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U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555  
Ref: 10 CFR 50.90

**SUBJECT:** Changes to the Texas A&M University AGN-201M Technical Specifications, Facility License R-23, Docket Number 50-59 Associated with the November 11, 2016 License Amendment Request (ADAMS Accession No. ML15315A027)

Attn: Mr. Alexander Adams Jr., Chief,  
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Mr. Patrick M. Boyle, Project Manager,  
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The purpose of this letter is to submit corrections to the proposed changes to the Texas A&M University (TAMU) AGN-201M Technical Specifications (TSs) table of contents, pages 14, 14a, and 15 associated with Facility Operating License R-23. TAMU is proposing the changes to ensure that the TSs, which has been submitted to date, associated with the November 11, 2016, license amendment request (LAR), match the NRC authority file for the AGN-201M TSs. The NRC identified minor differences between the TSs submitted and the NRC TS authority file for the AGN-201M TSs. We appreciate the diligence of the NRC in identifying these minor differences and have been corrected in the enclosed TS pages. In the future, we will make every effort to ensure this issue does not reoccur. Enclosed are the revised TS pages for the LAR.

Changing the TSs does not change the initial "no significant hazards determination" stated in the November 11, 2015, application. Should you have any questions regarding the information provided in this submittal, please contact me or Mr. Jerry Newhouse at (979) 845-7551 or via email at [mcdeavitt@tamu.edu](mailto:mcdeavitt@tamu.edu) or [newhouse@tamu.edu](mailto:newhouse@tamu.edu).



**NUCLEAR SCIENCE CENTER**

Oath of Affirmation

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Sincerely,

Sean M. McDeavitt, PhD  
Director, TEES Nuclear Science Center

*Submitted with Level 2 Delegate Authorization from Dr. Yassin Hassan in letter dated February 8, 2016 (ADAMS Accession No. ML16043A048)*

CC: next page



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ENCLOSURE

TEXAS A&M UNIVERSITY

FACILITY LICENSE R-23, DOCKET NO. 50-59

AMENDED FACILITY OPERATING LICENSE

AGN-201M REACTOR

PROPOSED CHANGES TO THE TECHNICAL SPECIFICATIONS

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### Specification

- a. All portable radiation survey instruments assigned to the reactor facility shall be calibrated under the supervision of the Radiological Safety Office annually, but at intervals not to exceed 16 months.
- b. Prior to each day's reactor operation or prior to each reactor operation extending more than one day, the reactor room high radiation area alarm shall be verified to be operable. (See Article 3.4.e).
- c. A radiation survey of the reactor room, reactor control room, and accelerator room shall be performed under the supervision of the Radiological Safety Office annually, but at intervals not to exceed 16 months, to determine the location of radiation and high radiation areas corresponding to reactor operating power levels.

### Bases

The periodic calibration of radiation monitoring equipment and the surveillance of the reactor room high radiation area alarm will assure that the radiation monitoring and control systems are operable during reactor operation. (See Article 3.4.e).

The periodic radiation surveys will verify the location of radiation and high radiation areas and will assist reactor facility personnel in properly labeling and controlling each location in accordance with 10 CFR 20.

## 4.5 Reactor Components Stored at the Nuclear Science Center (NSC) Facility

### Applicability

This applies to the surveillance requirements of the AGN-201M reactor components stored at the NSC Facility.

### Objective

To verify the AGN-201M reactor components remain stored in specified locations and protected from tampering while at the NSC facility.

### Specifications

- a. NSC Accelerator Building
  1. Once a quarter the secured fenced area in the Accelerator Building shall be inspected to verify all reactor components are present and no indications of tampering exist. If indications of tampering are discovered, the Director of Nuclear Engineering or designee shall be notified. In addition, a special report in accordance with Technical Specification Section 6.9.3 shall be transmitted to the U.S. NRC.

2. Once a quarter a radiation and contamination survey shall be conducted around the exterior of the stored AGN-201M reactor components to verify that contamination is not migrating from the contained reactor components. If detectable loose surface contamination exceeds levels acceptable for an unrestricted area, the reactor components shall be decontaminated and repackaged as necessary.
- b. Cargo Container
1. Once a quarter a survey of the cargo container is required to verify that the tamper proof seal has not been broken. In the event the seal is found broken, the Director of Nuclear Engineering or designee shall be notified and an inventory of the cargo container shall be performed. In addition, a special report in accordance with Technical Specification Section 6.9.3 shall be transmitted to the U.S. NRC.
  2. Once a quarter a radiation and contamination survey shall be conducted of the exterior of the cargo container to verify that contamination is not migrating from the contained components. If detectable loose surface contamination exceeds levels acceptable for an unrestricted area, the cargo container exterior shall be decontaminated and the source of contamination identified and secured.

### Bases

These surveillances shall verify the components necessary for reassembly of the AGN-201M reactor remain secure, no indications of tampering exist, and that the radiological conditions of storage remain unchanged.

## 5.0 DESIGN FEATURES

### 5.1 Reactor

- a. The reactor core, including control and safety rods, contains approximately 660 grams of U-235 in the form of <20% enriched UO<sub>2</sub> dispersed in approximately 11 kilograms of polyethylene. The lower section of the core is supported by an aluminum rod hanging from a fuse link. The fuse melts at a fuse temperature of about 120°C causing the lower core section to fall away from the upper section reducing reactivity by at least 5%  $\Delta$  k/k. Sufficient clearance between core and reflector is provided to insure free fall of the bottom half of the core during the most severe transient.
- b. The core is surrounded by a 20 cm thick high density (1.75 gm/cm<sup>3</sup>) graphite reflector followed by a 10 cm thick lead gamma shield. The core and part of the graphite reflector are sealed in a fluid-tight aluminum core tank designed to contain any fission gases that might leak from the core.

- c. The core, reflector, and lead shielding are enclosed in and supported by a fluid-tight steel reactor tank. An upper or "thermal column tank" may serve as a shield tank when filled with water or a thermal column when filled with graphite.
- d. The 6 ½ foot diameter, fluid-tight shield tank is filled with water constituting a 55 cm thick fast neutron shield. The fast neutron shield is formed by filling the tank with approximately 1000 gallons of water. The complete reactor shield shall limit doses to operating personnel in unrestricted areas to levels less than permitted by 10 CFR 20 under operating conditions.
- e. Two safety rods and one control rod (identical in size) contain less than 15 grams of U 235 each in the same form as the core material. These rods are lifted into the core by electromagnets, driven by reversible DC motors through lead screw assemblies. Deenergizing the magnets causes a spring-driven, gravity-assisted scram. The fourth rod or fine control rod (approximately one-half the diameter of the other rods) is driven directly by a lead screw. This rod may contain fueled or unfueled polyethylene.

## 5.2 Fuel Storage

Fuel, including fueled experiments and fuel devices not in the reactor, shall be stored in locked rooms in the nuclear engineering department laboratories. The storage array shall be such that  $K_{eff}$  is no greater than 0.8 for all conditions of moderation and reflection.

## 5.3 Reactor Room, Reactor Control Room, Accelerator Room

The AGN-201M reactor and associated components shall be housed in the following locations approved by the AGN-201M License:

- Zachry Engineering Center
  - Reactor Room
  - Control Room
  - Accelerator Room
- Texas A&M Engineering Experiment Station Nuclear Science Center Facility
  - Accelerator Building
  - Cargo Container

## 6.0 ADMINISTRATIVE CONTROLS

### 6.1 Organization

The administrative organization for control of the reactor facility and its operation shall be as set forth in Figure 1 attached hereto. The authorities and responsibilities set forth below are designed to comply with the intent and requirements for administrative controls of the reactor facility as set forth by the Nuclear Regulatory Commission.