UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

JUN 14 1990

Docket No.: 50-54

MEMORANDUM FOR: Theodore Michaels, Project Manager
Division of Reactor Projects III/IV/V
and Special Project

FROM: Goutam Bagchi, Chief
Structural and Geosciences Branch
Division of Engineering Technology

SUBJECT: REVIEW OF CANAL AND GAMMA PIT CONCRETE REPAIR PROGRAM OF CINTICHEM RESEARCH REACTOR

Plant Name: Cintichem, Inc.
Licensee: Cintichem, Inc.
Review Status: Complete
TAC No.: M76887
Facility Operating License No.: R-81

The staff of the Structural and Geosciences Branch of the Division of Engineering Technology (ESGB/DET) has completed its review of the civil engineering aspects of the proposed repair.

Based on our review of the licensee's submittal and the supplementary information provided by the licensee via telephone, the proposed canal and Gamma pit concrete repair program is found to be adequate for one time use to transfer fuels and targets.

Our Safety Evaluation Report is provided in the Enclosure. We consider our efforts on TAC No. M76887 to be complete.

Goutam Bagchi

Goutam Bagchi, Chief
Structural and Geosciences Branch
Division of Engineering Technology

Enclosure:
Safety Evaluation Report

cc: W. T. Russell
S. Weiss
J. Richardson

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Enclosure
Review of Cintichem Concrete Repair Program
Specification 90-03 dated 3-12-90, revised 5-31-90
Docket No. 50-54

Introduction

In May 31, 1990 letter, Cintichem (the licensee) requested NRC review of their concrete repair program of the canal and gamma pit of the research reactor (reference 1). Specification 90-03 (reference 2) contains repair procedures and materials for restoring leaktight integrity as well as criteria for acceptance for post repair leaktightness. In addition, two additional reports were submitted for a NRC review (references 3 and 4). Upon approval of NRC, the canal and gamma pit will be repaired, water filled and fuel and target (specimen from which isotopes are extracted in the hot cell for commercial use) will be transported via canal and pit for disposal.

NRC concurrence of this repair program is an one time affair after which the plant will be decommissioned. The plant is shutdown currently and the canal and pit are empty.

Evaluation

The staff review consists of evaluating the above noted three documents. Additional information was obtained from Mr. Fred Morse and Jim McGovern of Cintichem and Dr. Bob Bores of Region I.

Olson Wright NDT & E, Inc. (reference 4) performed non-destructive testing of concrete at several thousand locations using Impact Echo test and concluded that, in general, concrete structure is in good condition except for several relatively small areas of questionable or poor quality concrete. Same conclusion was made by Construction Technology Laboratory (CTL) (ref. 3) after inspecting visually, removing concrete samples, testing them for mechanical strength and performing engineering calculation of the as built canal and pit. CTL proposed a repair procedure and this is largely adapted in the Cintichem specification 90-03. The specification addresses repair procedures, post repair inspection, leak test, acceptance criteria and quality assurance. The repair consists of concrete patch grouting and sealing of concrete crack and repair by grout. The specification specifically calls for an experienced company and work crew in the related area and asks for one year guarantee of the workmanship.

We were informed that current radioactive activity in pool water where spent fuels are stored indicated below maximum permissible concentration. We understand that water whose radioactivity level is below permissible concentration may be disposed to the environment. The licensee indicated that they could not recall any adverse accident associated with fuel and target transfer for the past 30 years.

The staff found that the proposed repair program described in the Specification 90-03 is adequate for an one time application of the canal and pit.

Review of the stated leak rate acceptance limit of 0.3 GPM for post repair test is beyond our Branch expertise.

Additional Comments

1. In Section 2.1.1, AISC appears instead of ACI

2. Canal outside wall crack at grid 55 (CTI report page A-7) is not reflected in the Specification 90-03 repair grid map.

Conclusion:

Because of reasons stated in the evaluation, the staff concludes that the repair program outlined in the Specification 90-03 is adequate for one time use. In particular, post repair inspection and leak test, and quality assurance program would assure leaktightness of canal and pit for a limited time. It is recommended that post repair inspection and leak test should be performed immediately before commencing fuel and target transfer and water be treated and disposed as soon as the work is completed.

References

1. Letter from J. J. McGovern of Cintichem to NRC "Orders Modifying License" dated May 31, 1990.

2. Repairs of Canal and Gamma Pit Specification 90-03, Cintichem, Inc. dated March 12, 1990, Revised May 31, 1990.

3. Evaluating of Reinforced Concrete Gamma Pit, Canal and Hold Up Tank, Construction Technology Laboratory, Inc. May 24, 1990.

4. Nondestructive Testing Investigation Concrete Integrity Evaluation, Olson Wright NDT&E, Inc., May 17, 1990.

DCS No: 070687891128
Date: February 22, 1990

PRELIMINARY NOTIFICATION OF EVENT OR UNUSUAL OCCURRENCE--PNO-I-90-14

This preliminary notification constitutes EARLY notice of events of POSSIBLE safety or public interest significance. The information is as initially received without verification or evaluation, and is basically all that is known by the Region I staff on this date.

Facility:
Cintichem, Incorporated
Tuxedo, New York
Docket Number 050-[illegible]

Licensee Emergency Classification:
___ Notification of Unusual Event
___ Alert
___ Site Area Emergency
___ General Emergency
_X_ Not Applicable

Subject: RELEASES TO INDIAN KILL RESERVOIR

On December 12, 1989, NRC Region I received notification that the licensee had identified a possible discharge of slightly contaminated water through a storm drain in the onsite parking lot. However, sampling of all available surface and groundwater on site indicated no measurable contamination. In particular, an onsite holding pond which received water from the storm drain (and which itself drained to the Indian Kill reservoir) showed no detectable contamination. The NRC monitored the licensee's action throughout this period, and on January 5, 1990, NRC Region I instructed the licensee to release no water from the holding pond to the reservoir prior to sampling and analyzing the samples to ensure that no measurable release to the reservoir occurred. Until February 9, 1990, no measurable activity was observed in the holding pond. On February 9 activity (I-131 at nearly twice the maximum permissible concentration (MPC) and Na-24 and I-133 at levels somewhat less than the MPC) was measured in the holding pond. Following the discovery of radioactivity in the holding pond on February 9, 1990, all discharges to the reservoir were halted. The licensee began pumping the holding pond to onsite holding tanks and additional tanks that had been brought on site. The licensee processed this water and transferred it to another tank for sampling and analysis prior to discharge downstream of the reservoir.

During a reactive inspection on site from February 9 to February 16, 1990, an NRC inspection team closely observed the handling of the water from the holding pond, other onsite sources and releases from the site. As part of these activities, the NRC independently measured numerous samples from various onsite sources, processed water tanks, the holding pond and the reservoir itself to ensure an independent assessment of radioactivity in these samples and to verify the licensee's capability to accurately measure the radioactivity in the water. The NRC measurements verified that the licensee could correctly quantify the activity in the samples.

On February 20, 1990, the licensee informed NRC Region I that three discharges of holding pond water had been made to the reservoir on February 9, 1990, after sampling the discharge, but before analysis of the samples had been completed. These samples, when analyzed, indicated that the three discharges contained I-131, I-133 and Na-24. The licensee became aware of the holding pond contamination about 9:00 a.m. on February 9, 1990, after the third discharge and following the analysis of sample from the first discharge at 12:30 a.m. At that time the licensee terminated further discharges from the holding pond.

During the reactive team inspection, the licensee did not inform any NRC member of these three contaminated discharges. In meetings with the Tuxedo Town Board and a

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DCS No: 070687891128
Date: February 22, 1990

PRELIMINARY NOTIFICATION OF EVENT OR UNUSUAL OCCURRENCE--PNO-I-90-14

public Town Meeting, NRC and New York State representatives indicated they were unaware of any measurable activity discharged to the reservoir. Licensee representatives at these meetings did not correct these misunderstandings. It should be noted that no activity has been detected in the reservoir itself in samples analyzed by the NRC, New York State, the water company's contractor or the licensee.

The State of New York, the town of Tuxedo and Orange county, New York, officials have been informed of the information reported above. NRC Region I plans to issue a press release relative to this matter.

CONTACT: M. Austin
FTS 346-5390

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Region I Form 83
(Rev. April 1988)

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

Docket Nos. 50-54
70-687
CAL No. 1-90-005

FEB 28 1990

License Nos. R-81
SNM-639

Cintichem, Incorporated
ATTN: Mr. James J. McGovern
Plant Manager
P. O. Box 816
Tuxedo, New York 10987

Gentlemen:

This letter is to confirm our understanding of your commitments made during telephone discussions with Dr. Robert Bores of this office on February 23, 1990.

Based on those discussions, we understand that, until further notice, you are taking the following actions.

1. Release no water intentionally from the onsite holding pond to the Indian Kill Reservoir.

2. Eliminate, to the extent possible, any leakage/seepage from the holding pond to the reservoir through the S-1 gate at the sampling point.

   - To the extent that such leakage cannot be eliminated, sample the leakage with a composite sampler and analyze these samples on at least a 12-hour basis. If the composite sampler becomes inoperable, take and analyze grab samples taken at no more than 6-hour intervals.

3. Make all discharges from the holding pond in a batch mode to the 001 discharge point to the Indian Kill Creek downstream of the reservoir, in accordance with an established written procedure, following sampling and gamma spectral analyses to ensure that the radioactive content is below the applicable maximum permissible concentrations (MPCs).

   - In the event that heavy rains or surface run-off to the holding pond requires that, to preserve its integrity, the holding pond be emptied or lowered prior to the completion of the analyses on a batch basis, pumping to the 001 discharge point may be begun. In that case, sampling and analysis of the holding pond

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shall be done on an hourly basis until the batch release process can be re-established.

4. Immediately (within one-hour of detection) notify the NRC, Region I, through the NRC Operations Office (301-951-0550) should any radioactivity be measured above background levels in the holding pond or at S-1, or, should any unanalyzed release from the holding pond occur.

   - For purposes of this notification the sensitivity of analyses shall be such that at least 0.1 times the applicable MPCs can be detected.

If our understanding of your actions, as described above, is not in accordance with your actual plans and actions, please contact this office within twenty-four (24) hours of receipt of this letter.

Your cooperation with us is appreciated.

Sincerely,

Malcolm R. Knapp, Director
Division of Radiation Safety and
Safeguards

cc:
W. G. Ruzicka, Manager, Nuclear Operations
D. D. Grogan, Manager, Radiochemical Production
T. Vaughn, Manager, Health, Safety and Environmental Affairs
A. Dorozynski, Supervisor, Town of Tuxedo
Public Document Room (PDR)
Nuclear Safety Information Center (NSIC)
State of New York

bcc:
Region I Docket Room (w/concurrences)
Management Assistant, DRMA
J. Roth, DRSS
A. T. Clark, NMSS
G. C. Comfort, NMSS
M. Austin, DRSS