U.S. NUCLEAR REGULATORY COMMISSION
REGION I

REQUALIFICATION PROGRAM EVALUATION AND
BWR POWER OSCILLATION INSPECTION

COMBINED REPORT NO.	89-12 (OL)
FACILITY DOCKET NO.	50-354
FACILITY LICENSE NO.	NPF-57
LICENSEE:	Public Service Electric and Gas Company P. O. Box 236 Hancocks Bridge, New Jersey 08038
FACILITY:	Hope Creek Generating Station
EXAMINATION DATES:	June 19 - 24, 1989
NRC EXAMINERS:	T. Walker, Senior Operations Engineer C. Sisco, Operations Engineer M. Daniels, Examiner, Sonalysts, Inc. R. Miller, Examiner, Sonalysts, Inc.

CHIEF EXAMINER: Terry E. Walker — 9/26/89
T. Walker, Senior Operations Engineer — Date

INSPECTION DATES: June 22 - 23, 1989

INSPECTOR: Carl Sisco — 9/26/89
C. Sisco, Operations Engineer — Date

APPROVED BY: Allen D. Howe for — 10/5/89
Richard J. Conte, Chief, BWR Section — Date
Operations Branch, DRS

EXECUTIVE SUMMARY

Written and operating examinations were administered to three crews consisting of four Reactor Operators (ROs) and ten Senior Reactor Operators (SROs). The examinations were graded concurrently by the NRC and the facility training staff. As graded by the NRC, all four ROs and eight of the ten SROs examined passed all portions of the examination. One SRO did not perform satisfactorily on the simulator evaluation as graded by the NRC and the facility. He passed the remaining two portions of the examination. One SRO passed the written examination as graded by the facility, but failed the written examination as graded by the NRC. He passed the remaining two portions of the examination. All three crews that were evaluated performed satisfactorily on the simulator portion of the examination as graded by the facility and the NRC.

The licensee's licensed operator training program was determined to be satisfactory based on the criteria established in section ES-601 of NUREG-1021, Rev. 5. Several weaknesses were identified in the requalification training program. Quality control in all aspects of the examination process appeared to be weak. Examples of a lack of attention to detail were found in the preparation, administration and grading of the examinations. Deficiencies such as incorrect references on test items, oversights in incorporation of changes identified during review of the test items, and numerous errors in calculation and tabulation of numerical grades indicated a weakness in quality control. Deficiencies were also noted in the facility's methods for evaluating individual operators on the simulator and for grading written examinations.

The inspection of the licensee's implementation of NRC Bulletin 88-07 on power oscillations is documented in section 8 of this report. Operators were not adequately trained on a minor aspect of this issue. Overall, the training provided was effective as noted during the requalification examination. No violations were identified.

DETAILS

1. Introduction

During the examination period the NRC administered requalification examinations to 14 licensed operators (4 ROs and 10 SROs). Two on-shift crews and one staff crew were evaluated. The examiners used the process and criteria described in NUREG 1021, "Operator Licensing Examiner Standards," Rev 5., section ES-601, "Administration of NRC Requalification Program Evaluations." The examiners also reviewed the licensee's procedures for conducting licensed operator training and the results of the requalification examinations administered by the facility.

An entrance meeting was held with the licensee on March 31, 1989, in the Regional Office. The purpose of this meeting was to brief the licensee on the requirements of the requalification program evaluation and to outline a prospective schedule for the examinations.

The licensee personnel contacted during the examination are listed in Attachment 1. The members of the combined NRC/facility examination team, and the facility evaluators are also identified in Attachment 1.

2. Examination Results

2.1 Individual Examination Results

The following is a summary of the individual examination results:

NRC Grading	RO Pass/Fail	SRO Pass/Fail	TOTAL Pass/Fail
Written	4 / 0	9 / 1	13 / 1
Simulator	4 / 0	9 / 1	13 / 1
Walk-Through	4 / 0	10 / 0	14 / 0
Overall	4 / 0	8 / 2	12 / 2

Facility Grading	RO Pass/Fail	SRO Pass/Fail	TOTAL Pass/Fail
Written	4 / 0	10 / 0	14 / 0
Simulator	4 / 0	9 / 1	13 / 1
Walk-Through	4 / 0	10 / 0	14 / 0
Overall	4 / 0	9 / 1	13 / 1

2.2 Generic Strengths and Weaknesses

The following is a summary of generic strengths and weaknesses noted by the NRC from the results of the individual requalification examinations. This information is being provided to aid the licensee in upgrading the requalification training program. No licensee response is required.

STRENGTHS

- Ability to locate the appropriate procedure for performance of JPM tasks
- Ability to locate and operate in-plant equipment
- Ability to recognize entry conditions and utilize Emergency Operating Procedures (EOPs)
- Ability to perform Emergency Plan event classifications
- Knowledge of recirc pump NPSH requirements
- Recognition of Technical Specification surveillance requirements

WEAKNESSES

- Ability to obtain keys needed to bypass a control rod at RSCS
- Failure to consistently review precautions and limitations when performing procedural tasks
- Understanding of the automatic actions that occur on start of a Station Service Water (SSW) pump

- Understanding of the effects of TACS low pressure on SACS while SACS is being operated from the Remote Shutdown Panel
- Understanding of the relationship between the purpose of restoring Primary Containment Instrument Gas and the effects of a loss of offsite power on integrated plant operations
- Understanding of the design feature that lessens the probability of RCIC overspeed
- Understanding of the operation of the APRM/LPRM input count circuitry and indications
- Ability to diagnose the failure of a recirculation flow unit
- Ability to identify the source of a leak in the drywell
- Knowledge of the Technical Specification requirements for Secondary Containment integrity

3. Requalification Program Evaluation Results

The facility program for licensed operator requalification training was evaluated based on the criteria of ES-601, Paragraphs C.3.b.(1), C.3.b.(2), D.1.c.(2)(c), D.2.c.(2)(b) and D.3.c.(2)(b).

3.1 Requalification Program Requirements

The review of the licensee's procedures for conduct of licensed operator training indicated that the requalification program meets the requirements of 10 CFR 55.59(c)(2), (3) and (4) for lectures, on-the-job training and evaluations. The program is also based on a Systems Approach to Training (SAT) and, therefore, meets the criteria of ES-601, paragraph C.3.b.(1)(d).

During review of the results of the facility administered requalification examinations, it was noted that the licensed operator that was a member of the combined NRC/facility examination team had not taken the annual operating test required by 10 CFR 55.59. The facility had planned to exempt the individual from the annual examinations because of his participation in preparation of the NRC requalification examinations. When it was explained to the training personnel that the requirement for an annual operating test could not be waived, the licensee committed to administering an operating test to the individual.

3.2 Examination Results

On an individual basis, 85.7% of the operators passed the overall examination as graded by the NRC which meets the criteria of 75% established in ES-601, paragraph C.3.b.(1)(b).

All three of the crews were determined to be satisfactory by the NRC and the facility which satisfies the criteria for the simulator evaluation provided in ES-601, paragraph D.1.c.(2)(c) (4). For a program to be judged satisfactory, no more than one third of the crews may be evaluated as unsatisfactory by the NRC.

All of the individual operators passed the walk-through examination which satisfies the criteria of 75% established in ES-601, paragraph D.2.c.(2)(b)(2).

With respect to the written examination, 92.9% of the operators passed as graded by the NRC (100% as graded by the facility) which meets the criteria of ES-601, paragraph D.3.c. (2)(b) that at least 75% of the operators must pass the examination for the program to be judged satisfactory.

3.3 Agreement on Pass/Fail Decisions

The NRC failed two SROs on the overall examination while the facility only failed one of the individuals that the NRC failed. This resulted in 92.9% agreement on pass/fail decisions between NRC and facility grading which meets the criteria of 90% established in ES-601, paragraph C.3.b.(1)(a).

Both the NRC and the facility found all the crews satisfactory on the simulator evaluations and therefore the criteria of ES-601, paragraph D.1.c.(2)(c)1. was met. The program may have been judged unsatisfactory if the NRC evaluated one crew unsatisfactory and the facility found the same crew to be satisfactory.

The final results of the individual simulator evaluations were identical between the NRC and facility grading which meets the criteria for 90% pass/fail decision agreement established in ES-601, paragraph D.1.c.(2)(c)2. Initially the facility evaluated all the individuals as satisfactory on the simulator portion of the examinations. After the NRC results were revealed (the NRC evaluated one SRO as unsatisfactory) and the differences in the evaluations were discussed, the facility evaluators recognized their error and changed their evaluation of the individual from satisfactory to unsatisfactory. Initially the facility had evaluated the operator's performance on each scenario discretely, but did not evaluate his overall performance. The facility did not identify a generic weakness in control board operations, because it never resulted in failure of an individual scenario. After discussions with the NRC, the facility recognized that the overall performance of the individual should be evaluated and committed to changing their procedures to ensure that overall performance is evaluated in future examinations. Another factor that contributed to the initial difference in the pass/fail decision was that the lead facility examiner factored past performance and personal considerations (such as illness) into the evaluations. This issue was

discussed with the facility evaluators and they recognized that it is not appropriate to consider such factors when performing an evaluation.

There was 100% agreement between the NRC and the facility on pass/fail decisions on the walk-through examinations which meets the criteria of 90% agreement from ES-601, paragraph D.2.c.(2)(b)(1).

There was one disagreement between the NRC and the facility on a pass/fail decision on the written examination. The NRC failed one individual that the facility passed which resulted in 92.9% agreement between the NRC and the facility. This met the program criteria for 90% agreement established in ES-601, paragraph D.3.c.(2)(b), but several weaknesses in facility grading techniques were identified as a result of comparison of NRC and facility grading. These weaknesses are discussed in paragraph 6 of this report.

3.4 Common Job Performance Measures

Of the five common Job Performance Measures (JPMs), one was missed by two examinees as graded by the NRC and by three examinees as graded by the facility. Two of the common JPMs were each missed by one individual as evaluated by both the NRC and the facility. None of the common JPMs were missed by at least 50% of the examinees; therefore, paragraph C.3.b.(2)(a) of ES-601 is not applicable.

Nine of the examinees missed the same common JPM question which indicates a program deficiency in accordance with paragraph C.3.b.(2)(b) of ES-601. The same common JPM question was missed by more than 50% of the examinees. This deficiency was not considered to be significant with respect to the program evaluation. The question that was missed pertained to the differences between the automatic actions that occur when a service water pump is started from the control room versus from the circuit breaker on the local panel. Even though the question had a Knowledge and Ability (K/A) rating above 4.0, the specific knowledge tested was not operationally significant. Because there are no differences in the automatic actions between a control room and local start, no additional actions are required to be performed by the operator.

Twelve (or 85.7%) of the examinees correctly answered at least 80% of the common JPM questions which meets the criteria of ES-601, paragraph C.3.b.(2)(e) that at least 75% of the examinees score over 80% on the common JPM questions. The remaining two examinees answered greater than 70% of the common JPM questions correctly.

3.5 Licensed Operator Training

The results of the requalification examinations and review of the requalification program indicated that the facility trains and

evaluates operators in all positions permitted by their individual licenses; therefore, paragraph C.3.b.(2)(c) of ES-601 is not applicable.

The facility had trained operators for the in-plant JPMs as evidenced by the 100% pass rate on the walk-through examination; therefore, paragraph C.3.b.(2)(d) of ES-601 is not applicable. A generic weakness identified in the performance of JPMs appeared to be the result of a weakness in the facility's training program. The licensee expects operators to verify initial conditions and observe the precautions and limitations prior to performing a task in accordance with a facility procedure, but in many cases this was not done during performance of the JPMs. The licensee acknowledged that the operators should be trained to perform JPMs just as if they were performing the task in the plant.

3.5 Facility Evaluators

All of the facility evaluators were found to be satisfactory in accordance with the standards established in Attachment 5 to ES-601; therefore, paragraph C.3.b.(2)(f) of ES-601 is not applicable. As discussed above, the lead facility examiner gave credit for past performance and factored personal factors (such as illness) into the evaluations which was not appropriate. The facility evaluators were hesitant to ask follow-up questions to probe the operator's knowledge during performance of the JPMs. This was due to their interpretation that ES-601 prohibited follow-up questioning in addition to the prewritten JPM questions. After discussions with the NRC examiners, most of the facility evaluators improved in this area.

3.6 Summary of Results

The Hope Creek licensed operator training program was evaluated as satisfactory. The program met all the criteria of ES-601, paragraph C.3.b.(1) for a satisfactory program. Because greater than 50% of the examinees missed the same common JPM question, one of the items listed in ES-601, paragraph C.3.b.(2) was applicable. ES-601 requires that a requalification program be determined to be unsatisfactory if three or more of the items in paragraph C.3.b.(2) are applicable. A program may be determined to be unsatisfactory if one or two of the items are applicable. The licensee's requalification program was determined to be satisfactory because only one item from paragraph C.3.b.(2) was applicable and it was not considered to be a significant deficiency. The facility's program also met all the criteria for a satisfactory requalification program for the simulator, walk-through and written portions of the evaluations. These criteria are described in ES-601, paragraphs D.1.c.(2)(c), D.2.c.(2)(b) and D.3.c.(2)(b).

4. Requalification Examination Preparation

The licensee submitted reference materials, test items and a Sampling Plan approximately 60 days before the examinations were administered. These materials were reviewed in the Regional Office and the specific test items proposed by the facility were reviewed on-site by the combined NRC/facility examination team. The facility then revised the items and produced the examination that was administered to the examinees. The test items that were administered to the operators are listed in Attachment 2.

Preparation of simulator scenarios was determined to be a program strength. Very few changes were identified during the preparation week and the few changes that were needed were made quickly and correctly. All the scenarios contained appropriate critical tasks, events, and crew responses. The facility used a different definition of a time-critical response than that provided in ES-601, but all scenarios contained responses that met the definition in ES-601, as well as responses that met the facility definition.

The JPMs that were submitted for NRC review required a generic revision to include obtaining the procedure and location of the appropriate step in the procedure in the cases where this would be expected of the operator performing the task. Equipment required for task performance was indicated on the cover sheet of the JPMs, but obtaining that equipment was not included in the performance standards. Steps for obtaining equipment had to be added to all the JPMs that required equipment for performance.

Performance Standards for verifying prerequisites and observing precautions and limitations also had to added to most of the JPMs. These were identified as expected actions when performing any task and, therefore, should have been included as expected actions in the performance of the JPMs. The performance standards for the JPMs did not include any administrative controls such as notifications and log entry requirements. These items were covered in most cases when verification of prerequisites was added to the performance standards.

Many procedure errors were identified during the review of the JPMs. The facility did not correct these errors prior to administration of the examinations to ensure there was no compromise of the examinations. When a larger bank of JPMs is available, procedure changes can be made without compromise of the examinations.

The licensee did not understand the purpose of the Sampling Plan. The plan that was submitted indicated the emphasis that each topic received during the most recent requalification cycle, but it did not include a summary of the specific examination subject requirements. The NRC fitted the facility proposed test items into the Sampling Plan and no omissions were identified.

The written examination question bank contained many items that could not be used simultaneously, which significantly reduced the effective size of the bank. Some of these test items indicated that they should not be used with certain other items, while the majority of the similar items did not contain any restrictions. The duplication was especially evident on the items prepared for the static simulator portion of the examination. This indicated that facility personnel had not performed a thorough review of the individual questions that were prepared by contract personnel.

A number of questions had to be reworded for clarity, a few questions had to be deleted, and numerous mistakes were identified in the references to lesson plans, learning objectives, and K/A rating factors. The quality of the questions was especially poor on the static simulator test items, the majority of which required revision or deletion. The questions, for the most part, were technically accurate, but the numerous mistakes in the references made the validity of the test items questionable. These mistakes in the test item references indicated a lack of attention to detail in the preparation and review of the written examination materials.

Quality control was especially weak for the examination materials that were submitted to the NRC following review by the combined NRC/facility examination team. The facility had a full week to make changes and review the corrected materials prior to submittal to the NRC for final review. The written examinations that were submitted did not contain the specific test items that had been agreed upon by the examination team. In several cases revisions that had been agreed upon were not made to questions, answers and references. There were also several cases where changes to the estimated time for completion were not made as agreed upon. The revision to add performance standards for obtaining equipment when appropriate was not made correctly to any of the JPMs. Steps to verify prerequisites and observe precautions and limitations had not been added as agreed upon. In one instance, none of the agreed upon revisions were made to the JPM. The errors were not technical in nature, but the lack of attention to detail in the facility preparation and review of the materials indicated a weakness in quality control of the requalification program.

5. Requalification Examination Administration

The dedication of the facility training personnel during the extensive hours that were required for administration of the examinations was a strength of the program. The stress of the long hours did not affect the quality of the evaluations. Training and operations personnel were very cooperative throughout the examination process.

Administration of the examinations required much more time than planned for when the examinations were scheduled. Several factors contributed to the length of the examinations. No time limit was placed on the JPM pre-written questions and as a result, a large amount of time was used that had not been accounted for in the examination schedule. In several

instances confusion and miscommunications resulted in inadvertent changes and delays in the schedule for the written examination and JPMs. Administration of the simulator portion of the examination following the other portions increased the stress on the examinees and examiners alike. Consideration should be given to changes that will shorten the amount of time required to administer the examinations and reduce the stress on the examinees and evaluators.

The simulator portion of the examination was conducted smoothly and efficiently. The scenarios required minimal setup time and the simulator operator did not allow any delays to occur during performance of the scenarios.

The fidelity of the simulator was excellent for administration of the simulator and walk-through portions of the examinations. On the two occasions when the simulator malfunctioned the problem was corrected quickly with minimal impact on the examinations.

During the first set of scenarios there were several instances when the realistic aspect of the simulator was compromised which tended to distract the operators from operating the simulator as if it were the real plant. The operators attention was directed to unrealistic items such as the lack of administrative details; i.e., data sheets for surveillances; and the fictitious personnel outside the control room (by using unrealistic names and inconsistent methods for making Emergency Plan notifications). After the importance of maintaining a realistic atmosphere in the simulator was brought to the attention of the facility evaluators and simulator operator, the distractions were eliminated.

The logistics of the walk-through examination were fairly smooth considering the mismatch ratio of examinees to examiners (5:4). The time validation of the JPMs was reasonably accurate, but could be improved using the data collected during administration of the examination.

Many of the prewritten JPM questions required clarification which indicated that question validation was not performed as thoroughly as it should have been. The facility evaluators were hesitant to provide clarification until the NRC examiners explained that it was not only acceptable, but expected practice to clarify questions.

Several unannounced (or inadvertent) schedule changes resulted in delays in administration of the written examinations. Setup of the simulator for the static examinations required a significant amount of time and caused additional delays in the schedule. There was also some confusion concerning proctoring responsibilities for the written examinations. The facility is responsible for continuous proctoring of the examinations, while the NRC observes as deemed necessary.

An instance of lack of attention to detail was observed during administration of one the static scenarios. A recorder that provided information relevant to plant status had failed prior to freezing the simulator

and the failure was not detected by the facility instructors responsible for setting up the scenario. The failed recorder was brought to their attention by one of the examinees resulting in an interruption in the examination so that the situation could be resolved.

One question on Part A of the examination had to be replaced during administration of the examination. Several questions on Part B of the examination required clarification for the examinees. These problems should have been identified during examination preparation which indicates that a thorough review was not performed on these test items. The examination validation process should ensure that all questions are clear and solicit only one answer.

6. Examination Grading and Analysis of Results

Crew performance on the simulator portion of the examination was critiqued by the lead facility examiner immediately following each scenario. These critiques were brief and there was little input from the licensed operators. The NRC and facility evaluators discussed the results of the simulator examination following each individual scenario. In the majority of instances the NRC and facility evaluators agreed on all the areas that were evaluated.

The results of the individual JPMs were discussed immediately following administration of the walk-through examinations. In most cases the NRC and facility evaluators agreed on the evaluations. In one case the NRC and facility evaluators did not agree on the evaluation of an individual JPM, but the facility was more conservative which is acceptable.

There was some confusion on how to grade follow-up questions on the JPMs. The NRC chief examiner clarified that follow-up questions could be asked to determine if the examinee's knowledge of a task was satisfactory or to clarify a prewritten question. No point values should have been assigned to follow-up questions. Review of the facility results indicated that, in several cases, point values had been assigned to follow-up questions. This resulted in minor differences between the NRC and facility grades on the JPM questions.

Copies of the facility results were supplied to the NRC at the exit meeting. Numerous errors were discovered in these results which indicated a weakness in quality control. In eight of 14 cases, the grade for the JPM questions on the inventory form did not agree with the grade calculated from the individual JPM forms. The copies of the JPM evaluations were missing many pages, both prewritten questions and pages containing performance standards and evaluations. As a result of the incomplete information, the exact facility grade for the JPM questions could not be verified (enough information was available to determine that all individuals scored above 70%) in several cases. Additional discrepancies were identified between the results on the JPM inventory forms and those supplied with the summary of results (Attachment 4) requested by the NRC.

No mistakes were made in pass/fail decisions, but these deficiencies indicate that quality control in examination grading and review of results may not be sufficient to prevent an incorrect decision on a facility administered examination.

Comparison of NRC grading and facility grading on the written examinations indicated several weaknesses in facility grading techniques. There were a number of instances where the facility did not deduct credit when incorrect additional information was supplied or an incorrect assumption was made by the examinee. The facility did not apply proportional grading methods in several instances where they should have been utilized. Proportional grading techniques were discussed several times during preparation of the examinations, but was not always correctly utilized by the facility evaluators.

The most significant weakness in facility grading (and the main reason for the difference in the pass/fail decision) was a tendency to give credit for information that was not supplied in the examinee's answer. This was especially evident in the grading of the static simulator portion of the examinations. NRC review of the facility administered examinations identified additional examples of this weakness in grading technique. A failing grade on the written examination was overturned when additional credit was allowed for information that was implied, but not stated in the answer. The pass/fail decision was overturned by training department management without the concurrence of the responsible instructors. The facility recognized the potential for error when a manager who may not have the technical knowledge required to properly grade an examination has the power to change the grading. The licensee committed to changing their procedures so that management no longer has the authority to alter the results of requalification examination grading without the concurrence of the responsible instructors. In spite of this corrective action, it appears that this situation may have caused the facility instructors to alter their grading methods to give credit for implied information.

There were also differences between facility and NRC grading on the written examinations, when the facility grading was more conservative. It is acceptable for the facility to have higher performance standards than the NRC; therefore, these differences did not indicate any deficiency in the facility's grading techniques.

While grading the examinations, the NRC identified a question that did not elicit a single correct answer. This question was deleted from the examination for the purposes of NRC grading.

Several examples of lack of attention to detail were noted in grading of the written examinations. A significant math error was made on one individual's written examination grade. This error was brought to the licensee's attention by the NRC, but was not corrected when a summary of

the examination results (Attachment 4) was supplied to the NRC at a later date. During review of the facility examinations the NRC identified two instances where the original grading had not been done correctly. As a result, after review by the licensee, the grade on the examination was changed from a passing grade to a failing grade and the individual was notified of his failure and proposed remediation. These are additional examples of poor quality control in the requalification program.

In the licensee's analysis of the written examination results, if the examinees scored lower than 80% on a question, the question was evaluated to determine if the question was appropriate and worded clearly. If there was no problem with the question, remediation of the K/A was recommended if appropriate. This analysis identified four questions that needed to be rewritten or deleted and three areas of weakness that required remedial training. However, no evaluation was provided for four of the questions used on the examinations. The analysis for three questions that had results below 80% indicated that the results were above 80%; therefore, no evaluation was performed. These omissions in the analysis of the results indicate a lack of attention to detail in the facility review process.

7. Requalification Program Summary of Weaknesses

Quality control was determined to be a weakness in the licensee's requalification training program. Examples of a lack of attention to detail were identified throughout the examination process.

Mistakes in the references of the test items indicate a lack of attention to detail and weaken the validity of the items. Unidentified, repetitive questions in the written examination question bank and questions that had to be clarified or replaced during administration of the written examination and JPMs indicate weaknesses in the review process. Numerous errors and omissions in the materials submitted to the NRC for final review also indicated a poor examination review process. These deficiencies, combined with the lack of attention to detail noted in the setup of the static simulator examinations, indicate a weakness and, therefore, a potential for inadequate individual and programmatic performance evaluations in future examinations (see Sections 4 and 5).

While the licensee provided their analysis of the written examination results to the NRC, no analysis of the results of the simulator or walk-through portions of the examination was provided, and no evaluation of requalification program performance was provided to the NRC.

The omissions in the licensee's analysis of the examination indicate a potential weakness in the licensee's ability to properly evaluate examination results and incorporate the results of the analysis into the licensed operator training program (see section 6).

Inappropriate grading techniques, such as giving credit for implied information and not deducting for incorrect, additional information or assumptions resulted in nonconservative scoring on the written examinations. These inappropriate grading techniques, as well as numerous calculation and tabulation errors in the grading of the written and walkthrough examinations, indicate that present quality control measures may not preclude an incorrect pass/fail determination in future examinations (see section 6).

8. Inspection of Implementation of NRC Bulletin 88-07 and Supplement 1, BWR Power Oscillations (NRC Temporary Instruction 2515/99)

An inspection was conducted to evaluate the licensee's response to and implementation of NRC Bulletin (NRCB) 88-07 and Supplement 1 to this bulletin. The licensee's response to the bulletin and the supplement are contained in Public Service Electric and Gas Letter dated September 22, 1988. The individuals that provided substantial information during this inspection are listed in Attachment 1.

8.1 Training

The inspector reviewed lesson plans for operator training and determined that the training material properly addressed the power oscillation issue as requested by NRCB 88-07 and Supplement 1. Training was conducted for all licensed operators, including shift technical advisors, in a timely fashion.

Results of the requalification examinations indicated that this training was effective. No deficiencies were observed in licensed operator understanding of the potential for power oscillations and knowledge of the actions to be taken if they occur.

The inspector interviewed four (4) licensed operators (one (1) of which was a shift technical advisor) to determine knowledge of power oscillations and the actions required to mitigate a power oscillation transient. All operators interviewed were thoroughly briefed regarding the LaSalle Unit 2 power oscillation event. The inspector determined that the operators were knowledgeable of the methods to prevent, detect, and suppress power oscillations.

The inspector determined that some confusion existed in identifying Local Power Range Monitoring (LPRM) indications of potential power oscillations. The LPRM upscale or downscale alarms were interpreted by some operators as only the Control Room overhead annunciator, LPRM indications on the four-rod-display, or LPRM indications from the full-core-display. The inspector concluded this confusion resulted from inadequate training of the operators, as well as unclear procedural steps to clearly specify the term "LPRM upscale or downscale alarms." Discussions were held with the Operations Manager

and Principal Training Supervisor concerning the confusion of the operators on the term "LPRM upscale and downscale alarms." Prompt corrective actions were taken to alleviate this confusion by revising procedures and lesson plans as necessary. The licensee committed to providing retraining to the operators in future requalification training.

8.2 Procedural Implementation

The inspector reviewed the documentation of the procedural assessment conducted by the licensee to incorporate NRCB 88-07 and Supplement 1. The inspector determined that the assessment was adequate.

The inspector reviewed the procedures that incorporated NRCB 88-07 and Supplement 1. The procedures reviewed are listed in Attachment 3. From this review, the inspector determined that an inconsistency existed between the Reactor Engineering procedures and operating procedures that prohibit plant operations in Region III of the power-to-flow map. The licensee took prompt corrective action and revised the Reactor Engineering procedures to remove the inconsistency.

From review of the operating procedures, the inspector determined that an inconsistency existed between the operating procedures that did not clearly identify the LPRM indications used to detect potential reactor power oscillations. The licensee took prompt corrective action and revised the operating procedures to clearly state the LPRM indications to be used by the operating staff to detect power oscillations.

8.3 Installed Instrumentation

The inspector reviewed the assessment of the installed instrumentation used to detect power oscillations. From this review, the inspector determined that installed instrumentation is adequate to detect power oscillations.

8.4 Conclusion

The inspector determined that the plant operators are adequately trained to prevent, detect, and suppress power oscillations. The plant procedures provide adequate direction to the operating staff, and the plant is equipped with adequate instrumentation to provide indication of power oscillations.

9. Exit Meeting

An exit meeting was held at the conclusion of the examinations on June 27, 1989. The personnel in attendance are listed in Attachment 1. The NRC results of the simulator and walk-through portions of the examinations were presented. Examination preparation and administration were discussed

along with the results of the facility administered examinations. The findings of the inspection on the BWR Power Oscillation issue were summarized by the inspector.

Attachments:
1. Persons Contacted
2. Requalification Examination Test Items
3. Procedures Reviewed
4. Licensee Results

ATTACHMENT 1

Persons Contacted

Public Service Electric and Gas

C. Conner, General Manger - Nuclear Services (1), (2)
C. Vondra, Operations Manager (4)
R. Hovey, Operating Engineer (1)
D. Hanson, Manager Nuclear Training (1)
W. Gott, Principal Training Supervisor - Operations Training (1), (2)
S. Ketcham, Operations Instructor (1), (4)
J. Joullian, Operations Instructor (General Physics) (1), (4)
C. Bauer, Operations Instructor (1), (4)
C. Buckley, Operations Instructor (1), (3), (4)
J. Zambuto, Principal Training Supervisor - Simulator Support (1)
R. Beckwith, Station Licensing Engineer (1)
C. Brennan, Lead Engineer - Nuclear Fuel (1)
P. Opsal, Senior Operations, Technical Support
M. Trum, Senior Shift Supervisor (3)

Nuclear Regulatory Commission

R. Conte, Chief, BWR Section (1)
T. Walker, Senior Operations Engineer - Chief Examiner (1), (3)
C. Sisco, Operations Engineer (1), (3)
M. Daniels, Examiner (Sonalysts) (3)
R. Miller, Examiner (Sonalysts) (3)

NOTES:

(1) Attended Exit Meeting, June 27, 1989
(2) Attended Entrance Meeting, March 31, 1989
(3) Member - Combined Facility/NRC Exam Team
(4) Facility Evaluator

ATTACHMENT 2

REQUALIFICATION EXAMINATION TEST ITEMS CREW E

SCEN NO. SIMULATOR SCENARIOS

ESG-001 - Steam Line Rupture in the Drywell
ESG-015 - TACS Isolation with ATWS
ESG-019 - Recirc System Failure to Runback with Station Blackout

NO.	JOB PERFORMANCE MEASURES	TASK NO.	LOCATION
1 -	Reset a Recirc Pump Runback	2020010101B	CONTROL ROOM
2 -	Manually Start RCIC and Bring to Rated Flow	2170030101	CONTROL ROOM
3 -	Bypass Rod Sequence Control System	2000940501	IN PLANT
4 -	Start a Primary Condensate Pump	2560020101	CONTROL ROOM
5 -	Restoring Instrument Air in an Emergency	2000970501	IN PLANT
6 -	Suppression Chamber Makeup Using HPCI	2000190501	CONTROL ROOM
7 -	Place 'A' SSW Pump In Service @ Ckt. Breaker	2760010104R	IN PLANT
8 -	Place RHR in Suppression Pool Cooling	2050080101	CONTROL ROOM
9 -	Post-LOCA/Isolation Operation of PCIG	3780050101	CONTROL ROOM
10-	Bypassing a Control Rod in RSCS	2140310101	IN PLANT

WRITTEN EXAMINATION - PART A

SCENARIO A1 - Loss of MSIC Inverter AD483 w/Recirc Runback Failure (GE-SS02)

QNUM	TEST ITEM NO.		QVAL
2.01 -	2990210301M-#1		0.5
2.02 -	2990210301CC-#2	(RO only)	0.5
2.03 -	4000700401E-#1		0.5
2.04 -	2990210301B-#1		0.5
2.05 -	299064C302A-#1	(SRO only)	0.5
2.07 -	2990210301M-#2		0.5
2.14 -	4000650401D-#1		0.5

SCENARIO A2 - Unisolable Small Break LOCA in the Steam Tunnel (GE-SS09)

QNUM	TEST ITEM NO.		QVAL
9.02 -	2990210301ZJ-#3		0.5
9.04 -	2990210301EEE-#1		1.5
9.06 -	2000790501A-#2		1
9.07 -	2000770501A-#4		0.5
9.08 -	2990210301ZJ-#4		0.5
9.09 -	2990210301ZJ-#5		0.75
9.10 -	2990190302-#3	(SRO only)	0.5

REQUALIFICATION EXAMINATION TEST ITEMS CREW E

WRITTEN EXAMINATION - PART B

QNUM		TEST ITEM NO.		QVAL
B1	-	2000370502-#2	(SRO only)	0.75
B2	-	Fundamentals		0.5
B3	-	2990210301N-#19		0.75
B4	-	299210301PP-#9		0.5
B5	-	2000370502-#5		0.5
B6	-	2990190302-#3	(SRO only)	0.5
B7	-	2990210301H-#4		1.5
B8	-	4000640401B-#1		0.5
B9	-	2000380502A-#1	(SRO only)	0.5
B10	-	2000380502A-#2		0.5
B11	-	2990210301HH-#2		0.75
B12	-	2990210301-#1		1
B13	-	2990210301H-#1		0.5
B14	-	4000670401A-#1	(RO only)	1
B15	-	400090401B-#1	(RO only)	0.75

REQUALIFICATION EXAMINATION TEST ITEMS STAFF CREW

SCEN NO.	SIMULATOR SCENARIOS
ESG-001	- Steam Line Rupture in the Drywell
ESG-008	- Fuel Cladding Leak with Isolation
ESG-015	- TACS Isolation with ATWS
ESG-019	- Recirc System Failure to Runback with Station Blackout

NO.	JOB PERFORMANCE MEASURES	TASK NO.	LOCATION
1	- Place SACS Loop 'B' in Service from the RSP	5000080101	IN PLANT
2	- Placing a H2/O2 Analyzer in Service	2290060101	CONTROL ROOM
3	- Manual Vent of SCRAM Air Header	2000920501	IN PLANT
4	- Manual Emergency Starting of DGs Locally	2640180194AA	IN PLANT
5	- Bypassing MSIV Isolation Interlocks	2000010501B	CONTROL ROOM
6	- Suppression Chamber Makeup Using HPCI	2000190501	CONTROL ROOM
7	- Place 'A' SSW Pump In Service @ Ckt. Breaker	2760010104R	IN PLANT
8	- Place RHR in Suppression Pool Cooling	2050080101	CONTROL ROOM
9	- Post-LOCA/Isolation Operation of PCIG	3780050101	CONTROL ROOM
10	- Bypassing a Control Rod in RSCS	2140310101	IN PLANT

REQUALIFICATION EXAMINATION TEST ITEMS STAFF CREW

WRITTEN EXAMINATION - PART A

SCENARIO A1 - Loss of MSIC Inverter AD483 w/Recirc Runback Failure (GE-SS02)

QNUM		TEST ITEM NO.	QVAL
2.01	-	2990210301M-#1	0.5
2.03	-	40000700401E-#1	0.5
2.04	-	2990210301B-#1	0.5
2.05	-	2990640302A-#1	0.5
2.07	-	2990210301M-#2	0.5
2.11	-	2990210301CC-#1	0.5
2.14	-	4000650401D-#1	0.5
2.15	-	2990210301TT-#1	0.5

SCENARIO A2 - Unisolable Small Break LOCA in the Steam Tunnel (GE-SS09)

QNUM		TEST ITEM NO.	QVAL
9.02	-	2990210301ZJ-#3	0.5
9.04	-	2990210301EEE-#1	1.5
9.06	-	2000790501A-#2	1
9.07	-	2000770501A-#2	0.5
9.08	-	2990210301ZJ-#4	0.5
9.09	-	2990210301ZJ-#5	0.75
9.10	-	2990190302-#3	0.5

WRITTEN EXAMINATION - PART B

QNUM		TEST ITEM NO.	QVAL
B1	-	2000370502-#2	0.75
B2	-	Fundamentals	0.5
B3	-	2990210301N-#19	0.75
B4	-	2990210301PP-#9	0.5
B5	-	2000370502-#5	0.5
B6	-	2990190302-#3	0.5
B7	-	2990210301H-#4	1.5
B8	-	4000640401B-#1	0.5
B9	-	2000370502A-#2	0.5
B10	-	2000380502A-#2	0.5
B11	-	2990210301HH-#2	0.75
B12	-	2990210301-#1	1
B13	-	2990210301H-#1	0.5

REQUALIFICATION EXAMINATION TEST ITEMS CREW D

SCEN NO. SIMULATOR SCENARIOS

ESG-003 - Jet Pump Failure w/Main Turbine Trip
ESG-011 - Unit Synchronization of w/Gradual Loss of Instrument Air
ESG-020 - Break in Combined Suction of Primary Condensate Pumps

NO.	JOB PERFORMANCE MEASURES	TASK NO.	LOCATION
1	- Local Control of Recirc MG Set	2020080101A	IN PLANT
2	- De-energization of Scram Solenoids	2000040501	CONTROL ROOM
3	- Placing a H2 Recombiner In Service	2290090101	CONTROL ROOM
4	- Manual Shift from CW to RACS for DW Cooling	5880040101	CONTROL ROOM
5	- Bypass PCIG Isolation Interlocks	200170501A	IN PLANT
6	- Suppression Chamber Makeup Using HPCI	2000190501	CONTROL ROOM
7	- Place 'A' SSW Pump In Service @ Ckt. Breaker	2760010104R	IN PLANT
8	- Place RHR in Suppression Pool Cooling	2050080101	CONTROL ROOM
9	- Post-LOCA/Isolation Operation of PCIG	3780050101	CONTROL ROOM
10	- Bypassing a Control Rod in RSCS	2140310101	IN PLANT

WRITTEN EXAMINATION - PART A

SCENARIO A1 - Single Recirc Pump Trip w/EHC Failure As Is (GE-SS05)

QNUM	TEST ITEM NO.		QVAL
5.01 -	2990210301DD-#4	(RO only)	0.5
5.02 -	2990210301DD-#5		0.5
5.03 -	2990210301DD-#6		0.5
5.04 -	2990210301BB-#3		0.5
5.06 -	2990210301XX-#1		0.5
5.08 -	2990210301H-#1		0.5
5.11 -	2990210301QQQ-#3		0.5
5.14 -	2990210301TTT-#1		0.5
5.15 -	2990640302D-#1	(SRO only)	0.5

SCENARIO A2 - Drywell Steam Leak with Rod Insertion Failure (GE-SS010)

QNUM	TEST ITEM NO		QVAL
10.02 -	2990210301RR-#2	(RO only)	0.5
10.04 -	2990210301N-#3		0.5
10.05 -	2990210301H-#3		1
10.07 -	2990210301P-#3		0.5
10.08 -	2000940501-#1		0.5
10.10 -	2990210301PPP-#1		1
10.12 -	2990190302-#4	(SRO only)	0.5
10.14 -	2990210301RRR-#11		0.5

REQUALIFICATION EXAMINATION TEST ITEMS CREW E

WRITTEN EXAMINATION - PART B

QNUM		TEST ITEM NO.		QVAL
B1	-	2000370502-#2	(SRO only)	0.75
B2	-	Fundamentals		0.5
B3	-	2990210301N-#19		0.75
B4	-	299210301PP-#9		0.5
B5	-	2000370502-#5		0.5
B6	-	2990190302-#3	(SRO only)	0.5
B7	-	2990210301H-#4		1.5
B8	-	4000640401B-#1		0.5
B9	-	2000380502A-#1	(SRO only)	0.5
B10	-	2000380502A-#2		0.5
B11	-	2990210301HH-#2		0.75
B12	-	2990210301-#1		1
B13	-	2990210301H-#1		0.5
B14	-	4000670401A-#1	(RO only)	1
B15	-	400090401B-#1	(RO only)	0.75

REQUALIFICATION EXAMINATION TEST ITEMS STAFF CREW

SCEN NO.	SIMULATOR SCENARIOS
ESG-001	- Steam Line Rupture in the Drywell
ESG-008	- Fuel Cladding Leak with Isolation
ESG-015	- TACS Isolation with ATWS
ESG-019	- Recirc System Failure to Runback with Station Blackout

NO.	JOB PERFORMANCE MEASURES	TASK NO.	LOCATION
1	- Place SACS Loop 'B' in Service from the RSP	5000080101	IN PLANT
2	- Placing a H2/O2 Analyzer in Service	2290060101	CONTROL ROOM
3	- Manual Vent of SCRAM Air Header	2000920501	IN PLANT
4	- Manual Emergency Starting of DGs Locally	2640180194AA	IN PLANT
5	- Bypassing MSIV Isolation Interlocks	2000010501B	CONTROL ROOM
6	- Suppression Chamber Makeup Using HPCI	2000190501	CONTROL ROOM
7	- Place 'A' SSW Pump In Service @ Ckt. Breaker	2760010104R	IN PLANT
8	- Place RHR in Suppression Pool Cooling	2050080101	CONTROL ROOM
9	- Post-LOCA/Isolation Operation of PCIG	3780050101	CONTROL ROOM
10	- Bypassing a Control Rod in RSCS	2140310101	IN PLANT

ATTACHMENT 3

Procedures Reviewed

RE-IO.ZZ-001 - "Core Operations Guidelines"

RE-FM.ZZ-002 - "Guidelines for Control Rod Movement - Special Testing and Operations"

RE-ST.SE-004 - "Neutron Monitoring System Noise Surveillance"

OP-IO.ZZ-003 - "Startup From Cold Shutdown To Rated Power"

OP-IO.ZZ-004 - "Shutdown From Rated Power To Cold Shutdown"

OP-IO.ZZ-006 - "Power Changes During Operations"

OP-AB.ZZ-112 - "Recirculation Pump Trip"

OP-AB.ZZ-300 - "Reactor Power Oscillations"