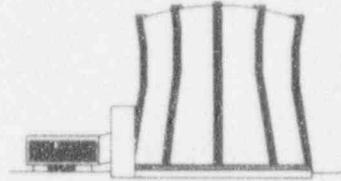


TEXAS ENGINEERING EXPERIMENT STATION

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NUCLEAR SCIENCE CENTER
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97-0129

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

SUBJECT: Reply to a Notice of Violation

REFERENCE: Facility License R-83, Docket 50-128, Inspection
Report 50-128/97-01

This letter is being written in reply to the violations found during the NRC inspection conducted March 17-21, 1997 at the Texas A&M University Nuclear Science Center (NSC).

In the inspection report it was concluded that the NSC reactor was operated safely, but there is an indication for increased management attention to licensed activities. Three consecutive inspections have found problems with required audits. The NRC inspection in 1992 found that Reactor Safety Board (RSB) audits were not being performed. This was attributed to a failure to establish direct individual responsibilities for routine surveillance items and audits. The "Management Overview Program" (MOP) was implemented to assign these items to specific staff members and managers. The individual directly involved in the particular activity (such as Health Physics or Security) would be responsible for scheduling the audit, correcting any items and reporting to NSC management and the RSB. It was felt that this would avoid communication problems and smooth the implementation of any corrective actions.

The NRC inspection in 1994 identified that one RSB audit (Reactor Maintenance and Records) had been left out of the MOP. The MOP recognized that an audit was to be performed once a quarter. Unfortunately, the Technical Specification (6.2.4) listed four audit areas (a through d). Item "a", Facility Operations, did not explicitly state reactor maintenance records were to be included. This oversight resulted in only four audits being assigned to the individual manager. Facility operations were being audited once a year as required, but it was an incomplete audit. The emergency plan audit was identified as being performed in 1994 but a failure to control the audit report resulted in the report being lost before it could be acted upon by the facility.

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The MOP had been established over several years as an effective tool to schedule and remind personnel of audits and required activities. Four of the eight recently identified violations were a result of individuals using the MOP improperly and postponing events that interfered with personnel or operational schedules. When interviewed, staff members noted that their work schedules would get very busy and they would postpone items or forget completely. The NSC management intends to correct these program weaknesses by creating a new staff position, Reactor Administrative Assistant. This individual's primary responsibilities will be to coordinate the MOP, ensure RSB audits are performed and oversee the scheduling of surveillance activities. This position will duplicate, as much as possible, departments at power reactors that manage facility-wide audit programs. The position will report directly to the Director and will act as an assistant to all managers and supervisors. The individual is authorized to go directly to the licensee or RSB chairman if there is difficulty in performing his duties.

The NSC management (Director and Assistant Director) will exercise more control of day-to-day activities by performing formal audits of records and operations. The Reactor Administrative Assistant will assign these audits as necessary.

Listed below are the individual violations and the facility response as required by 10 CFR 2.201.

Violation 50-128/9701-01

Requalification lectures not given quarterly as required in NSC Requalification Program.

Reason for Violation

Individual directly responsible for Operator Training and Requalification Program failed to schedule lectures.

Corrective Action

Requalification program implementation responsibility has been assigned to the individual designated as Reactor Administrative Assistant. Quarterly lectures for first and second quarter of 1997 (Reactor Physics and Reactor Security Plan) have been completed.

Violation 50-128/9701-02

One or more operators did not attend requalification lectures that were part of the requalification program in 1996.

Reason for Violation

Lectures are scheduled at times when the majority of operators are available. Operators who are unable to attend scheduled lectures must coordinate with the lecturer to attend make-up lectures. If a make-up lecture could not be scheduled before the examination the operator would be allowed to read the lesson plan and discuss the material with the lecturer. In a few cases, the operators who attended make-up lectures failed to sign the attendance sheet. In the other cases, the operator read the lesson plan and did not sign for lecture attendance because that would have been a false statement. The NSC staff felt that it was within the intent of the Requalification Program to allow self-study of the lecture material as long as the respective examination was passed.

Corrective Action

The "Nuclear Science Center Reactor Operator and Senior Reactor Operator Requalification Program" will be amended to explicitly allow operator self-study to substitute for a missed lecture. This amendment has already been submitted to the NRC (4/15/97). Responsibility for the records and documentation of the Requalification and Training Programs has been reassigned to the Reactor Administrative Assistant.

Violation 50-128/9701-03

10 CFR 55.21 required physical examinations were not performed every two years as required on four operators.

Reason for violation

The individual manager responsible for the Requalification Program did not have a reliable method of tracking operator physicals. The dates of the operator physicals were listed on a sheet of paper that was not updated. The MOP was never used to keep track of operator licenses. The medical records of all NSC staff had been moved in 1993 to a controlled central location to comply with state and university regulations. It is felt that this may have contributed to the missed physicals because the medical records were no longer easily accessible to the manager.

Corrective action

The Reactor Administrative Assistant will formally track operator physicals and license renewal dates. All operators have now had their required 2-year physicals.

Violation 50-128/9701-04

Some Reactor Safety Board audits were not performed at least quarterly and some audits exceeded the 15-month audit period.

Reason for Violation

All audits were scheduled at the required periodicity on the MOP. The responsible manager postponed several audits in 1995 until the last month of the calendar year resulting in two audits exceeding the time limit of 15 months. The responsible manager allowed a security audit that was scheduled to occur in the first quarter of 1996 to be postponed until October of 1995 a period of 17 months between audits. It was this rescheduling that resulted in several quarterly audits that were listed properly on the MOP being performed within a month of each other in 1995 and 1996. It should be emphasized that all the audits were performed each year, but not within the time periods of the Technical Specifications.

Corrective Action

The Reactor Administrative Assistant will coordinate the RSB audit program. A commercially available software package will enhance the MOP. This software package is specifically designed to manage scheduled activities and tasks. Audits for first and second quarter of 1997 (Emergency Plan and Security Plan) have been completed.

Violation 50-128/9701-05

Radiation surveys were not performed in the waste storage building.

Reason for Violation

The NSC staff does not consider this to be a valid violation and contests the violation. It had been the Health Physics interpretation of 10 CFR 20.1501(a) that periodic surveys of radioactive material storage areas should evaluate the radiation levels at the boundary of the storage area. Documented surveys on the exterior of the waste storage building are performed monthly and the building is marked on all exterior doors with Radioactive Material and Radiation Area warning signs. The Radiation Work Permit (RWP) that was in effect during the movement of the bags of contaminated trash required the general area to remain below 5 millirems/hr. The Health Physics (HP) staff would monitor the area while working using a survey meter. The 130 millirems/hr contact reading that the inspector found on a bag was primarily beta radiation and less than 100 millirems/hr

at 30 cm. The general area was still less than 100 millirems/hr and the area posting was correct.

10 CFR 1003 defines a survey as

"...an evaluation of the radiological conditions and potential hazards incident to the production, use, transfer, release, disposal, or presence of radioactive material or other sources of radiation. When appropriate, such an evaluation includes a physical survey of the location of radioactive material..."

The HP staff felt that it would not be good ALARA practice to perform frequent surveys of the interior of the waste storage building. The building is normally unoccupied and is locked with keys in the control of the HP staff. Upon entry for a significant period (i.e. sorting of material for disposal) a survey meter is used to verify that the area dose rates are still less than 100 millirems/hr but these readings are not generally documented.

Corrective Action

Although the NSC feels there was not a violation of the intent of 10 CFR 20.1501(a) it is conceded that it would be a better practice to have physical surveys of storage areas documented. The HP staff will perform monthly surveys of radioactive material storage areas and new surveys when radiological conditions are changed. New survey maps have been prepared and initial surveys are completed. The general area dose rates (6/2/97) are less than 5 millirems/hr.

Violation 50-128/9701-06

Annual dose limits to the general public were not in compliance with 10 CFR 20.1302 in 1995 and 1996. Annual dose rates at the facility perimeter exceeded 100 millirems.

Reason for Violation

The NSC staff contends that no violation exists and contests the violation. 10 CFR 20.1301(a) states that

"Each licensee shall conduct operations so that the total effective dose equivalent to individual members of the public from the licensed operation does not exceed 0.1 rem in a year"

10 CFR 20.1302 requires demonstration by measurement or calculation that the total effective dose equivalent to the individual likely to receive the highest dose from the licensed operations does not exceed the annual dose limit.

The NSC has exceeded values of 100 millirems/year at the perimeter, but the dose rates never exceeded 2 millirems/hr. Radioactive effluents are well below regulatory limits. Taking into account the occupancy of the area it is not conceivable that a member of the general public ever received an annual exposure of 100 millirems. The NSC facility perimeter is nearly one-half mile from any location of extended occupancy (Easterwood Airport and Brayton Firemen Training Field) and 300 yards from a building that is occupied less than 20 hours a week (Texas A&M University Range Science Field Lab).

The NSC feels that when perimeter occupancy is taken into account the annual exposures would be reduced by at least a factor of four, but a factor of two would be sufficient to be in compliance. Cember (*Introduction to Health Physics*, 1969) suggests a factor of one-sixteenth for occasional occupancy and one-fourth for partial occupancy. The NSC HP staff considered the correction of dose rates by explicitly dividing by four to be a trivial calculation and was implied by stating that perimeter occupancy was minimal. This has been the practice of the Texas Bureau of Radiation Control (BRC) when reporting in its Environmental Monitoring Annual Report and in previous NSC Annual Reports.

The NSC does not use occupancy as a method of increasing the annual dose rates, but has always attempted to maintain all radiation levels ALARA. Identification of perimeter locations that may have high levels is often delayed until the environmental dosimeters are collected and a dose report is sent to the NSC from the BRC. This generally results in a one to two month delay in responding to a high quarterly dose rate. Corrective actions usually do not occur until half way into the next quarter. The NSC has attempted to monitor dose rates directly with micro-roentgen meters but the accuracy of the portable survey meters at such low levels is poor and do not extrapolate to the actual dosimeter readings.

The storage of radioactive material near the facility perimeter resulted in exceeding 100 millirems per year for 1995 and 1996. In both years when the quarterly reports were received, corrective action was immediate and involved moving the material away from the perimeter. In 1994, the perimeter was extended near the waste storage shed because the multi-curie calibration sources stored in the facility caused high perimeter readings. Again, these actions were not necessary based on occupancy but were based on good ALARA practice.

Corrective Action

The NSC feels that there was no violation of 10 CFR 20.1302. The NSC intends to continue maintaining perimeter dose rates ALARA. A significant amount of the contaminated material has been moved

away from the perimeter. The fence adjacent to the waste storage building has been extended another 60 feet to reduce the occupancy to zero. The Texas BRC has been notified and will move the environmental dosimeters in July. In all future annual reports, an occupancy factor of one-sixteenth will be applied to all annual perimeter dose measurements.

Violation 50-128/9701-07

The NSC facility license allows the licensee to receive, possess, and use in amounts as required, any byproduct material, without restriction to chemical or physical form, for analysis or instrument calibration.

Contrary to the above, the NSC received and possessed byproduct material from another site that was not used for analysis or calibration.

Reason for Violation

The following is excerpted from a letter to the NRC, dated 4/15/97, requesting a change to the facility license.

"It has come to our attention from a recent inspection, that when the Nuclear Science Center (NSC) facility license was amended in October 1993 we inadvertently requested a change that did not include all forms of radioactive materials produced, used and stored at an operating research reactor.

"Specifically, license condition II.B.3 was changed to

Pursuant to the Act and 10 CFR, Chapter I, Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material," to receive, possess, and use in amounts as required, any byproduct material without restriction to chemical or physical form, for analysis or instrument calibration but not to separate such byproduct material as may be produced by operation of the reactor

"The amendment was initiated by a combined NRC and State of Texas radioactive material license inspection in 1992. The State of Texas requested that the NSC transfer all radioactive material within the NSC site boundary to an amended NRC facility license. This action was performed with insufficient review by the NSC management of the final license conditions. The NSC staff and management have been incorrectly interpreting the license by the original intent and not how the license was written. With further review and Region IV guidance it appears the license condition II.B.3 does not address the bulk of the radioactive material at the NSC site.

"The Texas A&M University NSC reactor is a 1 MW TRIGA used for isotope production and radiation research. It would be impossible to operate the reactor and only produce radioactive

material "for analysis and calibration". Activated structure and experiment materials are produced in and around the reactor during the normal daily operations. Experimental devices that have failed or become obsolete are stored on site for decay or possible reuse. During routine handling operations, an amount of low-level radioactive waste is produced and is stored at the facility. High-activity isotopes are regularly produced and shipped for commercial and research purposes."

The NSC Management initiated the transfer of material from Hanford, Washington in August of 1993 to acquire several reactor neutron detectors, a large quantity of BORAL, the neutron radiography systems, and numerous spare TRIGA reactor parts for research and education purposes. The NSC also expected to receive the reactor console and instrumentation in the shipment. The former NSC Assistant Director, who was only able to view sealed boxes, evaluated the material at Hanford on a visit in the summer of 1993. These boxes were labeled as TRIGA equipment (6 boxes), Radiography equipment (6 boxes), Shutters/Collimators (14 boxes) and TRIGA reactor (7 containers). The equipment in the boxes and containers could only be transferred as a complete unit and Hanford would not separate the materials within the boxes. The negotiations for the equipment were occurring at approximately the same time as the R-83 license was being amended. The amended license was thought to include the types of byproduct materials previously received under the Texas State license (radioactive material for education and research). The low specific activity (LSA) material was shipped from Hanford and received on the NSC license based on what all individuals considered to be the intent of the license.

The bulk of the material received was non-radioactive. Many of the slightly radioactive or contaminated parts will be extremely useful in future operations at the NSC. Some of the radioactive material could not be put to use at the facility, although all parts have the potential for training and education in an academic environment. The entire shipment of 26 boxes was received at the facility for research and education purposes. The equipment received had a total value of \$650,000. Some of the equipment could be considered priceless to university reactor program.

The NSC staff and management never intentionally violated the facility license. It is now clear that the license was written for a facility that might perform environmental monitoring and not an active university reactor program.

Corrective Action

The NSC immediately initiated an amendment to the facility license after the NRC inspection. The final amendment request has been written (5/26/97) and excerpted below:

"To support the NSC's wide range of research activities the facility license condition II.B.3 should be changed to read Pursuant to the Act and 10 CFR, Chapter I, Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material," to receive, possess, and use in amounts as required any byproduct material without restriction to chemical or physical form in connection with operation of the reactor that has a definite research and development purpose and any byproduct material generated by the licensed activities, but not to separate such byproduct material except for byproduct material produced in reactor experiments.

In addition to the above amendment, it is requested that an additional condition II.B.7 be added as follows:

Pursuant to the Act and 10 CFR, Chapter I, Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material" to possess and store for decay such byproduct materials as are within the facility boundary at the time of this amendment."

The NSC has temporarily transferred the Hanford radioactive material to the Texas A&M University state license until the facility license is amended.

Violation 50-128/9701-08

Onsite emergency drill was not performed in 1996 as required by the NSC Emergency Plan.

Reason for Violation

The annual emergency drill was scheduled on the MOP for August of 1996. The individual responsible for setting up and initiating the emergency drills wanted to perform a significant site emergency that involved as many staff members as possible. He intended to perform the drill in the fall semester of 1996 to involve student workers. Due to operational commitments or the limited personnel at the facility, the drill was postponed several times. The responsible individual failed to perform the drill before the end of the calendar year. This was self-identified as a violation but a memorandum to the Emergency Plan Drill file was not written prior to the inspection.

Corrective Action

The responsibility to schedule and perform required facility drills has been delegated to the Reactor Administrative Assistant. Five emergency drills have been performed at this date and the biennial offsite drill will be performed after annual training of the offsite emergency organizations this summer.

The NSC staff and management consider personnel and reactor safety to be a priority. Viewing the number of violations as an indicator of overall facility operations would be incorrect. The violations may be grouped into four particular areas:

Operator Requalification Program (9701-01,02,03)

Control of waste storage shed (9701-05 and -06, both contested)

Failure to perform activities scheduled on the MOP (9701-04 and -08)

Failure to obtain an adequate (or correct) materials license

Violations in groups one and three result from the NSC's management delegating critical tasks to personnel who did not adequately perform those tasks. NSC Management acted decisively when program weaknesses were identified by RSB audits late in 1996 but failed to self-identify the problems. The first quarter audit of 1997 was already scheduled at the time of the NRC inspection. In the early 1990's, the NSC Management attempted to decentralize the total control of licensed activities. The object was to empower senior staff members and reduce micro-management of work groups. This management technique is sound and currently is used in many industries (including some nuclear power utilities).

The NSC Management will continue to place direct responsibility on the senior staff for performing tasks in accordance with regulations and Technical Specifications. The Reactor Administrative Assistant will act as an advisor and auditor of the NSC senior staff. The position of Reactor Administrative Assistant can not be effective if it is not filled with high-quality conscientious personnel. The qualifications for the position will include a Senior Reactor Operator license and a Bachelors degree in a technical field.

The NSC Management recognizes that overall responsibility for maintaining compliance with regulations and the daily operation of the reactor facility can not be delegated. The NSC Management will provide increased attention and oversight by the performance of audits and evaluations of licensed activities.

Please contact Dr. W.D. Reece, NSC Director if you require additional information.

Sincerely,



Dr. B. Don Russell

Deputy Director, TEES

Xc: Region IV

Ted Michaels

Reactor Safety Board

17122/ R-83 Correspondence

12110/Central File