearly 1,000 others.

For security, the computer systems operating the annunciation signs are placed in track-side vaults which are located away from the platforms. There is no environmental conditioning. Equipment installed in the vault is subjected to a wide variety of adverse conditions. If the vaults are located in tunnels, the temperature is benign but the humidity levels can be high. Vaults above ground are exposed to both high and low temperatures. These are not the cleanest environments.

A common condition in both installations is almost constant vibration from passing trains.

For both the New York Transit Authority and Long Island Railroad, Chassis Plans provided semi-custom rugged 4U solutions capable of accepting the customers' unique plug-in boards for network and sign communication and audio management and capable of reliable operation in these adverse environments. The systems were constructed with long-life components for support for the expected 5-8 year program life.

Chassis Plans has a long history of working with the railroad industry and can bring that experience to your project.