



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

December 3, 2020

LICENSEE: National Institute of Standards and Technology  
FACILITY: National Bureau of Standards Test Reactor  
SUBJECT: SUMMARY OF NOVEMBER 20, 2020, MEETING WITH NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (EPID L-2019-PMP-0110)

On November 20, 2020, a Category 1 public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) staff and representatives of National Institute of Standards and Technology (NIST) via teleconference. The purpose of this meeting was to discuss the licensing approach with NIST regarding the installation of a liquid deuterium (LD<sub>2</sub>) cold source for its cold neutron research at the NIST National Bureau of Standards Test Reactor. The NIST is in the process of designing and building an LD<sub>2</sub> cold source to replace the current liquid hydrogen (LH<sub>2</sub>) source. This was the first public meeting related to the installation of the LD<sub>2</sub> cold source. The meeting notice and agenda, dated November 3, 2020, is available in the Agencywide Documents Access and Management System (ADAMS) at Accession No. ML20309A221. NIST's presentation used in the meeting is also available in ADAMS at Accession No. ML20329A526. A list of meeting attendees is provided as an enclosure to this summary.

NIST began the meeting by providing an overview for the use of the LH<sub>2</sub> cold source including the description of the LH<sub>2</sub> and associate regulatory review process involved in approving the LH<sub>2</sub> use at the NIST. NIST also provided a brief analysis on the difference between LH<sub>2</sub> and LD<sub>2</sub> cold sources and the potential for anticipated accidents. An external expert panel also reviewed NIST LD<sub>2</sub> project and it went through the performance calculations, deuterium safety, operation strategy for LH<sub>2</sub> and LD<sub>2</sub> at different temperatures and pressures and recommended that the NIST specifically evaluate off-site dose from an uncontrolled release of the deuterium inventory with the expected tritium inventory. The presentation also went through the efforts so far that NIST has invested in this LD<sub>2</sub> project study, as part of addressing any differences in accident analysis results from the NIST current licensing basis.

Following the presentation, NIST and the NRC staff discussed the potential licensing pathway and schedule for a LD<sub>2</sub> cold source license amendment. NIST stated that it could submit a license amendment request (LAR) for the potential use of LD<sub>2</sub> cold source by the end of 2020 and is targeting an installation date for the cold source in 2023. The LAR would be a request for a 20.1302, "Compliance with dose limits for individual members of the public," paragraph (c) of Title 10 of the *Code of Federal Regulations* (10 CFR) adjustment to the Part 20 Appendix B Derived Air Concentrations for the tritiated deuterium (DT) gas to enable the Department of Energy methodology, which was based on the International Commission on Radiological Protection (ICRP) 66 and ICRP 66 amends ICRP 30 to include DT inhalation research by Peterman (1985). If the NRC approves the LAR, the rest of the LD<sub>2</sub> cold source installation would be conducted under 10 CFR 50.59, "Changes, tests and experiments."

At the end of the meeting, NIST and the NRC staff discussed and agreed that, if it would be beneficial for both NIST and the NRC staff, an additional pre-application meeting can be arranged.

Please direct any inquiries to me at 301-415-1404, or by electronic mail at [Xiaosong.Yin@nrc.gov](mailto:Xiaosong.Yin@nrc.gov).

**/RA/**

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Office of Nuclear Reactor Regulation

Docket No. 50-184

Enclosure:  
As stated

cc: See next page

cc:

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Director, Department of Natural Resources  
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Test, Research and Training  
Reactor Newsletter  
Attention: Amber Johnson  
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ADAMS Accession Nos.: ML20309A221 Mtg. Notice  
ML20329A526 Mtg. presentation  
ML20329A514 Mtg. Summary  
ML20329A527 Package

NRC-001

OFFICE	NRR/DANU/PM	NRR/DANU/LA	NRR/DANU/BC	NRR/DANU/PM
NAME	XYin	NParker	GCasto	XYin
DATE	12/1/2020	11/30/2020	12/3/2020	12/3/2020

OFFICIAL RECORD COPY

LIST OF ATTENDEES

NOVEMBER 20, 2020, MEETING WITH

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

11:00 A.M. - 1:00 P.M.

<u>Name</u>	<u>Organization</u>
Greg Casto	U.S. Nuclear Regulatory Commission
Zachary Gran	U.S. Nuclear Regulatory Commission
John Parillo	U.S. Nuclear Regulatory Commission
Paulette Torres	U.S. Nuclear Regulatory Commission
Edward Helvenston	U.S. Nuclear Regulatory Commission
Molly-Kate Gavello	U.S. Nuclear Regulatory Commission
Xiaosong Yin	U.S. Nuclear Regulatory Commission
Thomas Newton	National Institute of Standards and Technology
Robert Williams	National Institute of Standards and Technology
Bryan Eyers	National Institute of Standards and Technology
Paul Brand	National Institute of Standards and Technology
John Jurns	National Institute of Standards and Technology
Randy Strader	National Institute of Standards and Technology