

Nuclear Reactor Laboratory
Engineering Building (20)
P. O. Box 210020
Tucson, Arizona 85721-0020



John G. Williams, Director
e-mail: jgw@bigdog.engr.arizona.edu
voice (520) 621-9729
FAX (520) 621-8096

October 16, 1996

U.S. Nuclear Regulatory Commission
Document Control Desk MS P1-37
Washington, DC 20555

Ref: 10CFR50.36(c)(5)
and 10CFR50.71(a)

Re: Required Report: License No. R-52 Docket No. 50-113

DESCRIPTION OF THE OCCURRENCE

On the morning on September 19, 1996, between 1000 and 1100, an approved experiment was installed in the reactor core of the University of Arizona Reactor, under the supervision of a licensed SRO, in accordance with facility procedure UARR 163. The installation involved a movement of fuel, governed by procedure UARR 105. Following the completion of the core change, facility procedures UARR 100, 105, and 116 require the presence of a licensed SRO during the next reactor start up.

On the same day, at approximately 1115, the reactor was started up and operated, at a power of 1 Watt, for approximately 6 minutes by a licensed Reactor Operator, without supervision of a Senior Reactor Operator, in violation of Tech. Specs. condition 6.1 (b). This was discovered at 1415 by the Laboratory Director, who makes this report.

In the facility operating log, the RO had entered the name of an SRO, who was in the building at the time, but who was not aware of the operation, and who had not authorized it. In addition, facility procedures UARR 100, 105, and 116, were violated. These procedures require the presence of an SRO when the reactor is started up following the movement of fuel, or of in-core facilities.

The operation did not cause any risk to the health and safety of the public, or to the reactor facility.

The reactor was shut down normally by the RO, after he had determined that the critical control rod heights were in accordance with the predicted reactor excess reactivity. The purpose of the run was to perform this check, which is part of the Critical Approach Checklist, UARR 153, which is performed on each day when the reactor is operated. A

9610180028 961016
PDR ADOCK 05000113
S PDR

180004

IE22
11

licensed SRO must be on call during all reactor operations, and must be present in the control room during the start-up after any core change.

CAUSE OF THE OCCURRENCE

When questioned afterwards (at 1700, on 9/19/96) the RO stated that he thought he had "tacit approval" for the operation, and that he overlooked the requirement for the presence of an SRO owing to the fact that procedure UARR 163, which he was following, did not specifically call attention to the requirement for an SRO to be present, though it does reference UARR 105 and 116, which do specifically state this requirement. A contributory cause was that when the core change had been completed at 1100, the need for the presence of an SRO during the next start-up was not noted in the facility operating log.

CORRECTIVE ACTION

The error was discovered by a licensed SRO at 1415 the same day, before the reactor was operated again. This SRO was the Reactor Laboratory Director, who makes this report.

Initial remedial actions, taken by the Reactor Laboratory Director, were: (1) the suspension from licensed duties of the RO in question, effective 1500, 9/19/96, (2) the revision of the procedure UARR 163 to specifically state the need for an SRO to be present after the installation of equipment involving a core change, and (3) the assignment to the suspended RO of the task of delivering a requalification class to all licensed operators of the facility, entitled: "Who May Authorize What, and How."

A report, within 24 hours, was made to the NRC Region IV Office by telephone and telefax, on the morning of 9/20/96. Similar reports were made to the NRC Headquarters at the same time. Such a report is required by facility technical specifications in the event of a reportable occurrence. Subsequent analysis revealed the event did not meet the definition of a reportable occurrence, because it could not have resulted in the operation of the reactor outside the limiting conditions for operation. The installed reactor core could not have been operated outside those limits.

On Friday, 9/27/96, at 1200, the suspended RO presented a requalification class, as required, to all licensed operators. He had prepared a document (attached) showing all instances of statements in the facility procedures, technical specifications and emergency plan, that indicate who may or must authorize any action. This document was used to provide information for the class, and as the basis for the requalification test which

followed, and has subsequently been placed in the reactor control room for reference by licensed Operators. At the conclusion of this class, the Reactor Laboratory Director reinstated the suspended RO.

Facility technical specifications, section 6.7 c, requires a written report within 30 days to the USNRC Document Control Desk, with a copy to Region IV, of:

4. Any observed inadequacy in the implementation of administrative or procedural controls.

This report is made in accordance with that requirement.

SUMMARY AND CONCLUSIONS

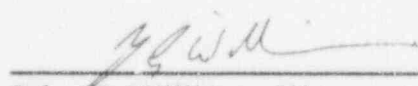
The event reported here resulted from an instance of an RO using initiative beyond his authority. This was attributed to a failure of training to emphasize the formal nature of procedural requirements. A contributory cause was the lack of sufficiently specific instructions in a procedure. No adverse consequences resulted.

The remedial action had the effect of reinforcing the formal nature of procedural requirements, for all operators, and especially the individual involved. It also resulted in the preparation of a document, now available for the use of all operators, that summarizes all the formal requirements for authorization that exist within the facility technical specifications, emergency plans, and procedures. In addition, one procedure was revised to remove a deficiency in the clarity of its requirements. Similar instances were discovered as a result of the review done by the RO in three other procedures. These will be revised at the next meeting of the Reactor Committee.

As a result of these remedial actions a recurrence of a similar error is unlikely.

REPORT PREPARED AND SUBMITTED BY

DATE



John G. Williams, Director
Nuclear Reactor Laboratory

10/16/96

JGW/dg
attachment

October 16, 1996

4

cc: USNRC, Region IV
Samuel J. Collins, Director
Div. of Radiation Safety & Safeguards
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

University of Arizona Reactor Committee
Vice Pres. for Research, M. Cusanovich

C:\OFFICE\WPWIN\WPDOCS\WILLIAMS\VIOLAT.ROB

REACTOR OPERATOR TRAINING SESSION

September 27, 1996

Who Can Authorize What

Reactor Operator

authorizes the designated staff member to reset the Area Monitor alarm if the alarm is the result of a wrong trip setting or spurious signal (UARR 101 §4.5.1a)

Senior Reactor Operator

authorizes continuation of a run when reactivity changes by more than 10¢ (UARR 100 §2.3.12 and §2.4.2)

authorizes continued operation when the CAM alarm sound if the alarm level was inadvertently left below the normal setting (UARR 100 §2.4.4)

authorizes installation and used of neutron radiography tube (UARR 113 §1)

authorizes use of the demountable fuel element (UARR 117 §1)

authorizes persons to use the hoist to access pit no. 6 (UARR 133 §1)

approves experiments for irradiation in Co-60 facility in reactor room (UARR 133 §2)

approves insertion of non-fixed electronic detectors in the reactor (UARR 141 §3)

authorizes entry of persons to the Control Room or Reactor Room (UARR 149 §11)

authorizes continuation of preliminary reactor checkout when any CAM meter reads above 250 CPM (UARR 151 §3.I)

authorizes continuation of preliminary reactor checkout when Perihelic gauge reads greater than 1.6 inches (UARR 151 §3.II)

authorizes continuation of preliminary reactor checkout when either the "zero" or calibrate differ from 0 or 100 by more than one percent on the right or left safety channel (UARR 151 §3.IV)

Reactor Supervisor

authorizes reactor operation (UARR 100 §1.5)

decides, in the case of a faulty fuel element, either to seal off the facility or to remove the fuel element from the reactor (UARR 103 §6)****

approves work on the electronic equipment in the reactor console and control rod drive system (UARR 108 §1)

approves the repair, modification, calibration or installation of equipment (UARR 109 §4)

approves irradiation requests (UARR 110 §1)

authorizes resumption of reactor operation after a spurious earthquake SCRAM (UARR 115 §4)

Reactor Supervisor, continued

approves experiments which are not significantly different from previously approved experiments (UARR 130 \$1)*****
approves removal of small quantities of reactor pool water (UARR 137 \$1)
designates persons authorized to read self-reading dosimeters (UARR 138 \$6)
authorizes repair or modification of FIR (UARR 139 \$10)
authorizes installation of FIR in reactor (UARR 139 \$10)
approves insertion of non-fixed electronic detectors in the reactor (UARR 141 \$3)
authorizes the "one other person" (the Staff Member) who must be present whenever the reactor is not shutdown (UARR 147)
approves neutron radiation and radioisotope production requests (UARR 10 \$C)

Director of the Nuclear Reactor Laboratory

approves experiments similar in nature to experiments previously approved by the Reactor Committee (UARR 100 \$1.4)*****
prepares Entry Authorization List (UARR 100 \$2.1.1)
prepares Authorized Entry List (UARR 100 \$2)
designates persons who may transfer radioactive waste to the RCO (UARR 135 \$1)
approves issuance of NRL keys and alarm codes (UARR 157 \$2)

Reactor Committee

approves newly proposed facility procedures (UARR 100 \$1.4)
approves updating existing facility procedures (UARR 100 \$1.4)
approves new tests and experiments (UARR 100 \$1.4)
approves the repair, modification, calibration or installation of equipment (UARR 109 \$4)
approves irradiation requests (UARR 110 \$1)
authorizes resumption of reactor operation after an actual earthquake SCRAM (UARR 115 \$3)
approves irradiation of demountable fuel element in excess of 500 Watt-minutes/day (UARR 117 \$10)
authorizes shipment and receipt of special nuclear material (UARR 127 \$2)
approves specific procedure for each incident of receipt or shipment of special nuclear material (UARR 127 \$3)
approves new experiments (UARR 130 \$2)
approves irradiations of:
 a. Fissionable material in amounts > 50 μ gms
 b. Materials which may release energy or gas or undergo reaction
 c. Toxic materials (UARR 10 \$D)
approves reactor changes, experiments, and procedures (Emerg. Plan \$3.0)
authorizes operation of the reactor after an emergency (Emerg. Plan \$9.0)

V.P. for Research

appoints Reactor Committee chairmen, members, and alternates (UARR 100 §1.4)

Emergency Director

may activate any portion of the emergency organization (UARR 101 §2.3.1f and others)

authorizes re-entry of the NRL by necessary personnel (UARR 101 §4.5.1k and Emerg. Plan §3.4)

authorizes termination of the emergency (UARR 101 §4.6.1n)

authorizes radiation exposures to emergency team members in excess of normal occupational limits (Emerg. Plan §3.1.1)

OTHER ITEMS

Tech Specs 6.5 & 6.7

Actions to be Taken in the Event of a Reportable Occurrence:

- a. Notify the Reactor Laboratory Director and
Take corrective action prior to resumption of the operation involved.
- b. Submit a report to the Reactor Committee which includes:
 1. an analysis of the cause of the occurrence
 2. efficiency of corrective action*
 3. recommendations for measures to prevent or reduce the probability of reoccurrence
- c. Submit report:
 1. to the USNRC Region IV within 24 hours by telephone and telegraph in writing**
 2. in writing to the NRC within 10 days

UARR 100 § 2.3

Procedure for Start-up, Operation, and Shutdown of the Reactor

1. The reactor supervisor authorizes reactor operations.
2. An SRO shall be present in the control room or the reactor room for:
 - a. the installation or removal of experiments with reactivity worth greater than 10¢.
 - b. after any core changes (fuel movement).
 - c. after any unintentional shutdowns (SCRAMs)

UARR 10 § C

Neutron Radiation and Radioisotope Production

Material will not be inserted into the reactor until the irradiation request has been approved by the reactor supervisor.

Materials will be inserted into the reactor or removed from the reactor only under the direct supervision of a reactor operator or other member of the staff.

UARR 113

Installation & Use of the Neutron Radiography Tube

After removing the shield plugs from the neutron radiography tube, place the plugs on the reactor room floor at least three (3) feet from the edge of the reactor pool.

A Senior Reactor Operator shall be present at the first start-up:***

- a. after any core changes (UARR 100 §2.3.7)
- b. after any unintentional shutdowns (SCRAMs) (UARR 100 §2.3.7)
- c. following visual inspection of Transient Rod drive cylinder (UARR 105)
- d. after any removal of fuel (UARR 105)
- e. after any addition of fuel (UARR 105)
- f. after removal and reinstallation of a control element (UARR 107)
- g. after any repair or calibration of a safety channel (UARR 108)
- h. after any repair, inspection, or adjustment of a control rod or control rod drive (UARR 108)
- i. after the adjustment of any of the ion chambers or fission chambers in the power measuring channels (UARR 108)
- j. following the installation or removal of the FIR, the rabbit, and irradiation tube which will fit into a fuel location or the A-1 position (UARR 116)
- k. after installing the reactivity oscillation system (UARR 118)
- l. after removing the reactivity oscillator system (UARR 118)