

Reliable Use of Old Electrical Systems in Extended Operation



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PUBLIC MEETING ON DEVELOPMENT OF GUIDANCE DOCUMENTS TO SUPPORT LICENSE RENEWAL FOR 100 YEARS OF PLANT OPERATION

21 January 2021

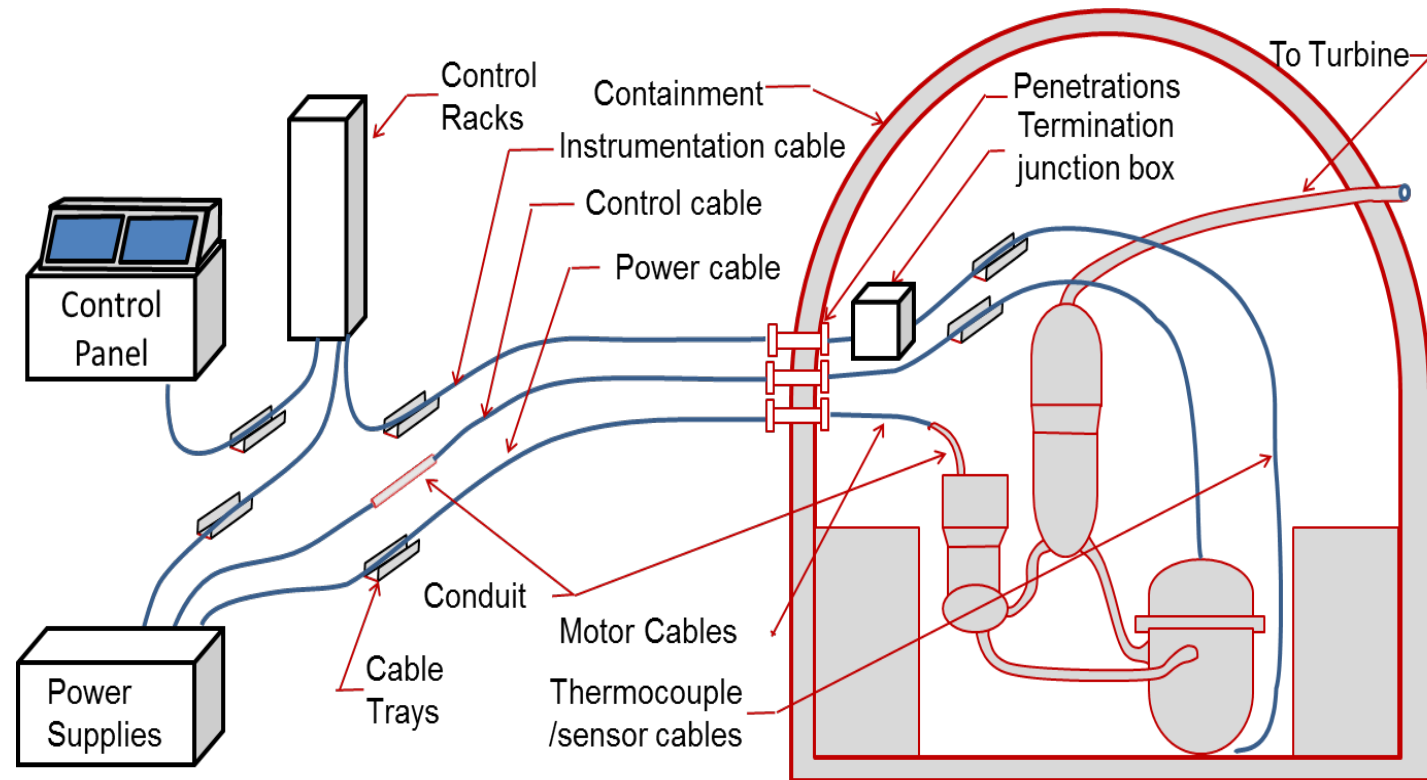


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Cables in Subsequent-Subsequent License Renewal

“Provided plant operators continually maintain, replace or repair equipment and components and make necessary upgrades, there is no operational reason that the [subsequent] license renewal process should be different than the first license renewals.”

“Effective programs require a technical understanding of aging effects, inspection and assessment techniques, mitigation measures, and guidance on repairs or replacements.”



PNNL-25432

NEI Second License Renewal Roadmap 2015

Continued Use of Aging Cables

CAMPs



➤ Use Cable Aging Management Programs

Mitigation



➤ Arrest/attenuate active aging

Rejuvenation



➤ Treat to extend useful life

Monitoring



➤ Effectively test and online monitor

Simulation



➤ Digitally assess physical assets

Test Bed



➤ Develop and demonstrate

Validation



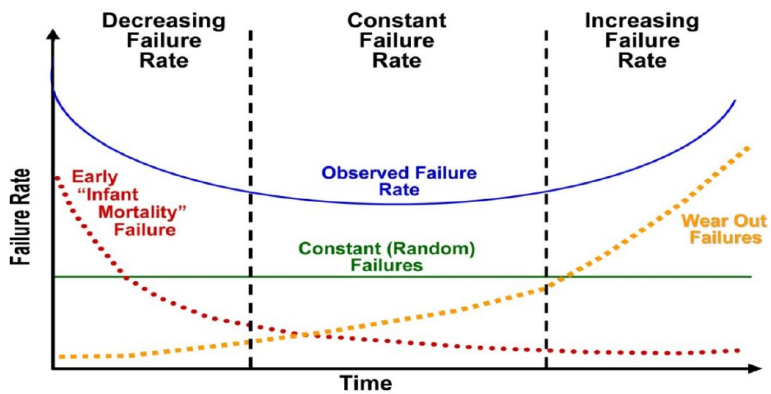
➤ Qualify in place



Managing Inventory

CAMPs

- Use Cable Aging Management Programs
 - Operating experience: plant, industry
 - Generic Aging Lessons Learned
 - Licensee Event Reports
 - Inventory: Cables, Environments
 - Testing: Historical Record, Established Criteria



allthingsnuclear.org



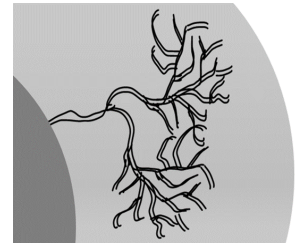
Halting/Reversing Aging

Mitigation

- Arrest/attenuate active aging
 - Alleviate adverse environments
 - Provide location intervention

Rejuvenation

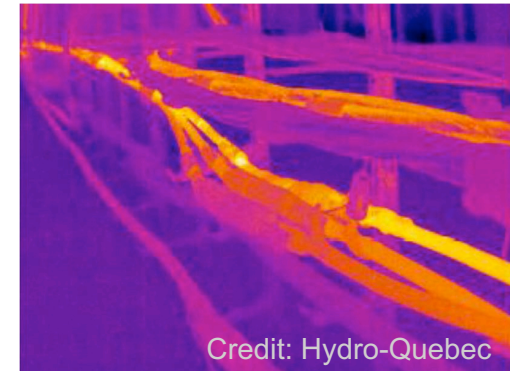
- Treat to extend useful life
 - Renew mechanical properties
 - Renew/bolster electrical properties



Aging Management Tools

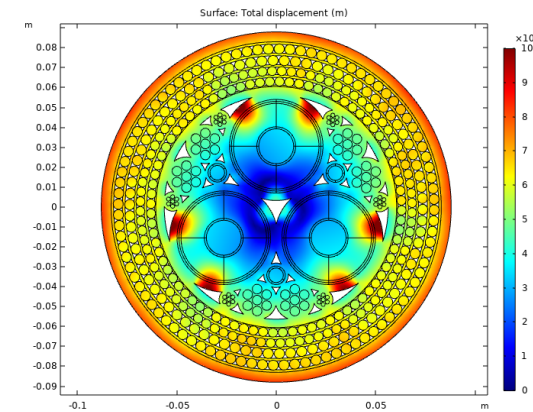
Monitoring

- Effectively test and online monitor
 - Combination of test methods
 - Online or *in situ* assessment
 - Feed data to digital twin, AI



Simulation

- Digitally assess physical assets
 - Analytical and data-based models
 - Tighter following of cable health
 - Earlier prediction of status change



Condition-based Management

Test Bed



- Develop and demonstrate
 - Offline analysis of NDE tools
 - Offline type testing



Validation



- Qualification in place
 - Risk based
 - Risk insights

