

Lupold, Timothy

59

**From:** Hills, David  
**Sent:** Monday, August 13, 2012 4:32 PM  
**To:** Rosenberg, Stacey; Lupold, Timothy  
**Cc:** Bilik, Tom; Bozga, John; Holmberg, Mel; Jones, Donald; Meghani, Vijay; Neurauter, James; Sanchez Santiago, Elba; Shaikh, Atif  
**Subject:** FW: DOEL 3 (BELGIUM) - FLAW INDICATIONS IN THE REACTOR PRESSURE VESSEL

FYI – See below regarding applicability to Quad Cities. Who in NRR has technical lead on this issue? Any additional details available?

- Dave

---

**From:** Ring, Mark  
**Sent:** Monday, August 13, 2012 2:13 PM  
**To:** Hills, David  
**Subject:** FW: DOEL 3 (BELGIUM) - FLAW INDICATIONS IN THE REACTOR PRESSURE VESSEL

Dave,

I asked the Quad RIO to look into what the licensee knew and was doing on the Belgium NDE results indicating cracking in the vessel. Here's the reply I received from Jim McGhee. Please let me know if you need more or if you find out any more from NRC NDE folks. Thanks.

-Mark

---

**From:** McGhee, James  
**Sent:** Monday, August 13, 2012 1:45 PM  
**To:** Ring, Mark  
**Cc:** Draper, Jason; Elliott, Roy; Orlikowski, Robert; Cushman, Brian  
**Subject:** FW: DOEL 3 (BELGIUM) - FLAW INDICATIONS IN THE REACTOR PRESSURE VESSEL

The UFSAR quote below is from Section 5.3.1.2. It goes on to say

Chicago Bridge and Iron (CB&I), which completed fabrication of the Unit 2 RPV prior to its shipment to the plant site, provided a certification comparable to the ASME Code N-1A form. The following footnote was included in that certification: [5.3-3]

"This unstamped vessel was built as a 'State Special' based on agreements between the State of Illinois and Commonwealth Edison Company. A portion of the vessel was fabricated by Rotterdam Dockyard Company. This vessel was not stamped because Rotterdam Dockyard Company does not hold an ASME certificate of authorization. Procedures equivalent to the requirements of the ASME Code were used."

---

**From:** McGhee, James  
**Sent:** Monday, August 13, 2012 1:38 PM  
**To:** Ring, Mark  
**Cc:** Cushman, Brian; Draper, Jason; Elliott, Roy; 'LUIS GASCO LEONARTE'; Orlikowski, Robert  
**Subject:** RE: DOEL 3 (BELGIUM) - FLAW INDICATIONS IN THE REACTOR PRESSURE VESSEL

According to the licensee the affected unit is Unit 2. The following discussion comes from the Section 5.3.2 of the USFSAR:

The Quad Cities Unit 1 RPV was fabricated entirely in the United States by Babcock & Wilcox (B&W). The Unit 2 RPV was fabricated by several different vendors, including one in Holland, as noted in the following paragraphs. [5.3-2]

Fabrication work on the Unit 2 bottom head assembly and lower shell course was performed by the Rotterdam Dockyard Company (RDM) in Rotterdam, Holland. These two pieces were seam-welded together and returned to the United States as a fully completed subassembly including control rod drive (CRD) stub tubes, shroud support skirt, and vessel support skirt.

According to the licensee, the component steel was fabricated in the US by Babcock & Wilcox. These were sent to RDM where they were "bent" to shape and welded together. Final assembly of the vessel was performed in the US. Without looking further, I can't determine if the beltline region was included in the RDM work.

As far as inspection, they only look at the seam welds. According to the ISI guys, the only other inspection they ever did after initial construction was a VT3 on the inner clad surface and that was stopped after it was determined to have no value.

They had the initial communication on the issue and are currently waiting for more specific information from the utility before determining what they need to do. The sites understanding is that the components in question at the Belgian facility were manufactured in total at the RDM facility as opposed to being assembled there as was Unit 2. I will follow up as more information comes available.

Jim

---

**From:** Ring, Mark  
**Sent:** Monday, August 13, 2012 11:24 AM  
**To:** McGhee, James  
**Subject:** RE: DOEL 3 (BELGIUM) - FLAW INDICATIONS IN THE REACTOR PRESSURE VESSEL

Good. Thanks.

---

**From:** McGhee, James  
**Sent:** Monday, August 13, 2012 11:06 AM  
**To:** Ring, Mark  
**Cc:** Cushman, Brian; Orlikowski, Robert; Draper, Jason; Elliott, Roy  
**Subject:** RE: DOEL 3 (BELGIUM) - FLAW INDICATIONS IN THE REACTOR PRESSURE VESSEL

Checking to verify manufacture of Unit 1 RPV and any beltline inspections performed that could show this type defect.

Jim

---

**From:** Ring, Mark  
**Sent:** Monday, August 13, 2012 9:40 AM  
**To:** Cushman, Brian; McGhee, James; Ray, Teresa  
**Cc:** LUIS GASCO LEONARTE; Draper, Jason; Elliott, Roy; Orlikowski, Robert  
**Subject:** FW: DOEL 3 (BELGIUM) - FLAW INDICATIONS IN THE REACTOR PRESSURE VESSEL

FYI

---

**From:** Lara, Julio  
**Sent:** Monday, August 13, 2012 9:30 AM  
**To:** Casto, Chuck; Pederson, Cynthia; Shear, Gary; Reynolds, Steven; OBrien, Kenneth; Skokowski, Richard

**Cc:** Cameron, Jamnes; Daley, Robert; Dickson, Billy; Duncan, Eric; Giessner, John; Hills, David; Kunowski, Michael; Peterson, Hironori; Riemer, Kenneth; Ring, Mark; Skokowski, Richard; Stone, AnnMarie  
**Subject:** FW: DOEL 3 (BELGIUM) - FLAW INDICATIONS IN THE REACTOR PRESSURE VESSEL

---

**From:** Bernardo, Robert *nrc*  
**Sent:** Monday, August 13, 2012 9:26 AM  
**To:** Taylor, Ryan  
**Cc:** Brand, Javier; Lara, Julio; Powers, Dale  
**Subject:** DOEL 3 (BELGIUM) - FLAW INDICATIONS IN THE REACTOR PRESSURE VESSEL

Good morning,

We wanted to pass this along to the regional OpE POC's, since there are POTENTIALLY US plants that might be affected (mostly region 2). We'll keep you informed as we get more information.

**IRS 8244P - DOEL 3 (BELGIUM) - FLAW INDICATIONS IN THE REACTOR PRESSURE VESSEL**

Doel 3 is a PWR that commenced operation in 1982. In July, UT examinations to detect possible under-clad defects of the reactor vessel belt region instead found indications of fabrication flaws. This was the first time this type of testing had been performed on this portion of the vessel. The flaws appear to be laminar in nature, running parallel to the inside and outside surfaces being examined. The vessel rings containing the flaws were forged in the early 1980's at the Rotterdam Dockyards, which also forged reactor vessel rings for several plants in the U.S., including Catawba 1, McGuire 2, North Anna 1 & 2, Quad Cities 1, Sequoyah 1 & 2, Surry 1 & 2, and Watts Bar 1. Staff are in communication with the Belgian regulator to exchange information and review pending results from follow-up testing.

*Bob Bernardo*  
Reactor Systems Engineer  
US Nuclear Regulatory Commission  
NRR/DIRS/IOEB  
O-7D17; MS O-7C02A  
301-415-2621  
[Robert.Bernardo@nrc.gov](mailto:Robert.Bernardo@nrc.gov)