Ø7-187-91

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR STATION

UNIT II OPERATIONS

02-REQ-007-355-2-01 Revision 0
02-NLO-007-355-2-01
02-LOT-007-355-2-01

TITLE: VALVE MISPOSITIONING EVENTS INVOLVING HUMAN ERROR

	SIGNATURE	DATE
PREPARER		10/17/89
TRAINING SUPPORT SUPERVISOR		10-18-89
TRAINING SUPERVISOR		10/18/89
PLANT SUPERVISOR		10/18/89

Summary of Pages

(Effective Date: 10/18/89)

Number of Pages: 12

Date	Pages
September 1989	1 - 12

TRAINING DEPARTMENT RECORDS ADMINISTRATION ONLY:

VERIFICATION:

DATA ENTRY:

RECORDS:

5/3/300

ATTACHMENT 6
LESSON PLAN TEMPORARY/PUBLICATION/ADDENDUM CHANGE FORM

The attached change was made to:

Lesson plan title: Valve Mispositioning Events Involving Human Error

Lesson plan number: 02-REQ/NLO/LOT-007-355-Z-01 Rev 0

Name of instructor initiating change: Don Hunt

Reason for the change: To incorporate TCO-02-LIC-90-073 into the LP. This incorporates the Lessons Learned from OR #89-149 into the LP. At the next revision of the Lesson Plan, this addendum can be added to the LP permanently and the addendum change cancelled. This addendum includes the Modified Case Study format (page A-1) and a copy of the OR (pages A2 - A6) and copies of the OR closeout documents (pages A-7 & 8).

Type of change:

1. Temporary change ____
2. Publication change ____
3. Addendum change ____

Disposition:

✓ 1. Incorporate this change during the next scheduled revision.

____ 2. Begin revising the lesson plan immediately. Supervisor initiate the process.

____ 3. To be used one time only.

Approvals:

Instructor: [signature] /Date 7/1/91

Training Area Supervisor (or designee): [signature] /Date 7/2/91

I. TRAINING DESCRIPTION

A. Title of Lesson: Valve Mispositioning Events Involving Human Error

B. Lesson Description:

1. Provide training on uniform valve positioning and position verification methods to prevent degradation of safety system functions and lost plant availability.

C. Estimate of the Duration of the Lesson: 2 hours

D. Method of Evaluation and Grade Format: Open reference written exam and receive 80% or better score.

E. Method and Setting of Instruction: Classroom lecture

F. Prerequisites:

1. Instructor:

a. Demonstrated knowledge and skills in the subject, at or above the level to be achieved by the trainees, as evidenced by previous training or education, or

b. SRO license for Nine Mile Point Unit Two or a similar plant, or successful completion of SRO training including simulator certification at the SRO level for Nine Mile Point Unit Two.

c. Qualified in instructional skills as certified by the Training Analyst Supervisor.

2. Trainee:

a. Meet eligibility requirements per 10CFR55
or

b. Be recommended for this training by the Operations Superintendent or his designee or the Training Superintendent.

G. References:

1. INPO 87-003, Good Practice OP-214, Independent Verification, June 1987.

2. INPO SOER, 85-2, Valve Mispositioning Events Involving Human Error

3. INPO 85-017, Guideline, Guidelines for the Conduct of Operations at Nuclear Power Stations.

4. LER 410-88-01, Rx Scram Due to a Loss of Feedwater Flow Caused by Personnel Error.

5. SER 16-89, RCIC Suction Line Over Pressurization.

6. N2-ODI-5.08 Operator Good Practices
7. NMP55509 Lessons Learned RWCU Transient
8. OR 89-146 WCS Isolation due to High NRHX outlet temperature

II. REQUIREMENTS

A. As recommended in INPO SOER 85-2, Valve Mispositioning Events Involving Human Error, Training Recommendations.

III. TRAINING MATERIALS

A. Instructor Materials:
   1. Instructor copy of Lesson Plan
   2. Whiteboard and Markers
   3. Transparency package
   4. Copy of SOER 85-2, Valve Mispositioning Events Involving Human Error
   5. Copy of LER 88-01, Rx Scram Due to Loss of Feedwater Flow Caused by Personnel Error

B. Trainee Materials:
   1. Copy of SOER 85-2, Valve Mispositioning Events Involving Human Error
   2. Copy of LER 88-01, Rx Scram Due to Loss of Feedwater Flow Caused by Personnel Error

IV. EXAMINATIONS AND MASTER ANSWER KEYS

Exams and answer keys are filed with requal records.

V. LEARNING OBJECTIVES

A. Terminal Objectives

TO-1.0 Properly position and/or verify position of a valve in accordance with approved procedures or orders.

B. Enabling Objectives

EO-1.1 State the method for verifying a manual valve is in the open position.

EO-1.2 State the method for verifying a manual valve is in the close position.

EO-1.3 State the method for verifying a manual valve is in a throttled position.

EO-1.4 State the method for verifying a manual valve is in the locked open position.

EO-1.5 State the method for verifying a manual valve is in a locked throttled position.

EO-1.6 State the alternate methods of determining valve position when the normal method is not available (valve inaccessible).

EO-1.7 State the actions required if a valve position discrepancy is found during a lineup.

EO-1.8 State the action required if a procedural discrepancy is found during a lineup.

EO-1.9 Given a case study event identify the contributing factors in each.

VI. LESSON CONTENT

LESSON CONTENT	DELIVERY NOTES	OBJECTIVES/ NOTES

I. INTRODUCTION

A. Purpose

1. Provide uniform methods of determining valve position and positioning valves.
2. Review valve mispositioning events and there effect on safety systems and plant availability.

B. Summary

1. Valve mispositioning events cause:
   a. Degradation of safety systems.
   b. Reduced plant availability.
2. Human error predominant cause.

C. Case Studies

1. Case A
   a. Event
      1) Safety related instrument isolation valves left closed following maint. — Filling Ref. legs
      2) Two valves found during review of operators rounds book.
      3) Third valve found when an alarm did not clear. — ATWS pressure transmitters read O psig during S/U-H/U and increase in pressure.
      4) Fourth valve found during restoration of third valve.

b. Contributing Factors		1.9
1) No formal work requests as required by procedures.	WR should have been generated.	
2) Valve check list not used.	All valve manipulation should be done using procedure or checklist. Human error.	
3) No post job valve lineup check.	Post maintenance error.	
4) Failure to recognize abnormal data during rounds log taking.	Should utilize normal band identified in log sheets. Two recent LERs involving this.	
5) Log review inadequate.	(LER 89-16, 89-17) Nimo will now use additional SRO to review logs. Human Error	
c. Effect		
1) Loss of one division of ATWS CKT.	T.S. inoperability	
2. Case B		
a. Event		
1) Containment penetration valves not closed following maintenance.	Service air penetrations	
2) Found when oxygen concentration and nitrogen makeup were off normal.		
b. Contributing factors		1.9
1) No entry made in locked valve log as required by procedures.	Procedural violation - Human error	

2) No drywell closeout procedure.	Close out procedure should cover valves manipulated during entry.	
3) No procedure directs valve closure.	Procedural discrepancy	
4) Startup checklists did not require lock valve check.	Procedural discrepancy	
c. Effect		
1) Potential containment leakage path.	Problem in Cond. 1, 2, 3	
3. Case C		
a. Event		
1) Test connection and inboard containment isolation valves left open by contractor.	Newly installed DBA recombiner	
2) Found during torus inspection while operating.	Noticed air flow through test connection.	
b. Contributing factors		1.9
1) Lack of coordination between construction contractor and operations personnel.	Inadequate markup procedure.	
2) Plant operator placed tags on wrong valves.	In attention to detail - Human error. (NMP2 requires two Operators checking markup accuracy and hanging.)	
3) No identification tags on valves.	Being addressed at both units.	

	4) System alignment verification waived at work completion - superintendent thought the check would be on pre-startup check sheet.		
	5) Valves not included on pre-startup checklist.	Procedural discrepancy	
c.	Effect		
	1) Containment leakage path.	Problem in mode 1, 2, 3	
4.	Case D		
a.	Event		
	1) Cooling FCV left closed and tagged after maintenance on heat exchanger.	Cooling water from containment spray.	
	2) Found during non-routine flow balancing test.	Noticed hold tag still hanging on valve during non related surv.	
b.	Contributing factors		1.9
	1) No administrative procedure to account for hold notice tags.	Poor procedure control.	
	2) Operability check of cooling water side of heat exchanger not required by post-maintenance procedure.	Post maintenance testing.	

3) Valve not included on pre-startup checklist. — Procedural discrepancy

4) Routine surveillance failed to detect mispositioned valve. — Missed valve - human error.

c. Effect

1) Unavailability of cooling for one of two primary containment spray systems. — T.S. inoperability

5. LER 88-01

a. Event

1) Incorrectly determined standby prefilter lineup in IAS.

2) Valved out on line prefilter. — Air pressure loss caused FWP min flow valves failed open causing loss of feed.

3) Found error when air pressure decayed and caused scram.

b. Contributing factors — 1.9

1) Operator improperly verified valve position by observing stem length. — Stem position only used if marked.

6. OR 89-146

a. Event

1) Manual valves mis- positioned.

2) Filter-Demin placed in service.

3) Reactor Water discharge to Phase Seperators.

b) Contributing Factors

1) Manual valves operated/put in abnormal line-up without;
-notifying SSS of specific status
-procedural controls
-Administrative controls (mark-up/hold-out)
-Log entry
-Turnover notification.

D. Position Verification

1. Unlocked valves 1.1

a. Open

1) Manipulate in closed direction.

2) Remove slack from operating mechanism. 1.1

3) Verify valve stem movement.

4) Reopen 1.2

b. Closed

1) Manipulate in closed direction.

2) Only as necessary to verify valve is closed and not binding or difficult to operate.

c. Throttled 1) Normally verified in closed direction. 2) Count number of turns to full closed. 3) Reopen to throttle position. 4) Second verifier to observe initial positioner preferred.		1.3
2. Locked valves a. Verify locking device installed. Check position indicators if installed. Physical Rotation not used unless specifically directed to.	NMP2 mispositioned SDV air throttle valve during second position verification. Resulted in SDV vent and drains not repositioning on a Scram. Problem: -Improper verification -No SSS notification	1.4,1.5
3. Alternate position verification		1.6
a. If possible at least one check should be done locally at valve. 1) Remote position indicators. a) Acceptable for initial and second verification if periodic testing proves indicators are accurate. b) Should utilize different remote indicators when available.		1.6

2) Use of process parameters
   a) Care must be taken due to possible alternate conditions that make method unreliable.

Alternate flow paths.

3) Observation of valve stem possible.
   a) Only used as an aid if stem is marked.
   b) Not to be used as sole determinant of a valves position. 1.6
4) Authorized scribe marks on valve for throttle valves.
5) Functional mechanical position indicators.

E. Position Verification Performances
   1. Should ensure each verification constitutes:
      a. Actual component identification.
      b. Determination of required position.
      c. Determination of actual position.

2. If discrepancy is found while verifying position station shift supervisor shall be notified immediately. 1.7
3. Follow approved procedure/ valve lineup. OP/OSP/Valve lineup
   a. If incorrect notify station shift supervisor. 1.8
4. Review applicable Technical Specifications prior to valve positioning/ verification.

LESSON CONTENT	DELIVERY NOTES	OBJ/NOTES

A. OR MODIFIED CASE STUDY

Using the modified case study format, discuss the events described in OR #89-149"CONTAMINATION OF DFM SUMP #5 WHICH IS OUTSIDE THE RESTRICTED ZONE"

1. Plant conditions:
   a. mode switch in RUN
   b. PLANT STATUS OPERATING
   c. Rx Pwr 25%
2. Related Surveillance: N/A
3. Sequence of Events:
   a. SAMPLE ANALYZED FROM SUMP #5
   b. SUMP FOUND TO BE CONTAMINATED
   c. SUMP OUTSIDE THE RESTRICTED AREA
   d. SUMP ISOLATED AND PUMP SECURED

Have each trainee read a paragraph of the event description(reference document Page 1 THROUGH 4). After each paragraph, have the class pick key points of that paragraph to be listed on the board to aid in analysis of the event.

REF DOC OR #89-149

After reading the event description use a guided class discussion to determine the following without further reference to the OR:

1. Probable root cause.
2. Recommended corrective actions.
3. Relevance to NMP2 today.
4. Actions that can be taken to prevent this event from happening again at NMP2.

After finalizing the class generated list, compare the class's findings with those in the OR.

INSTRUCTOR NOTE: Use of OR document may be useful for the discussion of items 1 through 4 above.

HE CE EP N/A

This page added as addendum Page 7/1/91 Dkt

OCCURRENCE REPORT CHECKLIST

O.R. #: 89-149

DATE RECEIVED: 9/28/89

IS OCCURRENCE REPORTABLE:
YES (NO) 10/3/89

LER NUMBER: N/A
RESPONSIBLE DEPARTMENT: CHEMISTRY

STATION SUPT. NOTIFIED: N/A
DATE: N/A

IS A PART 21 REQUIRED:
YES (NO)

IS A SPECIAL REPORT REQUIRED: NO FC#:

IS SORC REVIEW REQUIRED:
(YES) NO NA

SORC DATE:

NCTS FORMS FILLED OUT:
YES NO NA

This page added as addendum 7/1/91

OCCURRENCE REPORT (TEMPORARY AP-10.2.2, FORM 1, REV 03)

NMP UNIT	LER NUMBER	CONTROL NUMBER
2		89-149

TYPE

____ (01 - ONE HOUR IMMEDIATE)
____ (02 - FOUR HOUR IMMEDIATE)
____ (03 - 30 DAY REPORT)
____ (04 - ENVIRONMENTAL)
____ (05 - SPECIAL) FC NUMBER ____

•SECTION 1 - INITIATION•

EVENT DATE	EVENT TIME	INITIATING DEPARTMENT	TYPE (Circle One)
9/26/89	0531	OPS	(EVENT) CONDITION

EVENT DESCRIPTION (Use continuation sheets as necessary)

At 0531 ON 9/26/89, chemistry analysis of a sample from sump 5 (DFM SUMP 5) was found to have the following contamination levels:

CR-51 : 9.94(-3) uCi/gm
NA-24 : 5.04(-5) uCi/gm
ZN-65 : 8.62(-5) uCi/gm
and other nuclides. (See attached printout)

Sump 5 is located outside of the restricted area.

POWER MWt	POWER MWe	MODE SWITCH
1190	311	RUN

SSS	CSO
DeGracia	LOMBER

METHOD OF DISCOVERY

TESTING ____ PROCEDURE NO. ____
REVIEW ____
INSPECTION ____ NRC INSPECTOR NAME(S) ____
OPERATIONAL EVENT ____
ENVIRONMENTAL EVENT ____
OTHER SAMPLE ANALYSIS

SYSTEM NUMBER	SYSTEM NAME	WORK REQUEST (Yes or No)	WORK REQUEST NUMBER
15	MAKE UP WATER TREATMENT	163851	163851

INITIAL CORRECTIVE ACTION DESCRIPTION

SUMP WAS ISOLATED AND PUMP SECURED.

SETPOINT/LIMIT REQUIRED	SETPOINT/LIMIT FOUND	SETPOINT/LIMIT LEFT
NO	NA	NA

TECH SPEC REQUIREMENT (Yes or No)	SECTION NUMBER
	3.11.1.1

EQUIPMENT	MODEL NUMBER	SERIAL NUMBER
SUMP 5	NA	NA

MANUFACTURER NA

REPORTED BY MHan — 9/26/89 1351

This page added as addendum change 7/1/91

A-3

NMP UNIT	LER NUMBER	CONTROL NUMBER
NMP 2		89-149

•SECTION 2 - FIRST REVIEW, REQUIREMENTS AND REPORTABILITY•

PRELIMINARY CLASSIFICATION: REPORTABLE (Yes or No) (Yes)

OFF NORMAL HOURS: ON-CALL STATION SUPERINTENDENT NOTIFIED (Yes or No)	DATE	TIME
R.G. Smith / P. Wolza (Yes)		
NORMAL HOURS: STATION SUPERINTENDENT/DEL. NOTIFIED (Yes or No)	DATE	TIME
R.G. Smith / P. Wolza / G. Sanford (Yes)	9/27/89	1600
NRC OPERATIONS CENTER NOTIFIED (ENS) (Yes or No) (No) / NAME	DATE	TIME

REPORTABLE UNDER

1 HOUR REPORTABLE — REVISED FOR 10CFR 20.2201 REPORTABILITY ALSO, NOT REPORTABLE 9/28/89

10CFR50.36, PART ___	___ c.1.i.A	___ c.1.ii.A	___ c.2	
10CFR50.72, PART ___	___ a.1.i	___ b.1.i	___ b.1.ii	___ b.1.iii
	___ b.1.iv	___ b.1.v	___ b.1.vi	

4 HOUR REPORTABLE

10CFR50.72, PART ___	___ b.2.i	___ b.2.ii	___ b.2.iii	___ b.2.iv
	___ b.2.v	___ b.2.vi		

30 DAY LER REPORTABLE

10CFR50.73, PART ___	___ a.2.i	___ a.2.ii	___ a.2.iii	___ a.2.iv
	___ a.2.v	___ a.2.vi	___ a.2.vii	___ a.2.viii
	___ a.2.ix	___ a.2.x		

SPECIAL REPORT REQUIRED (Yes or No) (No)	SECTION

TECHNICAL SPECIFICATION REQUIREMENTS (Explain)
N/A

SURVEILLANCE PERFORMED (Yes or No) (No)	SURVEILLANCE NUMBER

REVIEWED & COMPLETED BY SSS, ASSS, OR HIGHER MGMT LEVEL IN OPERATIONS DEPT.	DATE	TIME
[signature]	9/27/89	1230

•SECTION 3 - SECOND REVIEW AND CONCURRENCE•

DIRECTOR NUCLEAR REGULATORY COMPLIANCE OR DESIGNEE CONCURRENCE WITH CLASSIFICATION (Yes or No) (IF NO EXPLAIN)
AGREE WITH REPORTABILITY DETERMINATION ABOVE. JE

PART 21 EVALUATION NECESSARY (Yes or No) (No)	DIRECTOR REGULATORY COMPLIANCE OR DESIGNEE (STANFORD)	DATE
	[signature]	9/29/89
ROOT CAUSE EVAL. RECOMMENDED (Yes or No)	SUPT. TECHNICAL ASSESSMENT OR DESIGNEE	DATE
NO	Rhonda Treadwell	2/23/90
STATION SUPERINTENDENT CONCURRENCE WITH CLASSIFICATION (Yes or No)	SORC REVIEW REQUIRED (Yes or No)	
YES	YES	

IF NO, NEW CLASSIFICATION

EXPLAIN

STATION SUPERINTENDENT	DATE
R B Control	9/30/89

This page added as addendum change 7/1/91

NMP UNIT	LER NUMBER	CONTROL NUMBER 89-149

•SECTION 4 - RESOLUTION AND ACCEPTANCE•

LONG TERM CORRECTIVE ACTION RECOMMENDATION

RESOLUTION SUMMARY

LESSONS LEARNED TRANSMITTAL REQUIRED (Yes or No)	ASSIGNED PREPARER		
SORC CHAIRMAN ACCEPTANCE	DATE	TIME	MEETING NUMBER
CLOSED BY			DATE

This page added as addendum Dec 7/1/89

A-5

NMP UNIT	LER NUMBER	CONTROL NUMBER 89-149

EVENT DESCRIPTION (Continued from previous page)

This page added as addendum change 7/1/91

A-6

INTERNAL CORRESPONDENCE
FORM 112-2 R 02-80 55-01-013

NIAGARA MOHAWK

FROM M. Dooley
R. Smith

DISTRICT Nine Mile Point Nuclear Station

DATE October 6, 1989 FILE CODE

SUBJECT OR Close Out
OR 89-149

Attached is a copy of the Occurrence Report(s) (OR)(s) listed above that has/have been assigned to your department to supply the Long Term Corrective Actions and Resolution Summary for close out. Complete and return the (OR)(s)to the Nuclear Regulatory Compliance Department on or before 11/2/89 as required by AP-10.2.2.

If you have any questions concerning this Occurrence Report, please contact Nuclear Regulatory Compliance. Thank you.

MD/lmc
(0646V)

Attachment

cc: Station Superintendent Unit 1/Unit 2
(circle the applicable)

Contact
Al Moisen/R.P.
x2884 D. Barcomb
when OR is scheduled
for SORC

This page added as addendum Dec 7/1/91
A-7

INTERNAL CORRESPONDENCE
FORM 112-2 R 02-80 55-01-013

NIAGARA MOHAWK

FROM M. Dooley

A. Ross

DISTRICT Nine Mile Point Nuclear Station

DATE October 3, 1989 FILE CODE

SUBJECT OR Close Out
OR 89-149

Attached is a copy of the Occurrence Report(s) (OR)(s) listed above that has/have been assigned to your department to supply the Long Term Corrective Actions and Resolution Summary for close out. Complete and return the (OR)(s)to the Nuclear Regulatory Compliance Department on or before 11/2/899 as required by AP-10.2.2.

If you have any questions concerning this Occurrence Report, please contact Nuclear Regulatory Compliance. Thank you.

MD/lmc
(0646V)

Attachment

cc: Station Superintendent Unit 1/Unit 2
(circle the applicable)

10/4

Mark,

It would be very difficult for me to supply a long term corrective action for this Occurrence Report. I, am not particularly knowledgable with the system design or operation, the two of which are most probably the root cause of this event.

—Perhaps OPS. Thanks
Andy Ross

This page added as addendum Page 2/1/91

A-8