UNITED STAT DEPARTMENT OF COMMERCE
National Institu... of Standards and Technology
Gaithersburg, Maryland 20899-

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Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Supplement for request for changes to NBSR Technical Specifications to allow low power testing.

Ref: Docket 50-184, TR-5 Facility License

Sirs/Madams:

On November 17, 2017, NCNR sent a response to a request for additional information regarding our license amendment request of March 2, 2017, and subsequent changes to three technical specifications. After discussions with NRC staff, we are requesting changes to technical specifications 3.1.3 and 3.3.2, and elimination of the proposed 1.3.31. Attached is a copy of the Technical Specification pages to be changed, with change bars.

Please contact Dr. Thomas Newton at (301) 975-6260, if you have any questions.

Respectfully,

Robert Dimeo, Director
NIST Center for Neutron Research

I declare under penalty of perjury that the foregoing is true and correct.

Executed on November 20, 2017

By: ______________________

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NRR

NIST

1.3.30 Shutdown Margin

The minimum shutdown reactivity necessary to provide confidence that the reactor can be shutdown by means of the control and safely systems starting from any permissible operating condition, with the most reactive shim arm in the most reactive position and the regulating rod fully withdrawn, and that the reactor will remain shutdown without further operator action.

1.3.31 Surveillance Activities

Those tests, checks and calibrations done to predict the operability of the equipment described in Section 4.0.

1.3.32 Surveillance Intervals

Maximum intervals are established to provide operational flexibility and not to reduce frequency. Established frequencies shall be maintained over the long term. The surveillance interval is the time between a check, test or calibration, whichever is appropriate to the item being subjected to the surveillance, and is measured from the date of the last surveillance. Surveillance intervals are:

(a) Five Year
Interval not to exceed six years.

(b) Biennial
Interval not to exceed two and one-half years.

(c) Annual
Interval not to exceed 15 months.

(d) Semi-annual
Interval not to exceed seven and a half months.

(e) Quarterly
Interval not to exceed four months.

(:f) Monthly
Interval not to exceed six weeks.

(g) Weekly
Interval not to exceed ten days.

1.3.33 Unscheduled Shutdown

Any unplanned shutdown of the reactor caused by actuation of the reactor safety system, operator error, equipment malfunction, or a manual shutdown in response to conditions that could adversely affect safe operation, not including shutdowns that occur during testing or equipment operability check

(1) An excess reactivity limit provides adequate excess reactivity to override the xenon buildup and to overcome the temperature change in going from zero power to 20 MW, without affecting the required shutdown margin. In addition, the maximum reactivity insertion accident at startup, which assumes the insertion of 0.5% Lip into a critical core, is not affected by the total core excess reactivity.

(2) These specifications ensure that the reactor can be put into a shutdown condition from any operating condition and remain shutdown even if the maximum worth shim arm should stick in the fully withdrawn position with the regulating rod also fully withdrawn.

3.1.3 Core Configuration

Applicability: Core grid positions

Objective: To ensure that effective fuel cooling is maintained during forced flow reactor operation.

Specification

The reactor shall not operate unless all grid positions are filled with full length fuel elements or thimbles, except during subcritical and critical startup testing with natural convection flow.

Basis

Core grid positions shall be filled to prevent coolant flow from bypassing the fuel elements for operation of the reactor with forced coolant flow.

3.1.4 Fuel Burnup

Applicability: Fuel

Objective: To remain within allowable limits of burnup effectiveness of the moderator dump or approach to critical for a previously unmeasured core loading, it is necessary to operate the reactor without restriction on reactor vessel level. This is permissible under conditions when forced reactor cooling flow is not required, such as is permitted in the specifications of Section 2.2(4).

(2) Deuterium gas will collect in the helium cover gas system because of radiolytic disassociation of D_2O. Damage to the primary system could occur if this gas were to reach an explosive concentration (about 7.8% by volume at 77°F (25°C) in helium if mixed with air). To ensure a substantial margin below the lowest potentially explosive value, a 4% limit is imposed.

(3) Materials of construction, being primarily low activation alloys and stainless steel, are chemically compatible with the primary coolant. The stainless steel pumps are heavy walled members and are in areas of low stress, so they should not be susceptible to chemical attack or stress corrosion failures. A failure of the gaskets or valve bellows would not result in catastrophic failure of the primary system. Other materials should be compatible so as not to cause a loss of material and system integrity.

3.3.2 Emergency Core Cooling

Applicability: Emergency Core Cooling System

Objective: To ensure an emergency supply of coolant.

Specifications

The reactor shall not be operated, except during subcritical and critical startup testing with natural convection flow, unless:

(1) The D_2O emergency core cooling system is operable.

(2) A source of makeup water to the D_2O emergency cooling tank is available.

Basis

(1) In the event of a loss of core coolant, the emergency core cooling system provides adequate protection against melting of the reactor core and associated release of fission products.

(2) The emergency core cooling system employs one sump pump to return spilled coolant to the overhead storage tank. Because only one sump pump is used, it must be operational whenever the reactor is operational. There is sufficient D_2O available to provide approximately 2.5 hours of cooling on a once-through basis. In the event that the sump pump fails and the D_2O