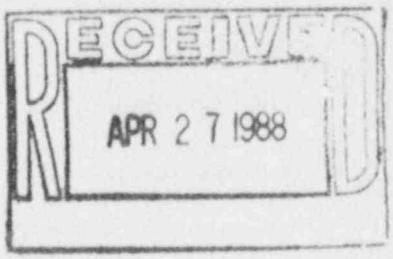
COLLEGE OF ENGINEERING

THE UNIVERSITY OF TEXAS AT AUSTIN

Department of Mechanical Engineering · Nuclear Engineering Program · Austin, Texas 78712 · (512) 471-5136

April 22, 1988



Mr. L.J. Callan, Director
Division of Reactor Projects
Nuclear Regulatory Commission
611 Ryan Plaza, Suite 1000
Arlington, Texas 76011

Re: Docket 50-192

Dear Mr. Callan:

The enclosed report is provided for the inspection notice of violation dated March 24, 1988.

An attachment of draft documents that supported the immediate response of the licensee to the referenced items is also included.

Please note that the licensee is experiencing the very unusual situation of construction, operation and dismantling acitivities at various stages of planning, implementation and completion. Curtailment of present routine operation activities are planned for April 29, 1988 with cessation of all operation by May 29, 1988. The licensee continues to incorporate numerous improvements in the docket 50-602 facility that are identified or recognized docket 50-192 deficiencies.

Sincerely,

Thomas L. Bauer

Thomas L. Bauer
Assistant Director
Nuclear Engineering
Teaching Laboratory

TLB:dlw
Enclosures (Items 1,2,3 &4)

cc: D. Klein
H. Marcus

IC-88-588

IE01

Letter of Reply to
Notice of Violation

Univ. of Texas
TRIGA Mark I

Docket 50-192
Operating License 50-192

1. Reason for violation items A and B

The violations identified by the inspection report Mar 24, 1988 were the indirect result of the development of multiple Technical Specification documents during the period January 3, 1930 to November 9, 1984. The original document was in effect February 10, 1980 at the time of the license renewal request (docket 50-192). The current document was in effect July 29, 1983 at the issuance of the license renewal. Development of another document began in the subsequent months for the license application (docket 50-602) dated November 9, 1984. The latter two documents contained several changes to the administrative commitments from the original document. Unfortunately, the latter two documents also contain minor differences caused by different guidance material during the development process. The first document was developed from another licensee's document while the latter used the guidance of the ANS standards more directly, as well as the example of other licensee's documents. This series of sequential Tech. Specs. developments thus led to less than adequate (timely) attention to the details of the applicable document and perhaps confusion on the part of the staff responsible both for development and implementation of the documents. A contributing factor was the lack of a one-to-one correspondence of the applicable Tech. Specs. with procedures written from previous Tech. Specs.

The delay of actions by the licensee during the 41.5 month effective time for the original to current Tech. Spec. document development for docket 50-192 allowed the subsequent development of Tech. Specs. for docket 50-602 to interfere with the licensee's proper attention. It should be emphasized that the corrective action most important to these violations is the avoidance of a multiple commitment to license documents. This is clearly a one-of-kind situation that is expected to exist only during the existence of the University's commitment to two docket activities. The licensee will also be actively changing the Tech. Specs. during the next 6 months to represent the shutdown condition of the Facility. No facility critical operation is planned after May 29, 1988.

2. Corrective steps and results

Item A

An immediate check of the review dates on all procedures and a list was made of all modifications, of any type. A list was made of all changes and is to be submitted to the reactor committee for review at the next scheduled meeting. Changes were classified as typographical (5), clarification (3), and substantive (8). All substantive changes were conservative changes or corrections to procedure supplements and not the procedure itself.

Item B.1

An immediate review by staff of section 6.5 items was made to determine which items were explicitly addressed by procedures, which items were implicitly addressed by manufacturer documentation and which items were not addressed by either.

An alarm response procedure has been written and will be submitted for review by the reactor committee. A routine maintenance procedure has been drafted to identify applicable subject equipment. Action on this procedure is expected to be deferred indefinitely since pending facility shutdown will probably negate the idea of "routine maintenance". No major routine maintenance items were identified that impact safe operation. Transient rod inspections and instrumentation and control system calibrations are already applicable procedures.

Item B.2

The positive period method used by the license is a variation of a method specified in an approved experiment. A specific procedure is being prepared to be applied at the docket 50-602 facility. This procedure will be reviewed and applied, if necessary, at the docket 50-192 facility. Facility activities are expected to shutdown the docket 50-192 operation before the calibration procedure would be applicable. An amendment to the Tech. Specs. is planned that would remove this specification and others that directly relate to reactor operation.

3. Corrective steps to avoid future violation

Item A

A procedural control has already been drafted for use with the docket 50-602 activities, its use on the 50-192 activities will be examined. The procedures after committee review will be redated with revised dates to reflect the current status. A procedure drafted to address the issue of procedure controls has been reviewed, and a modified form will be submitted to the committee for review. A version of this procedure with a slight modification will be implemented for the remainder of the anticipated license period for the docket 50-192 activities.

Item B

No corrective action is proposed to prevent reoccurrence of this violation since a review and implementation of the appropriate procedures will resolve the deficiency. However, a method will be examined to better coordinate correspondence between the Tech. Specs. requirement with the applicable procedure. This coordination is already being applied to docket 50-602 activities.

4. Date for full compliance

Item A

Compliance of the items of part A are scheduled for a reactor committee meeting on April 29, 1988.

Item B

Compliance of the items of part B are scheduled to be completed within a period determined by the "routine" requirement and the procedure applicability. This time period was chosen so that the Tech. Specs. can be amended to reflect the shutdown condition of the reactor core prior to the implementation of fuel shipment and facility dismantlement. The last

scheduled day for operation of the R-92 facility at full power is May 29, 1988.

Item B.1

Compliance with item B.1. will be effective the date of the April 29, 1988 meeting.

Item B.2

Compliance with item B.2. is scheduled for the next applicable calibration or the change of Tech. Specs. to represent a shutdown facility condition. This period will be less than 6 months (probably 90 days) after the next scheduled reactor committee meeting.

Typographical Corrections To Technical Specification Required Procedures

1. Procedure: Procedure For Determination Of Reactivity Insertion Rates, Shutdown Margin, And Excess Reactivity

   Section: 3, Line 1
   Original: Measurement of shutdown margin *(<.2% ΔK/K/sec):
   Revised: Measurement of shutdown margin *(>.2% ΔK/K):

2. Procedure: Procedure For Fuel Movement

   Section: 6, Step e, Line 2
   Original: ... number shallbe plotted ...
   Revised: ... number shall be plotted ...

3. Procedure: Appendix - Fuel Measurements

   Section: 3, Line 1
   Original: ... to maximum bridge balance
   Revised: ... to maximum; bridge balance

   Section: 8, Line 1
   Original: ... to five position
   Revised: ... to fine position

4. Procedure: Procedure For Semi-Annual Measurement Of Rod Drop Times

   Section: 6, Step b, Line 1
   Original: ... terminal 16 to
   Revised: ... terminal 5 to

5. Procedure: Console Calibration Check

   Section: VII, Part C, Instruction 6, subpart a
   Original: 0.00001 molar KCl
   Revised: 0.0001 molar KCl
   Solutions used contain 7.465 mg/l KCl=0.0001 M KCl

   Section: IX, Part B, Line 2
   Original: ... using XA4TP
   Revised: ... using XA4TP1

   Section: IX, Part B, Tests 2 and 5
   Original: 2. 4.175 ± 0.003 _____ V DC
   5. 7.083 ± 0.018 _____ V DC
   Revised: 2. 4.715 ± 0.03 _____ V DC
   5. 7.018 ± 0.018 _____ V DC

Clarifications Added to Technical
Specification Required Procedures

1. Procedure: Procedure For Semi-Annual Measurement Of Rod Drop Times

Section: 5, Step 2
Original: ... terminal #16.
Revised: ... terminal #17.

Section: 5, Step b
Original: ... terminal #4.
Revised: ... terminal #5.

Section: APPENDIX, Channel A
Original: Probe to terminal 16
Revised: Probe to terminal 17

Section: APPENDIX, Channel 13
Original: Probe to terminal 4
Revised: Probe to terminal 5
Justification: Actual Test Points Not changed, only numerical reference to point changed to reflect clarification of label assignments discovered during detailed circuit traceing activities.

Section: APPENDIX: Third set of instructions
Original: Set trig RESET SINGLE
Perform drop
Revised: Set trig RESET SINGLE
Set view CHANNEL A
Perform drop

Section: Appendix
Original: none, add note
Revised: Note - Float Oscilloscope Power
- Ground Oscilloscope to Rod Drive Chasis

2. Procedure: Console Calibration Check

Section: I, part C
Original: Unchanged, add note below
Revised: Note: Log compensation voltage jack - J2C, Adjustment Pot.-R3
Linear compensation voltage jack-J2D, Adjustment Pot.-R4

Section: II, Part D
Original: unchanged, add note below
Revised: Suggested Equipment - Keithley Current Source (grounded)
Keithley Micro-Micro Ammeter (float ground)
Test Junction Box

Section: III, Parts A thru D; V, Parts A thru D; VI, Parts A thru G; VIII, Parts A and D
Original: Entire sections as written

Revised: Insert the following statement at the beginning of each section - Completion of this section not required - Use discontinued or function duplicated during system upgrade.

Section: VII, Part B, Instruction 3, line 1
Original: ... control R508 with ...
Revised: ... control R23 with ...

Section: VII, Part B, Instruction 4, line 1
Original: ... control R506 with ...
Revised: ... control R21 with ...

Section: VIII, Part B, Instruction 1, Subpart c
Original: As written
Revised: Add - Note: TC Element #5981 only has two functioning thermocouples

Section: VIII, Part B, Instruction 2 thru 12
Original: As written
Revised: Delete - Instructions 2 thru 12 in entirety
Add _ 2. Using DC voltage supply, such as Keithley Millivolt Potentiometer, adjust voltage supply for signal representing 500°C from a chromel-alumel Thermocouple accounting for cold junction compensation in pyrometer
Example: Vrequired = V(500°C) - V(ref)
19.8mv = 20.64 mv - 0.84 mv
with reference junction temp of 21°C
3.Disconnect thermocouples from terminals 6, 7, 8, & 9 of TB1, verify pyrometers indicate full scale scrammed mode.
4. Connect voltage source to terminals for each meter, V=_____mV

Meter	Terminal	Polarity
Right	6	+
	7	-
Left	8	+
	9	-

5. Read Pyrometers Left _____°C, Right _____°C
6. Reconnect thermocouples and compare fuel temperatures to reactor tank water temperature
Water _____°C, Left _____°C, Right _____°C
7. Verify fuel temperature trip level set at ≤ 450°C
Left trip _____°C, Right trip _____°C

Section: IX, Part A, Instruction 6
Original: ... meter deflection. _____ x 10^{-3} amps
Revised: ... meter deflection (125%). _____ 10^{-3} amps
Suggested equipment: Harrison Meter Calibrator (float groun)
Beckman Voltmeter
Test Junction Box

Section: IV, Part D, Instruction 2,3, and 4
Original: 2. ... A7TP2/S7 ...
3. ... A8TP3/S8 ...
4. ... A4TP3/S8 ...
Revised: 2. ... XA7TP2/S7 ...
3. ... XA8TP3/S8 ...
4. ... XA4TP3/S8 ...

Section: IX, Part D, Instruction 5
Original: 5 ... A4TP3/S8
Revised: 5 ... XA4TP3/S8
Add - Note: Source trip voltage level may be verified as >2cps by the following process:
Pull source, connect pulse counter to J5. Count for 10 min. True CPS = measured CPS ÷ 1200. If XA4TP3 voltage with the source out is less than 1.5V and the true count rate calculated is greater than 2 cps, the source trip is at a level > 2cps.

3. Procedure: Procedure for weekly calibration of area radiation monitors

Section: Step 2, Line 2
Original: ... Adjust each reading to <500 volts as necessary
Revised: ... Adjust each reading to the measured plateau as necessary

Section: Step 4, Line 1
Original: ... in the Instrument Calibration ... obtained in #2 above
Revised: ... in the Weekly Instrument Calibration ... obtained in step 3

Section: Step 5, Line 3
Original: Log this in the Instrument Calibration Log.
Revised: Log the alarm level in the Weekly Instrument Calibration Log

4. Procedure: Control rod inspection procedure

Section: Step 9, Line 2
Original: ... by prompt drops.
Revised: ... by prompt drops or positive period.

Minor Substanative Changes to Technical
Specification Required Procedures

1. Procedure: Procedure For Fuel Inspection And Measurement

Section: 4, Line 1, Step b
Original: Two persons ...; b. One person
Revised: Three persons ...; b. Two persons
Justification: Change to more conservative condition

2. Procedure: Console Calibration Check

Section: VII, Part A, Instruction 4, lines 3, 4
Original: ... HI range = 0.00005 μc/cc, 1 mr/hr; the LO range = 0.005 μc/cc, 10 mr/hr.
Revised: ... HI range = 0.00125 μc/cc, 2.5 mr/hr; the LO range = 0.0125 μc/cc, 25 mr/hr.
Justification: Reevaluation due to detector aging and shift of high voltage plateau

3. Procedure: Procedure for weekly calibration of area radiation monitors

Section: Step 1, Line 1
Original: ... the 1 μc/2.5 μc radium ... test stand from the CAM drawer.
Revised: ... the 10 μc/0.8 μc radium ... test stand.
Justification: Use of larger test source results is more accurate point source approximation since source to detector distance for given count rate is increased.

Section: Step 3, Line 1
Original: ... each of the first four ... with the 8.5 μc
Revised: ... each of the four ... with the 10 μc
Justification: Same as for Step 1, Line 1

Section: Step 5, Line 1
Original: ... of the five G/M ...
Revised: ... of the four G/M ...
Justification: Reflects actual number of detectors available as stated in Step 3.

4. Procedure: Emergency Plan

Section: S1, Emergency Call List, Emergency Contacts #1 and #2

Original: 1. T.L. Bauer	Reactor Supervisor	471-5136	345-5044
2. M.G. Krause	Senior Reactor Operator	471-5136	259-1355
Revised: 1. T.L. Bauer	Reactor Supervisor	471-5787	345-5044
2. M.G. Krause	Senior Reactor Operator	471-5787	259-1355

Justification: Reassignment of secondary facility phone number to primary facility phone number, original primary phone number retained by facility director at reassigned office.

Section: S1. Emergency Call List, Emergency Contacts #5 & #6
Original: 5. D.H. Eppes Nuclear Technical Specialist 471-5136
448-4681
6. D.G. Decker Safety Engineer 471-3511 305-5914
Revised: 5. D.G. Decker Safety Engineer 471-3511 345-5914
Justification: Reflect change in personnel

5. Procedure: Power Calibration Procedure, least-squares Linear Fit

Section: 2, numerator of m term
Original: $\Sigma X_i Y_i - \Sigma X_i \Sigma Y_i$
Revised: $\Sigma X_i Y_i - \Sigma X_i(\Sigma Y_i)/n$
Justification: Correction of error in least squares curve fit equation

6, Procedure: Semi-annual Tests of Minimum Interlocks and Safety Circuits

Section: Step 10, line 2
Original: zero adjustment.
Revised: zero adjustment. Alternate method: Adjust % PWR zero control to give indicated reading at 10%.

7. ~ Procedures with no date in index

8. ~CAM PROCEDURE - new solid state model

Alarm Response Procedure

INSTRUCTIONS:

1. Identify alarm.
2. Check system status.
3. Verify action level.
4. Take action specified.

EVENT:

ALARM - Area Monitor (Any 1 of 4)
CHECK - Identify radiation source and level with available equipment
Take necessary steps to limit radiation exposure
ACTION LEVEL - Measured Dose > 100 mR/hr, unknown source
ACTION - Shutdown Reactor, Evacuate Reactor Room

ALARM - Continuous Air Monitor
CHECK - Identify potential radiation source
ACTION LEVEL - Countrate > 2000 CPM, unknown source
ACTION - Evaluate CAM performance, monitor system closely
ACTION LEVEL - Countrate > 5000 CPM, unknown source
ACTION - Shutdown Reactor, Evacuate Reactor Room

ALARM - Pool Water Activity
CHECK - Verify meter zero, lo sensitivity mode, and/or switch purification suction from skimmer to direct
ACTION LEVEL - Water Activity > 0.0125 $\mu Ci/cm^3$
ACTION - Monitor CAM and other systems for abnormal radiation levels

ALARM - Pool Temperature
CHECK - Observe installed instrumentation or measure sample with thermometer; do not place mercury thermometer directly in pool
ACTION LEVEL - Water Temperature > $48^{\circ}C$ ($120^{\circ}F$)
ACTION - Initiate Pool Cooling or Shutdown Reactor

ALARM - Pool Level
CHECK - Visually observe pool level
ACTION LEVEL - Water Level < 4.5 m (15') above top grid plate
ACTION - Initiate Pool Fill or Shutdown Reactor

ALARM - Heat Exchanger Differential Pressure
CHECK - Observe setpoint and function of differential pressure sensor, check for abnormal pressure indications in flow lines.
ACTION LEVEL - ΔP < 7 kPa (1 Psi)
ACTION - Adjust System Pressure or Shutdown Heat Exchanger

10/87 docket 50-602

Item 4

Apply Item 7 to present R-92 license:

Procedure Title:	NETL Procedure Outline and Control	line 8
Revision Date:	~~Draft~~ Revised 4/88	line 9
Personnel:	administrative, supervisory operator, senior operator, reactor operator, research, faculty, assistant, technician, or student.	line 10
Components:	equipment, instruments, or materials, safety devices, special tools, measurement instruments, calibration standards.	line 15
Supplements:	methods to perform calculations, specific manuals, basic data tables, data sheets, forms, logs.	line 20
Prerequisites:	other procedures or tasks, special physical conditions.	line 25

Instructions: line 30

1. Identify procedure by descriptive title, date of original or latest revision, and the procedure page number, (ADM - 1).

2. Determine responsible person for the procedure. Classification of personnel required to perform the procedure is to be specified.

3. Assemble applicable components for the procedure. Documentation of components required to complete the procedure is to be provided.

4. Locate the information related to the procedure. Sources of information applicable to the procedure should be compiled.

5. Verify the proper prerequisites for the procedure. Assurance of proper conditions for the procedure should be determined.

6. Follow the procedure instruction steps. Deviations from the procedures should not alter the substance or intent of the procedure.

7. Document temporary or permanent changes to a procedure. Notes on procedures are for guidance only. A change log documents changes.

   a. Temporary changes or minor changes require approval of a senior operator. Record procedure page, effective date, initial, and change in the procedure change log.

   b. Permanent changes or major changes require review by the reactor committee. Revise and reissue the procedure by reprint with the changes and the revision date.

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Record of Procedure Changes

Page	Date	Initial	Change