



DOZAFE

SIL2 Stockpile Dozer Telemetry System



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TECOM

SIL2 RATED DOZER TELEMETRY SAFETY SYSTEM

Dozer drivers work alone and often are operating in hazardous and sometimes even dangerous locations, where they are not in view and not under direct supervision. The nature of this type of work will often place dozer drivers at a higher risk of injury or even death.

One serious hazard, often seen around stockpiles, is the risk of falling or inadvertently driving into a valve draw point (down-hole), which is caused by a sudden collapse of the loose material around the perimeter of the feeding funnel, created as the material is drawn away.

Another severe hazard often encountered when working stockpiled material is bridging. This occurs when a void is created directly below compacted surface material. Many lives have been lost due to dozer operators driving across an area of a stockpile that looks to the eye to be stable, only to find the weight of the dozer collapses the formed bridge into the void and buries the dozer operator.

Both hazards above have had a high number of such severe incidents and multiple deaths, that have taken place both in Australia and overseas.

TECOM recognized that many of these injuries or deaths might have been prevented, if an early warning telemetry and alarm system had been integrated in place with dozers at the time.

Therefore, leveraging off the technology of our acclaimed SIL rated radio safety systems, we developed DOZAFE - which has been specifically designed to help address these hazards and dangers by providing notification and alarms while working around certain areas.

DOZAFE aids the dozer and its operator through multiple event monitoring devices and appliances:

- A SIL2 rated emergency stop for use by the dozer operator on the material stockpile to stop any conveyors as well as to close any valve draw point operation
- The dozer mounted HMI interface (display) allows for the display notification of alerts and alarms of a previously defined GPS geofence, that has been placed around or above any known hazard. The TECOM GPS provides information to the Global Navigation Safety System (GNSS), allowing the operator to take extreme care while working, or avoid a hazard by taking an alternative route.

TYPICAL APPLICATIONS

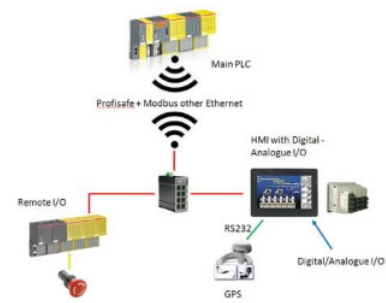
- Coal Washery Stockpiles
- Mine Sky Conveyor Stockpiles
- Material Transfer Points

FEATURES

- SIL2 approved in accordance with AS 61508
- Supports remote isolation
- Supports transfer of plant operation information
- Allows operator to perform plant control functions remotely
- Extensive diagnostics
- Open communication network

Events that can be monitored include:

- Operational and danger zones - entering or leaving any GPS marked geofenced areas
- Roll over - falls, slips or rolls over in an uncontrolled movement
- E-stop - the operator raises the alarm by activating the emergency stop
- Fire suppression - activation of the on-board fire suppression system
- Conveyor/draw points - start and stop operation
- Radio status - communications loss
- Loss of momentum - unexpected or unplanned stoppage
- Engine stop - sudden engine shut-down while in the operational zone
- Doors and interlocks - open doors and interlocks while in operational zone
- Seat belts - not engaged while dozer is in motion
- All available OEM engine management sensors



HAZARDOUS ZONE WARNING

The DOZAFE Controller (DSCS) will alert the operator of any predefined GPS marked zones, such as:

OPERATIONAL ZONE - The operator and work-site control room are alerted by way of notification, both audibly and visually, when entering or leaving a zone that has been geofence marked as a work-site operational area, such as a stockpile. This allows for event logging movements of tracked equipment.

DANGER ZONE - The operator and work-site control room are alerted by way of an alarm, both audibly and visually, when entering a GPS geofenced area that has been previously determined to be a hazardous or dangerous location. Geofenced (GPS marked) locations include:

- Physical structures: conveyors, draw points, buildings, poles, fences, dams etc.
- Natural Hazards: slippery surfaces, debris, falling objects, cliff faces, steep inclines or declines etc.
- Moving objects: crane booms, dragline operational area, reclaimer zone, trains and traffic zones

PROHIBITED ZONE - The operator and work-site control room are alerted when the dozer enters an area which is geofenced as a prohibited zone. The area might be marked to prevent entry or other events from occurring or damages to surface, flora or fauna or the area is not controlled by work-site.

COMMUNICATION MEDIUM

- Safety Integrity Level (SIL)2 data transfer for critical signals via data radio
- Voice, video and data (essential communications) via Ethernet & data radio
- Global navigational safety system data via GPS receiver



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