CASRY – Collision Avoidance System for yards and terminals

Reliable and economical solution especially designed for rail yards and terminals

The CASRY system consists of a number of Collision Avoidance Devices (CADs) mounted in the locomotives, at level crossings, near the loading/unloading stations and at certain important locations like point zones in rail yards. All CADs can communicate among themselves with the help of built-in Radio Modems. A minimum of 2km range of communication will be guaranteed with 99% availability.

The Loco CAD (CAD installed in the locomotive) is interfaced with the speedometer pulse generator (if already existing in the locomotive) and loco brake system. The CAD on the ground is connected to the field devices such as RF Tags (variable data tags), wheel sensors, etc. and receives requisite input data from them.

All CADs receive information in real time, from the field devices and other CADs through radio modem. The CAD processes this information continuously and if any collision situation arises, the Loco CAD applies brake automatically to the train / loco to prevent such collision or minimize its impact.

CASRY is designed in such a manner to facilitate easy localized and customized to target the problem; thereby enhancing their efficacy and reliability.

Collision Prevention Functions

- Prevention of Head-on Collisions
- Prevention of Rear End Collisions
- Prevention of Collisions due to fouling
- Prevention of Collisions due to shunting operations
- Speed Control and Movement at restricted areas
- Prevention of Collision due to parting and jumbling
- Train approach warning at Level crossings
- Brake application in emergency (SOS)
- Speed restrictions in designated areas

CASRY Modules

Loco CAD

This is a CAD designed and engineered to be installed in the locomotives operating in the rail yards. Each Loco CAD comprises the following: Computer system, Radio modem, GPS modem, RF tag reader, DMI, Braking Unit, DI/DO subsystems. Every locomotive installed with a Loco CAD can achieve complete collision prevention functionality. Power for the ACD is provided from the locomotive.

Terminal / Station CAD

This is a CAD installed at Terminals or Loading/unloading stations. This CAD can be interfaced with various inputs such as wheel sensors, RF Tags, Track Circuit inputs to derive certain information regarding the status of the system. It major components of Radio modem, CPU, DI/DO, serial interfaces and power supply modules.

LC CAD

In rail yards where level crossings exist, prevention of collision between rail and road users is achieved with LC CAD. The LC CAD is a device installed at manned and unmanned level crossings with Red flashing lamps and bells mounted on posts on either side of the crossing. This unit consists of a CPU and radio modem for communication with other CADs. The Omni-directional antenna of the radio modem will be mounted on the top of a 12 meter tower and connected by a RF cable. The tower will be provided with lightening protection. Power for operations can be drawn from AC mains or solar panels with a charger unit and Battery.

HAND HELD UNIT

HHU will be used to configure the CADs and to down load the event log data. It consists of Micro Controller based unit , Wireless Interface (Bluetooth), Key Pad, LCD Panel, and Serial port. Data can be uploaded or down loaded to / from the CADs through Bluetooth or through serial port.

FIELD CAD

This is a CAD installed at point zones for detection of the occupation of the zone. This CAD can be interfaced with RF Tags, Track Circuits, etc. to derive certain information about the track status.

CENTRAL MONITORING SYSTEM

As an optional feature, a central monitoring system is provided for monitoring the health status of the entire system. Emergency events can be immediately attended to based on the real-time event gathering and recording. The CADs can communicate with the Central system by means of Local GSM/GPRS network.

It can be used to monitor the position of different locomotives continuously (once in 4 seconds) and display them on yard layout in the form of a mimic diagram on the 19' display unit. The status of the CADs will be dynamically updated on the mimic diagrams.

Technical specifications

- Intel Processor, 16 MB RAM with 32 MB Flash Disc Memory and RTC.
- GNSS module with GPS/ GLONASS/GALILEO
- Operating frequency VHF/UHF Band
- TX Power 1 W to 2 Watts, programmable
- Communication Range 3 to 5 km., line of sight
- Digital I/O 24 Optically isolated, Relay contacts
- DMI for Loco pilot
- Adaptive braking
- Operating Voltage: 110v or 72vDC / 24vDC / 12VDC
- Ingress Protection Class IP54
- Operating Temperature Range – 10 to 70°C
- Optional Solar Power for operation of System
- Event logging

CASRY Implementation Plan

- Technical Feasibility study
- Time and cost estimate
- Positional GPS survey
- Inter CAD radio communication survey
- Wayside points survey for RF tag, wheel sensor, etc.
- Route design and Assessment of CADs
- Manufacturing and installation of CADs
- Customization and commissioning of the CASRY network
- Training of personnel
- Warranty Maintenance
- Post warranty Maintenance (if required)

KERNEX
Delivering Railway Safety

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