framatome

Seismic Trigger

Qualified Detection System for Seismic Events

A detection system for seismic events which addresses highest requirements for robustness, reliability and capability – and thus contributes to improving the safety of nuclear power plants (NPPs)

Challenge

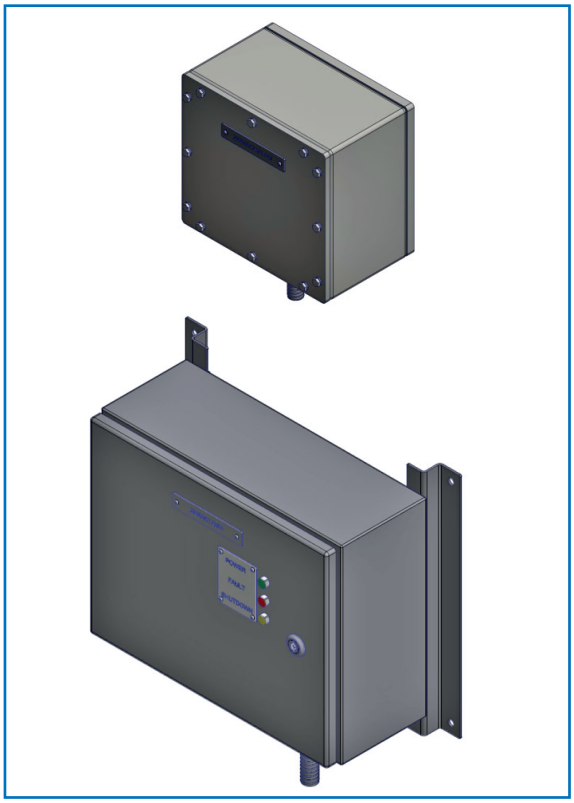
Due to higher safety requirements, utilities have started to reassess the safety margins of their NPPs in order to develop action plans for possible plant upgrades and to increase safety measures to protect both the nuclear installations and their environment. These measures were performed together with actions to limit the consequences of major seismic events.

The detection of seismic events at the earliest stage and with the highest reliability targets deterministic actions before the power plant's structures get damaged in a way that may prevent a safe emergency shutdown.

Solution

Framatome's Seismic Trigger guarantees an optimum level of reliability corresponding to the highest qualification criteria. Based on piezoelectric sensors the Seismic Trigger uses pure analog technology without any software. The system operates together with analog or digital control systems (for example reactor protection system) or allows, for example, the automatic operation of valves.

Installed on the ground or wall mounted, the system provides three analog signals in real time as an 4–20 mA current signal. A peak-hold function is implemented to fit the needs of low-frequency-sampling instrumentation and control (I&C) electronics. Furthermore, the Seismic Trigger calculates the vector sum of the two horizontal signals in order to eliminate any directional errors. For more flexibility an alarm signal is provided in the form of a relay output.



2-component design

Customer benefits

- High availability thanks to robust design in 100% analog technology
- Low operational costs thanks to low maintenance and continuous self-monitoring
- High protection thanks to optimized elimination of false alarms
- Interface compatible with analog and digital control units

Your performance
is **our** everyday **commitment**

Technical information

Performance

- Sensor signal range: ±20, ±30, ±50, ±100 or ±300 mg
- Frequency: from 1 Hz to 13 Hz
- Error: less than 5% of measurement value

Power supply

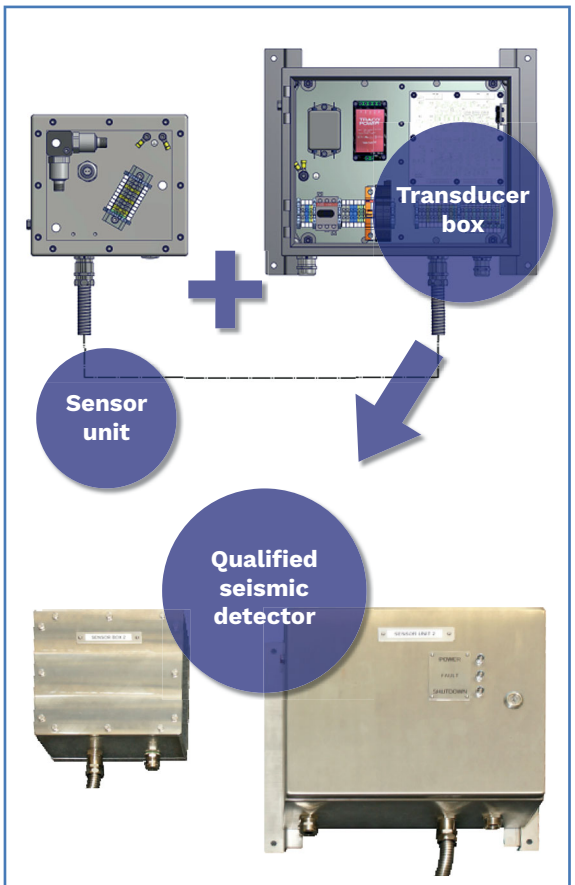
- Voltage: 230 VAC or 24 DC
- Consumption: 6 W maximum

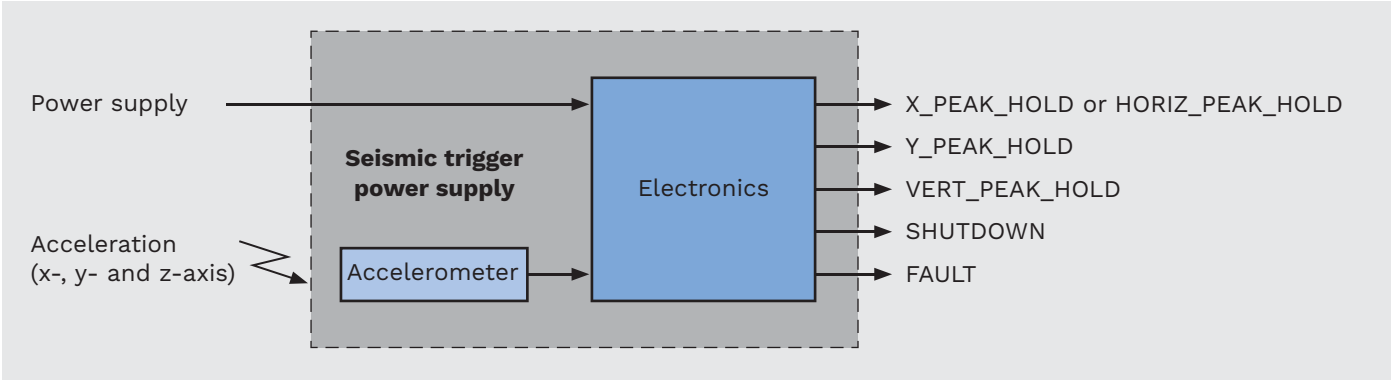
Sensor characteristics

- Type: 3 piezoelectric accelerometers for x-, y- and z-axis
- Sensitivity: 1,000 mV/g

Output signal

- Analog signal 4–20 mA
- Peak-hold function
- Vector-sum calculation
- FAULT output
- SHUTDOWN output
- 3 indicators LED (power supply status, shutdown status, fault status)
- Short-circuit proof





System outputs

References

Framatome's Seismic Trigger system has been installed at Taishan NPP in China.

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