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ROP Monthly Meeting

May 22, 2019

10:00 am – 12:15 pm

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Agenda

10:00 am	Introduction/Opening Remarks	
10:15 am	Update on Changes to the Engineering Inspection Program	D. Bollock
10:45 am	Operating Experience - Brunswick CryoFit Coupling Failure	J.Carneal
11:00 am	FAQ 19-02 – Brunswick CryoFit Coupling Failure	NEI
11:15 am	Transition of FAQ 19-01 to Final Approval	J.Quinones
11:20 am	NEI's Response Letter on the 3/27/19 Executive ROP Meeting	NEI
11:40 am	ROP Enhancement – Next Steps	R. Gibbs
12:00 pm	Opportunity for Public Comments	Members of the Public
12:10 pm	Closing Remarks	NRC Management
12:15 pm	Adjourn	

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Update on Engineering Inspections

Douglas Bollock
NRR/DIRS/IRIB

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Engineering Inspection Implementation Plan

- Draft Inspection Procedures (IPs) complete - June 2019
- Develop and deliver training on new procedures for NRC staff
  - Inspection procedure changes, ties to the regulation, examples of more than minor findings, lessons learned from previous inspections
- Inspection scheduling and inspection implementation

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Focused Engineering Inspections

- Selection Criteria for Focused Engineering Inspections (FEIs)
  - Risk significance, including PRA insights and common cause failure potential
  - Operating Experience, including past industry performance trends in SSC failures and insights from NRC inspections
  - Potential for challenges, including changing conditions, which would not be identified through other inspections.

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Next Steps

- Inform the Commission of staff selections for FEIs.
  - Fire Protection (FP) FEI replaces current triennial FP and Power-Operated Valves (POV) replaces Environmental Qualification
- Work with regions to make adjustments to inspection schedules

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Questions?

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Brunswick Unit 1: RCS Leak - NOUE and Manual Scram

Jason Carneal
NRR/DIRS/IOEB

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RCS Leak – Event Timeline

- Unit 1: Operating at 100% power on 03/28/2019
- NOUE declared at 14:50 for leak rate greater than 10 gpm for 15 minutes
- Inserted a manual reactor scram from 34% power at 16:03 in accordance with procedural guidance
- Indications of leak from reactor vessel level reference leg because of erratic readings
- Licensee cooled down to Mode 4. Terminated NOUE on leak rate below 10 gpm

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CryoFit Coupling Failure

- Leak was identified on 1-inch CryoFit Coupling
- Coupling supplied by Raychem (defunct in 1999)
- Made from Titanium – Nickel Alloy (Tinel)
- Expands when cooled / contracts to original shape when warmed to ambient temperature
- Forms metal to metal swaged connection with pipes and CryoFit compatible fittings
- Susceptible to hydrogen embrittlement in water environment at high temperatures, pressures and when in the presence of hydrogen

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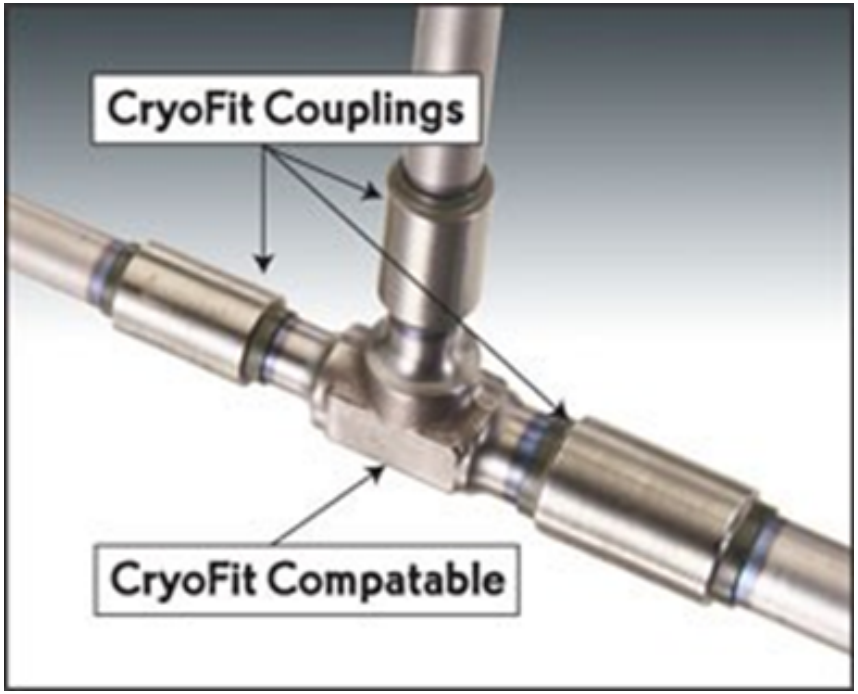
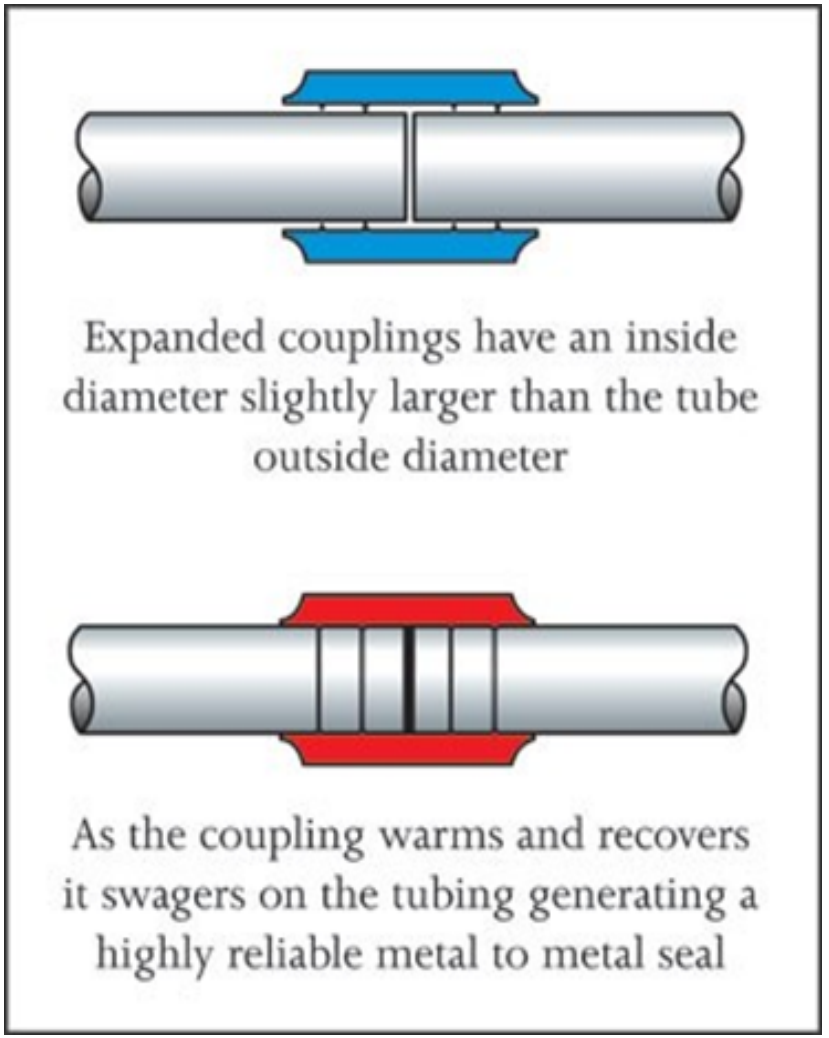
CryoFit Coupling





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Seabrook Failures (1991)

- NRR performed operating experience search of licensee event reports, inspection reports and other data looking for existence of CryoFit failures
- Identified a fracture of a CryoFit coupling on a pressurizer gas space sampling line (360° circumferential fracture at midpoint of coupling)
- A second CryoFit coupling in the same line fractured in a similar manner after an accidental physical impact during repair.
- NRC issued Information Notice 91-87, “Hydrogen Embrittlement of Raychem CryoFit Couplings.”
- No other known failures of CryoFit couplings since.

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Extent of Condition

- Only identified failures were the previously discussed failures at Seabrook in 1991
- Working with INPO to help verify extent of condition and raise industry awareness of the event.
- Possibly work with NEI to validate extent of condition

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Remaining Questions

- Extent of Condition?
- Was failure mode actually hydrogen embrittlement?
- Possible material aging component that could cause hydrogen embrittlement in addition to the known causal factors related to high temperature, pressure and hydrogen concentration?

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Questions?

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FAQ 19-02 – Brunswick Reactor Coolant System Leakage

Nuclear Energy Institute

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Transition of FAQ 19-01 to Final Approval

Joylynn Quinones-Navarro
NRR/DIRS/IRAB

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Proposed SECY on ROP Enhancement

Nuclear Energy Institute

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ROP Enhancement
Next Steps

Russell Gibbs
NRR/DIRS/IRAB

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ROP Enhancement – Longer Term Activities (1)

- Perform holistic review of problem identification and resolution (PI&R) inspections
- Examine effectiveness of the Cross-Cutting Issues Program
- Evaluate significance determination process decision-making to improve efficiency and effectiveness

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ROP Enhancement – Longer Term Activities (2)

- Evaluate changes to supplemental inspection for White findings (IP 95001)
- Optimize independent spent fuel storage installation and radiation protection inspections
- Evaluate crediting licensee performance in other safety cornerstones for emergency preparedness inspection findings

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Questions?

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Opportunity for Public Comments

Members of the Public

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Closing Remarks

NRC/NEI Management