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

March 27, 2014

LICENSEE: Massachusetts Institute of Technology

FACILITY: Massachusetts Institute of Technology Research Reactor

SUBJECT: SUMMARY OF MARCH 6, 2014, PUBLIC MEETING WITH MASSACHUSETTS INTITUTE OF TECHNOLOGY RE: DIGITAL INSTRUMENTATION AND CONTROL UPGRADE LICENSE AMENDMENT APPLICATION

On March 6, 2014, a Category 1 public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) and representatives of the Massachusetts Institute of Technology (MIT) at NRC Headquarters, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. The purpose of this meeting was to discuss the MIT design concept for their proposed digital instrumentation and control (I&C) upgrade. MIT stated that they plan to submit the associated license amendment request (LAR) in September 2014. A list of attendees is provided as an enclosure.

MIT presented slides (See Agencywide Document Access and Management System (ADAMS) Accession No. ML14078A636) describing their current Instrumentation for neutron flux scrams. This system includes ten detectors and eight channels, six of which are used for reactor trip. These latter six are arranged in two groups of one-out-of-three coincident logic (i.e., period and power trips):

- Channels 1 and 2 are of the same design and are interchangeable. Each uses a fission chamber and an uncompensated ion chamber as the neutron sensing elements. The fission chamber is operated as a pulsed counter in the source range to provide visible neutron level indication at reactor startup. The uncompensated chamber is operated in the power range once the fission chamber saturates after a four decade power increase.

- Channel 3 uses an uncompensated ion chamber and provides a safety system scram initiated by its associated scram amplifier at a period between 10 and 11 seconds.

- Channels 4, 5, and 6 use uncompensated boron-lined ion chambers as the neutron sensing elements. Each high flux trip is set to provide a reactor scram at a detector output for that channel that corresponds to a reactor power of 6.6 megawatts.

- Channel 7 utilizes a compensated ion chamber as its neutron sensing element. This channel is the console operator's principal indication of reactor power.

- Channel 8 utilizes an uncompensated ion chamber as its neutron sensing element. Its principal function is to provide an indication of the reactor power level when offsite electrical power has been lost.

Then MIT presented the plan for the new instrumentation, which includes four detectors and two-out-of-four coincident logic. The four detectors will be used for both period and power trips. Some discussion was held regarding a report previously docketed by MIT (ADAMS Accession No. ML13339A344). Specifically, the NRC staff pointed out that this report predominately addressed one piece of equipment (i.e., Mirion 's DWK 250 system). The NRC staff expressed interest in the following additional information:

1) MIT's Plan (e.g., LAR outline) for the LAR. Specifically, how MIT is planning to address Draft Chapter 7 of NUREG-1537, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors," which will be issued as an Interim Staff Guidance.

2) The NRC Staff expressed an interest in knowing what all of the configurable parameters were (Mirion and Applicant), and how the proper setting will be demonstrated.

3) MIT's Regulatory Evaluation.

The NRC Staff recommended three topics for a subsequent Phase 0 meeting:

1) Coincidence logic boards
    a. Development
    b. Testing (e.g., Simplicity – Elimination of consideration of common cause failure)

2) Existing Certifications (e.g., Technischer Uberwachungsverein e.V (TUV))
    a. System Software Version Numbers
    b. Mirion Configurable Items
    c. User Configurable Items

3) NUREG-1537 Compliance Plan
    a. Outline for LAR
    b. Plan for Addressing Criteria in NUREG-1537

The meeting was attended by MIT staff, individuals representing Mirion Technologies (vendor), and NRC staff. Additional individuals participated in the meeting through audio teleconferencing.

Members of the public were in attendance. Public meeting feedback forms were received.

Please direct any inquiries to me at 301-415-3724, or Duane.Hardesty@nrc.gov.

/RA/

Duane A. Hardesty, Project Manager
Research and Test Reactor Licensing Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Docket No. 50-20

Enclosure:
List of Attendees

cc: See next page

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ADAMS Accession Nos.: Pkg.: ML14078A659; Meeting Notice: ML14056A550; Meeting Summary: ML14078A545; Meeting Handout: ML14078A636 (Non-Prop) **NRC-001**

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LIST OF MEETING ATTENDEES

March 6, 2014 Meeting with Massachusetts Institute of Technology

Digital Instrumentation & Control Upgrade

Name	Organization
Duane Hardesty	U.S. Nuclear Regulatory Commission (NRC)
Alexander Adams, Jr.	NRC
Norbert Carte	NRC
William Schuster*	NRC
Thomas O'Malley	Mirion Technologies
Roy Ray	Mirion Technologies
Franz Terheiden*	Mirion Technologies
Roderik Wiedemeier*	Mirion Technologies
Edward Lau	Massachusetts Institute of Technology (MIT)
Susan Tucker	MIT
Tom Newton	MIT
Shawn Hanvy	MIT
Dan Cronin*	University of Florida Training Reactor (UFTR)
Brian Shea*	UFTR *

*Participated via telecon

cc:

City Manager
City Hall
Cambridge, MA 02139

Department of Environmental Protection
One Winter Street
Boston, MA 02108

Beverly Anderson, Interim Director
Radiation Control Program
Department of Public Health
Schrafft Center, Suite 1M2A
529 Main Street
Charlestown, MA 02129

John Giarrusso, Planning and Preparedness Division Chief
Massachusetts Emergency Management Agency
400 Worcester Road
Framingham, MA 01702-5399

Test, Research, and Training
Reactor Newsletter
University of Florida
202 Nuclear Sciences Center
Gainesville, FL 32611

Dr. Thomas H. Newton
Director of Reactor Operations
Massachusetts Institute of Technology
Research Reactor
MITNRL-NW 12
138 Albany Street
Cambridge, MA 02139