

Digital Protection Relay Upgrades

Turnkey replacements, upgrades and lifecycle management solutions for your critical electrical distribution equipment

Challenge

Nuclear plants need to reduce costs and keep equipment reliability high while managing protection relay aging, obsolescence and qualified resources trained to properly service antiquated technology.

Nuclear plant operators need a cost-effective strategy for addressing technical and licensing requirements of electromechanical-to-digital protection relay upgrades to maximize the financial benefits of modern protective relaying in support of continued and long-term operation.

Solution

There have been significant advances in modern digital protection relay technology, which offers reduced lifecycle costs, increased reliability and improved operational flexibility compared to existing electromechanical protection equipment.

Replacement of existing relays with digital protection relays is the optimal option to ensure reliable, safe, long-term plant operation. The transition supports the renewal of nuclear power plants' operating licenses and allows utilities to reduce lifecycle costs for electrical distribution assets.

Framatome's Total Switchgear Solutions team, as an integrator of nuclear systems, offers a series of qualified relays for nuclear safety and non-safety related applications. Framatome's team provides unmatched equipment qualification and commercial grade dedication expertise, strong relationships with relay manufacturers, robust project management practices and in-depth knowledge related to relay replacement. This knowledge spans protective relaying, digital technology, modification engineering and relay installation at a nuclear facility.



Customer benefits

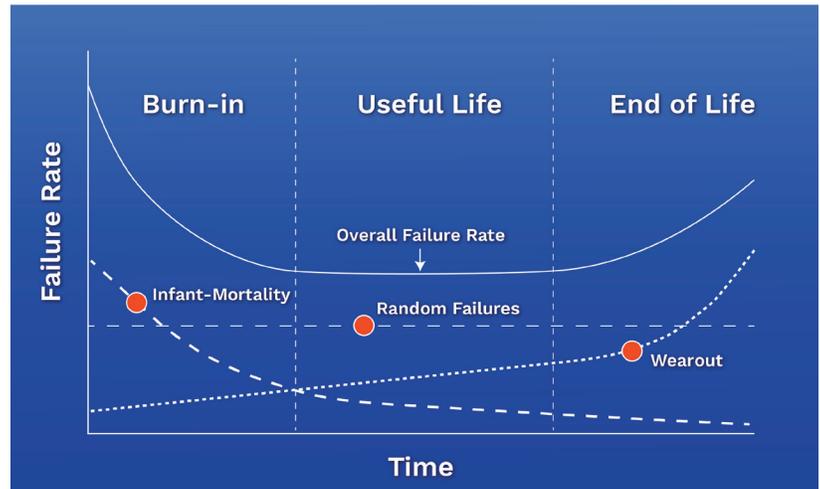
- Achieve reduced maintenance and lifecycle costs
- Increase safety and reliability for electrical distribution assets
- Off-the-shelf family of nuclear qualified relay models for safety and non-safety end uses
- Qualified replacement switchgear doors pre-wired with new digital protection relays and auxiliaries
- Turnkey solutions to manage qualification, supply, modification engineering, relay replacement and licensing

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

Technical Information

Protective relays are devices designed to detect undesirable electrical conditions and initiate one or more actions to protect electrical distribution assets and vital plant equipment. As original electromechanical relays near or exceed their useful lives, failure rates for electromechanical relays will continue to increase. Unacceptably high failure rates means increasing probability of equipment failure and associated consequences such as:

- Electrical fault
- Catastrophic switchgear failure
- Personnel injury



“Bathtub” curve of failure rate versus time

Qualified protection solutions for nuclear applications with relays from electrical protection industry leader Schweitzer Engineering Laboratories (SEL).

- Generator Protection
- Feeder Protection
- Differential Protection including High Impedance
- Motor Protection
- Transformer Protection
- I/O Modules
- Accessories and Auxiliary Devices
- Qualified and Pre-Wired Switchgear Doors
- Related Engineering Services

Regulatory Guidelines

Framatome’s qualification program defines the qualified life, and verifies the seismic ruggedness, environmental performance requirements, software and cyber security requirements for nuclear application. Framatome’s comprehensive Qualification Program is designed to provide high-quality electrical protection solutions that reduce overall cost and risk to the end user.

Approach to Implementation

Framatome’s Total Switchgear program offers a turnkey approach for the nuclear industry to manage qualification, supply, replacement and licensing and has the experience in electromechanical-to-digital relay upgrades in nuclear facilities.

Framatome recommends that plants undergo a systematic approach to upgrading to multifunction digital protection relays on a defined replacement schedule to maximize the technical benefits and cost savings. These upgrades can present positive return-on-investment in an asset management project.

Depending on the existing panel, switchgear or cabinet arrangement, Framatome can assist with determining the optimum solution for the relay replacement.

Framatome’s Nuclear Products division is focused on innovative, quality products and services that deliver the best value in the industry.

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