



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

MAY 15 1989

MEMORANDUM FOR: M. W. Hodges, Chief
Reactor Systems Branch
Division of Engineering & Systems Technology

THRU: Laurence E. Phillips, Section Leader *LEP*
Section C, Reactor Systems Branch
Division of Engineering & Systems Technology

FROM: Harvey I. Abelson, Reactor Systems Engineer
Section C, Reactor Systems Branch
Division of Engineering & System

SUBJECT: SRXB PROGRESS STATUS - INTERSYSTEM LOCA (ISL) PROJECT

The following summarizes SRXB progress to date concerning the subject effort:

- (1) A detailed action plan for resolution of the ISL issue was forwarded to Dr. Murley on March 29, 1989. The focus of the plan was the development and implementation of a pilot inspection program intended to identify the sources and extent of vulnerability of domestic reactors to ISL.
- (2) Our acquisition and review of all available background material regarding ISL has been completed. This includes previous inspection reports, event reports, documentation of past requirements, documentation related to Generic Issues 105 and II.E.6.1, as well as other material.
- (3) Based on BNL's recent and extensive efforts in supporting RES activities on GI 105, we have decided to utilize BNL expertise to assist us in the current ISL project. BNL's assistance would reduce NRR staff requirements.
- (4) A meeting was held with BNL on April 17, 1989 to discuss their participation in this effort. BNL presented the results of their recent ISL study for PWRs and BWRs, as documented in NUREG/CR-5102 and 5124. The meeting was attended by RES as well as NRR (SRXB, EMEB, HFEB, RRAB). BNL expressed their interest and availability in participating.
- (5) SRXB assisted Bernie Grenier (PMSB) in preparing a statement of work for BNL technical assistance. The statement of work was issued with NRC Form 173 on May 4.
- (6) SRXB held a working meeting with BNL on May 4 to begin development of a Temporary Instruction (TI) for the pilot inspection program. Agreement was reached on what specific information should be obtained during the inspections and what preparatory work and materials were required in advance. Human factors staff from NRR/HFEB and from BNL attended a portion of the meeting.

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- (7) We requested that BNL prepare a draft TI by May 15. A meeting to discuss the draft will be scheduled shortly thereafter. Our target date for completion of a final TI is May 21, a time for use in the first pilot inspection in June.
- (8) As part of HFEB's task to define the human factors elements to be addressed by the TI, an information gathering trip to Vogtle Unit 2 by HFEB (and SRXB) staff is tentatively planned for May 24-25. This visit will entail interviews with plant personnel concerning the 3/8/89 event (an ISL precursor), a review of selected procedures, and walkdowns of accessible areas. The information will be evaluated and factored into the final TI. BNL plans to accompany NRR on the visit.
- (9) The first of the six pilot inspections is tentatively scheduled for the week of June 12 at the Haddam Neck facility in Connecticut. The NRR Project Manager and Project Director have already been informed of these plans. We will contact Region I and the Haddam Neck RI shortly and have them obtain P&IDs for all interfacing systems, selected procedures (e.g., PIV surveillance/testing, PIV maintenance, operations involving disturbance of PIVs), and other material.
- (10) A computer search and review of past inspection reports relevant to ISL has revealed the following:
 - Attachment 1 lists all plants receiving the April 20, 1981 "Event V" Order and indicates which of these facilities has been inspected (as of 2/28/89) to TI 2515/84, issued 4/5/87. The intent of this TI was to verify implementation of the action items specified in the Order. The TI deals exclusively with procedures for leak rate testing of the "Event V" PIVs. No deviations were found for any of the inspected facilities.
 - Prior to issuance of TI 2515/84 and the above inspections, Region I implemented a special ISL inspection program at all its facilities. These inspections (performed by the Resident Inspectors) took place in 1985 and addressed the following: verification of as-built isolation interfaces (comparison with NUREG/CR-2069), PIV surveillance and maintenance procedures, training of facility personnel, and actions taken in response to industry operating experience regarding PIV problems. Attachment 2 lists the facilities inspected and the corresponding inspection reports. Our review of a sampling of these documents shows a wide variation in level of detail. No violations were noted. Region I planned to follow-up these limited inspections with more comprehensive inspections at selected facilities. We have been able to locate only one follow-up report - for Oyster Creek (50-219/85-36). This document is the most comprehensive inspection report on ISL to date and contains some elements which will be incorporated into the TI we are currently developing.

(11) Concerning the candidate interfacing lines to be addressed during the pilot inspections, the following is noted:

- The BNL PWR study initially identified all lines interfacing with the RCS for three case study plants (representing the 3 domestic PWR vendors). Any interfacing line which satisfied a certain set of criteria was then considered as a potential ISL pathway and was analyzed further. The following lines were selected:
 - a) Low Pressure Injection (all vendors)
 - b) RHR suction (all vendors)
 - c) High Pressure Injection (W and CE)
 - d) Accumulator outlet (all vendors)
 - e) Letdown (all vendors)
 - f) Excess Letdown (W)
 - g) Low Pressure Auxiliary Pressurizer Spray (BW)

Lines with diameters less than 2 inches were not considered in the BNL study on the basis that the expected flow through these lines was within charging pump capacity and thus the potential for core uncover was negligible. In the current pilot inspection program, however, lines with diameters less than 2 inches (except instrument air) will be considered and a survey will be taken of vital equipment (ECCS and RPS) located in the vicinity of each line. Equipment not environmentally qualified and situated in the vicinity of a potential line break would need to be identified.

(12) The human factors portion of the pilot inspection program will focus on those elements (e.g., maintenance, surveillance, training, communications, administrative controls) where existing weaknesses can lead to an over-pressurization event or ISL. The ability of plant operators to recognize a breach in an isolation barrier through alarms and other indications also will be addressed as will design features (e.g., interlocks, power removal) intended to minimize ISL potential.

(13) Attachment 3 shows the proposed schedule for the 6 pilot inspections. A memorandum to the NRR PD and PM, Resident Inspector, and Regional Projects Division Director for each of these facilities informing them of our inspection plans and listing the information that will be needed in advance, is in preparation and will be issued within the next few days.



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Enclosures:
As stated

cc w/enclosures:
See next page

APPENDIX I

PLANTS RECEIVING AN ORDER FOR
MODIFICATION OF LICENSE DATED APRIL 20, 1981

✓ Salem 1 (W)	✓ St. Lucie 1 (CE)	✓ Rancho Seco (B+W)
✓✓ Surry 1/2 (W)	✓ Trojan 1 (W)	✓ Oconee ①/2/3 (B+W)
✓✓ Cook 1/2 (W)	✓✓ Prairie Island 1/2 (W)	✓ ANO-1 (B+W)
✓ Farley 1 (W)	✓✓ Point Beach 1/2 (W)	✓ Three Mile Island 1 (B+W)
✓✓ Turkey Point 3/4 (W)	— Maine Yankee 1* (CE)	✓ Crystal River 3 (B+W)
✓ Beaver Valley 1 (W)	✓ ANO-2 (CE)	— Ginna (W)
✓ Robinson 2 (W)	✓ Fort Calhoun 1 (CE)	✓ San Onofre 1 (W)
✓ Kewaunee (W)	✓ North Anna 1 (W)	— Palisades 1 (CE)
— Nine Mile Point 1 (GE)	— Davis Besse 1 (B+W)	— Oyster Creek (GE)

PLANTS RECEIVING PRIOR ORDER

— Indian Point 2/3 dated February 11, 1980 (W)
 ✓ Zion ①/2 dated February 29, 1980 (W)

PLANTS RECEIVING A LICENSE AMENDMENT

✓ Haddam Neck** (2/26/81) (W)
 — LaCrosse (2/29/80) (AC)

OTHER PLANTS INSPECTED TO TI 2515/84

Salem 2
 Beaver Valley 2
 North Anna 2
 Byron 1 and 2

*Confirmatory Order dated April 20, 1981
 **Event V testing is part of IST Program.

✓ = inspected to TI 2515/84 (Module 525584) — no deviations found in all cases
 — = not inspected as of 2/28/89

EVENT V INSPECTIONS - REGION IB&W/CE Plants

Calvert Cliffs 1 & 2
 Maine Yankee
 Millstone 2
 Three Mile Island 1

50-317/85-15; 50-318/85-13
 50-309/85-09
 50-336/85-21
 50-389/85-17

Original
check with back license
LPI back license 6.1975.
Acc. 1.1.921

General Electric Plants

FitzPatrick
 Limerick 1
 Millstone 1
 Nine Mile Point 1
 Oyster Creek
 Peach Bottom 2 & 3
 Pilgrim
 Shoreham
 Susquehanna 1 & 2
 Vermont Yankee

50-333/85-C9
 50-352/85-19
 50-245/85-14
 50-220/85-09
 50-219/85-15
 50-277/85-21; 50-278/85-17
 50-293/85-11
 50-322/85-24
 50-387/85-18; 50-388/85-16
 50-271/85-20

Westinghouse Plants

Beaver Valley 1
 Ginna
 Haddam Neck
 Indian Point 2
 Indian Point 3
 Salem 1 & 2
 Yankee

50-334/85-16
 50-244/85-10
 50-213/85-11
 50-247/85-15
 50-286/85-19
 50-272/85-12; 50-311/85-13
 50-29/85-11

Original

HPCI

Virginia
Jugor, Chap.

PROV...

mainten. does not
require post main PSI, etc
after, requires maintenance

PROPOSED SCHEDULE FOR PILOT INSPECTIONS

<u>HADDAM NECK</u>	Week of June 12 - 16
<u>PRAIRIE ISLAND</u>	Week of July 10 - 14
<u>ST. LUCIE 1</u>	Week of July 31 - August 4
<u>PALO VERDE</u>	Week of August 21 - 25
<u>WOLF CREEK</u>	Week of September 11 - 15
<u>DAVIS-BESSE</u>	Week of October 2 - 6