1. TANK GAUGING AND LEAK MONITORING

Engineering note: Tank gauge wiring from the tank gauge monitor connecting to the devices in the storage tank (tank float and leak detectors) and to the overfill alarm and/or spill container is to be Intrinsically Safe. This requirement is to protect the main storage tank and spill container from possible electric spark to ignite fuel in either of these locations. There are tank vapors present on and/or near the tank, and in the fill box container, particularly on a hot day, it is possible to have fuel vapors. For this reason, please consider removing any electrical items from the fill box or making any electrical items located within the fill box explosion proof.

1. Acceptable manufacturers subject to compliance with the specifications:
2. Critical Fuel Systems
3. Franklin Fueling
4. Pneumercator
5. General
6. Provide a storage tank monitoring system capable and sensing leaks in the tank and the associated piping.
7. Design Criteria
8. Tank Level Transmitter: The system shall include a probe capable of detecting the fuel level in the tank. Provide a float type level sensor to provide accurate level monitoring that is unaffected by changes in the specific gravity of the tank liquid and is suitable for use with fuels up to and including No. 6 fuel oil. The level sensor shall consist a head, connected to a float assembly by a stainless-steel rod or flexible cable. The sensor head assembly shall mount to the tank through a standard 4" 125/150 lb. opening and must be capable of operating in a submerged manhole environment without damage. The unit shall be capable of easy installation and maintenance. The sensor’s operation shall be unaffected by internal tank obstructions located outside of a 14" diameter cylinder extending from the top of the tank to the bottom and centered on sensor’s mount. A second float is used to measure the accumulation of water at the bottom of the tank.
9. Monitoring Panel: Provide a microprocessor-based tank gauging, leak detection, and overfill prevention system per NFPA 30 Flammable and Combustible Liquids Code, NFPA 31 Standard for the Installation of Oil-Burning Equipment and NFPA 110 Standard for Emergency and Standby Power Systems. The tank gauge shall communicate all tank level and leak data to the BAS for each storage tank indicated on the drawings. The indicator, printer, level sensors, leak sensors, and overfill alarm station shall be supplied by one manufacturer. The indicator and sensors shall be intrinsically safe for Class 1, Division 1, Groups C and D hazardous locations as defined by the National Electric Code. The monitoring panel shall display the tank volume in gallons. The panel shall indicate alarm conditions for fuel high level, fuel low level, tank leak and containment pipe leak. The tank gauges shall be able to monitor all tanks as shown on the drawings. All tank levels or leak sensors signals shall be provided as 4-20 mA or contact closure for easy interfacing to other devices as shown on the drawings. Continuous sensor wiring fault detection (open or shorted) shall be provided. Automatic delivery detection logic shall trigger a printed, and data logged, report displaying the time, date, and amount delivered for delivery verification. Provide idle tank theft alarming capability for standby tanks or emergency generator tanks as required.

As an option a printer can be added to the tank gauge to provide local printing of current status, alarms, and inventory.

1. The system shall be fully field configurable. The system shall be able to automatically generate a stick chart based on measured delivery flow and measured level if an accurate stick chart is not available for the tank.
2. The printer shall automatically, or manually, print:
3. Current inventory
4. Time/date
5. Last 10 time/date stamped alarms
6. Quality Assurance: The tank monitoring system shall be manufactured and labeled in accordance with UL508 requirements (CSA C22.2 #14 for use in Canada) and shall be labeled as Intrinsically Safe for Tank Monitoring applications.
7. Leak Detection

Review the design to meet codes including leak detectors to be located properly.

1. Provide and install leak detectors in the annular space within the double wall tank (the piping sump and/or floor or vault below the storage tank as shown on the drawing).
2. Provide and install an overfill alarm station for each tank that will alarm when signaled from one of the above tank gauges when an overfill condition has been reached. The overfill alarm panel shall contain a 4” weatherproof alarm horn with automatic silencing, 180 degree flashing lamp, bell silencing pushbutton, and alarm test pushbutton. Optional digital display of gallons can be added. Alarm can be instantly silenced with the silencing pushbutton or in 90 seconds automatically if silencing pushbutton is not activated.
3. Provide and install an Overfill Caution Sign near the Overfill Alarm Station. The Caution Sign shall read: CAUTION WHEN ALARM BELL SOUNDS OIL TANK FILLED TO CAPACITY DO NOT OVERFILL.