U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-440/OL-94-01

Docket No. 50-440 License No. NPF-58

Licensee: Cleveland Electric Illuminating Company

Facility Name: Perry 1

Examination Administered At: Perry Nuclear Generating Station

Examination Conducted: January 31 to February 4, 1994

RIII Examiners: G. Buckley, PNL
M. Riches, PNL

Chief Examiner: D. R. McNeil — Date: 2/24/94

Approved By: M. J. Jordan, Chief, Operator Licensing Section 1 — Date: 2/24/94

Examination Summary

Examination administered January 31 to February 4, 1994, (Report No. 50-440/OL-94-01).
Written and operating requalification examinations were administered to 6 Senior Reactor Operators (SROs) and 8 Reactor Operators (ROs). One additional SRO participated during the dynamic simulator scenarios to complete a crew composition. Three crews, two operations crews and one staff crew, were evaluated during the dynamic simulator portion of the exam.

Results:
One crew failed the dynamic simulator portion of the exam. There were no failures of the Job Performance Measures (JPMs) nor of the written portion of the exam. Based on the results of the examination and in accordance with the criteria of NUREG-1021, Revision 7, Operator Licensing Examiner Standards, ES-601, D.2.a, the Perry Requalification Training Program was determined to be satisfactory.

STRENGTHS/WEAKNESSES:

Strengths:

Simulator scenarios were challenging (See section 3.c.1)

Crew members kept the supervisors informed of availability (See section 3.c.1)

Knowledge and use of procedures (See sections 3.b.1 and 3.c.1)

The Perry Station simulator (See section 3.c)

Weaknesses:

The submitted written exam was weak and non-challenging (See section 3.a.2)

Implementation of dynamic simulator critical tasks (See section 3.c.2)

All scenarios selected required emergency depressurization (See section 3.c.2)

Both crew supervisors were simultaneously directing EOP actions (See section 3.c.2)

REPORT DETAILS

1. Examiners

*D. McNeil, Chief Examiner, NRC, Region III
M. Riches, Pacific Northwest Laboratories
G. Buckley, Pacific Northwest Laboratories

2. Persons Contacted

Facility

*R. Stratman, Vice President
*D. Igyarto, Plant Manager
*D. Cobb, Supt. Ops.
*M. Wesley, Manager
*C. Persson, OTU Supervisor
*D. Benyak, Auditor
*N. Johnson, License Training Instructor
*M. Klawon, OTU Clerk
*J. Perry, Auditor
*L. Routzattn, Regulatory Affairs Compliance Engineer
H. DeBoer
P. Hetrick
A. Raymens
P. Tocci

U.S. Nuclear Regulatory Commission (NRC)

M. Ring, Chief, Operations Branch
M. Jordan, Chief, Operator Licensing Section 1
*D. Roth, Inspector, RIII
*D. Kosloff, Senior Resident Inspector, Perry Station

* Indicates present at exit meeting on February 4, 1994.

3. Training Program Observations

The facility's trainers and operators were professional throughout the exam and put in additional time when required without complaint. During the examination, the simulator failed, requiring rescheduling of one crew's scenarios. The simulator evaluators and operating crew worked outside their normal work hours to complete the examination in a timely manner. The facility trainers appeared knowledgeable and were responsive to NRC concerns and questions.

The following information is provided for evaluation by the licensee via their SAT based training program. No response is required.

a. Written Examination

The Category A examination was given in the simulator with references available. Both the RO and SRO examinations had 13 questions. All operators completed the examination within the allowed 1 hour time limit. The Category B examination was given in a standard classroom environment with references available. The SRO examination had 25 questions while the RO examination had 24 questions. All operators completed the examination before the allowed 2 hour time limit nad elapsed. All operators passed the written examination.

Mastery of the subjects was demonstrated by the average SRO and RO scores of 95% and 91%, respectively. This is also demonstrated by the high percentage (60%) of operators finishing the Category B portion of the examination within one hour rather than the two hours allotted for the section.

Because of high scores and short time operators required to take the examination it was suggested to the utility that an effort be made to make the examinations more discriminatory.

1. Strengths:

All operators were able to finish the examination within the required time limits. Scores ranged from 86.5% to 100%.

2. Weaknesses:

The lengths of the written examinations as submitted were insufficient. The intent for the written examination is stated in ES-602, Attachment 2, Section B.2.g, "Time Limits." The written test should not be such that candidates have time to find every answer in a reference. The taking of the test should take two-thirds of the available time, with only the remaining one-third of the time for answer reviews, verifications, and reference searches. To achieve the proper examination length more questions than that suggested in the Examiner's Standard should be used. Past experience has indicated 20-25 questions on the Category A examination and 35-40 questions on the Category B examination are needed to achieve the desired examination length.

Section A, "Plant and Control Systems," of the examination submitted to the NRC did not differentiate between the SRO and RO licenses. The facility revised the examination at the NRC's request to make that distinction. The examination did not take advantage of the simulator control room setting for all questions.

The Section B examination submitted to the NRC was not discriminating. A region based examiner without Perry Station experience took the examination without references and was able to achieve a test score of 60% within 60 minutes. The NRC met with utility examiners and requested changes to the submitted exam to make it more challenging.

b. Job Performance Measures (JPMs)

All operators passed the JPM portion of their examination. Eleven operators performed all assigned JPMs correctly, three operators missed one JPM each on their examinations. JPMs administered are listed below. Note that only five of the listed JPMs were administered to each licensee.

The JPMs performed in the simulator/control room were:

1. Reactor Feed Pump (RFP) Quick Restart - RFP B
2. Transfer of EH13 to the Preferred Source
3. Bypass Control Rod Position in Reactor Auxiliary Control Cabinet (RACC)
4. Vent the Reactor Pressure Vessel (RPV) with Reactor Core Isolation Cooling (RCIC)
5. Hydrogen Igniter Startup
6. Control Ventilation Chill Water (CVCW) Restoration - Isolation Bypass
7. Control Rod Drive (CRD) Pump Trip Recovery
8. Standby Liquid Control (SLC) Alternate Injection
9. Bypass of Reactor Water Cleanup (RWCU) Isolations

The JPMs performed in the plant were:

1. Transfer Bus EH11 to the Diesel Generator (DG) and perform Operations in Parallel with the Grid
2. Control Power Transfer Control Room (CR) to Remote Shutdown Panel (RSP)
3. Control Transfer to CR - Shutdown Suppression Pool Cooling "B"
4. Combustible Gas Mixing System A Startup
5. Residual Heat Removal (RHR) Loop B Containment Flood
6. Hydrogen Recombiner A Startup
7. Operate Main Steam Isolation Valves (MSIVs) from the RSP
8. Manually Initiate Carbon Dioxide for the Control Room Subfloor Areas
9. Suppression Pool Level Control - Division II
10. Startup RCIC from Division I RSP
11. Transfer Suppression Pool Water to the Hotwell

1. Strengths:

Operators were familiar with plant locations and procedures. They were able to rapidly proceed to the proper procedures

and accurately execute the steps of the procedures.

Facility evaluators were knowledgeable concerning each of the JPMs. They were able to provide accurate, realistic cues in almost all circumstances.

2. Weaknesses:

Some of the evaluators terminated the JPMs rather than let the operators state that they had completed the task assigned them and they were finished. This is an acceptable practice when the JPM is terminated before a procedure is completed to the last step (ie, when performing an emergency start of the emergency diesel generator and the last steps call for lining up cooling water or ventilation systems and those steps are not desired for JPM evaluation). If a JPM proceeds to the last step, the operator should be the one to terminate the JPM by stating that he/she has completed the assigned task.

c. Dynamic Simulator Examination

The simulator scenarios were challenging and of adequate length. The crews demonstrated good use of procedures and teamwork in most cases. Three crews, two operating and one staff, were examined. All simulator scenarios were completed in one day; four scenarios were used. Scenarios RP1A and PC1A were used on one crew. Scenarios PC6A and RP5B were used on two crews. The following is a description of each scenario:

1. Scenario OT-3070-001-RP1A required the operators to perform PTI-N31-P0002 (surveillance), respond to a RCIC isolation and enter a technical specification (tech spec) requiring plant shutdown. The operators were then required to respond to a loss of bus F1A06 which caused a loss of RFPT "A." During troubleshooting a personnel error caused a loss of all feedwater with a failure of the Reactor Protection System (RPS). Both Control Rod Drive (CRD) pumps tripped resulting in a loss of all high pressure feed to the reactor. The crew was required to Emergency Depressurize (ED) the reactor and restore water level using low pressure injection pumps.

2. Scenario OT-3070-001-PC1A required the operators to continue a reactor up-power maneuver started during the previous shift. As the operators began withdrawing control rods, they discovered an uncoupled control rod and took actions to recouple the control rod. The rod dropped and caused fuel failure with a subsequent increase in Main Steam Line (MSL) radiation. The high radiation resulted in a Main Steam Line Isolation Valve (MSIV) closure and reactor scram. All rods did not insert. RPV water level was lowered to control

power while control rods were manually inserted. ED was required when the suppression pool temperature and reactor pressure could not be maintained below the Heat Capacity Limit (HCL).

3. Scenario OT-3070-001-RP5B required the operators to secure Emergency Service Water (ESW) Pump "A". APRM "A" failed high causing the recirculation Flow Control Valves (FCVs) to ramp closed. The recirculation Hydraulic Control Units (HCUs) were shut down to lockup the FCVs and terminate the power decrease. After APRM "A" was bypassed the recirc HPUs were restarted and power restored to the pre-transient level. A loss of feedwater heating to the 6A heater occurred followed by an earthquake which caused a loss of feedwater and an inadvertent Alternate Rod Insertion (ARI) initiation signal. All control rods did not insert and a total loss of high pressure feedwater occurred. This required the operators to ED to restore water level. Standby Liquid Control (SLC) was initiated to shut down the reactor.

4. Scenario OT-3070-001-PC6A started with surveillance SVI-C71-T0051 in progress. A control rod scrammed due to a blown Division I fuse. During recovery of the control rod, an air leak on the Division 3 Diesel Generator (D/G) air start system caused the D/G to be declared inoperable. A failed drain valve on feedwater heater 5A caused a loss of feedwater heaters 5A and 6A. Attempts were made to reduce power and rod line, but fuel damage occurred. The reactor scrammed and the MSIVs shut on high radiation. A small break was present in a guardpipe with a breach of guardpipe integrity. The RPV was depressurized in an attempt to control containment temperature and pressure.

One crew was unable to successfully complete all the Crew Critical Tasks (CCT) in scenario RP5B. During the emergency depressurization required by the scenario, the crew erroneously determined that all reactor pressure vessel level indication was invalid. This caused them to exit the Emergency Operating Procedure (EOP) for power/level control and enter the EOPs for vessel and containment flood. Since they exited the power/le. EOP, they were unable to successfully complete the CCT requiring them to raise reactor vessel level after the emergency depressurization to a vessel level between -30" and 4% reactor power on the Average Power Range Monitors (APRMs). The crew's performance was determined to be unsatisfactory for this scenario by the NRC and the facility. The crew was removed from watch standing responsibility and will be remediated and re-examined by the facility prior to resuming watch standing duties.

1. Strengths:

The simulator was determined to be a strength in the training program. The simulator was able to simulate all conditions the scenarios required without halting or simulation failure. The pictures of additional control room equipment were considered a positive effort to enhance training. Although the simulator was not available for one day during the examination due to an electrical fault, it was recognized the failure was due to circumstances beyond the control of the simulator group. The simulator was repaired and ready for service within 12 hours.

Communications were generally good. Crew members would frequently announce their availability to crew supervision, and many crew members insisted on repeat-backs of information.

The use of the Shift Technical Advisor (STA) is noted as a strength. The STAs all performed as a backup to the crew supervisors. The STAs on each crew continually and independently reviewed the Emergency Operating Procedure (EOP) steps that had been executed to ensure they were completed.

2. Weaknesses:

The implementation of Crew Critical Tasks (CCTs) was considered a weakness (refer to NUREG 1021, Rev 7, Examiner Standards (ES) 604, Attachment 1, Critical Task Methodology, for guidance in identifying CCTs). The following are examples of CCTs that are poorly implemented:

a. In scenario OT-3070-001-RP1A, page 17, the CCT "Maintains reactor water level between the Level 3 (L3) and the Level 8 (L8) points" is identified. This does not meet the definition of a CCT under the scenario conditions, but is a standard for determining individual competency. Under the scenario conditions, the operators could have left the feedwater control system in automatic and not exceed L3 or L8. The actual critical task at this point would be to recognize and take actions for the preprogrammed ATWS if the L3 or L8 conditions were exceeded.

b. In scenario OT-3070-001-PC6A, page 15, the CCT "Maintains reactor power less than 95% and flow greater than 48 mlb/hr using Recirc Flow Control Valves" is identified. This does not meet the definition of a CCT under the existing scenario conditions, but is also a standard for determining individual competency. The concern at this point in

the scenario is whether the power/flow combination will enter the forbidden region of the plant's operating curve. The actual critical task at this point would be to scram the reactor if power entered the forbidden region or if power oscillations occurred.

All scenarios submitted required emergency depressurization during the execution of the scenario. This was a concern because a crew that recognized all examinations ended in emergency depressurization could emergency depressurize to get its CCT without understanding the need for emergency depressurization.

On one crew the Unit Supervisor (US) and the Shift Supervisor (SS) were simultaneously directing EOP flowchart actions. At one point the US directed an operator to maintain a reactor pressure band using Safety Relief Valves (SRVs). Within a few moments the SS directed the same operator to perform a different task on another panel which would take him away from the SRV control switches and the ability to control reactor pressure. There should normally be only one designated SRO directing operator action during accident mitigation.

A generic weakness noted was each crew's inability to track SRV status during and after emergency depressurization. While controlling reactor pressure the P601 panel operator was using various SRVs. When ordered to initiate emergency depressurization, the operator would open all eight Automatic Depressurization System (ADS) valves and leave the other SRVs previously opened in the open condition. The US and SS believed only the eight ADS valves were open when there were more than eight valves open.

4. Operations, Security, Rad Protection, Other

a. Strengths:

Training, Operations, and Security were all professional in their dealings with the examination team. The examination team was able to quickly process through the gate house and into the plant. The examination team was able to quickly obtain all materials needed for efficient administration of the examination.

b. Weaknesses:

Areas of the plant are in need of housekeeping. During the exam prep week, several items were identified that needed attention. The facility responded and those items were corrected. An additional tour of the turbine building revealed multiple items in

need of attention. Those items were identified to the facility by the NRC Senior Resident.

5. Simulator Observations:

No simulator discrepancies were identified during the course of the examination. The simulator was not available on the second day of the examination due to a failed undervoltage relay. Schedule adjustments were made to work around the loss of the simulator for that day. Control room panel, P-808 was not available on the fourth day of the examination due to a failed card in the panel. The loss of P-808 did not affect the conduct of the examination.

6. Exit Meeting

An exit meeting with the Perry Nuclear Generating Station management was held at the Perry Station training offices on February 4, 1994. Those attending the meetings are listed in Section 2 of this report. The following items were discussed during the exit meeting:

- Strengths and weaknesses noted in this report.

- The general observations relating to the plant noted in Section 4.

The personnel attending the exit verified that no proprietary information was disclosed and that no license commitments were made as a result of the NRC Requalification Examination.

ENCLOSURE 2

REQUALIFICATION PROGRAM EVALUATION REPORT

Facility: Perry Nuclear Station

Examiners: D. McNeil, Chief Examiner
G. Buckley, Pacific Northwest Laboratories
M. Riches, Pacific Northwest Laboratories

Dates of Evaluation: January 31 - February 4, 1994

Areas Evaluated: X Written X Oral X Simulator

Examination Results:

	RO Pass/Fail	SRO Pass/Fail	Total Pass/Fail	Evaluation (S or U)
Written Examination	8/0	6/0	14/0	S
Operating Examination				
Oral	8/0	6/0	14/0	S
Simulator	6/2	4/3	10/5	S

Evaluation of facility written examination grading: S

Crew Examination Results:

	Crew 1 Pass/Fail	Crew 2 Pass/Fail	Crew 3 Pass/Fail	Evaluation (S or U)
Operating Examination	Pass	Pass	Fail	S

Overall Program Evaluation

Satisfactory

Submitted:
D. McNeil
Examiner
2/25/94

Forwarded:
M. Jordan
Section Chief
2/25/94

Approved:
M. Ring
Branch Chief
2/25/94

ENCLOSURE 3

SIMULATION FACILITY REPORT

Facility Licensee: Cleveland Electric Illuminating Company

Facility Licensee Docket No.: 50-440

Operating Tests Administered: January 31 - February 4, 1994

This form is to be used only to report observations. These observations do not constitute audit or inspection findings and are not, without further verification and review, indicative of noncompliance with 10 CFR 55.45(b). These observations do not affect NRC certification or approval of the simulation facility other than to provide information that may be used in future evaluations. No licensee action is required in response to these observations.

While conducting the simulator portion of the operating tests, the following items were observed (if none, so state):

ITEM	DESCRIPTION
Simulator Lost Power	All power to the simulator was lost sometime between the evening of January 31 and the morning of February 1. A relay had burned-up, apparently due to age. The utility repaired the simulator by the morning of February 2.
No Power to Electrical Panel	Power to Electrical Panel P808 was lost sometime between the evening of February 2 and the morning of February 3.