

ArevaEPRDCPEm Resource

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Subject: Draft RAI 387 Supplement 2
Attachments: RAI 387 Supplement 2 Response - DRAFT.pdf

Getachew,

Attached is DRAFT RAI 387 Supplement 2. Earlier today AREVA provided a date of July 8, 2010 for submittal of the final response. Please let me know if the staff has any questions and if we need any further interaction on this response.

Thanks,

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Response to

Request for Additional Information No. 387(4591), Supplement 2

4/12/2010

U.S. EPR Standard Design Certification

AREVA NP Inc.

Docket No. 52-020

SRP Section: 11.02 - Liquid Waste Management System

Application Section: 11.2

QUESTIONS for Health Physics Branch (CHPB)

DRAFT

Question 11.02-20:**Phase 4 RAI****Follow-up to Open Item 273, Supplement 1, Question 11.2-15**

(a) In the response dated Nov. 6, 2009, the applicant provides information addressing the staff's concerns about the inconsistent listing of LWMS components in FSAR Table 11.2-2 given system depictions of FSAR Figures 11.2-1 to 11.2-3. A review of the response indicates that the descriptions of newly added components to FSAR Table 11.2-2 (pages 8 and 9) are incomplete as they not include descriptive parameters and the parameters are left to be supplied by vendors. The applicant is requested to provide this information or specify that this aspect of the design is not part of the design certification, or assign a COL information for these table entries.

For LWMS components used to process waste water and demonstrate compliance with 10 CFR Part 20, Appendix B (Table 2, Col. 2.) effluent concentration limits and 10 CFR Part 50, Appendix I design objectives, Table 11.2-2 should include a footnote that states that LWMS processing components are designed to meet or exceed the listed operating parameters, and equal or exceed the decontamination factors listed in FSAR Table 11.2-3.

(b) A review of FSAR Sections 1.8.1 and 11.2 indicates that the listing of COL information items is incomplete. Regulatory Guide 1.206 (Section C.III.4) addresses COL information that a COL applicant is required to address because of plant and site-specific conditions that cannot be described at the design certification stage. In this context, the staff has determined that the following COL information items should be added to the FSAR. The COL information items are:

1. The COL applicant is responsible for ensuring that offsite liquid effluent discharges and associated doses to members of the public (using plant and site-specific parameters) due to radioactive liquid effluents comply with effluent concentration limits of 10 CFR Part 20, Appendix B (Table 2, Col. 2); dose limits of 10 CFR 20.1301, 20.1302, and 20.1301(e) in unrestricted areas; and design objectives of Sections II.A and II.D of Appendix I to 10 CFR Part 50.
2. The COL applicant will include plant and site-specific information describing how design features and implementation of operating procedures for the LWMS will address the requirements of 10 CFR Part 20.1406(b) and guidance of SRP Section 11.2, Regulatory Guides 4.21 and 1.143, IE Bulletin 80-10, and NEI 08-08 when the LWMS is augmented with the installation and operation of mobile skid-mounted processing systems connected to permanently installed LWMS processing equipment.

Response to Question 11.02-20:

- (a) Response provided in the original RAI 387 submittal on May 12, 2010.
- (b) See the Response to RAI 301, Question 11.02-17 and its associated U.S. EPR FSAR markups for the COL information items that address COL item 1 listed in Part b of this question. New COL items 11.2-3 and 11.2-4 were added in U.S. EPR FSAR Tier 2, Table 1.8-2 in response to RAI 301, Question 11.02-17.

The following COL item will be added to U.S. EPR FSAR Tier 2, Table 1.8-2 and Section 11.2.1 to address COL item 2 listed in RAI 387, Question 11.02-20(b) for plant and site-specific conditions that cannot be addressed as a part of design certification:

- A COL applicant that references the U.S. EPR design certification and that chooses to install and operate mobile skid-mounted processing systems connected to permanently installed LWMS processing equipment will include plant and site-specific information describing how design features and implementation of operating procedures for the LWMS will address the requirements of 10 CFR Part 20.1406(b) and guidance of SRP Section 11.2, RG 4.21 and 1.143, IE Bulletin 80-10, and NEI 08-08.

For consistency with this new COL item concerning optional mobile skid-mounted processing systems connected to the LWMS, a sentence is also being deleted from U.S. EPR FSAR Tier 2, Section 11.2.1 which states “No requirement for interface with mobile waste treatment systems is anticipated.” This is an option that is being addressed by the COL applicant via the added COL item.

FSAR Impact:

U.S. EPR FSAR Tier 2, Section 11.2.1 and Table 1.8-2 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

DRAFT

Table 1.8-2—U.S. EPR Combined License Information Items
Sheet 39 of 53

Item No.	Description	Section	Action-Required by COL Applicant	Action-Required by COL Holder
11.2-5	<p><u>A COL applicant that references the U.S. EPR design certification will confirm that the site-specific data (such as distance from release location to unrestricted area, contaminant migration time, and discharge flow rate) are bounded by those specified in Section 11.2.3.7. For site-specific parameters that exceed the values provided in Section 11.2.3.7, a COL applicant that references the U.S. EPR design certification will provide a site-specific analysis to demonstrate that the resulting water concentrations in the unrestricted area would meet the concentration limits of 10 CFR Part 20, Appendix B, Table 2.</u></p>	11.2.3.7		
11.2-6	<p><u>A COL applicant that references the U.S. EPR design certification and that chooses to install and operate mobile skid-mounted processing systems connected to permanently installed LWMS processing equipment will include plant and site-specific information describing how design features and implementation of operating procedures for the LWMS will address the requirements of 10 CFR Part 20.1406(b) and guidance of SRP Section 11.2, RG 4.21 and 1.143, IE Bulletin 80-10, and NEI 08-08.</u></p>		<p>← 11.02.20(b)</p>	
11.3-1	<p>A COL applicant that references the U.S. EPR design certification will confirm that the perform <u>a site-specific</u> gaseous waste management system cost-benefit analysis for the typical site is applicable to their site; if not, provide a site-specific cost benefit analysis.</p>	11.3.4	¥	
11.3-2	<p><u>A COL applicant that references the U.S. EPR design certification will provide a discussion of the onsite vent stack design parameters and site-specific release point characteristics.</u></p>	11.3.3.3		

11.2 Liquid Waste Management System

The liquid waste management system is designed to monitor, control, collect, process, handle, store, and dispose of liquid radioactive waste generated as the result of normal plant operations and AOOs. The liquid waste management system collects radioactive liquid effluents, then temporarily stores, and treats radioactive liquid effluents from several systems throughout the plant. Some plant systems also discharge decontaminated wastewater from various processes. The liquid waste management system consists of two subsystems: the liquid waste storage system and the liquid waste processing system. The liquid waste storage system collects radioactive wastewater into five liquid waste storage tanks, then discharges the collected wastewater in batches to the liquid waste processing system for treatment. The wastewater is subsequently treated with either an evaporator, a centrifuge, an evaporator in series with a demineralizer, a centrifuge in series with a demineralizer, or with the demineralizer system alone. Treated wastewater next discharges to the monitoring tanks. In the monitoring tanks, the treated wastewater is chemically adjusted to an optimum pH and checked for activity prior to its discharge from the plant. The wastewater activity is constantly monitored during discharge. If the activity exceeds an allowable limit, the discharge valves automatically close and the content of the monitoring tanks is sent back to the processing system for further treatment.

11.2.1 Design Basis

The liquid waste storage system is designed to store radioactive liquid wastes collected from the various systems and buildings in which they were generated and transfer these liquid wastes to the liquid waste processing system. The treated wastewater is returned to the storage system, where it is monitored to verify compliance with regulatory limits. The U.S. EPR liquid waste management system is designed to meet the individual dose limits and compliance specified in 10 CFR 20.1301 and 20.1302 and the ALARA design objectives of 10 CFR Part 50, Appendix I. In addition, effluent concentrations are well below the annual average concentration limits of 10 CFR Part 20, Appendix B, Table 2. The ALARA design objectives are consistent with the Environmental Radiation Protection Standards for Nuclear Power Operations of 40 CFR Part 190 as implemented under 10 CFR 20.1301(e).

The primary functions of the liquid waste processing system are to separate radionuclides from the stored liquid wastes and to return both the decontaminated liquids and the concentrated radionuclides to the liquid waste storage system in separate process streams. The liquid waste storage and liquid waste processing systems fulfill these primary design functions under modes of normal plant operation. The U.S. EPR liquid waste storage and processing systems have the design capacity to receive, hold, process, and release the maximum expected volume of wastewater

11.02-20(b)

arising from plant operations (including startup, shutdown, and outage periods). ~~No requirement for interface with mobile waste treatment systems is anticipated.~~

11.2.1.2.4 Mobile Systems

A COL applicant that references the U.S. EPR design certification and that chooses to install and operate mobile skid-mounted processing systems connected to permanently installed LWMS processing equipment will include plant and site-specific information describing how design features and implementation of operating procedures for the LWMS will address the requirements of 10 CFR Part 20.1406(b) and guidance of SRP Section 11.2, RG 4.21 and 1.143, IE Bulletin 80-10, and NEI 08-08.

11.2.2 System Description**11.02-20(b)**

The U.S. EPR liquid waste storage and liquid waste processing systems manage liquid wastes generated by the plant during normal modes of operation. The liquid waste storage system collects and segregates incoming waste streams, provides initial chemical treatment of those wastes, and delivers them to one of the processing systems. The liquid waste processing system uses evaporation, centrifugal separation, and demineralization to remove the radioactive and chemical contaminants from the wastewater and to concentrate those contaminants. The treated wastewater is returned to the liquid waste storage system for monitoring and eventual release. The concentrates are returned to the liquid waste storage system concentrate tanks for eventual transfer to the radioactive concentrates processing system.

The liquid waste storage and processing systems operate independently of the operating modes of the plant. The systems provide sufficient storage and treatment capacity to process the daily inputs produced during plant startup, normal operation, plant shutdown, maintenance, and refueling periods. The systems are operated on an as-needed basis throughout the plant operating cycle. Operating experience has shown that the peak volume demand occurs during plant outages, when maintenance activities generate increased volumes of wastewater (particularly the Group II wastewater streams).

The liquid waste storage system, schematically illustrated in Figure 11.2-1—Liquid Waste Storage System includes liquid waste storage tanks, concentrate tanks, and monitoring tanks that temporarily store the liquid wastes at various stages of treatment. The system also includes recirculation pumps, a sludge pump, a concentrate pump, and combination recirculation-discharge pumps to move the liquid waste between the various tanks. Chemical tanks and chemical proportioning pumps precisely mix and inject chemicals to treat the liquid wastes. Piping and control valves route the liquid wastes between the storage system tanks and pumps, and to interfaces with the liquid waste processing system.

The liquid waste processing system consists of three separate unit operations:

- The evaporator, shown in Figure 11.2-2—Liquid Waste Processing System, Evaporator System, employs a vapor-compressor evaporator with a separate