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RES Management Briefing
Indications in the Doel 3 (Belgium) Reactor Pressure Vessel

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U.S. NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

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Background

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- Doel 3 is a 1,006 MWe, 3-loop, Framatome-supplied PWR in the Port of Antwerp near the Dutch-Belgian border
 - Began operation in 1982
 - Designed to ASME Code, Section III, 1974 Addenda
 - Reactor pressure vessel (RPV) shell is made of forged rings
 - The raw material was supplied by Krupp
 - The forgings were manufactured by Rotterdamsche Droogdok Maatschappij (RDM) in 1974-1975
 - RPV was installed in 1978



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Belgian Request for NRC Support



- On 8/28/2012, the Federal Agency for Nuclear Control (FANC) requested NRC support (ML1224A335)
- NRR requested RES support (ML1224A258)
- RES agreed to support NRR request (ML1224A108)
- NRC support to FANC
 - International Expert Review Team
 - Mark Kirk, RES/DE/CIB – meeting on November 27/28 in Belgium
 - NRC participation on three technical expert working groups
 - Working Group #1: NDE (Carol Nove, RES/DE/CIB)
 - Working Group #2: Metallurgy (Jeff Poehler, NRR/DE/EVIB)
 - Working Group #3: Fracture Mechanics (Gary Stevens, RES/DE/CIB)
 - NRC liaison to all 3 Working Groups: Bob Hardies, NRR/DE
 - Working Group meetings held on 10/16/12 in Brussels

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Working Group #1 Meeting



- Carol Nove (RES/DE/CIB) attended
- Overview of findings in the reactor shells of Doel 3 and Tihange 2

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- Discussions on documents provided by licensee prior to meeting
- Question and answer session with licensee personnel

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Working Group #2 Meeting



- Jeff Poehler (NRR/DE/EVIB) attended

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Working Group #3 Meeting



- Gary Stevens (RES/DE/CIB) attended
- 22 attendees from around the world
- Agenda:
 - Introductory remarks by Chairman (Guy Roussel, Bel V)
 - Some national regulatory views on structural integrity
 - Sweden
 - UK
 - Exchange of views about the safety topics provided by Chairman
 - Presentations on topics by some members:
 - Spain (CEN), France (ASN), Japan (JNES), Netherlands (ILENT), European Commission
 - Free discussion
- No discussion on technical reports (next meeting)

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Working Group #3 Meeting (cont'd)



- Generally, attendees of WG3 felt that:

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Industry Actions



- Industry engaged via NEI 03-08
- On 10/10/12, EPRI held a debrief call with NRC on their activities in response to Doel 3
- EPRI coordinated a visit of 6 U.S. representatives to Belgium on 9/19/12
 - The meeting was requested by WANO and Electrabel
- EPRI summarized the meeting
 - It was apparent from their summary that NRC has more information than EPRI
- EPRI has no current plans to return to Belgium
 - They will continue correspondence on NDE issues, prime understand the ramifications for U.S. plants

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Industry Actions (cont'd)



- EPRI/Industry has not identified any actions for U.S. plants yet
 - They will continue to monitor and review results and then make informed decisions when the timing is right

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Results of NRR/RES Debrief



- On Monday (10/23), NRR/RES met for a trip debrief
 - Hardies, Poehler, Stevens, Nove, Kirk, Fairbanks
- RES (Carol and Gary) are awaiting direction
- NRR plans:
 - Addressing recent FOIA
 - E. Leeds brief
 - Executive Team brief on Thursday
 - 1-page brief for Chairman
 - Potential Commissioners' TA brief
 - Trip report
 - Public meeting to be scheduled in December
 - Bilateral with France in December

U.S. Vessels That May Have RDM Forgings

Catawba 1
McQuire 2
North Anna 1&2
Quad Cities 2
Sequoyah 1&2
Watts Bar 1&2

31 plants in U.S. have forged vessels from Crueset-Loire, RDM, JSW, Lohar, Brierley Steel

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Status/Next Steps



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- FANC has requested further NRC support
 - WG3 support requested by FANC (so far) is estimated as 0.5 FTE through 12/31/12 and another 1-week trip to Belgium
 - WG1 and WG3 support has not been requested yet, other than another trip to Belgium
 - Int'l Expert Group (Kirk) – 1 or 2 meetings in Belgium plus document review
- NRR is briefing their management

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Status/Next Steps (cont'd)



- RES is meeting with NRR Monday p.m. to discuss next steps:
 - Develop recommendations for additional work on this issue
 - Provide direct support to NRR for addressing this issue in U.S. plants
 - Assist the Belgians to address issues with Doel 3 and Tihange 2 that have implications for U.S. plants
 - Establish resource estimates

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