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**Hardies, Robert**

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**From:** Kirk, Mark (RES)  
**Sent:** Wednesday, January 23, 2013 10:55 AM  
**To:** Hardies, Robert; Fairbanks, Carolyn; Poehler, Jeffrey; Rosenberg, Stacey; Csontos, Aladar; Stevens, Gary; Tregoning, Robert; Davis, Robert; Nove, Carol  
**Cc:** Hiser, Allen; Pham, Bo; Terao, David; Downey, Steven  
**Subject:** recent Doel International Review Board (IRB) activity  
**Attachments:** 2013-01-21 IERB clarification of comments sent to FANC.docx; 2013-01-21 reply e-mail.docx

Dear Colleagues –

On Friday last the FANC contacted the IRB asking for clarification on several of the points we made in our assessment of the Doel/Tihange safety case so that the FANC could effectively communicate these points to their licensee.

Based on an exchange of e-mails over the weekend between the various members of the Board we formulated a response, which was sent on Monday.

I have attached for your information the e-mail exchange with the FANC, as well as the IRB's response.

Best

Mark

Mark Kirk  
Senior Materials Engineer  
NRC/RES/DE/CIB  
[mark.kirk@nrc.gov](mailto:mark.kirk@nrc.gov)

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----- Original Message -----

**From:** Martens Benedikt

**To:** VAN WONTERGHEM Frederik ; pelabeau@ulb.ac.be

**Cc:** Tim Williams ; helmut.Schulz.krtn@t-online.de ; andre.pineau@mines-paristech.fr ; kim.wallin@vtt.fi ; stvims@ims.bas.bg ; Alejandro.HUERTA@oecd.org ; markericksonkirk@verizon.net ; BENS Jan ; SCHRAUBEN Manfred ; WERTELAERS An

**Sent:** Monday, January 21, 2013 9:10 AM

**Subject:** RE: Doel 3 - Tihange 2 International Review Board - Final Report

Dear Frederik,

Hereby I send you the feedback of the members of the International Expert Review Board on the remarks of the licensee and the Agency, as you requested last week.

The Board will pleased be to elaborate further on its recommendations if required.

Best regards,

Benedikt

**From:** VAN WONTERGHEM Frederik [mailto:Frederik.VANWONTERGHEM@FANC.FGOV.BE]

**Sent:** vrijdag 18 januari 2013 14:29

**To:** pelabeau@ulb.ac.be

**Cc:** Tim Williams; helmut.Schulz.krtn@t-online.de; andre.pineau@mines-paristech.fr; kim.wallin@vtt.fi; stvims@ims.bas.bg; Alejandro.HUERTA@oecd.org;

(b)(6) BENS Jan; SCHRAUBEN Manfred; WERTELAERS An; Martens Benedikt

**Subject:** RE: Doel 3 - Tihange 2 International Review Board - Final Report

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If possible, we would like to ask you if the members of the International Review Board could review the licensee remarks.

In case you consider the licensee remarks on a specific recommendation not sufficient to close the issue, we would like to ask you to elaborate further these recommendations and if possible, clearly state what is the safety concern, how the results of the additional actions should be used,...

It would be very helpful to receive an answer by Monday evening 21 January (16h00) at the latest.

Best regards,

Frederik Van Wonterghem

Het FAMG is ISO 9001:2008 gecertificeerd - LIAFCN niet gecertificeerd ISO 9001:2008.

De afzender aanvaardt geen aansprakelijkheid voor schade van welke aard ook voortvloeiende uit het gebruik van elektronische berichten.

Disclaimer (Fr) - Disclaimer (NL)

Van: Martens Benedikt [<mailto:bmartens@SCKCEN.BE>]

Verzonden: 15 January 2013 09:03

Aan: BENS Jan; SCHRAUBEN Manfred; WERTELAERS An; VAN WONTERGHEM Frederik

CC: Tim Williams; 'Labeau Pierre-Etienne'; [helmut.Schulz.krtn@t-online.de](mailto:helmut.Schulz.krtn@t-online.de);

[andre.pineau@mines-paristech.fr](mailto:andre.pineau@mines-paristech.fr); [kim.wallin@vtt.fi](mailto:kim.wallin@vtt.fi); [stvims@ims.bas.bg](mailto:stvims@ims.bas.bg);

[Alejandro.HUERTA@oecd.org](mailto:Alejandro.HUERTA@oecd.org); Mark Kirk (b)(6)

Onderwerp: Doel 3 - Tihange 2 International Review Board - Final Report

Dear Mr. Bens,

Dear all,

Hereby you will find the final version of the report of the Doel 3 - Tihange 2 International Expert Review Board.

This version includes the Executive Summary, our conclusions were already transmitted last Friday as you requested.

Best regards,

Benedikt Martens

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[www.sckcen.be](http://www.sckcen.be)

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## **NRC INTERNATIONAL TRAVEL TRIP REPORT**

### **Traveler, Office, Division, Phone Number:**

Robert Hardies	NRR/DE	(301) 415-5802	<a href="mailto:robert.hardies@nrc.gov">robert.hardies@nrc.gov</a>
Mark Kirk	RES/DE	(301) 251-7361	<a href="mailto:mark.kirk@nrc.gov">mark.kirk@nrc.gov</a>
Carol Nove	RES/DE	(301) 251-7664	<a href="mailto:carol.nove@nrc.gov">carol.nove@nrc.gov</a>

### **Subject:**

Travel to Brussels, Belgium to meet with the Federation Agenschap voor Nucleaire Controle (FANC), other international regulators and two review panels to discuss licensee analyses of reactor pressure vessel forging inspection findings on the Doel-3 and Tihange-2 plants.

### **Dates of Travel and Countries/Organizations Visited:**

January 6-10, 2013  
Brussels, Belgium  
Federation Agenschap voor Nucleaire Controle (FANC)

### **Desired Outcome:**

Acquire information on the results found at Doel-3 and Tihange-2 nuclear power plant reactor pressure vessel ultrasonic inspections and the on-going licensee investigations and calculations concerning large numbers of quasi-laminar indications from FANC, Bel V and AIB Vinçotte International. Participate in a roundtable discussion between regulatory bodies and expert review panels regarding the licensee evaluations.

### **Results Achieved:**

The NRC acquired information about the quasi-laminar indications identified during ultrasonic inspection of the Doel 3 nuclear power plant, about the possible metallurgical origin of the indications, and about fracture mechanics analyses of the indications. The NRC will use the information received to address the potential for similar indications to exist in U.S. plants. The NRC also acquired information about the conclusions of the Belgian expert review panel and the separate international review panel.

### **Summary of Trip:**

The purpose of this trip was to support FANC's request for NRC participation<sup>1</sup> on three technical expert working groups and one international expert review panel in support of the Belgian nuclear safety authority's assessment of the indications detected in July 2012 in the beltline shell region of the Doel Unit 3 reactor pressure vessel (RPV). Similar indications were also found at Tihange Unit 2.

The meeting consisted of FANC presentations to three expert working groups composed of expert members proposed by foreign nuclear safety authorities or related organizations (NRC,

<sup>1</sup> Relevant ADAMS Accession Nos.: FANC Request for NRC support (ML1224A335), NRR request for RES assistance (ML1224A258), and RES response to NRR request for assistance (ML1224A108).

IAEA, NEA, JRC Petten, etc.) that were willing to participate in this issue and two review panels. FANC presented their evaluation of the Doel and Tihange licensee analyses.

**Additional Information/Discussion:**

Three review groups made presentations:

- a) International review board (IRB)
- b) National (Belgian) review board (BRB)
- c) FANC's technical support organizations (FANC-TSO)

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**Pending Actions/Planned Next Steps for NRC:**

The NRC is establishing a plan to address the findings. Proposed activities include:

Develop a communications plan and an information notice.

Perform confirmatory fracture mechanics analyses of forgings with large numbers of laminar indications.

Hold a public meeting with industry on March 5, 2013.

**Points for Commission Consideration/Interest:**

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