

January 30, 2012

Yassin Hassan, Ph.D.
Interim Department Head
Department of Nuclear Engineering
Texas A&M University
337 Zachary Engineering Center
3133 TAMU
College Station, Texas
77843-3133

SUBJECT: TEXAS A&M UNIVERSITY AGN 201M RESEARCH REACTOR – RE:
ISSUANCE OF AMENDMENT NO. 14 TO AMENDED FACILITY OPERATING
LICENSE NO. R-23 (TAC NO. ME7375)

Dear Dr. Hassan:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment No. 14 to Amended Facility Operating License No. R-23 for the Texas A&M University (TAMU, the licensee) AGN 201M research reactor. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated September 5, 2011 (Agencywide Documents Access and Management System Accession No. ML11264A037).

The amendment reflects the requested change to the Limiting Condition for Operation (LCO) for the Low Power set-point for Nuclear Safety #3 safety channel listed in Table 3.1 of the TSs. The requested change represents a change in the units of the set-point to accommodate a change in the instrument's measured value.

The related safety evaluation supporting Amendment No. 14 is enclosed.

Sincerely,

/RA/

Alexander Adams, Jr., Senior Project Manager
Research and Test Reactors Licensing Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Docket No.: 50-59

Enclosures: 1. Amendment No. 14
2. Safety Evaluation

cc w/encls.: See next page

Texas A&M University

Docket No. 50-59

cc:

Mayor, City of College Station
P.O. Box Drawer 9960
College Station, TX 77840-3575

Governor's Budget and
Planning Office
P.O. Box 13561
Austin, TX 78711

Texas A&M University System
ATTN: Chris Crouch, Reactor Supervisor
Department of Nuclear Engineering
Texas A&M University
337 Zachary Engineering Center
3133 TAMU
College Station, Texas
77843-3133

Radiation Program Officer
Bureau of Radiation Control
Dept. Of State Health Services
Division for Regulatory Services
1100 West 49th Street, MC 2828
Austin, TX 78756-3189

Technical Advisor
Office of Permitting, Remediation & Registration
Texas Commission on Environmental Quality
P.O. Box 13087, MS 122
Austin, TX 78711-3087

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

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ADAMS Accession Nos.: ML120190436, *concurring by e-mail NRR-058

OFFICE	PRLB/PM	PRLB/PM	PRLB:LA	OGC	PRLB:BC	PRLB:PM*
NAME	DHardesty	AAdams	GLappert	LSubin	JQuichocho	AAdams
DATE	1/13/2012	1/19/2012	1/19/2012	1/26/2012	1/26/2012	1/30/2012

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TEXAS A&M UNIVERSITY

DOCKET NO. 50-59

AMENDMENT TO AMENDED FACILITY OPERATING LICENSE

Amendment No. 14
License No. R-23

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for an amendment to Amended Facility Operating License No. R-23, filed by Texas A&M University (the licensee) dated September 5, 2011, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations set forth in Chapter I of Title 10 of the *Code of Federal Regulations* (10 CFR);
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance that (i) the activities authorized by this amendment can be conducted without endangering the health and safety of the public and (ii) such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public;
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied, and;
 - F. Prior notice of this amendment was not required by 10 CFR 2.105 and publication of a notice for this amendment is not required by 10 CFR 2.106.

2. Accordingly, the license is amended by changes to Technical Specifications as indicated in the enclosure to this license amendment, and paragraph 2.C.(2) of Amended Facility Operating License No. R-23 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 14, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Jessie Quichocho, Chief
Research and Test Reactors Licensing Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Enclosures:

1. Changes to Facility Operating License
2. Changes to Technical Specifications

Date of Issuance: January 30, 2012

ENCLOSURE 1 TO LICENSE AMENDMENT NO. 14

AMENDED FACILITY OPERATING LICENSE NO. R-23

DOCKET NO. 50-59

Replace the following page of the Amended Facility Operating License No. R-23 with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

Operating License

Remove

Insert

Page 3

Page 3

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 14, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

(3) Physical Security Plan

The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security plan, including all amendments and revisions made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p), which are part of the license. This plan, which contains information withheld from public disclosure under 10 CFR 2.790, is entitled "Texas A&M University AGN-201M Reactor Facility Security Plan," with revisions through September 24, 1984.

- D. The licensee shall maintain in effect and fully implement all provisions of the NRC-approved physical security plan, including amendments and changes made pursuant to the authority of 10 CFR 50.54(p). The approved security plan consists of the document withheld from public disclosure pursuant to 10 CFR 2.790(d), entitled "Security Plan for the Texas A&M University AGN-201M Reactor Facility", dated September 13, 1974
- E. This amended license is effective as of the date of issuance and shall expire at midnight, August 26, 1997.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Brian K. Grimes, Assistant Director
For Engineering & Projects
Division of Operating Reactors

Attachment:
Appendix A – Technical
Specifications dated

Date of Issuance: April 25, 1979

Amendment No. 14
January 30, 2012

ENCLOSURE 2 TO LICENSE AMENDMENT NO. 14

AMENDED FACILITY OPERATING LICENSE NO. R-23

DOCKET NO. 50-59

Replace the following page of Appendix A, Technical Specifications, with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

Technical Specifications

Remove

Insert

Page 7

Page 7

Table 3.1

<u>Safety Channel</u>	<u>Set Point</u>	<u>Function</u>
Nuclear Safety #1		
Low count rate	≥ 10 cps	scram below 10 cps
Nuclear Safety #2		
High Power	≤ 10 watt	scram at power > 10 watts
Low Power	$\geq 1.0 \times 10^{-12}$ amps	scram at source levels $< 1.0 \times 10^{-12}$ amps
Reactor period	≥ 5 sec	scram at periods < 5 sec
Nuclear Safety #3 (Linear Power)		
High Power	≤ 10 watt	scram at power > 10 watt
Low Power	$\geq 1.0 \times 10^{-12}$ amps	scram at source levels $< 1.0 \times 10^{-12}$ amps
Manual scram	-----	scram at operator option

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 14 TO

AMENDED FACILITY OPERATING LICENSE NO. R-23

TEXAS A&M UNIVERSITY AGN-201M REACTOR

DOCKET NO. 50-59

1.0 INTRODUCTION

By letter dated September 5, 2011 (Agencywide Document Access and Management System (ADAMS) Accession No. ML11264A037), to the U.S. Nuclear Regulatory Commission (NRC), Texas A&M University, (TAMU or the licensee) submitted a request for amendment to the Technical Specifications (TSs), Appendix A, to Amended Facility Operating License No. R-23 for the AGN-201M Reactor. The request, when issued, will be Amendment No. 14 to the license.

1.1 BACKGROUND

The licensee constructed a new control console to replace obsolete technology in their original console. As a result of a Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.59 review of the new TAMU AGN-201M Reactor control console, the licensee determined that a minor revision of the TSs is necessary before the new control console can be implemented. The licensee is requesting that the specified set-point for the low-level scram set point specification, as measured and displayed by the Nuclear Safety #3 (Linear Power) safety channel, be changed in the TSs. The revised TSs will allow the licensee to operate the reactor with the new control console.

The current specification for the Nuclear Safety #3 (Linear Power) safety channel is given in TS Table 3.1 as follows:

Low Power	$\geq 5\%$ full scale	Scram at source levels < 5% full scale
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The proposed specification is:

Low Power	$\geq 1.0 \times 10^{-12}$ amps	Scram at source levels < 1.0×10^{-12} amps
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2.0 EVALUATION

The requested amendment reflects changing a set-point for the TSs for a Limiting Condition for Operation (LCO), listed in Table 3.1. Specifically, the request changes the set-point to the Nuclear Safety Channel No. 3, (Linear Power) Low Power scram that prevents control rod withdrawal if the indicated neutron flux signal is less than "0.5 counts/sec." The proposed set point for the new TAMU equipment is functionally equivalent to the present set-point of "5% of full scale" for the original AGN console.

The purpose of the low power scram set point of Channel 3 is to prevent the occurrence of a possible startup without the safety channel or an observable neutron signal or power level. A startup attempted without the safety channel or sufficient intrinsic neutron induced signal or power level could result in the reactor exceeding the licensed power level or a Limiting Safety System Setting. In the case of the TAMU-AGN-201M Reactor, the design (negative temperature coefficient, low excess reactivity, and a fuse-link which shuts down the reactor at 120 watts) protects the health and safety of the public by preventing or mitigating the consequences of such a scenario.

The licensee stated this change is required because TAMU constructed and implemented a new control console to replace obsolete technology in the original console. One of the changes implemented in the new console was a picoammeter for Channel #3 that allows the channel 3 meter to automatically change ranges as power level signal increases. The set point of <5% of full scale was applied to each scale when the operating scale was changed manually. With the new system, which has automatic scale changes, the <5% of full scale scram trip could not be implemented.

According to the licensee, the system this change replaced required the reactor operator to manually change scale of the Channel 3 display as power level increased. The licensee states that the new circuit has been designed with a continuous, auto ranging feature to eliminate the need for manual range switching. Eliminating manual switching is expected to greatly simplify reactor operation and significantly decrease the number of inadvertent scrams that the facility will experience due to switching errors made by inexperienced operators and student trainees. The licensee also states that reducing the number of inadvertent scrams will help reduce the mechanical stresses on the control rods.

The licensee states that the proposed set point of $\geq 1.0 \times 10^{-12}$ amperes in the continuous range for Nuclear Safety #3 (Linear Power) channel is numerically equivalent to the current TS requirement of scrambling the reactor at < 5% of the full-scale reading on the previous console. The licensee proposes that the specification for the TAMU continuous range Nuclear Safety #3 (Linear Power) channel be revised to this equivalent numerical set point on the existing Nuclear Safety #3 (Linear Power) channel.

The NRC staff has reviewed the licensee's application. The NRC staff finds that this new $\geq 1.0 \times 10^{-12}$ amperes set point was chosen to be the same as the other low power trip set point (Nuclear Safety # 2). This change still inhibits rod withdrawal below the minimum required neutron source level. The revised TS will continue to ensure that a startup cannot be attempted without instrumentation that is responsive and indicating neutron signal levels high enough to allow reliable observation of the rate and level of reactor power.

A similar change was made at Idaho State University (Docket No. 50-284, Amendment No. 7) and the Pennsylvania State University research reactor (Docket No. 50-05, Amendment No. 32).

On the proposed TS replacement page submitted with this application, the licensee also made a change in the description of the Nuclear Safety #2 indicating that the channel was designated as "Nuclear Safety #2 (Log Power)" safety channel. However, the application did not discuss the change. In a phone call on January 23, 2012, between D. Hardesty, the TAMU Project Manager and C. Crouch, TAMU AGN-201M Reactor Supervisor, the licensee decided to keep the current description for the Nuclear Safety #2 safety channel and not proceed with the change.

Based on our review, the NRC staff concludes that the proposed TS is technically acceptable and continues to meet the regulatory requirement of 10 CFR 50.36. The change to the set-point in Table 3.1 of the TSs for the new TAMU-AGN control console preserves the original intent of the LCO to prevent reactor startup unless the neutron detector channels can be verified operable and responding while accommodating the wider range indicating scale of the new instrument.

4.0 ENVIRONMENTAL CONSIDERATION

This amendment related to the control console TS setpoint involves "...changes in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20." The NRC staff has determined that this amendment involves no significant hazards consideration, no significant increase in the amounts, and no significant change in the types, of any effluents that may be released off site, and no significant increase in individual or cumulative occupational radiation exposure. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9).

Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

5.0 CONCLUSION

The NRC staff has concluded on the basis of the considerations previously discussed that: (1) the amendment does not involve a significant hazards consideration because the amendment does not involve a significant increase in the probability or consequences of accidents previously evaluated, create the possibility of a new kind of accident or a different kind of accident from any accident previously evaluated, or involve a significant reduction in a margin of safety; (2) there is reasonable assurance that the health and safety of the public will not be endangered by the proposed activities; and (3) such activities will be conducted in compliance with the Commission's regulations, and the issuance of this amendment will not be inimical to the common defense and security or the health and safety of the public.

Principal Contributor: D. Hardesty, Project Manager

Date: January 30, 2012