Contribution ID: **6** Type: **Poster**

ESTIMATION OF THE RADIATION DOSES DURING THE DISMANTLING OF THE EQUIPMENT IN BUILDING 117/1 AT THE IGNALINA NPP

Wednesday 25 May 2016 09:00 (9 hours)

The Ignalina nuclear power plant (NPP) was the only NPP in Baltic States, build in north east Lithuania near the border of Belarus. The Ignalina NPP was operating two world's largest and most advanced RBMK-1500 design reactors (electrical capacity –1500 MW, thermal capacity –4800 MW). It supplied about 70% of Lithuania' s national electricity demand. In line with accession to the European Union treaty commitments, the Ignalina NPP was closed: Unit 1 was shut down at the end of 2004, and Unit 2 was shutdown at the end of 2009. Since 1 January 2010, decommissioning has become the major Ignalina NPP activity. The auxiliary plant systems can now be progressively dismantled. The first area to undergo dismantling was the Emergency Core Cooling System (ECCS) equipment of Unit 1 which is in Building 117/1.

Building 117/1 is located close to Unit 1 of Ignalina NPP reactor building. It is a rather big building (the volume is 13748 m3) with more than 30 rooms located at -3.6–7.2 m level. The main part of the Ignalina NPP Unit 1 Emergency Core Cooling System (ECCS) is located in this building. The main systems which are located in Building 117/1 are the following:

• Emergency Core Cooling System (ECCS);
• Helium storage facility;
• Nitrogen supply system.

During the planning of D&D activities in Building 117/1, the overall dismantling activities were segregated into ten smaller activities. The first one is the preparatory activity, which includes of civil works, initial dismantling and modification or installation ventilation systems, installation cranes, preparation of temporary waste storage area, etc. After the preparatory activity, the dismantling activity can be started during which components such as ECCS pressured tanks (PT), large diameter pipes, valves are dismantled. According to the national law, during D&D activities, it is necessary to minimise the amount of radioactive waste, and therefore it is necessary to perform the decontamination activity. In order to perform successful decontamination of the contaminated internal large diameter pipe surface, it is necessary to halve these pipes, and therefore the third activity was defined as pipe halving. To achieve free release (FR) level of the components, the dry decontamination method (manual vacuum blasting technique) was selected during the analysis of D&D strategy options. During initial dismantling, dismantling, pipe halving and decontamination, the components are transported from origination area to a temporary storage area, then from the temporary storage area to a decontamination area, etc. These activities were called 'handling'. Waste sorted by component type, contamination level (exempt waste, very low level waste, low level waste) was loaded into an appropriate container and transported to the final destination. In parallel with all described activities inside Building 117/1, the activities of management and radiological measurement and characterization of the components were performed. After dismantling of the components and transportation of all waste from the building, it is necessary to perform the close out activity, which consist of final monitoring of the building, decontamination and disassemble of D&D equipment and dismantling of cranes, etc.

For preparation of the equipment dismantling project in Building 117/1, DECRAD computer code [2] was used. DECRAD was developed at the Lithuanian Energy Institute (LEI) by Nuclear Engineering Laboratory.

In principle the dismantling activity defines the total duration of the D&D activities. The duration of the decontamination, handling, loading packages, transportation activities are of course dependent on the duration of the dismantling activities. Preparatory and close out activities compose 30% and 22% of all the D&D activity duration respectively (see Figure 3). Duration of the radiological measurement activity depends on duration of the dismantling and the decontamination activities. The management activity is performed during the whole project.

In the paper the information on the necessary personnel and collective doses received for different activities will be presented. The predicted duration of the project and collective doses to the personnel will be compared with the real data obtained after the dismantling of the equipment in Building 117/1.

REFERENCES

[1] Environment Impact Assessment Report, Ignalina NPP Building 117/1 Equipment Decontamination and

Dismantling, VT Nuclear Services Ltd. and Lithuanian Energy Institute (Nuclear Engineering Laboratory), 2008.
[2] The software Decrad validation report, TA-14-13.10. Lithuanian Energy Institute, Nuclear Engineering Laboratory (2010).

Country or International Organization

Lithuania

Type ”YES” to confirm submission of required
 Forms A and B via the official channels

YES

Author: Dr SIMONIS, Audrius (Lithuanian energy institute)

Co-authors: Mr POSKAS, Gintautas (Lithuanian energy institute); Prof. POSKAS, Povilas (Lithuanian energy institute)

Presenter: Dr SIMONIS, Audrius (Lithuanian energy institute)

Session Classification: Session 4A - Poster

Track Classification: Technical and Technological Aspects of Implementing Decommissioning Programmes