framatome

Integrated Safety Control

Hardwired Safety Control for Emergency Diesel Generators (EDG)

Framatome's integrated electronic safety control represents a pre-qualified stand alone system built-up of discrete hardwired components. Framatome's superior know-how guarantees customized solutions at best price

Challenge

Emergency diesel generator (EDG) safety controls must operate safely and reliable to assure the emergency power during design base events of nuclear power plants (NPPs). Single failure and diversification considerations shall be fulfilled by such controls. In addition, input-monitoring, simple design, easy maintenance and repair must keep the potential risk of outage times due to repairs at a minimum. Furthermore, the implications form the qualification concerns of digital controls demand a simple and robust alternative control.

Solution

The integrated electronic EDG safety control incorporates long-term experience of Framatome with an ideal system setup for NPPs. It considers different infrastructures by modular interface configuration.

As a possible diversification of digital systems it is based on electronic technology with a long tradition and proof of suitability of the individual boards.

The maintenance is supported by the interchangeability of these integrated electronic modules and the testability of each signal. The project specifc modification of this instrumentation and control (I&C) system is realized by the hardwired interconnections of the various modules.

All modules can also be utilized in a redundant setup even with a certain degree of diversification for highest availability and reliability.

- 8x2 – fold AND-gate unit with 4 inverted outputs
- 8x2 – fold OR-gate unit with 4 inverted outputs
- 2 – fold timing unit T-ON/T-OFF delayed, with inverted outputs
- 8 – fold output amplifier unit
- 2- fold limit unit, each input channel with min/max switching functions
- 4 – fold pulse-time length limitation unit with inverted outputs
- Frequency-analog converter unit for digital, NAMUR and analog input signals. 3 parallel outputs with simulation functionality

Realization of all required safety functions in software.free integrated electronic draw-out units

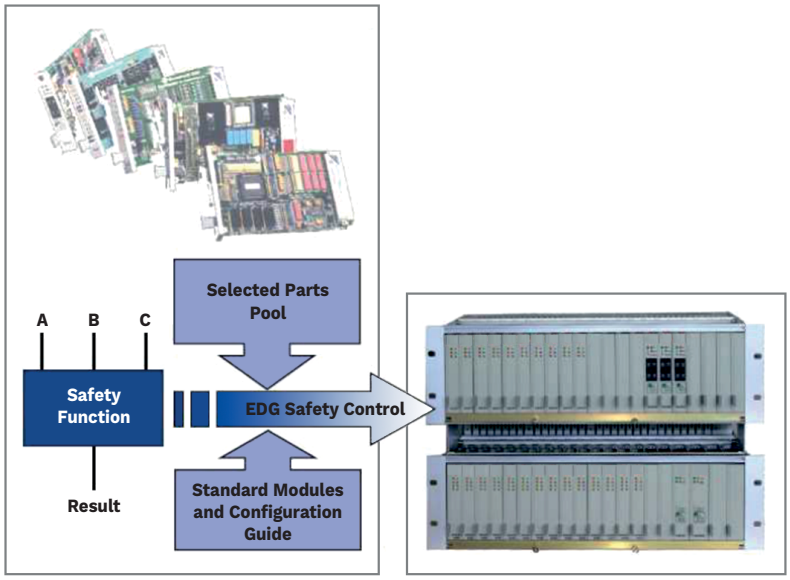
Your performance
is **our** everyday **commitment**

Technical information

- Global requirements for world wirde application with different engine types
- Covers all required EDG safety functions
- Software-free
- Separation of safety classes 1 E and N1E with integrated priority management
- Analogous and binary inputs/outputs
- Reaction times: ~3 – 10 ms
- MTBF: >200 years
- Qualified and fit-for-function selected discrete devices for the various control functions
- Slim footprint by draw-out units in 19” frame units in standard seismic proven cubicle
- Mobile Test-Case

Customer benefits

- Easy system integration and qualification through modular concept
- Software-free solutions for easy qualification approval
- Modular extension with integrated test logics
- Included spare parts management and easy replacement of obsolete devices



Mobile Test-Case

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