



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555

Information in this record was deleted in
accordance with the Freedom of Information Act.
Exemptions
FOIA/PA 2008-0145

MEMORANDUM FOR:

- C. Kammerer, OSP
- S. Schwartz, OSP
- V. Miller, OSP
- J. Greeves, NMSS
- J. Glenn, NMSS
- F. Combs, NMSS
- M. Lamastra, NMSS
- D. Broadus, NMSS

Cunningham
Chase

FROM:

Richard L. Blanton, OSP

RWB

SUBJECT:

CONFERENCE CALL ON NPI - JUNE 15, 1992

The second conference call with Region I on the Neutron Products, Inc. regulatory issues will be on Monday June 15, 1992 at 2:00 pm in White Flint Conference Room 1F21. The discussion will be of the results of the actions since the last call, the issues as defined by Region I and OSP, and consideration of further action.

Please review the attached for more information. If you cannot attend this meeting, please contact me at 504-2322.

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UNITED STATES
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APR 7 1992

MEMORANDUM FOR:

C. Kammerer, OSP
S. Schwartz, OSP
J. Greeves, NMSS
J. Glenn, NMSS
F. Combs, NMSS
M. Lamastra, NMSS
S. Baggett, NMSS
C. Jones, NMSS
R. Blanton, OSP

FROM:

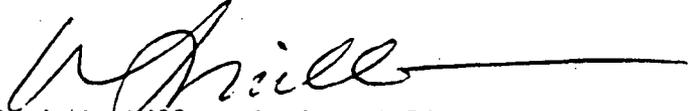
Vandy L. Miller, Assistant Director
for State Agreements Program
Office of State Programs

SUBJECT:

NEUTRON PRODUCTS, INC. ISSUES

Attached is the list of issues provided by Region I as discussed during the conference call on April 1. Please review the list and make any additions or deletions.

Please send the additions or deletions to Richard Blanton, Mail Stop 3D23, or call them to him at 504-2322, by COB April 13, 1992. We tentatively plan to hold the second conference call on Wednesday morning, April 15.


Vandy L. Miller, Assistant Director
for State Agreements Program
Office of State Programs

Enclosure: As stated



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

April 3, 1992

MEMORANDUM FOR: Vandy L. Miller, Assistant Director for
State Agreements Program

FROM: John R. McGrath
Regional State Agreements Officer

SUBJECT: NEUTRON PRODUCTS, INC. ISSUES

As per our conference call of April 1, enclosed is a listing of issues which Region I believes should be addressed in discussions with the State. Please forward to NMSS for their review for our next conference call scheduled for April 14.

John R. McGrath
John R. McGrath
Regional State Agreements Officer

DRAFT

NEUTRON PRODUCTS ISSUES

Phase II issues/concerns for discussion between NRC and Maryland staff.

•IN-PLANT HEALTH PHYSICS ISSUES

① combine keep

•personnel contamination issue

Personnel have, in the past, left the LAA with contamination on their clothing tracking contamination to unrestricted areas. Has the installation of the portal monitor solved this problem?

•adequacy of instrument calibrations

Calibration techniques for instrumentation used in the evaluation of personnel exposures have been questionable. Has this been assessed by NPI?

② stay on

•cobalt melt issues

Melt operations, particularly clean-up, involve high personnel exposures and possibly environmental releases. The State has required more detailed procedures and monitoring of this operation. Are there any additional requirements needed to address this concern?

③ "

•security issue

Access to the LAA via the courtyard area has never been locked. Has NPI provided the necessary security over this area?

④ "

•plant contamination/housekeeping issues

LAA has been found to be littered with scrap, tools and other items, some of which have had high levels of contamination. Has NPI implemented a housekeeping program (to help keep doses to employees ALARA)?

⑤ part of decontamination

•sump clean-up

Soil contamination was found beneath the floor of a former restroom. NPI has removed some contaminated soil, but the issue has not been closed out. What additional decontamination is required?

•OFF-SITE CONTAMINATION ISSUES

⑥

•soil contamination of dry pond area

Runoff from the roof and courtyard etc. has contaminated a dry pond and drainage from that area offsite. Has NPI removed all of the contaminated soil required by the State, and has NPI addressed the source of the contamination?

⑦

•hot-spot contamination of nearby residences

Contamination, possibly hot particles, have been found on adjacent residences. Has the source of the contamination been determined and has the problem been addressed?

•adequacy of effluent monitoring

The evaluation of effluents from the hot cell have been questionable. Is the current monitoring technique adequate?

• radioactivity in routine sewage

The level of radioactivity in sewer discharge (e.g. from personnel shower runoff) for NPI has, as far as we know, not been determined. What surveys need to be made to determine compliance with sewer disposal limits?

• POOL WATER ISSUES

⑦ • pool contamination

There remain leaking sources in the bottom of the main pool. Should NPI be required to dispose of these sources?

• water quality

In addition to the radioactivity, questions exist concerning the level of metal oxidizing microorganisms in the pool and other water quality concerns (Ph, conductivity). Has NPI completed the modifications to the water treatment system as suggested during the NRC inspection in January 1992? What other actions need to be taken to address pool water quality?

⑦ • WASTE ACCUMULATION ISSUES

• courtyard waste area

A large volume of uncharacterized waste is currently stored in a building off the courtyard. Should NPI be required to dispose of this waste?

• proposal to cover courtyard and store additional waste

The State wants NPI to cover the courtyard (viewed as a possible source of offsite contamination), but if NPI does cover it, they want to use it as additional waste storage area. Should NPI be allowed to store additional waste?

⑤ • DECOMMISSIONING ISSUES

• ultimate decommissioning of NPI

What are the costs involved in decommissioning NPI and how are these costs going to be addressed?

• financial assurance requirements

What financial assurance requirement should be placed on NPI?

• bankruptcy issue

NPI is currently in Chapter 11 bankruptcy. What affect does this, or should this, have on the implementation of financial assurance requirements and the imposition of civil penalties?

DRAFT



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DRAFT

NEUTRON PRODUCTS, INC.

Supplemental Issues

•HEALTH PHYSICS ISSUES

•Increasing total radiation doses (total man-REM)

Reported in the 1991 review, do the latest monitoring results indicate a continuing trend? What actions have been taken? Has the state followed up on this issue?

related to personal contamination?

•Improvements to personnel training program

•Initiate a management audit program

These are requirements imposed by the state in 1991. The status of each needs to be addressed.

include in issue #1

independent audit

•WASTE ACCUMULATION ISSUES

•Unauthorized off-site storage of DU

Identified in 1991, consists of old teletherapy heads. See letter from R Fletcher to V Miller dated 3/04/92, and memo from J Glenn to V Miller dated 4/08/92.

•OTHER ISSUES

•Numerous and repetitive nature of the violations cited during inspections

•Civil Penalty not paid or paid after delay

•Other indications of management antagonism toward state authority

Call McGrath - Mon 4/27

4/13/92

Note to Richard Blanton

Subject: Neutron Products, Inc.

② One problem with developing a list of concerns is that we do not have a handle on the current status of the facility. I suggest that prior to spending a lot of time on this activity, we have the State make a presentation about NPI.

I have the following areas that should be added to your list.

PRODUCT IRRADIATORS

- Are these pools also contaminated with cobalt-60?
- Are handling tools used in these pools also used in the main pool?
- Can NPI insure that product leaves the facility is free from contamination?

SERVICE LICENSED ACTIVITIES

- How does Chapter 11 affect NPI ability to recondition units or provide service in the field?
- Given that, recently, two NPI sources removed from equipment in the field have been found to exceed the 0.05 microcurie contamination limit. Is this an indication of infield failure to follow leak test procedures or the inability of NPI to detect that level in the hot cell operations.

DOES THE STATE HAVE A LICENSE OR LICENSES IN PLACE THAT CAN CLEARLY BE INSPECTED AGAINST?

IS OFFSITE CONTAMINATION CONTINUING AS NPI? IF YES, AT WHAT RATE WHAT IS BEING DONE TO STOP IT?

IF AN INDEPENDENT ASSESSMENT IS MADE, I SUGGEST THAT YOU BRING IN LOPEZ FROM TEXAS AND LYNCH FROM REGION III TO AUGMENT THE REGION I ASSESSMENT TEAM.

① HAS THE STATE ASKED FOR HELP YET?

S. Boygett

504-2572

Chuck-

FAX- 346-5241 4/3/92

A fairly familiar problem dealt with in a fairly standard way. If asked, I would suggest that they consider a treatment of mechanical scraping followed by biocide application (NaOCl is commoner than H₂O₂, but H₂O₂ is not bad), followed by another abrasion followed by another biocide application, ~~and then~~ in this case.

TC: J. McGraw
Per our discussion Tuesday regarding the attachment on NPI. This is FUI & Co's w/Key Term that went out to NPI.
Thanks.

W. A. Miller
4/3/92

The reason for the double treatment is that the fouling is quite severe + a second abrasion may be needed to get it all off.

W. A. Miller

4/3/92

Fa. Citrus Scraper



UNITED STATES
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475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

March 24, 1992

92 MAR 27 AM 5:43

MEMORANDUM FOR: Carlton Kammerer, Director
Office of State Programs

FROM: William F. Kane
Deputy Regional Administrator

SUBJECT: NEUTRON PRODUCTS

During our meeting with the Maryland staff on January 8, 1992, we agreed to discuss further a three phase approach that would involve NRC providing assistance to the State (at its request) to address its continuing concerns at the NPI facility in Dickerson, Maryland.

The State's immediate safety concern was the recent discovery of microorganisms in the NPI pool water supply which the State believed may affect the integrity of the pool liner and the encapsulated sources in the pool. In Phase I, Region I was requested to provide technical assistance to the State in evaluating the potential for microbial induced corrosion (MIC) in the water supply system. Harold Gray and Jim Medoff of our Division of Reactor Safety accompanied State inspectors to NPI on January 23-24 completing this first phase of our technical assistance. This was a limited inspection that focused exclusively on the MIC problem and did not address any of the other State concerns about the NPI facility. A copy of the staff report is enclosed for your information.

Phase II would provide a forum for discussing the need for a more extensive effort to scope out the other State concerns at NPI. Essentially we would meet with the State to assure that both the State and the NRC had a current understanding of the extent of the problem areas at NPI, and to discuss how best to address these problems from a regulatory standpoint. This discussion would not be limited to the plant problems, but may include the off-site contamination problem, the waste accumulation problem, and decommissioning issues. The goal of this meeting would be to prepare a complete list of concerns (including actions already taken by the State to address them and their effectiveness from the standpoint of licensee response) and brainstorm with the State to arrive at the best approach to understanding and resolving these problem areas. Phase II may include NRC assisting the State in a "scoping" inspection of the NPI facility to more clearly understand the complete scope of problems at NPI. As we discussed at the January 8 meeting with the State, we believe that State Programs is the appropriate office to take the lead in such a meeting.

Phase III of this project would then be to provide the State any specific technical assistance in any further evaluation of the areas identified during Phase II of the plan and to assist the State in obtaining corrective action from NPI.

Please contact John McGrath of my staff in the near term to discuss our availability to support Phase II activities.

A handwritten signature in black ink, appearing to read 'William F. Kane', written in a cursive style.

William F. Kane
Deputy Regional Administrator

JAN 31 1992

MEMORANDUM FOR: John McGrath
Regional State Agreements Officer, ORA

FROM: E. Harold Gray, Chief
Materials Section, EB
Division of Reactor Safety

SUBJECT: NRC - STATE OF MARYLAND COMBINED INSPECTION
OF NEUTRON PRODUCTS, INC.

An inspection of Neutron Products, Inc. (NPI) was performed by members of the NRC Region I office on 1/23-24/92 in cooperation with inspectors from the State of Maryland. Emphasis was put on inspecting the NPI main pool liner and North and South canal liners for bacterial content and for possible damage from microbiologically induced corrosion (MIC). The inspectors also reviewed NPI's method of controlling water chemistry since it is known that corrosion of stainless steel is partially dependent upon water chemistry.

Prior to observing the main pool and canal areas, the inspectors of the State of Maryland and the NRC met with NPI personnel to confirm that the main pool, South canal, and sections of the makeup water system were contaminated with slime metal oxidizing bacteria, and to discuss the method of controlling water chemistry and bacterial content in the makeup system, canals, and irradiator pools and main pools. The makeup water system at NPI takes water from a 65 feet deep well and puts it through a purification process of sand filters, ultraviolet light irradiator, reverse osmosis units and mixed bed demineralizers prior to sending it to the pools and canals. The discussion topics included the potential corrosive effects of slime metal oxidizing bacteria on source containers and stainless steel liners, the radiological consequences of any leaks which might result from advanced stages of corrosion of these materials, and the potential contributions of water chemistry to the corrosion of stainless steel materials.

It was determined from the information provided by the NPI staff that the potential radiation hazards are typically (b)(2)High Co 60 in the main pool (b)(2)High Co 60 in the North pool, and (b)(2)High Co 60 in the South pool. The license limits the total quantity of Co 60 to (b)(2)High. An opaque gelatinous mass was identified in the main pool in June 1991 which was later identified (11/6/91) by outside laboratory analysis to consist predominately of slime metal oxidizing cocci (Siderocapsa group) and bacilli. The ultraviolet light in the makeup system was determined to be inoperable for a portion of that year.

*(RM) or: 2ers
call Gray*

JAN 01 1992

John McGrath

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The bacterial colony was noted in October 1991 to consist of approximately a 1/8 inch thick biomass which started at the top of the water surface of the main pool and extended approximately one foot down. As of 1/23/91 the biomass extended 6 to 8 feet down into the main pool, indicating an active mass of bacteria. Similar colonies were identified in the South canal leading to the main pool, and in the 200 gallon storage tank in the makeup system. It is important to minimize bacterial counts of these organisms in the pools and canal liners since prolonged exposure may lead to microbiologically induced corrosion.

Members of the NPI staff indicated that water chemistry is monitored daily for radioactivity concentration and temperature, and weekly for conductivity, pH, and filter efficiency (df). Individual cation and anion analyses are done very infrequently and only by vendor laboratories at the request of NPI. Although main pool conductivities are currently at the 10 $\mu\text{mhos/cm}$ level, main pool and South canal conductivities have been in the 30 - 60 $\mu\text{mhos/cm}$ range in previous months (Aug., Sept., and Oct., 1991). A vendor supplied water chemistry analysis of the main pool performed in October 1990 indicated that chloride and sulfate levels in the main pool have been high (approx. 5.5 ppm and 33 ppm, respectively with an equivalent conductivity of 100-200 $\mu\text{mhos/cm}$). This could pose a problem if the levels remain high for an extended period of time, since chlorides have been known to contribute to intergranular stress corrosion cracking (IGSCC) and pitting in steels, and sulfates have been suspected of contributing to IGSCC. A water treatment resin change made on 11/30/91, lowered the main pool water conductivity to less than 10 $\mu\text{mhos/cm}$. It was noted that, although the conductivity meters and pH meters were initially calibrated by the original manufacturers and occasionally calibrated in-house with calibration standards, no descriptive program existed for the calibration and care of analytical instruments at NPI.

Inspection on 1/23/92 of the limited access area, containing the North and South canals, the hot cell, and the main pool, confirmed the existence of a biomass growing on the walls of the main pool and South canals. No biomass was noted on subsequent inspection (1/24/92) of one of the irradiator pools. The water in all areas was noted to be of high visual quality. NPI proposed the following plan to inhibit the growth and remove the bacterial colonies:

- Modify the water system design and replace components in the water system which could be a source of bacterial mass.
- Mechanically remove most of the biomass.
- Kill the remaining biomass by adding hydrogen peroxide to the water system and remove the debris.
- Prevent reinfection by periodically treating the system with hydrogen peroxide.

John McGrath

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The NRC and State inspectors met with NPI staff members and a consultant specializing in MIC and water chemistry to review and discuss the results of the inspection. Although it was concluded that no visible evidence of liner corrosion was noted to date and that no immediate safety hazard from corrosion was present, the State of Maryland recommended the following corrective program, with concurrence of the NRC:

- Keep close association with the consultant microbiological laboratory.
- Submit a timetable for corrective actions including diagrams/descriptions of the new water system.
- Evaluate the level of MIC producing bacteria (if any) in both of the irradiator pools.
- Clean and mitigate the levels of MIC in the South canal and main pool by:
 1. Mechanically scraping the sides of the infected liners.
 2. Providing a means of inhibiting bacterial growth by addition of a chemical inhibitor to the system, presumably hydrogen peroxide.
 3. Implementing a preventative maintenance program, including the frequency and scope of such a program.
 4. Submitting a description of the plan of action for control of the water systems.
 5. Considering the use of ultraviolet light in the main pool recirculation system.
- Continue monitoring of the gas pressurized leak detection channels which cover the pool and canal liner welds.
- Implement a plan to provide some frequency of chemical analysis of water from the irradiator and main pools, and from the North and South canals.
- Investigate the potential for corrosive attack of pool and canal liners from the outside.
- Implement a method of managing waste materials, including the sediment wastes created by the mechanical scrapings.

JAN 31 1992

John McGrath

4

NPI indicated that the water system changes would be made during the next 6 - 8 weeks, pending approval of the company management. It is recommended that the NRC be available to conduct a followup inspection after the water system revisions are made to observe the resulting pool and canal conditions and confirm that adequate controls on conductivity and pH measurements are in place. A list of those involved in this visit to NPI is attached.

E. Harold Gray

E. Harold Gray, Chief
Materials Section, EB
Division of Reactor Safety

cc:

T. T. Martin, RA
W. F. Kane, DRA
M. W. Hodges, DRS
M. R. Knapp, DRSS
J. P. Durr, DRS