

M-18

## NRC INTERNATIONAL TRAVEL TRIP REPORT

**Date:** October 22, 2012  
**Traveler:** Carol A. Nove  
**Office:** RES  
**Division:** DE  
**Branch:** CIB  
**Phone Number:** 301-251-7664  
**E-mail:** carol.nove@nrc.gov

**Subject:** Meetings in Brussels, BELGIUM Regarding the Indications Found in the Doel Unit 3 Reactor Pressure Vessel

**Dates of Travel:** October 14, 2012 – October 18, 2012 (Meeting dates = October 16, 2012 with FANC and October 17, 2012 with Vincotte)

**Countries/Organizations Visited:** BELGIUM/ Federal Agency for Nuclear Control (FANC) and AIB-Vincotte International (Vincotte)

**Subjects Discussed:** The purpose of this trip was to support FANC's request for NRC participation<sup>1</sup> on three technical expert working groups in support of Belgian nuclear safety authority's assessment of the indications recently detected in the beltline shell region of the Doel Unit 3 reactor pressure vessel (RPV). Similar indications were also found at Tihange Unit 2. This objectives of these working group meetings were:

- Share information and experience between nuclear safety authorities on regulatory approaches and actions in relation with the Doel 3 issue.
- Taking into account the lessons learned from the Doel 3 issue, discuss actions to be considered in other countries.
- Provide technical advice to Belgian nuclear safety authorities (FANC, Bel V, AIB Vincotte) on specific topics / questions related to the Doel 3 & Tihange 2 RPV issue. However, the actual evaluation of potential continued operation of the Doel 3 and Tihange 2 reactors remains the responsibility of the Belgian nuclear safety authorities.

The meeting consisted of three expert working groups composed of expert members proposed by foreign nuclear safety authorities or related organizations (NRC, IAEA, NEA, JRC Petten, etc.) that were willing to participate in this issue. The three expert working groups were as follows:

---

<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).

C/105

- Expert Working Group 1 - Non-destructive Examination Techniques, NRC Participant = Carol Nove (RES/DE/CIB)
- Expert Working Group 2 - Metallurgical Origin / Root Causes of the Flaw Indications, NRC Participant = Jeff Poehler (NRR/DE/EVIB)
- Expert Working Group 3 - Structural Mechanics and Fracture Mechanics – Approach for Justification, NRC Participant = Gary Stevens (RES/DE/CIB)

In addition, Bob Hardies (NRR/DE) acted as an NRC Liaison to all three working groups.

The chairman and technical secretary for each working group were provided by Belgian nuclear safety authorities.

This portion of this trip report summarizes the Working Group 1 (WG1) portion of the meetings, in which Carol Nove was the NRC participant.

Following introductions of the WG1 participants, the meeting opened with Vincotte NDT experts providing an overview of the three major exams that have been completed since June:

(b)(4)

(b)(4)

(b)(4)

Following these presentations, the Working Group had the opportunity to discuss the documents that had been made available by the licensee prior to the Working Group meeting. Comments and questions related to the content of each document were generated for presentation to the licensee.

The final portion of the WG1 meeting was a question and answer session with several representatives from the licensee.

This portion of this trip report summarizes the meeting between Carol Nove and Robert Hardies of NRC and Hans Vandriessche and Daniel Rozanski of AIB

Vincotte International, the inspection and certification organization for FANC. Mr. Vandriessche and Mr. Rozanski are both NDT experts (UT Level III) who have been thoroughly involved in the Doel 3 and Tihange 2 examinations.

This was an informal meeting during which the NRC staff had the opportunity to have detailed discussions regarding the UT examinations performed at Doel 3 and Tihange 2. The staff gained a more thorough understanding of the ultrasound examination techniques and results including how UT interacts with hydrogen flakes, as well as the recording and acceptance criteria used for the various UT exams performed. The staff re-iterated their request for detailed position and size information on all of the indications found in the Doel 3 vessel.

**Desired Outcome:** FANC's desired outcome for the WG1 meeting was to provide support to the Belgian nuclear safety authorities for defining essential questions that the Belgian licensee must address to satisfy safe continued operation of the Doel 3 plant.

For the NRC, the desired outcome of attendance at the WG1 meeting was to obtain information such that the NRC can assess: (1) the ultrasonic examinations of the Doel 3 vessel (b)(4) (what exactly was done, to what criteria was the UT technique qualified, how data was interpreted, how were indications counted, etc.); (2) whether the original ultrasonic examinations detected these anomalies, and if so, why were they not reported; (3) additional measures that may be required to fully understand the UT findings.

**Results Achieved:** The following results were achieved from NRC attendance at the WG3 meeting:

- NRC gained the perspective on how the Belgian nuclear regulator is managing the Doel 3 issue for their plants.
- The NRC gained details of the Doel 3 issue, including technical assessments performed to assess adequacy of the indications detected in the Doel 3 RPV. The reports summarizing these technical assessments are available, but are not included in this trip report. (b)(5)

(b)(5)

- The NRC gained insight on what actions other countries have taken, or are considering, in response to the Doel 3 findings and the results of those actions. (b)(4)

(b)(4)

(b)(4)

- The NRC became familiar and gained a working relationship with other international members of WG3.

**Summary of Trip:** Gary Stevens (RES/DE/CIB) visited the FANC Office in Downtown Brussels on Tuesday, October 16<sup>th</sup>, 2012 to attend the WG3 meeting.

(b)(4)

**Additional Information:** None.

**Pending Actions/Planned Next Steps for NRC:** FANC has requested that the NRC support another meeting of WG3 in late November or early December. RES and NRR

will discuss this request subsequent to debrief meetings with NRR and RES management.

The following summarizes the key actions from this meeting:

- NRC (Gary Stevens) to provide recent ASME Section XI Interpretation/Code Action on flaw proximity rules to WG3 Chairman
  - STATUS: COMPLETE (10/18/2012).
- NRC to attend another meeting of WG3 in late November or early December
  - STATUS: TBD.

**Points for Commission Consideration/Interest:** None.

(b)(4)

(b)(4)

(1 page follows)

(b)(4)

**(3 pages follow)**

(b)(4)

(5 pages follow)



(b)(4)

(14 pages follow)

(b)(4)

(11 pages follow)

(b)(4)

(14 pages follow)

(b)(4)

(20 pages follow)

(b)(4)

(23 pages follow)

(b)(4)

(22 pages follow)

(b)(4)

(14 pages follow)

(b)(4)

(27 pages follow)



(b)(4)

(11 pages follow)