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June 22nd, 2022

US Nuclear Regulatory Commission
11555 Rockville Pike
MS 12-D3
Rockville, MD 20852-2738

SUBJECT: RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION LETTER DATED JUNE 3rd 2022 REGARDING LICENSE RENEWAL APPLICATION FOR THE UNIVERSITY OF CALIFORNIA – DAVIS/MCCLELLAN NUCLEAR RESEARCH CENTER.

The purpose of this letter is to provide a response to the RAI letter received by UCD/MNRC from the NRC on June 3rd 2022. Along with this response letter an updated SAR Appendix B and an updated Emergency Plan have been submitted. The change in effectiveness of the updated Emergency Plan has been evaluated by the UCD/MNRC staff and an analysis has determined that the changes do not represent a reduction in the effectiveness of the Plan. The updated Emergency Plan is, therefore, being submitted to the NRC for informational purposes only under the provisions of 10 CFR 50.54q(3).

NRC RAI 1:
As necessary to demonstrate compliance with 10 CFR Part 20 dose limits and consistent with the guidance in NUREG-1537, provide a comprehensive updated description of the UCD/MNRC LOCA scenario, including a timeline of the major activities or assumptions, the postulated cause of the leak, the drain-down rate, the assumed time for the core to become uncovered, and any changes to the calculated dose rates, if identified.

UCD/MNRC Response: The UCD/MNRC LOCA scenario is described in detail in section 2.5 of the updated SAR Appendix B included with this response letter.

NRC RAI 2:
As necessary to demonstrate compliance with 10 CFR Part 20 dose limits and consistent with the guidance in NUREG-1537, provide the proposed plans to reduce or mitigate the potential radiation exposure to a member of the public such that the postulated LOCA scenario would not result in any member of the public receiving an annual dose in excess of 100 mrem, as required by 10 CFR 20.1301, such as:

2.1: *operator actions and/or facility equipment planned to be used to mitigate the consequences of the LOCA, and whether the equipment should be included in the technical specifications.*

UCD/MNRC Response: The system previously known as the Emergency Core Cooling System has been repurposed to become the Core Reflooding System (CRS). This system is required to cover the core with water after the LOCA scenario described in Chapter 13 and Appendix B of the SAR. The CRS is needed to reduce skyshine dose to the public; it is not required to prevent core overheating in the event of a LOCA. Core Reflooding System daily pressure checks and quarterly valve cycling/flow checks have been added to the proposed Technical Specifications to give reasonable assurance the CRS will function as intended in the event of the postulated LOCA. The CRS is described in more detail in the updated SAR Appendix B and Emergency Plan.

2.2: *procedures or processes to mitigate the consequences of the LOCA, including any changes to the UCD/MNRC Emergency Plan.*

UCD/MNRC Response: The UCD/MNRC Emergency Plan has been revised and is included with this response letter. The Emergency Plan now specifically addresses the mitigation of the consequences of the postulated LOCA accident.

2.3: *support needed from any off-site local support agencies, officials, or emergency response organizations, including the use of any signed agreements.*

UCD/MNRC Response: Off-site support is not strictly needed to ensure the dose consequences of the postulated LOCA accident remain below the applicable limits. Off-site response is relevant to RAI #3(3) and is discussed in that response.

2.4: *any other planned actions credited to mitigate the consequences of the LOCA.*

UCD/MNRC Response: No other response (other than initiating the Core Reflooding System) is required to mitigate the consequences of the LOCA.

NRC RAI 3:
The regulation, 10 CFR 20.1301(d) states that "[a] licensee or license applicant may apply for prior NRC authorization to operate up to an annual dose limit for an individual member of the public of 0.5 rem (5 mSv). The licensee or license applicant shall include the following information in this application:

***(1)** Demonstration of the need for and the expected duration of operations in excess of the limit in paragraph (a) of this section;*

UCD/MNRC Response: A Monte Carlo based simulation of the expected skyshine dose around the facility during the postulated LOCA accident results in doses beyond 100 mrem to the public (at the MNRC fence line) even when utilizing the Core Reflooding System. This system will cover the core with ~4 feet of water after 24 hours which will reduce the skyshine doses to near background radiation levels. This will limit the maximum dose to the public to less than 200 mrem.

(2) *The licensee's program to assess and control dose within the 0.5 rem (5 mSv) annual limit; and*

UCD/MNRC Response: The scenario analysis in SAR Appendix B section 2.5 shows that the utilization of the Core Reflooding System will limit the maximum dose to the public to less than 200 mrem. The use of the Core Reflooding System is described in detail in the MNRC Emergency Plan.

(3) *The procedures to be followed to maintain the dose "as low as is reasonably achievable."*

UCD/MNRC Response: Given the sparsely populated nature of the area surrounding MNRC (low utilization light industrial park) it is unlikely that any members of the public would be close to the MNRC boundary for more than a hour during the event, which would result in doses much less than 100 mrem. That said, in the event of a LOCA all non-essential MNRC staff and visitors would evacuate the facility. The local Sherriff would be notified of the event and would work with the McClellan Business Park (the owner of the surrounding property) to set up a temporary exclusion zone around the facility until the core could be covered with water by the CRS. This response is described in more detail in the updated MNRC Emergency Plan.

I declare under penalty of perjury that the foregoing is true and correct executed on June 22nd, 2022.

Sincerely,

Wesley Frey PhD
Facility Director