

Poehler, Jeffrey

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**From:** Fairbanks, Carolyn *NYC*  
**Sent:** Monday, August 13, 2012 4:06 PM  
**To:** Poehler, Jeffrey; Hardies, Robert  
**Cc:** Hopkins, Jon  
**Subject:** RE: ACTION: Followup of list of NPPs with RPVs forged by Rotterdam Dockyards (RDM)

I think Quad Cities 1 should be 2, not 1. From NUREG-1511:

Plant Name: Quad Cities 2  
Docket Number: 50-265  
NSSS Vendor: General Electric  
Vessel Manufacturer: CB&I, B&W, and Rotterdam Dockyard Co.  
Edition of ASME Code for Design: Summer 1965 Addenda to the 1965 ASME Code  
Date of Commercial Operation: March 10, 1973  
Date of License Expiration: December 14, 2012  
ART for the Limiting Beltline Material:  
Limiting Beltline Material: Axial welds, heat PQ-1300  
ID Fluence at EOL:  $4.9E17$  n/cm<sup>2</sup>  
Initial RT ~~te~~: 40°F  
Method of determining the Chemistry Factor: Chemistry data per  
Paragraph C.1.1 of RG 1.99, Rev. 2  
Increase in RTNDT at EOL: 46°F  
Margin: 46°F  
ART at EOL: **132 °F**  
USE for the Limiting Beltline Material:  
Limiting Beltline Material: Lower shell plate, heat C-1501-2 and axial  
welds, heat PQ-1300.  
1/4T Fluence at EOL:  $3.4E17$  n/cm<sup>2</sup>  
Initial USE: Heat-specific values not reported  
Percent Drop at EOL: 12% for plate and 20% for weld  
USE at EOL: Not applicable because heat-specific values not reported  
Date at which Screening Limit will be Exceeded: Not applicable because  
heat-specific values not reported  
Bases for Accepting the USE at EOL: Equivalent margins analysis was  
performed in Topical Report NEDO-32205, Rev. 12  
References:  
Initial RT chemical composition, initial USE, and fluence data are  
from July 1, 1992, letter from M. A. Jackson (CECo) to T. E. Murley  
(USNRC), Subject: Dresden Station Units 2 and 3; Quad Cities Station  
Units 1 and 2; LaSalle County Station Units 1 and 2  
iStaff

**From:** Poehler, Jeffrey *NYC*  
**Sent:** Monday, August 13, 2012 4:00 PM  
**To:** Hardies, Robert; Fairbanks, Carolyn  
**Subject:** RE: ACTION: Followup of list of NPPs with RPVs forged by Rotterdam Dockyards (RDM)

Watts Bar 2 hasn't operated yet...but may soon. Surry 1 and 2 were welded by Rotterdam but of plate not forgings.

B/114

Jeffrey C. Poehler  
Sr. Materials Engineer  
NRR/DE/EVIB  
(301) 415-8353

**From:** Hardies, Robert *NR*  
**Sent:** Monday, August 13, 2012 3:58 PM  
**To:** Poehler, Jeffrey; Fairbanks, Carolyn  
**Subject:** FW: ACTION: Followup of list of NPPs with RPVs forged by Rotterdam Dockyards (RDM)

Mystery solved. The numbers work out now. But which is the plant that has never operated....or s that one not on this list?

**From:** Hopkins, Jon  
**Sent:** Monday, August 13, 2012 3:52 PM  
**To:** Hilland, Patrick  
**Cc:** Cheok, Michael; Hardies, Robert  
**Subject:** FW: ACTION: Followup of list of NPPs with RPVs forged by Rotterdam Dockyards (RDM)

Pat,

Verification from DORL of U.S. NPPs with RDM reactor pressure vessels is below. Yes except for the BWRs, Fermi & Quad, No.

Jon

**From:** Melghan, Sean *NR*  
**Sent:** Monday, August 13, 2012 3:47 PM  
**To:** Roque-Cruz, Carla; Hopkins, Jon  
**Cc:** Thompson, Jon; Sreenivas, V; Mozafari, Brenda; Lingam, Siva; Cotton, Karen; Poole, Justin; Chawla, Mahesh; Boska, John; Quichocho, Jessie; Dudek, Michael; Guzman, Richard; Martin, Robert; Frankl, Istvan; Coffin, Stephanie; Evans, Michele  
**Subject:** RE: ACTION: Followup of list of NPPs with RPVs forged by Rotterdam Dockyards (RDM)

Jon:

Below is the requested info re: RPVs forged by Rotterdam Dockyards (RDM).

With this e-mail I consider the question to be answered. If you need further info, please send e-mail to me and cc: Michele Evans.

V/R  
s

Site/Unit(s)	Question: Were RPV(s) forged by Rotterdam Droogdok Maatschappij	Comments
Catawba 1	Yes	
Fermi 2	No	
McGuire 2	Yes	
North Anna 1	Yes	
North Anna 2	Yes	

		According to the attached Quad Cities UFSAR Section 5.3.1.2 and Manufacturing History, the Quad Cities, Unit 1 RPV was manufactured entirely by Babcock & Wilcox. <b>The Unit 2 RPV history did not include any forging at Rotterdam (RDM), but did include assembly and welding on portions of the RPV at RDM.</b>
Sequoyah 1 & 2	Yes	Section 5.4.2, first sentence (Page 5.4-2), of the SQN UFSAR states that "The reactor vessel manufactured by DeRotterdam Drogdsk Mattschappu N.V. (The Rotterdam Dockyard Company) is cylindrical with a welded hemispherical bottom head and a removable, bolted flanged and gasketed, hemispherical upper head." So, to answer your question, Yes, the Sequoyah Units 1 and 2 reactor vessels are forged by Rotterdam Dockyards.
Surry 1	Yes	
Surry 2	Yes	
Watts Bar 1 & 2	Yes	

**From:** Meighan, Sean

**Sent:** Monday, August 13, 2012 10:57 AM

**To:** Thompson, Jon; Sreenivas, V; Mozafari, Brenda; Lingam, Siva; Cotton, Karen; Poole, Justin; Chawla, Mahesh

**Cc:** Boska, John; Quichocho, Jessie; Dudek, Michael; Guzman, Richard; Martin, Robert; Frankl, Istvan; Coffin, Stephanie; Evans, Michele

**Subject:** ACTION: Followup of list of NPPs with RPVs forged by Rotterdam Dockyards (RDM)

PMs:

(Tasking from Michele Evans)

Please read below and attached.

**Action:** Ask the licensees of the units below to verify if their units Reactor Pressure Vessel(s) were forged by Rotterdam Droogdok Maatschappij (also referred to as Rotterdam Dockyards or RDM). The RPV forgings may have been welded together by another company such as B&W. NRC is interested in who forged the parts

Due to the quick turn around requested and the evolving nature of the issue, we suggest you call your licensing contact, discuss the issue and get a call back with the answer. We understand the licensee would like some context with the question, feel free to send attached to the licensee. We actually suspect this issue is already on their radar screen.

**Due:** COB today.

Any questions, just call me.

BCs – if the primary PM for the site is out today, forward to the backup PM.

FYI, this tasking does not violate the Paperwork Reduction Act due to small number of (<10) requested responders.

Catawba 1	PWR	4	1129	1985	Westi
Fermi 2					
McGuire 2	PWR	4	1100	1983	Westi
North Anna 1	PWR	3	903	1978	Westi
North Anna 2	PWR	3	973	1980	Westi
Quad Cities 1	BWR	-	882	1972	Gene
Sequoyah 1	PWR	4	1162	1980	Westi
Sequoyah 2	PWR	4	1126	1981	Westi
Surry 1	PWR	3	839	1972	Westi
Surry 2	PWR	3	800	1973	Westi
Watts Bar 1	PWR	4	1123	1996	Westi
Watts Bar 2	PWR				Westi

**From:** Hopkins, Jon

**Sent:** Monday, August 13, 2012 10:06 AM

**To:** Meighan, Sean

**Subject:** REQUEST: Followup of list of NPPs with RPVs forged by Rotterdam Dockyards (RDM)

Sean,

Question for PMs to ask licensees is; Was your plants' RPV forged by RDM (Rotterdam Dockyards) ?

The RPV forgings may have been welded together by another company such as B&W. NRC is interested in who forged the parts.

NRC is interested because the of UT indications recently found on the RPV forgings at Doel 3 NPP in Belgium. The Doel 3 licensee, Electrabel, provided the below table of NPPs with RPVs forged by Rotterdam Dockyards (Only Belgium and U.S. included in this email. There are additional plants/countries). This is preliminary information the accuracy of which the NRC wants to confirm for U.S. NPPs.

Reactor Pressel Vessels forged by Rotterdam Droogdok Maatschappij (also referred to as Rotterdam Dockyards or RDM)

- o The Doel 3 and Tihange 2 RPVs were forged by RDM, which according to the Licensee Electrabel provided some 20+ vessels in Europe and the US.
- o The table below gives an overview of these RPVs (this list has been established by the licensee and could contain errors or omissions).

Doel 3	PWR	3	1000	1982	Fr
Tihange 2	PWR	3	1000	1982	Fr

Catawba 1	PWR	4	1129	1985	W
Fermi 2					
McGuire 2	PWR	4	1100	1983	W
North Anna 1	PWR	3	903	1978	W
North Anna 2	PWR	3	973	1980	W
Quad Cities 1	BWR	-	882	1972	G
Sequoyah 1	PWR	4	1162	1980	W
Sequoyah 2	PWR	4	1126	1981	W
Surry 1	PWR	3	839	1972	W
Surry 2	PWR	3	800	1973	W
Watts Bar 1	PWR	4	1123	1996	W
Watts Bar 2	PWR				W