

RSS - RIG SUPPLY SERVICES US Inc.

IS - SERIES

INTRINSICALLY SAFE (IS)

Analogue Instrumentation Solutions





RSS range of Intrinsically safe systems and components.

Tailored to meet your exact requirements. Where hazardous area classification require protected systems RSS are able to offer a full design fabrication , installation and commissioning capability.

With many years of experience in the design and application of intrinsically safe controls, whether a drilling or production system application; RSS can provide a solution to your IS instrumentation needs.

Case Study:

RSS in partnership with HAMCO were commissioned by Transocean to provide support services in the refurbishment of a pipe handling system for a rig upgrade . RSS scope of work comprised design ,assembly and installation /commissioning of an IS pipe handling control system for both upper and lower cabs. The system was required to be intrinsically safe due to space restrictions within the cabs.

RSS completed the project on time and within budget and have since been commissioned by Transocean to provide further services for similar projects

Listed below are some of the basic components that RSS will utilise in an IS subsystem:

- Sensors Pressure, Temperature, level, Pulse, Encoder
- Displays HMI Screens, single layer text, multi layer text, Black/White, Colour
- Enclosures Stainless Steel, Cast Alloy, Poly Carbonate
- Barriers PSU, Converters, Repeaters, Programmable, Signal Splitters
- Cable Colour coded, single Pair, Multi Pair, Certified

Back ground on IS circuits:

Intrinsic Safety is the method of protection for control and instrumentation circuits where the nominal voltage is 24 VDC or less and the current is normally less than 100 mA. The concept of intrinsic safety is to limit the voltage and current so that there is never a spark with enough energy to create an explosion.

Intrinsic safety when properly used removes the ignition from the explosion triangle. There are three components to an intrinsically safe circuit: the field device, intrinsically safe barrier and field wiring.

- Field devices known as intrinsically safe apparatus are classified as simple or complex.
- Simple apparatus, which do not need to be approved, are non-energy storing devices such as contacts, thermocouples, RTDs, LEDs and resistors.
- Complex apparatus such as transmitters, solenoids, relays and transducers may store excess energy and need to be approved by a third party.
- Contacts, transmitters and temperature sensors are the most commonly used field devices in intrinsically safe applications.
- The intrinsically safe barrier limits the current with a resistor and the voltage with a zener diode.
- Intrinsically safe circuits are designed so that they operate properly under normal conditions, but keep the energy levels below the ignition curves when a fault condition occurs.

There are three components to a barrier that limit current and voltage: a resistor, at least two zener diodes, and a fuse. The resistor limits the current to a specific value known as the short circuit current, I_{sc} . The zener diode limits the voltage to a value referred to as open circuit voltage, V_{oc} . The fuse will blow when the diode conducts. This interrupts the circuit, which prevents the diode from burning and allowing excess voltage to reach the hazardous area. There always are at least two zener diodes in parallel in each intrinsically safe barrier. If one diode should fail, the other will operate providing complete protection.