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UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

Docket No. 50-142

November 19, 1974

George E. Lear, Chief, ORB-3, L

RESPONSE TO TECHNICAL ASSISTANCE REQUEST, REVIEW OF UNIVERSITY OF CALIFORNIA, LOS ANGELES, SECURITY PLAN (TAR-769)

Licensee: University of California, Los Angeles
Branch & LPM Requesting Assistance: ORB-3, D. Jaffe
Review Branch Involved: L:IS&EP
Requested Completion Date: 9/30/74
Review Status: Complete

We have reviewed the University of California, Los Angeles, reactor security plan dated August 21, 1974, and its amendment dated August 21, 1974, against the "Interim Guidance - Organization and Content of Security Plans for Low Power Reactors", dated April 1974. We find the plan meets the requirements of 10 CFR 50.34(c) and 10 CFR 73.40 and is acceptable, provided the licensee's inventory of SNM does not equal or exceed the formula quantity specified in 10 CFR 73.1.

R. Wayne Houston, Chief
Industrial Security and
Emergency Planning Branch
Directorate of Licensing

cc: A. Giambusso
W. McDonald
D. Skovholt
K. Goller
D. Jaffe
F. Allenspach
H. Thornburg (2)
J. Whiteaker
T. Flood

C/2-7

Interim Guidance - Organization and Content of Security Plans for Low Power Research and Training Reactors

Applicability - This interim guidance is for use in developing and evaluating security plans for low power research and training reactors. For purposes of this guide, these reactors are defined as TRIGA reactors with authorized power levels less than or equal to 250 KW and all other research and training reactors with power levels less than or equal to 100 KW, including AGN's, zero power, and critical facilities.

Purpose - The purpose of the security plan developed according to this guidance is to protect the reactor against acts of sabotage. It is intended for use by the licensee to demonstrate compliance with 10CFR50.34(c) and 10CFR73.40. Conformance with this guide will not assure compliance with 10CFR73.50 and 10CFR73.60, if these parts are applicable to the licensee.

Definition of Terms - Terms used in these security plans should conform to the definitions as given in 10CFR73.2.

I. Design Features

A. Essential Equipment - Essential equipment should be designated in the security plan. This should include, but not necessarily be limited to, the following: the reactor, the reactor coolant system, reactor controls, and any associated equipment the

failure of which could endanger the health and safety of the public.

B. Security Area - security areas should be identified and described, including plan drawings or sketches showing these in context of the site location and showing access points. At least the fuel storage area, the reactor control room, and the reactor room or building should be described as security areas.

C. Security Systems

1. Locks and Keys - a description of the lock and key system should be provided; describe how keys are controlled; identify the specific individual (by position title) responsible for the security of the keys.

2. Communications - the communication system to be used in the event of a security violation should be described.

II. Administrative Controls

A. Organization

1. Security organization - the person responsible for the facility security program should be identified (by position title); the person(s) or group(s) having security functions and responsibilities on a day to day basis should be identified.

2. Local Law Enforcement Authorities - arrangements with the local law enforcement agencies for aid in the event of a security violation at the reactor facility should be described.

B. Access Control

1. Personnel - the categories of personnel who are authorized to enter security areas should be identified.

2. Control - the means employed to control access to security areas should be described.

C. Surveillance - Plans for providing surveillance of essential equipment and security areas during working and non-working hours should be described.

D. Procedures - procedures and plans for dealing with the following situations should be briefly described:

1. Response to detected unauthorized intrusions of security areas.

2. Security violations by authorized personnel.

3. Bomb threats.

4. Acts of civil disorder.

E. Security Program Review

1. The security program should be reviewed not less frequently than once every two years by the individual designated in item II.A.1. This provision should be documented in the security plan itself. In this connection the licensee is directed to the provisions of 10CFR50.54(p).

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

February 5, 1976

Docket No. 50-142

The Regents of the University
of California
ATTN: Mr. Harold V. Brown
Environmental Health and
Safety Officer
Los Angeles, California 90024

Gentlemen:

The Commission has issued the enclosed Amendment No. 10 to Facility Operating License No. R-71 for the UCLA Training Reactor in accordance with your application for amendment dated May 22, 1975, and Supplement dated November 5, 1975.

The amendment modifies the Technical Specifications relating to (1) production, monitoring and release of Argon 41, (2) changes to the restrictions on in-core experiments, and (3) administrative changes.

The Commission's staff has evaluated the potential for environmental impact associated with operation of the UCLA Training Reactor in the proposed manner. From this evaluation, the staff has determined that there will be no significant environmental impact attributable to the proposed action. Having made this determination, the Commission has further concluded, pursuant to 10 CFR Part 51, Section 51.5(c)(1) that no environmental impact statement need be prepared for this action. Copies of the Negative Declaration, which is being filed with the Office of the Federal Register for publication, and the Environmental Impact Appraisal are enclosed.

A copy of the related Safety Evaluation is enclosed.

Please note that we have discontinued the use of separate identifying numbers for changes to Technical Specifications. Sequential amendment numbers will be continued as in the past.

Sincerely,

George Lear

George Lear, Chief
Operating Reactors Branch #3
Division of Reactor Licensing

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Enclosures:
1. Amendment No. 10
2. Negative Declaration
3. Environmental Impact Appraisal
4. Safety Evaluation

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

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

DOCKET NO. 50-142

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 10
License No. R-71

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The applications for amendment by The Regents of the University of California (the licensee) dated May 22, 1975 and supplement dated November 5, 1975, comply with the requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   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: (i) that the activities authorized by this operating license can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the rules and regulations of the Commission;

   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; and

   E. Publication of notice of this amendment is not required since the amendment does not involve a significant hazards consideration.

2. Accordingly, Facility Operating License No. R-71, as amended, is hereby further amended by adding subparagraph (3) to Paragraph 2.C. and a change to the Technical Specifications as indicated in the attachment to this license amendment.

Subparagraph 2.C.(3)

"(3) Within 30 days following the issuance of Amendment No. 10 to this license, the licensee shall initiate an Environmental Program which will be maintained at the UCLA Nuclear Energy Lab for a minimum of two years subject to the following condition:

a. A system of not less than 12 Ca-Dy Sulfate (or equivalent) high sensitivity dosimeters, placed at 6 locations, from a commercial supplier will be used and changed on a quarterly basis."

3. This license amendment is effective thirty (30) days following date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

George Lear

George Lear, Chief
Operating Reactors Branch #3
Division of Reactor Licensing

Attachment:
Change to the
Technical Specifications

Date of Issuance: February 5, 1976

APPENDIX A

TECHNICAL SPECIFICATIONS

FACILITY LICENSE NO. R-71

UNIVERSITY OF CALIFORNIA, LOS ANGELES

NUCLEAR REACTOR

DOCKET NO. 50-142

DATE: March 1, 1971

The dimensions, measurements or other numerical values of these specifications may differ from the measured values as a result of normal construction and manufacturing tolerances or from variations in the normal accuracy of instrumentation.

I. Definitions

A. Reactor Shutdown

The reactor is shut down when all of the following conditions are met:

1. All control blades are fully inserted and the reactor is subcritical by a margin greater than 0.007$4\rho$. When calculating the subcritical margin, no credit shall be taken for experiments, temperature effects or xenon poisoning.

2. The console key switch is in the off position, the key is removed and under the control of a licensed operator.

3. No maintenance or work is in progress that could reduce the subcritical margin.

B. Reactor Operation

Reactor operation shall mean any conditions wherein the reactor is not shut down.

C. Reactor Scram

A reactor scram is the gravity drop of all control blades.

D. Experiment

An experiment shall be any of the following:

1. Any apparatus, device or material placed in the reactor core region, in the exposure facilities, or in a beam of radiation originating from the reactor core.

2. Any operation designed to measure or observe reactor parameters or characteristics.

E. Reactor Safety System

The reactor safety system is that combination of measuring channels which forms the automatic protective system for the reactor or provides information which requires manual protective action to be initiated.

F. Operable

Operable means a system or component is capable of performing its intended function in a normal manner.

G. Operating

Operating means a system or component is performing its intended function in a normal manner.

H. Operability Test

Operability test means qualitatively verifying the operability of the channel by observation of channel behavior or by the introduction of an externally generated signal.

I. Calibration

Calibration means adjusting a channel output such that it responds, within acceptable range and accuracy, to known values of the parameter which the channel measures. Calibration shall encompass the entire channel including equipment actuation, alarm or trip.

II. Site and Reactor Room

A. Site

1. The reactor shall be housed in a reinforced concrete building in the School of Engineering and Applied Science, University of California, Los Angeles, California.

2. The restricted area shall encompass the Nuclear Energy Laboratory which is comprised of the reactor room, control room, and surrounding support facilities.

B. Reactor Room

1. The reactor room shall have an independent ventilation and air-conditioning system.

2. All gases which may cause a hazard through neutron activation shall be exhausted from experiments or experimental facilities installed in or adjacent to the core or surrounding graphite to the environment via a common exhaust duct.

3. Air withdrawn from the reactor room shall be diluted to a volume rate of approximately 11,000 CFM, monitored for gaseous activity and particulate contamination, and exhausted to the atmosphere through a stack approximately 107 feet above ground level.

4. In the event that the limits for Argon 41 contained in 10 CFR Part 20, Appendix B, Table II, with a reduction factor of 460 are exceeded in the stack, the ventilation system shall be secured and shall cause the automatic damper system to seal the reactor room, and the reactor shall be shut down.

5. The 10-ton crane shall not be used in such a way that the control blade drive units could suffer damage by dropping or swinging a load.

6. Doors penetrating the reactor room are within the restricted area. All doors leading into the reactor room shall have a flashing alarm light indicating reactor operation and shall be under a lock and key security system.

III. Reactor Systems

A. Reactor Core

1. The core shall consist of a maximum of 24 assemblies of up to 11 plates each. These assemblies are contained in six aluminum boxes surrounded by graphite. The boxes are arranged in two parallel rows of three boxes each, separated by about 30 centimeters of graphite.

2. A fuel plate shall be enriched uranium-aluminum alloy fuel clad with aluminum. There shall be nominally 14.5 grams of uranium per fuel plate.

3. A neutron source shall be provided during reactor startup.

B. Primary Coolant System

1. The primary coolant shall be demineralized light water.

2. The primary coolant flow rate shall be greater than 15 gpm for reactor operation at power levels above 1 watt.

3. The average primary coolant outlet temperature shall not exceed 200°F.

4. The resistivity of the primary coolant shall be measured prior to each startup. The resistivity shall not be less than 0.5 megohm centimeters.

5. The primary coolant quick-dump valve shall be activated manually and upon receipt of an automatic shutdown signal prior to each startup to assure proper operation.

C. Reactor Control System

1. Four cadmium-tipped semaphore-type blades shall be used for reactor control. The control blades shall be protected by shrouds to assure freedom of motion.

2. The reactor shall not be made critical unless all control blade drives are operable.

3. The reactor shall not be made critical unless the interlocks in Table I are operable.

4. Tests, limits and frequencies of tests for the control system shall be as listed in Table II.

5. Following maintenance or modification to the reactor control system, an operability test of the affected portion of the system, including verification of control blade drive speed, shall be performed before the system is considered operable.

D. Reactor Safety System

1. The reactor shall not be made critical unless the reactor safety system is operable in accordance with Table III.

2. Tests for operability shall be made in accordance with Table IV.

3. The neutron channels shall be calibrated against an independent measure of core power at intervals not exceeding 12 months.

4. The following channels shall be calibrated at intervals not exceeding 12 months, or any time a change in channel performance is noted.

   a. log N period channel

   b. power level safety channels

   c. linear power level channel

5. Following maintenance or modifications to the reactor safety system, an operability test and calibration of the affected channel shall be performed before the reactor safety system is considered operable.

E. Pneumatic Sample Transfer System

1. A Pneumatic Sample Transfer System may be installed in the west vertical experimental port of the reactor.

2. All operations of the Pneumatic Sample Transfer System will be in accordance with approved procedures.

3. No sample shall be pneumatically inserted or removed from a critical reactor if the resultant stable positive period will be less than 20 seconds.

IV. Reactivity

A. The core excess reactivity at cold critical, without xenon poisoning, shall not exceed 0.023 ρ.

B. The primary coolant void and temperature coefficients of reactivity shall be negative.

C. The minimum shutdown margin, with the most reactive control blade fully withdrawn, shall be 0.018 ρ.

D. The reactivity insertion rate for a single control blade shall not exceed 0.0005 ρ/sec.

E. Items C and D shall be verified in accordance with Table II, Test 2.

V. Radiation Monitoring System

A. The reactor room shall be continuously monitored by at least two area radiation monitors. The monitors shall be capable of audibly warning personnel of high radiation levels. The output of these monitors shall be continuously indicated.

B. During reactor operations or core alterations, exhaust air drawn from the reactor room shall be continuously monitored for gross concentrations of radioactive gases.

C. The radiation monitors in items A and B shall be calibrated semiannually.

D. The release of radioactivity from the reactor facility shall be kept to as low a level as practical.

E. The concentration of Argon 41 released to the atmosphere shall not exceed the limits of 10 CFR Part 20, Appendix B, Table II, Column 1 with a reduction factor of 460 defined as the product of (1) a reactor use factor, (2) an occupancy factor, and (3) a dilution factor. The Commission shall be notified if, over any one year period, the reactor use factor, the occupancy factor or the dilution factor change so as to increase the effective reduction factor.

VI. Fuel Handling and Storage

A. New fuel may be stored in its shipping container or in other appropriate containers. Hot fuel shall be stored in steel-lined storage pits located in the concrete floor of the high bay. Fuel elements or fueled devices shall be stored and handled in a geometry such that k_{eff} is less than 0.8 under optimum conditions of moderation and reflection.

B. Irradiated fuel elements or fueled devices shall be stored so that temperatures do not exceed design values.

VII. Experiments

A. The reactor supervisor and the resident health physicist shall review and approve in writing all proposed experiments prior to their performance.

B. The following conditions shall govern the performance of experiments:

1. The reactivity worth of any single unconstrained experiment shall not exceed 0.006 ρ.

2. An experiment shall not be inserted or removed unless all the control blades are fully inserted or its absolute reactivity worth is less than that which would cause a 20-second positive stable period.

3. No explosive materials shall be irradiated.

4. The sum of the absolute reactivity worths of experiments shall not exceed 0.0023 ρ.

VIII. Administrative Requirements

A. The Chancellor of the University, the Dean of the School of Engineering and Applied Science, the Director of the Nuclear Energy Laboratory, and the reactor supervisor shall have line responsibility for the administrative control of the reactor facility, safeguarding the general public and facility personnel from radiation exposure and adhering to all requirements of the facility license and the Technical Specifications.

B. The reactor supervisor shall be responsible for the safe operation of the reactor, the scheduling and supervision of experiments utilizing the reactor, the control of the reactor fuel, the keeping of logs and records, the maintenance of the physical condition of the reactor and the training of operating personnel The reactor supervisor shall maintain the necessary records to assure compliance with Section V.E.

C. The reactor supervisor and health physicist shall review and approve in writing all proposed experiments prior to their performance. They shall submit to the Director of the Nuclear Energy Laboratory or to the Radiation Use Committee all new experiments and all proposed changes to the facility which might affect its safety.

D. A minimum of two qualified persons, one a licensed operator, shall be in the laboratory at all times during reactor operation, except for precritical console checkouts. A person is considered qualified when he receives and understands a briefing on the facility emergency procedures.

E. A licensed senior operator shall be readily available on call during all reactor operations.

F. Line responsibility for radiological safety at the Nuclear Energy Laboratory shall include successively the Campus Radiation Safety Committee, the Environmental Health and Safety Office and the Nuclear Energy Laboratory health physicist. The Campus Radiation Safety Committee shall be independent of the line organization for reactor operation in item A.

G. The Nuclear Energy Laboratory health physicist shall be responsible for implementing and enforcing the radiological safety program at the Nuclear Energy Laboratory.

H. There is a Radiation Use Committee which reviews and approves new experiments and proposed alterations to the reactor. The Committee shall review and audit reactor operations for safety. This committee shall be composed of the reactor supervisor and radiation health physicist, ex officio, and three other members having expertise in reactor technology. Committee members shall be appointed by the Dean of the School of Engineering and Applied Science. A quorum shall be three members. The Radiation Use Committee shall meet at least semiannually and shall keep written records of its meetings. The Committee shall report directly to the Dean of the School of Engineering and Applied Science. The Radiation Use Committee shall:

1. Review proposed changes to the facility or procedures, when such changes have safety significance, and shall determine whether they involve an amendment to the facility license, a change in the Technical Specifications incorporated in the facility license, or an unreviewed safety question pursuant to 10 CFR 50.59, and recommend action.

2. Review proposed tests or experiments significantly different from any previously approved and determine whether they involve an unreviewed safety question pursuant to 10 CFR 50.59, and recommend action.

3. Review facility operations, procedures and records for safety considerations and recommend improvements where appropriate. In addition to a continuing review of these matters, an intensive in-depth review of facility operations shall be made at least annually.

4. Review the circumstances of all abnormal occurrences and violations of Technical Specifications and proposed measures to preclude a recurrence, and recommend remedial action.

I. Any action recommended by the Radiation Use Committee, which may affect the operation and/or safety of the University community beyond the Nuclear Energy Laboratory facility, shall be brought to the attention of the Campus Radiation Safety Committee which shall have veto power to such a recommendation.

J. Procedures

The facility shall be operated and maintained in accordance with approved written procedures. All procedures and major changes thereto shall be reviewed and approved by the Director of the Nuclear Energy Laboratory prior to being effective. Changes which do not change the original intent of a procedure may be approved in writing by the reactor supervisor. Such changes shall be recorded and submitted to the Director for routine review. The following types of written procedures shall be maintained:

1. Normal startup, operation and shutdown procedures for the reactor. These procedures shall include applicable checkoff lists and instructions.

2. Procedures which delineate the operator action required in the event of specific malfunctions and emergencies.

3. Radiological control procedures for all facility personnel.

4. A laboratory emergency procedure to guide the behavior and action of all personnel in the event of an emergency condition. Semiannual evacuation drills for facility personnel shall be conducted to assure that facility personnel are familiar with the emergency plan.

5. Procedures for the installation, operation and removal of experiments where reactor safety is concerned.

6. Procedures for handling irradiated and unirradiated fuel elements.

7. Procedures for operation of the Pneumatic Sample Transfer System.

K. Records

In addition to requirements of applicable regulations, and in no way substituting therefor, the following minimum records shall be maintained:

1. Reactor operations, including unscheduled shutdowns and tests and experiments performed.

2. Abnormal occurrences.

3. Principal maintenance activities and the reasons therefor.

4. Reviews of changes made to the facility or procedures and reviews of tests and experiments performed without prior approval by the U. S. Nuclear Regulatory Commission pursuant to 10 CFR 50.59.

5. Shipments of radioactive materials.

6. Releases of gaseous and liquid wastes to the environs.

7. Facility radiation and contamination surveys.

8. Fuel inventories and fuel transfers.

9. Radiation exposures for all facility personnel.

L. Action to be Taken in the Event of an Abnormal Occurrence

1. Any abnormal occurrence shall be promptly reported to the reactor supervisor and shall be reviewed by the Radiation Use Committee. A report of the occurrence shall be prepared, including an evaluation of the cause(s) and recommendations for appropriate action to prevent or reduce the probability of recurrence. The results of the investigation shall be maintained as part of the permanent records.

2. All abnormal occurrences shall be reported to the U. S. Nuclear Regulatory Commission in accordance with Section M.1. of these specifications.

3. Abnormal occurrences shall include, but not necessarily be limited to, the following:

   a. a violation of the Technical Specifications or the facility license;

b. an uncontrolled or unanticipated reactivity change;

c. an uncontrolled or unanticipated release of radioactivity from the site;

d. a safety system component malfunction or other system or component malfunction which renders or threatens to render the safety system incapable of performing its intended safety function;

e. an observed inadequacy in the implementation of either administrative or procedural controls, such that the inadequacy causes or could have caused the existence or development of an unsafe condition with regard to reactor operation; and

f. abnormal degradation of reactor fuel as revealed by periodic inspection.

M. Reporting Requirements

In addition to the requirements of applicable regulations, and in no way substituting therefor, reports shall be made to the NRC as follows:

1. A report not later than the following working day (by telephone or telegraph to the Director, NRC Region V Inspection & Enforcement Office) and a report within 10 days (in writing to the Director, Division of Operating Reactors, USNRC, Washington, D. C. 20555) of:

   a. Abnormal occurrences as defined in Section L.

   b. Releases of radioactivity from the facility above the permissible limits specified in 10 CFR Part 20, Appendix B, Table II, as modified in accordance with Section V.E.

2. A report within 30 days (in writing to the Director, Division of Operating Reactors, USNRC, Washington, D. C. 20555) of:

a. Significant changes in the facility organization.

b. Significant changes in the transient or accident analyses described in the safety analysis report, as amended.

c. Substantial variances of safety related operating characteristics from previously predicted or measured values.

3. A routine report (in writing to the Director, Division of Operating Reactors, USNRC, Washington, D. C. 20555) at the end of each 12-month period providing the following information:

a. A narrative summary of reactor operating experience, including the energy generated by the reactor (in megawatt-hours).

b. A discussion of unscheduled shutdowns, including the corrective action taken to preclude recurrence.

c. A summary of the preventive and corrective maintenance operations performed having safety significance.

d. A discussion of the changes in the facility and procedures, and the tests and experiments, carried out without prior approval by the U. S. Nuclear Regulatory Commission pursuant to 10 CFR Part 50, Section 50.59.

e. A summary of the nature and amount of radioactive material released to the environs.

f. The results of any environmental surveys performed outside the facility.

g. A summary of significant (above 500 mRem) radiation exposures received by facility personnel and visitors in any one year, including the dates and times of significant exposures.

h. The results of the Environmental Program shall be included in the NEL facility annual report sent to the Commission and available to Commission inspectors upon request.

TABLE I

Control Blade Withdrawal Inhibit Interlocks

1. Startup channel count rate less than 1 count per second.
2. Log N period amplifier selector switch not in operate position.
3. Reactor period less than 6 seconds.

TABLE II

Control System Tests

	Test	Limit	Frequency
1.	Drop time of each control blade (from full withdrawn position)	1 second from initiation of blade drop to full insertion	annual (14 month maximum interval)
2.	Reactivity worth of each control blade, reactivity insertion rate of each control blade, and shutdown margin		annual (14 month maximum interval)
3.	Operability test of interlocks listed in Table I	operable	prior to each startup

TABLE III

Reactor Safety System

Safety System Trips	Drop Blades	Dump Valve Open
Period less than 3 seconds	yes	yes
Power at 125% of full power	yes	yes
Manual scram	yes	yes
Loss of electrical power to control console	yes	yes
Primary cooling system		
Loss of pump power	yes	no
Low water level in core	yes	no
No flow	yes	no
Shield tank system		
Low water level	yes	no
Ventilation system		
Loss of power to ventilation fans	yes	no

TABLE IV

Safety System Operability Tests

Component or Scram Function	Frequency
Log N period channel	Prior to the first startup of each day and after repair or de-energization
Power level safety channels	
Loss of primary coolant pump power	
Loss of primary coolant level	
Loss of shield tank water level	
Loss of power to ventilation fans	

NEGATIVE DECLARATION REGARDING

FACILITY OPERATING LICENSE R-71

FOR THE

UNIVERSITY OF CALIFORNIA AT LOS ANGELES

TRAINING REACTOR

DOCKET NO. 50-142

The U. S. Nuclear Regulatory Commission (the Commission) has considered the Amendment to Facility Operating License No. R-71 for the University of California at Los Angeles. The amendment provides for changes in Technical Specifications to allow for alterations in effluent discharge and monitoring thereof, restrictions on in-core experiments, and changes in some administrative aspects of the operation.

The U. S. Nuclear Regulatory Commission, Division of Reactor Licensing, has prepared an environmental impact appraisal for this research reactor. On the basis of this appraisal, we have concluded that an environmental impact statement for this particular action is not warranted because there will be no significant environmental impact attributable to the proposed action. The environmental impact appraisal is available for public inspection at the Commission's Public Document Room at 1717 H Street, N. W., Washington, D. C.

Dated at Bethesda, Maryland, this 19th day of December, 1975.

FOR THE NUCLEAR REGULATORY COMMISSION

Wm. H. Regan

Wm. H. Regan, Jr., Chief
Environmental Projects Branch 4
Division of Reactor Licensing

ENVIRONMENTAL IMPACT APPRAISAL

FOR THE

UNIVERSITY OF CALIFORNIA AT LOS ANGELES

TRAINING REACTOR

LICENSE NO. R-71

DOCKET NO. 50-142

The enclosed document discusses the environmental aspects of an amendment to the license for the operation of the University of California at Los Angeles Training Reactor to allow changes in effluent discharge and monitoring thereof, restrictions on in-core experiments, and changes in some administrative aspects of the operation. It is issued in support of the Commission's negative declaration with respect to the need for a separate environmental impact statement for the University of California at Los Angeles Training Reactor.

ENVIRONMENTAL CONSIDERATIONS REGARDING THE AMENDMENT OF THE LICENSE OF THE UNIVERSITY OF CALIFORNIA AT LOS ANGELES TRAINING REACTOR, OPERATING LICENSE R-71

THE PROPOSED ACTION

By application for license amendment dated May 22, 1975, the University of California at Los Angeles (UCLA) requested changes to the Technical Specifications for the UCLA Training Reactor. The requested changes to the Technical Specifications involve a modified stack discharge rate and new Argon-41 discharge limits, an additional restriction on in-core experiments, and administrative changes. These changes are indicated in the following discussion.

1. Effluent Discharge: Technical Specification II.B.3 would be modified to correctly state the height of the facility stack with the acceleration nozzle removed. Removal of the acceleration nozzle would provide an effluent flow rate out of the stack of 14,000 CFM in conformance with the original Technical Specification. The current release rate is 11,200 CFM. Technical Specification II.B.4 would be changed and V. E. added to allow for a reduction factor of 460 for allowable concentrations of Argon-41 in the stack and releases to the atmosphere respectively. Technical Specification V. B. would be changed to require the exhaust air to be monitored only during reactor operation and during core alterations. The present Technical Specifications require that exhaust air must be monitored continuously.

2. In-Core Experiments: Technical Specification III.E.3. was incorrectly worded in its original form, requiring that no sample be pneumatically removed from a critical reactor if the resultant stable period will exceed twenty (20) seconds. The term "exceed" should have been "less than." Additionally, the licensee has requested that this section be changed to reflect the additional potential for a transient, with a stable period of less than 20 seconds, which might result from the insertion of a sample into the reactor core.

3. Administrative Changes: The licensee has requested a new Technical Specification, VIII.B., which would assign the responsibility for maintaining records to the reactor supervisor. Additional administrative changes involve the substitution of "Nuclear Regulatory Commission" and "USNRC" for "Atomic Energy Commission" and "USAEC," respectively, in the Technical Specifications.

PROBABLE ENVIRONMENTAL IMPACTS OF PROPOSED ACTION

The probable environmental impacts of the proposed changes in the Technical Specifications for the UCLA Training Reactor are indicated and discussed below.

1. Effluent Discharge: The proposed stack modification and resulting increase in effluent flow rate out of the stack from 11,200 CFM to 14,000 CFM would result in a decrease in the concentration of radionuclides present in the effluent. The isotope of interest, Argon-41, would be reduced to a concentration of approximately 1.6×10^{-5} uCi/ml when the reactor is operation at 100 kW. Utilization of the exposure reduction factor for Argon-41 of 460 which includes consideration of an occupancy factor of 0.10, a reactor utilization factor of 0.188 and a dispursion factor of 0.115, is permissible under 10 CFR 20.106 (b), and results in acceptable effluent concentrations available to any non-occupationally exposed individuals who are potentially exposable to the reactor stack effluent.

As accidental radioactive discharges could only result during reactor operation or during alterations to the reactor core, the monitoring of exhaust air at other times does not materially add to the health and safety of the facility. Accordingly, the proposed Technical Specification V.D. is acceptable. No measureable environmental impact is expected as a result of these changes in Technical Specifications.

2. In-Core Experiments: Correcting the Techincal Specifications regarding removal of irradiated samples and adding the specification on insertion of samples will increase the inherent safety of the reactor and its operations. No environmental impact as a result of this change is expected.

3. Administrative Changes: The administrative changes to the Technical Specifications as indicated will not have any impact on the environment.

CONCLUSION

The NRC staff concludes that there will be no significant environmental impact associated with the amendment of the UCLA Training Reactor license and that no environmental impact statement is required to be written for the issuance of the amendment to the operating license for this facility.

FEB 5 1976

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 10 TO LICENSE NO. R-71

UNIVERSITY OF CALIFORNIA AT LOS ANGELES

UCLA TRAINING REACTOR

DOCKET NO. 50-142

Introduction

By application for license amendment dated May 22, 1975, the University of California at Los Angeles (the licensee) requested changes to the Technical Specifications for the UCLA Training Reactor. The changes to the Technical Specifications involve (1) modified Argon-41 restrictions, (2) changes to the restrictions on in-core experiments, and (3) administrative changes.

In reviewing the application for license amendment it was found that several changes were required in the proposed Technical Specifications. These changes were discussed with and concurred in by the licensee.

Discussion

Discussions of the licensee's proposed Technical Specification changes are contained in the following sections.

1. Modified Argon-41 (Ar-41) Restrictions

The UCLA Training Reactor has a graphite moderated core in which the fuel is arranged in separate, water cooled, fuel boxes. During reactor operation the air which is located between the fuel boxes is irradiated producing isotopes of Argon (Ar-41), Nitrogen (N-16), Oxygen (O-19), and Carbon (C-14). Of these isotopes, O-19 and N-16 have very short half-lives[1/] (29.4 and 7.3 seconds, respectively) and C-14 exists in very minute quantities; Ar-41 however has a half life of 109 minutes and is present in sufficient abundance to be a significant effluent. Air containing Ar-41 is drawn from the reactor room by the ventilation system, filtered and monitored for radioactivity, diluted with fresh air and exhausted through an acceleration nozzle at the top of the facility stack.

1/ A "half life" is the time it would take for the radioactivity of a given isotope to decrease to 1/2 of its initial value.

In the application for license amendment dated May 22, 1975, the licensee requested several changes to the Technical Specifications addressing the production, monitoring, and release of Ar-41. The requested changes are as follows: (1) Technical Specification II.B.3 would be modified to state correctly the height of the facility stack with the acceleration nozzle removed. Removal of the acceleration nozzle would establish a flow rate of 14,000 CFM in conformance with the original Technical Specification, (2) Technical Specification V.B. would be changed to require the exhaust air to be moniroted only during reactor operation and during core alterations. At the present time exhaust air must be monitored "continuously". (3) Technical Specifications II.B.4 would be changed and V.E. added to allow a reduction factor of 460 for allowable concentrations of Ar-41 in the stack and releases to the atmosphere, respectively.

2. Changes to the Restrictions on In-Core Experiments

Technical Specification III.E.3 states that "No sample shall be pneumatically removed from a critical reactor if the resultant stable period[2/] will exceed 20 seconds". This Technical Specification was incorrectly worded; the term "exceed" should have read "be less than". In addition, the licensee has requested that this section be changed to reflect the additional potential for a transient, with a stable period of less than 20 seconds, which might result from the insertion of a sample into the reactor core.

3. Administrative Changes

The licensee has requested that a Technical Specification be added to be designated as paragraph VIII B which would assign the responsibility to the reactor supervisor for maintaining records of AR-41 releases. Additional administrative changes include substitution of "Nuclear Regulatory Commission" for "Atomic Energy Commission" in Specifications VIII.K.4, VIII.L.2, and VIII.M.3.d; substitution of "NRC" for "AEC" in VIII.M and VIII.M.1., and substitution of "USNRC" for "USAEC" in VIII.M.2 and VIII.M.3. These administrative changes have no safety significance and will not be discussed further.

Evaluation

Our evaluation of the licensee's proposed Technical Specifications is contained in the following sections.

2/ The stable period is the time it would take the neutron flux to change by a factor of 2.3.

1. Modified Ar-41 Restrictions

The effect of removing the acceleration nozzle from the facility stack will be an increase in the gaseous discharge rate from approximately 11,200 CFM to approximately 14,000 CFM. This will result in a corresponding reduction in the concentration of Ar-41; thus, we find proposed Technical Specification II.B.3 to be acceptable.

We have reviewed the licensee's proposal to require exhaust air monitoring during reactor operation and during core alterations, as compared to the present requirements of Technical Specification V.B which requires "continuous monitoring". Accidental radioactive discharges could only result from reactor operation or from alterations to the reactor core such as the movement of fuel or experiments; thus, the monitoring of exhaust air during other than these times does not materially add to the safety of the facility. Accordingly, proposed Technical Specification V.B is acceptable.

The licensee has requested that we approve effluent release limits for Ar-41 in excess of those permitted by 10 CFR Part 20, Section 20.106(a). This request, submitted via license amendment dated May 22, 1975 and supplemented by letter dated November 5, 1975, was made pursuant to 10 CFR Part 20, Section 20.106(b). In the course of our review, we have made the following findings as required by 10 CFR Part 20, Section 20.106(b) prior to our approval of increased release limits: (1) The applicant has made a reasonable effort to minimize the radioactivity contained in effluents to unrestricted areas. Various experiments involving the sealing of the reactor, use of an inert "sweep gas", and provisions for a 3 hour delay time yielded only modest results with regard to reduction of the Ar-41 effluent. The licensee has, however, committed to reducing the use of the facility to a minimum level. We have approved a reactor utilization factor of .188 for consideration of the effective concentration of Ar-41. (2) It is not likely that radioactive material discharged in the effluent would result in the exposure of an individual to concentrations of radioactive material in air or water exceeding the limits specified in 10 CFR Part 20, Appendix "B", Table II. In making this finding, we have considered the effects of atmospheric dilution and occupancy of the facility as follows: (a) Since the facility stack is in a restricted area as defined by 10 CFR Part 20, Section 20.3(a)(14), the licensee may take credit for a dispersion factor pursuant to 10 CFR Part 20, Section 20.106(d). We have approved a dispersion factor of .115. The licensee has proposed an Environmental Program to be carried out over a two year period to confirm the conservative nature of the dispersion factor. The requirements of this program have been incorporated into the Facility Operating License as paragraph 2.C.(3); the associated reporting requirement are contained in Technical Specification M.3.h. (b) The anticipated human occupancy in the most adverse area, with regard

to expected radiation dose is low. We have approved an occupancy factor of .10 for consideration of the effective concentration of Ar-41. The combined effect of the reactor utilization factor, the dispersion factor, and the occupancy factor yields a reduction factor of 460. Accordingly, we find proposed Technical Specifications II.B.4 and V.E., which allow for a reduction factor of 460 for Ar-41 effluent in the stack and releases to the atmosphere, respectively, to be acceptable. If any of components of the reduction factor change over a period of one year so as to increase the effective value of the reduction factor, Technical Specification V.E. would require the licensee to so inform the Commission.

2. Changes to the Restrictions on In-Core Experiments

Technical Specification III.E.3 states that "No sample shall be pneumatically removed from a critical reactor if the resultant stable period will exceed 20 seconds". This Specification is deficient for two reasons. First, the requirement for stable periods to exceed 20 seconds is clearly in error since transients yielding shorter rather than longer periods are more hazardous in that they have the potential of rapidly increasing the reactor power. Secondly, this Specification does not recognize the potential for achieving a positive reactor period as a result of inserting a sample in the reactor. The proposed Specification III.E.3 requires that "No sample shall be pneumatically inserted or removed from a critical reactor if the resultant stable positive period will be less than 20 seconds". This Specification corrects the two above referenced deficiencies and is acceptable.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the changes do not involve a significant increase in the probability or consequences of accidents previously considered and do not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, 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 to the health and safety of the public.

Date: FEB 5 1976