Radiation Center | Oregon State University | Corvallis, Oregon 97331 (503) 754-2341

October 4, 1985

U.S. Nuclear Regulatory Commission
Region V
1450 Maria Lane, Suite 210
Walnut Creek, CA 94596-5368

Attention: Regional Administrator

Gentlemen:

Subject: Annual Report of Changes, Tests and Experiments Made Under the Provisions of 10 CFR 50.59 for the Oregon State University TRIGA Reactor (OSTR), License No. R-106, Docket No. 50-243.

The following report is submitted in accordance with the requirements of 10 CFR 50.59(b), and covers the OSTR's annual reporting period of July 1, 1984 through June 30, 1985.

During the specified reporting period there were three OSTR facility changes, one change to the OSTR facility procedures, and one change to the OSTR reactor experiments made pursuant to 10 CFR 50.59. The individual changes being reported are listed below by title and are described in more detail in Attachment A. Regarding the attachment, you will find that it includes a brief description of each change, followed by a summary of the safety evaluation conducted for the described change. As required, none of the changes involved a change in the OSTR Technical Specifications or an unreviewed safety question as defined in 10 CFR 50.59(a)(2).

1. Changes to the OSTR Facility:

   A. Installation of an annunciator on the ventilation fan for the argon ventilation system.

   B. Installation of an electronic timing device for measuring control rod drop time.

   C. Change in the display locations for data from the instrumented fuel element thermocouples.

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2. Changes to OSTR Facility Procedures:

   A. Revisions to the OSTR and Radiation Center Emergency Response Plan.

3. Changes to OSTR Reactor Experiments:

   A. Change to experiment "B-24-Revised" to add Subpart B-24F.

We hope you will find this year's report to be in good order. However, should you require more information or have any questions regarding our report, please let me know.

Sincerely,

Clifford V. Smith Jr.

Clifford V. Smith, Jr.
Reactor Administrator, OSTR
Director, Radiation Center

CVS/ef

Enclosure

cc: Document Control Desk, USNRC, Washington, D.C.
Director, Office of Inspection & Enforcement, USNRC, Washington, D.C.
Standardization and Special Projects Branch, Division of Licensing, USNRC, Washington, ATTN: Mr. Robert Carter
Director, Oregon Department of Energy, Salem, OR
A. G. Johnson, Assistant Director, Radiation Center
B. Dodd, Assistant Reactor Administrator, OSTR
S. E. Binney, Chairman, Reactor Operations Committee, OSTR
T. V. Anderson, Reactor Supervisor, OSTR

ATTACHMENT A

CHANGES TO THE FACILITY, TO FACILITY PROCEDURES, AND TO REACTOR EXPERIMENTS PURSUANT TO 10 CFR 50.59 FOR THE PERIOD JULY 1, 1984 THROUGH JUNE 30, 1985

1. Introduction

The information contained in this attachment provides a summary of OSTR changes made during the reporting period under the provisions of 10 CFR 50.59. As applicable, changes have been grouped into three categories: those dealing with the facility itself; those dealing with the facility's procedures; and those involving OSTR experiments. For each change identified, a brief description of the change and a summary of the safety evaluation is included.

2. 10 CFR 50.59 Changes to the Facility

There were three changes to the facility itself which were reviewed and performed under the provisions of 10 CFR 50.59 during the reporting period. A summary of each change and its safety evaluation follows.

a. Installation of an Annunciator on the Ventilation Fan for the Argon Ventilation System

Description

The specific ventilation system for the OSTR experimental (i.e., irradiation) facilities (such as the rotating specimen rack, the beam ports, the thermal column, etc.) is commonly called the argon ventilation system. This ventilation system is equipped with a fan to enhance air flow through the various reactor experimental facilities, and ultimately the system discharges its ventilation air into the intake plenum for the reactor building (main) ventilation fan. Although the fan for the argon ventilation system definitely creates a higher air flow through this system when it is operating, the negative pressure in the reactor building fan intake plenum (relative to the air pressure in the argon ventilation system) induces a reasonable air flow through the argon ventilation system without the argon fan operating.

Operation of the ventilation fan for the argon ventilation system is indicated by an "on" light on a control panel located on the west wall of the reactor control room. However, this indicator light is not in a totally conspicuous location and it is difficult to see from the reactor console. Because of the location of this indicator light, it was considered unlikely that the reactor operator would be immediately alerted if the argon ventilation system fan stopped.

As a result of the above, the OSTR operations staff recommended the installation of a visible and audible annunciator for the argon ventilation fan circuit which would immediately alert the reactor operator if the ventilation fan stopped operating.

Safety Evaluation

The installation of an annunciator on the argon ventilation system fan enhances safety and provides needed notification in the event the fan malfunctions. However, failure of the vent fan poses no safety problem, as an acceptable air flow through the argon ventilation system is still maintained due to the pressure-induced flow mentioned previously. In addition, air flow through the system is an optional matter controlled by the reactor operations staff using flow regulating valves installed as part of the original reactor equipment and upgraded and supplemented over the last two years under the provisions of 10 CFR 50.59.

The above facility change was reviewed by a Reactor Operations Staff Subcommittee and approved by the Reactor Operations Committee (ROC) prior to being made. It was concluded that this facility change did not require a change in the Technical Specifications or constitute an unreviewed safety question as defined in 10 CFR 50.59(a)(2).

b. Installation of an Electronic Timing Device For Measuring Control Rod Drop Time

Description

During an NRC inspection of the OSTR in March of 1985, the NRC representative suggested that consideration be given to an alternative method for measuring the drop times for the reactor control rods. At that time, the semiannual measurements of control rod drop times were being performed manually with a stop watch.

NOTE: The stop watch method has been very adequate considering the two-second drop time limit in the OSTR Technical Specifications.

In an effort to respond to the NRC's suggestion, the OSTR staff investigated possible ways of implementing an electronic timing device for the control rod drop time measurements. The results of the study demonstrated that the control rod drop time could be measured electronically using a commercially available counter-timer, a relay, and a five-position selector switch. The process utilized existing but non-used contacts on: 1) the control rod drive foot switches, and 2) the console CONT/ON switches. The CONT/ON switch starts the timer at the instant the control rod starts to drop, and the foot switch stops the timer when the rod reaches the bottom. The selector switch determines which control rod drop time is being measured.

Safety Evaluation

This addition does not compromise safety or affect any control circuitry. Spare contacts were used on existing control rod microswitches to make the rod drop measurements possible. The rod drop measurement apparatus is passive and responds to switch actuation only, and will not have an effect on the control rod drive circuits, even if the apparatus should malfunction.

The above facility change was reviewed by a Reactor Operations Staff Subcommittee and approved by the ROC prior to being made. It was concluded that this facility change did not require a change in the Technical Specifications or constitute an unreviewed safety question as defined in 10 CFR 50.59(a)(2).

c. Change in the Display Locations for Data from the Instrumented Fuel Element Thermocouples

Description

The display locations for fuel temperature data from the instrumented fuel element thermocouples (TCs) were changed so that the TCs measuring the maximum and minimum fuel temperature now display their readings on the more accurate OMEGA digital instrument on the right-hand side of the console, and the middle TC displays its reading on the analog meter in the left-hand console drawer.

Safety Evaluation

There are no adverse safety implications associated with this change. All of the TCs are routinely calibrated and were recalibrated after this change. It is known that the newer OMEGA digital instrumentation is more accurate, and therefore it increases safety to have the maximum and minimum fuel temperatures displayed on this new digital meter. (Note: Only one TC reading is actually required by the OSTR Technical Specifications.)

The above facility change was reviewed by a Reactor Operations Staff Subcommittee and approved by the ROC prior to being made. It was concluded that this facility change did not require a change in the Technical Specifications or constitute an unreviewed safety question as defined in 10 CFR 50.59(a)(2).

3. 10 CFR 50.59 Changes to Facility Procedures

There was one 10 CFR 50.59 change to facility procedures made during the reporting period. A description of this change follows.

a. Revisions to the OSTR and Radiation Center Emergency Response Plan

Description

Following an action drill and a number of training sessions held during the week of July 16-20, 1984, it was recognized that there were a number of minor corrections which needed to be made to the Emergency Response Plan. These changes are listed below:

Change No.	Page	Change
1	Cover page	Change revision date to July 24, 1984
2	2-2	Add definition of ERIP
3	2-3	Retyped to include text carried over from page 2-2. No revision of content.
4	3-4	Change Student Health Service to Student Health Center. This is necessary due to a name change.
5	3-5	Change Student Health Service to Student Health Center. This is necessary due to a name change.
6	3-6	Correct the spelling of responsibilities in two places on this page.
7	3-6	Reverse the order of the first two people in the line of succession for the Emergency Director. This order is more consistent with personnel responsibilities.
8	3-8	Correct the spelling of responsibilities in two places on this page.
9	3-11	Change Radiation Center Clerical Specialist to Radiation Center Clerical Assistant. The original job title was in error.
10	7-1	Change OSU Student Health Service to Student Health Center

Change No.	Page	Change
11	7-2	Change Trojan nuclear plant to Trojan Nuclear Plant
12	7-3	Add an 's' to air sampler
13	7-8	Change shutdown to shut down
14	7-14	Change shutdown to shut down
15	8-5	Revise paragraph b) completely to allow for the new 911 Emergency Dispatch system now in use in the Corvallis area
16	8-6	Change Student Health Service to Student Health Center
17	8-7	Change Student Health Service to Student Health Center

Safety Evaluation

Most of the changes are typographical and English corrections and therefore do not have any safety implications. One change reverses the order of two people who may fill the Emergency Director position. The new sequence is more consistent with personnel responsibilities and will enhance safety. The latter is true because the Assistant Director will now fill the position of Senior Health Physicist only, which will anable him to concentrate on any radiological safety aspects of the emergency. Another change is required because, since the plan was originally written, the Corvallis area has adopted a 911 emergency dispatch system. This also enhances safety because there are now less telephone numbers to call if there is need for assistance.

The above OSTR procedural changes were reviewed by a Reactor Operations Staff Subcommittee and approved by the ROC prior to being made. It was concluded that these changes did not require a change in the Technical Specifications or constitute an unreviewed safety question as defined in 10 CFR 50.59(a)(2).

4. 10 CFR 50.59 Changes to Reactor Experiments

There was one 10 CFR 50.59 change to a reactor experiment during this reporting period. A description of this change follows.

a. Change to Experiment B-24-Revised to Add Subpart B-24F

Description

A change to experiment B-24-Revised was made which added Subpart B-24F and thereby enabled zone plate encoded neutron holography to be performed in beamport #1. The experiment change provided for the radiography of small (less than 3.0 cm^3) objects and was designed so that only neutrons scattered approximately 90 degrees would be recorded by the radiography film.

The new subpart B-24F will allow the imaging of neutrons which are scattered from any object currently allowed to be radiographed by experiment B-24-Revised. Before imaging on the film, the scattered neutrons pass through a gadolinium or cadmium encoding aperture which will encode target spatial information on the film. The film cassette will be placed at a 90° angle to the beam axis and will be surrounded by a lead "igloo" which will completely enclose the cassette except for one small imaging aperture, which will allow scattered neutrons to reach the film, and for one entire face (the surface facing the beam port facility access plug) which will allow the cassette to be easily removed.

When it is necessary to change the target and/or coding aperture during experimentation, all requirements of the currently approved Experiment B-24-Revised will be met before entering the beam port facility blockhouse. This includes shutdown of the reactor, and full coordination with health physics personnnel.

No modifications to beam port #1 affect any existing shielding or alter any approved operating procedures, or reduce any safety margins now in use. All general procedures, safety requirements, and facility descriptions of B-24-Revised will apply to this experiment.

Safety Evaluation

None of the new experimental apparatus will be in the direct beam and so from a safety viewpoint this experiment is very similar to standard neutron radiography experiments. Radiation protection features are equivalent to those for other neutron radiography experiments.

The above experiment change to B-24-Revised was reviewed by a Reactor Operations Staff Subcommittee and approved by the ROC prior to being made. It was concluded that the change did not require a change in the Technical Specifications or constitute an unreviewed safety question as defined in 10 CFR 50.59(a)(2).

5. Forthcoming Changes to Be Made Under 10 CFR 50.59

At some point in the future we expect to replace the rotating specimen rack in the TRIGA reactor under the provisions of 10 CFR 50.59.