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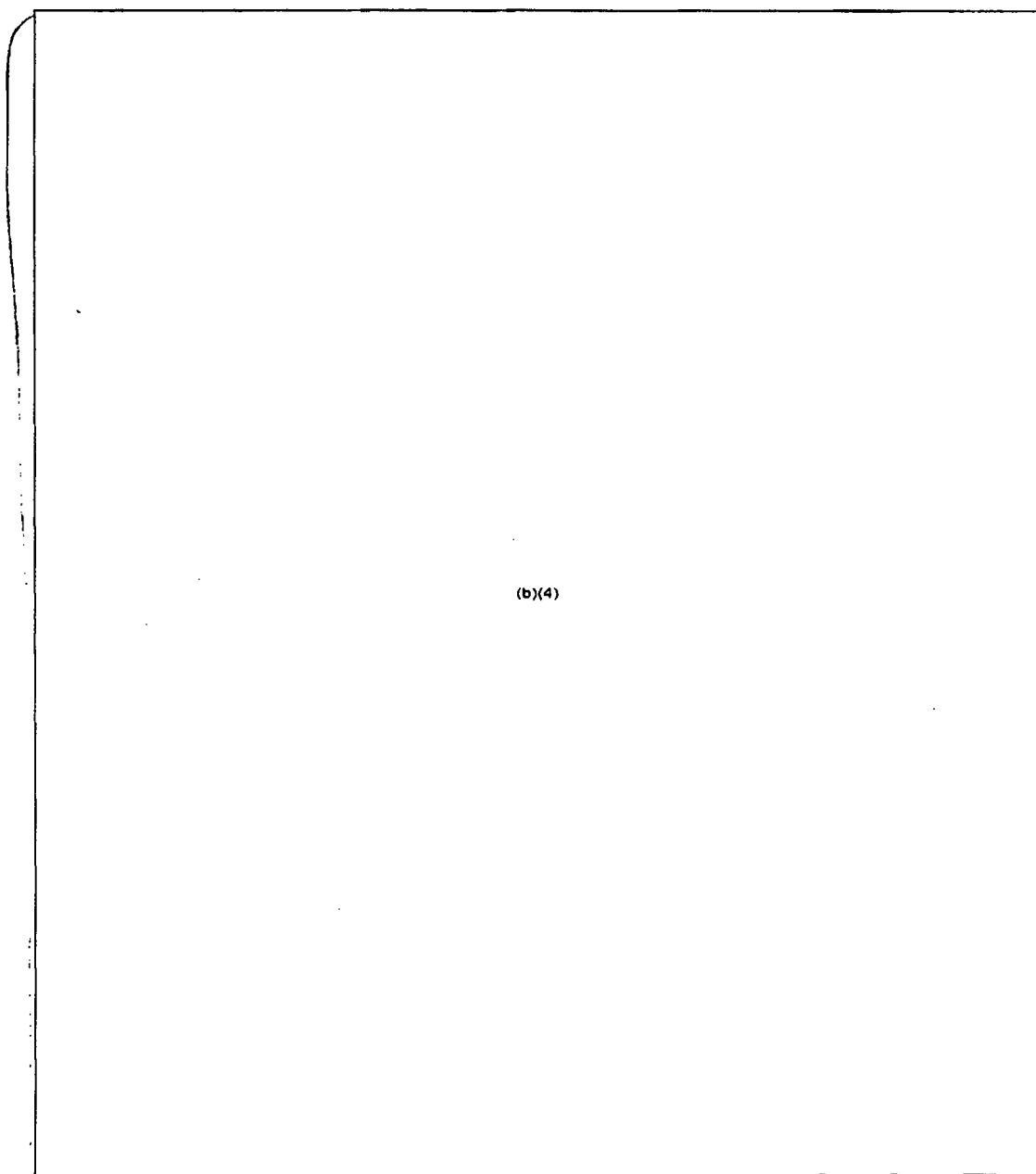
- Doel 3 is a 1,006 MWe, 3-loop, Framatome-supplied PWR in the Port of Antwerp near the Dutch-Belgian border
  - Began operation in 1982
  - Designed to ASME Code, Section III, 1974 Addenda
  - Reactor pressure vessel (RPV) shell is made of forged rings
    - The raw material was supplied by Krupp
 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



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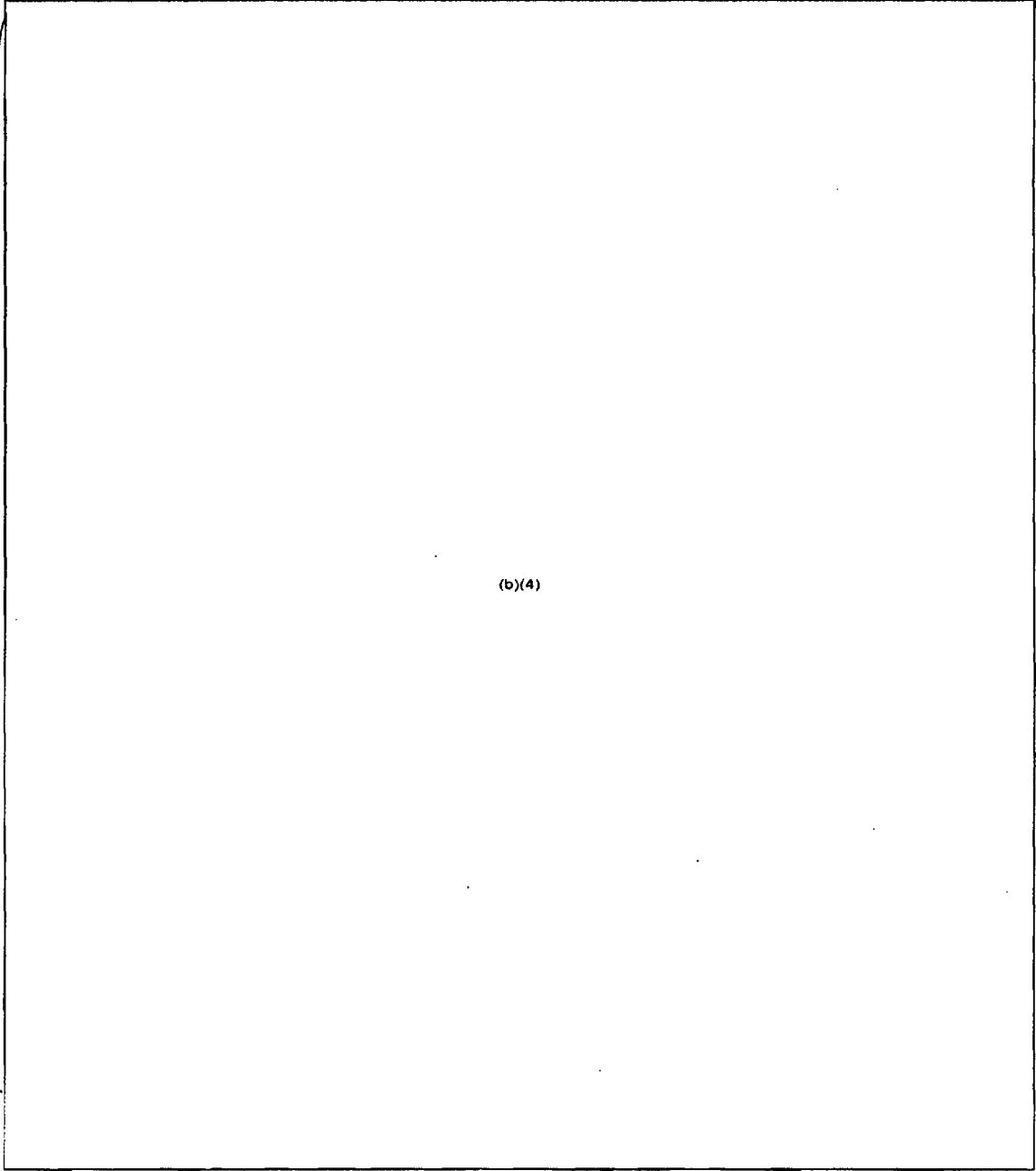
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## Belgian Request for NRC Support



- 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 person

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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 (C&N), 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
Hickory 2
North Anna 1&2
Quad Cities 2
Sequoyah 1&2
Watts Bar 1&2

31 plants in U.S. have forged vessels from Cruesot-Loire, RDM, JMW, Leda, Bismarck 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
    - Asslet 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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