MILLSTONE UNIT 3 SIMULATOR

FOUR YEAR CERTIFICATION REPORT

OCTOBER 1994

APPROVED:

10/24/94

Manager, Operator Training — Date

APPROVED:

10/24/94

Manager, Simulator Technical Support — Date

APPROVED:

10/25/94

Director, Nuclear Training — Date

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FOUR YEAR CERTIFICATION SUMMARY

The Millstone 3 simulator was initially certified on October 31, 1990. Certification was accomplished through the Northeast Utilities Simulator Certification Program, which is also the vehicle for ensuring continued certification. Based on the results of the Performance Test, which was rerun in its entirety over the past four years, the Millstone 3 simulator continues to demonstrate excellent physical and functional fidelity when compared to the reference unit. Our Simulator Certification Program contains a comprehensive testing program, as well as procedural controls to ensure that the Millstone 3 simulator retains its high fidelity.

This report contains the following thirteen sections and three attachments:

- Section 1 provides a description of testing methodology and assumptions.
- Sections 2 through 10 review and summarize the individual tests, which make up the Millstone 3 Simulator Performance and Operability Test.
- Section 11 reviews and summarizes the procedural controls for maintaining certification of the Millstone 3 simulator.
- Section 12 provides a list of open deficiencies on the Millstone 3 simulator (Attachment 1). As of October 11, 1994, there are 42 open deficiencies on the Millstone 3 simulator. A total of 668 deficiencies were dispositioned over the past four years.
- Section 13 discusses the testing sequence for the next four (4) year certification period (November 1994 through October 1998).

The Performance and Operability Tests described in sections 2 through 9 were all performed by NRC licensed SROs, SRO certified or previously certified instructors. Any deficiencies identified during the Performance and Operability Testing is being corrected through the Simulator Modification Control Procedure NSEM 5.01.

SIMULATOR CERTIFICATION PROGRAM OVERVIEW

The mission of our certification program is to:

- Ensure that the simulator has the capability to support the training program.

- Provide for certification in a timely, cost-effective manner, addressing the specific requirements of Regulatory Guide 1.149, NRC 10CFR55.45 (b) and NUREG 1258.

- Ensure ongoing compliance with the requirements set forth in ANSI/ANS 3.5, 1985.

The effort required to accomplish this mission has been grouped into three main components: Definition of the Scope of Simulator, Validation of the Scope of Simulation, and Configuration Management. NU has put in place a collection of formal procedures called the Nuclear Simulator Engineering Manual, to direct all aspects of the certification process and ensure compliance to the regulatory requirements. The NSEM is a controlled document.

The Scope of Simulation that NU is certifying is based upon the NU Simulator Training Guides, which encompass:

- All events specified in ANSI/ANS-3.5, 1985 and Regulatory Guide 1.149, 1987.

- The training requirements as specified in the various plant start-up, operating and emergency procedures.

- Outside events (e.g., selected LERs, plant design changes, etc.) that affect the training programs and/or the trainer configuration.

Validation of the defined Scope of Simulation consists of two main groupings of activities: (1) Performance Testing and (2) Verification. A specific performance test was developed for the Millstone 3 simulator, which fulfills the testing requirements of ANS 3.5, 1985; INPO 86-026, Guidelines for Simulator Training; and NUREG 1258. Included are the following test categories:

•Systems
•Malfunctions (Major and Minor)
•Normal Operations
•Instructor Interface
•Operability
•Real-Time Simulation

There are also activities, which are requirements of certification, but do not fit neatly within the context of performance testing, namely:

•Defined Simulator Operating Limits
•Plant-Referenced Physical Fidelity
•Approved Initial Conditions

The Millstone 3 Simulator Performance Test is a dynamic document and is the primary mechanism for validating simulator performance and fidelity. As such, it is updated to reflect modifications made to the simulator and/or new reference plant performance data. The entire performance test is repeated over a four year period at the rate of approximately 25 percent per year. The Operability Test and Physical Fidelity/Human Factor Evaluation are performed annually.

NU's Certification Program provides control over the configuration of the Millstone 3 simulator to ensure that it can effectively support the training mission and that regulatory commitments are satisfied.

The main components of Configuration Management are: Design Data Base, Documentation, Modification Control and Scope of Simulation Expansion.

The intent of the Simulator Design Data Base is to have available the complete data on which the simulator is designed, and on which upgrading is based. The specific data which forms the design basis for the current Millstone 3 simulator hardware configuration and software models has been identified and validated. It is NU's philosophy here not to create a separate, new data base, but to utilize existing controlled reference plant design data bases. As such, we utilize the latest revision plant documents and rely on the formal plant design change process for notification of modifications and transmittal of pertinent information. Open Simulator Design Changes constitute the Update Design Data Base described in ANS 3.5, 1985. In addition, there is also simulator-specific documentation, which is needed for certification and/or maintenance of the simulator. While this documentation is controlled and updated, it is not considered to be part of the Simulator Design Data Base.

NU has in place a modification control process that manages the implementation of design changes on the Millstone 3 simulator and fully complies with NRC regulations and industry standards regarding configuration control. Procedures within the NSEM control the coordination, resolution and documentation of identified differences between the simulator and reference plant. A Simulator Configuration Control Committee has been established to be responsible for overall simulator design control and management of all Nuclear Training resources involved in the simulator modification effort. The SCCC is comprised of representatives from both the Operator Training and Simulator Technical Support Branches, and is chaired by the Manager of Simulator Technical Support. A computer-based data retrieval program is used to track the status of all identified simulator discrepancies.

1. Testing Goals, Methodology and Assumptions

The NU simulator certification program, goals, methodologies and assumptions were established to ensure an efficient, effective and comprehensive approach to testing. Certain elements of this testing philosophy are worthy of mention here:

- Testing should be conducted during normal, abnormal and emergency conditions.

- The Simulator response, as verified by testing, during normal, abnormal and emergency conditions shall meet the following criteria necessary to support the contents of the training curriculum:

    - Correct operator diagnosis is possible.

    - Capabilities for operator intervention to mitigate events exist.

    - Actions or inaction taken by operators result in similar response as in the reference plant.

    - Alarms and automatic system actuation shall occur such that operator diagnosis and response is not adversely affected.

- Any deficiencies found during testing which violate these criteria shall be documented by generating a Deficiency Report (DR), to be dispositioned in accordance with the NSEM.

- The requirements of ANS 3.5 shall be implemented.

- All Simulator controls such as switches, annunciators, meters, controllers, recorders, lights, key locks, push buttons, etc., should be tested.

- Former Millstone 3 operators should be used, if possible, for Performance and Operability testing.

- In the absence of finite data, a combination of operating experience, engineering judgment and analytical results shall be used to test the simulator response to Major Malfunctions such as Large Break LOCA, Steam Line Break, etc.

- Two experienced observers should be used whenever possible to improve the observations made during testing.

- Provisions for the revision of NSEM procedures shall be available. Changes to that manual will not be forwarded to the NRC unless they significantly alter the intent of the test program.

- Testing shall be conduct .d whenever a modification is made to the simulator that effects its fidelity relative to the reference unit or its functional operation as a simulator. Modifications to the simulator design shall be validated through testing prior to use in training and examination.

During the development and conduct of specific testing it became necessary to establish additional guidance. This was done to more effectively apply the requirements of ANS 3.5 and respond to the unique attributes of each test. This additional guidance, or deviation from the general philosophy, is summarized:

SYSTEM TESTS

- Digital plant process computer points need not be included on the Simulation Diagrams. Their absence improves the clarity of the diagrams.

NORMAL OPERATIONS TESTING

- Testing of surveillance on redundant equipment or flow paths is not required if the primary piece of equipment or flow path is tested. For example, if the Train A Service Water Pump surveillance is performed, the Train B Service Water Pump surveillance need not be performed. Also, testing of surveillance which are strictly calculational is not required.

- The simulator's capability of performing a reactor trip followed by recovery to rated (full) power (ANS 3.5, Section 3.1.1, Item 4) may be tested by testing:

  - an increase in power from 20% to 100%, followed by
  - a reactor trip, then
  - an increase in power to 20%

  There is no need to test the power ascension to 100% twice.

YEARLY OPERABILITY TESTING

STEADY STATE TESTING

- Application of both instrument error and allowed tolerance is to be made as follows. The ANS 3.5 allowed tolerance (Section 4.1(3) or (4)) is to be applied as a function of the reference plant indicated value above the minimum scale value. The allowable instrument error is to be a function of the instrument range, not its reference plant indicated value, when the instrument error is given as a percentage.

  For example:

  For a pressure instrument with a range of 1500 to 2500 psig, reading 2250 psig in the reference plant, the simulator accuracy, as indicated on the instrument, is expected to be:

  (2500-1500) (.01) + (2250-1500) (.02) = 25 psig

  This assumes an instrument accuracy of 1% and that this parameter is a critical parameter.

TRANSIENT TESTING

- All parameters required by ANS 3.5, Appendix B, B2.2 are to be tested at .5 second intervals.

- In the case where the comparison between simulator response and reference plant response results in a discrepancy, that discrepancy is resolved via the Deficiency Report process and an appropriate retest conducted. Replotting of the transient is not required until the next scheduled yearly testing of the transient.

- Documenting the difference between the response of a simulator parameter and predicted reference plant response is not necessary for those differences of an obvious nature.

2. **System Tests**

The Millstone 3 Simulator models 25* Plant Systems. A separate test was conducted for each of these Systems to ensure that all of the following operate correctly:

- Control Board Hardware such as hand switches, meters, controllers, recorders, indicating lights, keylocks and push buttons
- Annunciators and PPC points
- Remote Functions (These are tasks performed by an instructor at the instructor station to simulate local actions; typically these are locally operated valves)
- Flow paths, both normal and abnormal

NSEM Procedure 4.01 "Verifying Simulator Capabilities via System Tests", is the generic procedure which governs the writing and performance of System Tests.

Each simulated plant system has its own performance test to ensure:

- That all components of a specific system are checked for consistency.
- That a consistent set of performance requirements are applied to each system.
- That as Plant Design Changes are implemented, the System Test will act as a benchmark for proper system response.

Selected system tests or subsets of the systems test will be performed at the discretion of the individual unit ASOT or SOA as determined necessary due to plant modifications in areas that have the potential to impact the dynamics or logic of a particular system.

* Due to the layout of the Millstone 3 control room and systems, it was judged easier to subdivide some systems into more than 1 test. Hence the difference between the number of tests (29) and the number of simulated systems (25).

3. **Normal Operations and Surveillance Testing**

ANSI/ANS 3.5 (1985) Section 3.1.1 requires the simulator to be capable of performing normal plant evolutions and surveillance.

The normal operations and surveillance required by ANS 3.5 Section 3.1.1(1), (2), (3), (4), (5), (6), (7), (8) and (10) were performed using controlled copies of Millstone 3 Operating Procedures and Surveillance. ANS 3.5, Section 3.1.1 (9) was tested in the reactor core system test. NSEM Procedure 4.10, "Normal Operations Verification" contains the generic guidance used to write the Millstone 3 Simulator Normal Operations and Surveillance Test.

Using controlled copies of Millstone 3 Operating Procedures the following sequence of operations was tested on the Millstone 3 Simulator:

- The Simulator was initialized to Cold Shutdown conditions.
- A Plant Heat up was performed.
- A Plant Start up was performed.
- A Load Increase to 100% power was performed.
- A Reactor Scram was initiated.
- A Reactor Trip recovery was performed.
- A Nuclear Start up was performed.
- A Plant Start up was performed.
- A Load Increase was performed (to 20% power).
- The Simulator was reinitialized to 100% power.
- A Plant Shutdown to hot standby was performed.
- A Reactor Shutdown was performed.
- A Plant Cool down was performed until Cold Shutdown was reached.
- The Simulator was initialized to 43% power.
- A Shift from 4 Loop to 3 Loop Operations was performed.

The specific Millstone 3 Operating Procedure and Surveillance Procedure titles and numbers used in this test are listed in the individual steps of the test procedure.

All Normal Operations and Surveillance Testing will be re-performed over a four-year interval.

4. **Malfunction Testing**

ANSI/ANS 3.5 (1985) Section 3.1.2 requires 25 specific malfunctions to be available on a simulator. The Millstone 3 Simulator is capable of all malfunctions that are applicable to PWRs.

The Millstone 3 Simulator is certified for 252 malfunctions, which are listed in a malfunction "Cause and Effects" document and are organized alpha-numerically by plant system. Each "Cause and Effect" description contains:

- The malfunction description/title
- Whether or not it is a variable malfunction
- The "Cause" of the malfunction
- The initial Plant Status that the malfunction "Effects" are written for
- What the "Effects" of the malfunction are on plant operations
- References showing where information was obtained

Each certified malfunction has its own test procedure. Guidance for writing malfunction test procedures and conducting tests is contained in:

- NSEM Procedure 4.04, Major Malfunction Testing
- NSEM Procedure 4.05, Malfunction Testing

Malfunctions which cause major integrated plant effects, such as Loss of Instrument Air, Loss of Normal Power, etc., have their respective malfunction test procedures written and tests conducted per the guidance in NSEM 4.04. For these "major" malfunctions, computer data, analytical data, or actual plant response data (if available) is typically used to verify correct malfunction response. Analytical data was obtained from the following documents/sources:

- Millstone 3 Final Safety Analysis Report (FSAR)
- Westinghouse WCAP-11145-P-A (NOTRUMP Best Estimate LOCA Analysis
- Millstone 3 Reference Plant Data Book
- Cycle 5 Reload Analysis Report

Malfunctions which do <u>not</u> cause large integrated plant effects or are very similar in response to a major malfunction have their respective malfunction test procedures written and tests conducted per the guidance in NSEM 4.05. This type of malfunction is typically an instrument malfunction, a controller malfunction, a pump trip, etc. Malfunction tests in this category are typically "Best Estimate" Analysis. "Best Estimate" Analysis means a Millstone 3 NRC licensed instructor or previously licensed individual utilizes his experience, operating procedures, piping and instrument drawings, electrical drawings and possibly hand calculations to estimate proper simulator response.

ANSI/ANS 3.5 (1985) Section 3.4.2 requires that provisions be available for incorporating additional malfunctions. As an example, malfunctions EG05 and EG12 were added to the simulator to reflect changes in MP3 plant design.
All certified malfunctions will be retested over a four year interval, as described in Section 13 of this document.

5. **Yearly Operability Testing**

ANSI/ANS 3.5 (1985) Section 5.4.2 and Appendix B specify Annual Operability Testing requirements. The methodology used to write and conduct Yearly Operability Tests is described in NSEM Procedure 4.09, "Simulator Operability Testing". Using the guidance provided in NSEM 4.09, a Yearly Operability Test specific to the Millstone 3 Simulator was written. This Millstone 3 specific test procedure is not contained in this report, but is available for review on request.

Yearly Operability Testing consists of the following items:

- Steady State Testing at 75% power and 100% power
- Stability Testing at 100% power
- Transient Performance Testing for ten (10) transients

Reference Plant data obtained at 75% and 100% power during the various plant startups and power reductions was used as the basis for Steady State Testing* Utilizing the Reference Plant data, comparisons were made between the Simulator and Reference Plant for approximately 50 selected critical and non-critical points. These 50 points include all those listed in ANS 3.5 Section B2.1.

A Stability Test was performed at 100% power for approximately 50 points over a one hour period. This test was in conformance with ANS 3.5 Section B2.1.

Acceptance criteria for the Steady State and Stability Tests were based on ANS 3.5 Section 4.1. No deficiencies were identified.

The ten transients described in ANS 3.5 Section B1.2 were analyzed using the parameters indicated in ANS 3.5 Sections B1.2.1, 2, or 3, as appropriate.

*For the next four year cycle, a third point at approximately 25 percent power will be added.

6. **Physical Fidelity**

ANSI/ANS 3.5 (1985) Sections 3.2 and 3.3.1 require sufficient panels and control simulation to conduct normal operations and malfunction response. Further, the simulator instrumentation and controls are required to duplicate the physical characteristics of the Reference Plant. In response to the issuance of 10 CFR 55.45, a two step evaluation process was employed for the existing Millstone 3 Simulator to ensure compliance with the ANS 3.5 Section 3.2 and 3.3.1 requirements.

NU has a strong commitment to maintain the Millstone 3 Simulator up to date with the Reference Plant Control Boards in a timely manner. NSEM Procedure 6.04, "Major Plant Changes", addresses controls on major design changes (such as Control Room Design Review) that challenge a "plant referenced simulator" to remain an effective training tool. Minor plant changes are addressed within the time constraints of ANS 3.5 Sections 5.2 and 5.3.

7. **Initial Conditions Testing**

Initial Conditions Testing was performed in November 1988. NSEM Procedure 4.02, "Initial Conditions", describes this process. The Millstone 3 Simulator has capabilities for storing 58 Initial Conditions.

All Certified Initial Conditions (ICs) were reviewed to ensure equipment alignments, plant conditions, remote functions, etc., were reasonable for the stated IC conditions. . The number of certified ICs may vary between 25 and 58, depending on simulator training requirements. Forty-nine ICs have been designated as the "base" group of ICs that will be maintained certified. These 49 certified ICs cover a broad range of conditions such as:

- Beginning of Core Life (BOL)
- Middle of Core Life (MOL)
- End of Core Life (EOL)
- Different Operating Modes such as Cold Shutdown, Hot Standby, Power Operations, etc.
- Different Power Levels

Only certified ICs are used for training or exams and are maintained up-to-date as plant changes and procedure changes occur.

8. Simulator Operating Limits Testing

Simulator Operating Limits Testing was performed between September 1988 and May 1989. The purpose of this testing was to identify any areas of possible negative training and to take actions to prevent such negative training. The process used for identification and action concerning Simulator Operating Limits is described in NSEM Procedure 4.08, "Simulator Operating Limits".

Two methods are used to prevent negative training when Simulator Operating Limits are reached: a) freezing the simulator and, b) administrative controls. The Reference Plant design limits and/or Simulator model limits which cause the Simulator to "freeze" are listed below.

The Millstone 3 Simulator will go to "freeze" if any of the following conditions exist:

-	RCS Pressure	2735 psig
-	Containment Pressure	60 psig
-	S/G Pressure	1300 psig
-	Fuel Temperature	4980°F
-	Fuel Clad Temp	3300°F

The simulator instructor can determine which of these operating limits caused the simulator to go to Freeze by reviewing a CRT display in the instructor station.

Administrative Simulator Operating Limits are controlled by the simulator instructor. These administrative limits are implemented through simulator instructor training and cautions placed in those Simulator Guides where such situations could occur.

The following simulator operating limits are dealt with administratively.

1. The simulator model for the RCS is a single phase system model. Because of this modeling limitation, the following effects are seen on the simulator:

   - The reactor vessel level indication system (RVLMS) does not respond properly during LOCA conditions.

   - The core exit thermocouple response is not correct during LOCA conditions.

2. The RCS pressure response for small break LOCAs does not match the predicted response when the SI accumulators inject. The simulator model shows a greater pressure drop on accumulator injection that is expected. This

issue is covered under open DR 90-3-0026. This problem will hopefully be resolved with the installation of the new NSSS model in 1995.

3. Increasing RCS activity using ISD point RCR0 to cause high containment radiation levels will cause radiation monitors SSR08 (SG blowdown sample flow monitor) and ARC21 (Main condenser air ejector monitor) to alarm even if steam lines are isolated.

4. Because of modeling limitations, the RPCCW surge tank is an active part of the RPCCW flow loop. This results in activity transport form one train to the other. On any malfunction causing activity inflow to the RPCCW system, the activity will eventually show up in both trains.

9. Instructor Station Testing

During November 1993, Simulator Instructor Station Testing was performed as described in NSEM procedure 4.11, "Instructor Station". No deficiencies were identified.

Instructor Station testing verified correct operation of the following features of the Millstone 3 Instructor Station:

- Backtrack
- Fastime
- Slowtime
- Boolean Trigger
- Composite Malfunction
- Variable Parameter Control
- Freeze
- Snapshot

To verify the I/O override feature of the Millstone 3 Simulator, a small number of the following points were tested to verify proper operation.

- Analog Outputs
- Analog Inputs
- Digital Inputs
- Digital Outputs
- "Crywolf" Annunciator feature
- Annunciator Override

The purpose of the I/O override feature testing was to verify the feature itself, not every I/O override point. The Millstone 3 simulator has the ability to I/O override essentially every point in the simulator. While this is a great capability, there are therefore thousands of I/O override points. Curriculum testing of a simulator lesson plan requires the testing of any individual I/O override point to be used in training or exams, thereby verifying the individual I/O override points to be used.

10. **Real Time Testing**

Real Time Testing was performed in 1992, per NSEM procedure 4.13, "Real Time Simulator Verification".

The purpose of this test was to verify that all simulation models are running in real time. Verification was accomplished by:

- Monitoring the operations of the internal Computer Clock and Interrupt Timers and comparing them against the vendor's specifications.
- Ensuring that the spare time remaining in the simulation computer for each of the following complex scenarios was > 10%:
  - Turbine load reject/trip
  - Steam line break
  - RCS hot leg double-ended LOCA
  - RCP locked rotor
- Installing software counters in the Reactor Core, RCS and Feed Water models and comparing their actual values to expected values for each of the above scenarios.

The results of these tests show that the Millstone 3 Simulator performs in real time. In addition, an internal software timer continuously monitors computer usage and will automatically bump out any task that slips two consecutive frames.

No deficiencies were identified. This test will be repeated once every four years or at any time a question exists that the Millstone 3 Simulator is not running in real time.

11. **Ensuring Continuing Performance of the MP3 Simulator**

To ensure that the MP3 Simulator performance remains in compliance with ANSI/ANS 3.5 (1985), Reg Guide 1.149 and 10 CFR 55.45 the following procedural controls have been implemented:

Major Plant Modifications - The Millstone 3 Simulator was certified as a Plant Referenced Simulator. Significant Reference Plant Control Room changes, such as Control Room Design Review modifications, must receive special consideration due to their potential major impact on training.

NSEM Procedure 6.04, "Major Plant Modifications", addresses this concern. This procedure ensures that major plant modifications affecting the Reference Plant Control Room are reviewed and acted on in a timely manner. This ensures that training and exams continue to be performed on a valid plant referenced simulator.

Plant Design Changes/Procedure Changes

All Plant Design Changes and Procedure Changes are sent to the Training Department to be reviewed for training impact and simulator impact. This assures that both training and the simulator are continually evaluated and updated as plant changes occur. Procedural controls covering this review process are in Training Procedures. Plant Design Changes requiring Simulator modifications are handled within the time allowed by ANS 3.5 Section 5.2 and 5.3.

Student Feedback - Student (licensee) feedback is an important input to simulator Fidelity. NSEM Procedure 6.01, "Student Feedback" describes how student feedback is obtained. Written feedback is requested by training staff from students on simulator training and fidelity as directed by NTM 6.01. This feedback is evaluated by the ASOT and if appropriate forwarded to the unit SOA for simulator analysis and disposition.

Reference Plant Performance Data - As plant events occur, data will be retrieved and evaluated to validate Simulator Fidelity. NSEM Procedure 6.03, Collection of Plant Performance Data", covers the collection of reference plant performance data.

Development of New Simulator Training Guides - Simulator Certification Procedure NSEM 6.02, "Development of New Simulator Guides," covers requirements for new simulator training guides. This ensures that new simulator training guides use only certified remote functions, certified malfunctions, certified Initial Conditions and do not exceed any Simulator Operating Limits.

Simulator Certification Documentation - As the Millstone 3 Simulator is modified, appropriate simulator certification documentation needs to be updated. NSEM Procedure 5.02, "Retest Guidelines" covers updating of the Performance Test.

Reference Plant Design Changes may result in simulator changes such as:

- Adding or deleting remote functions
- Adding or deleting malfunctions
- Changing remote functions or malfunctions
- Changing Performance Tests or their criteria

It is Northeast Utilities' interpretation that simulator documentation may be modified as the Reference Plant changes without requiring the submittal of an NRC Form 474 update. Changes to simulator certification documentation will be made per the NSEM procedures. Updated materials will be sent upon NRC request.

12. Open Deficiency Report (DR) List

Simulator Modification Control Procedure NSEM 5.01 furnishes guidance to establish controls for the coordination, resolution and documentation of identified differences between the simulator and its reference plant.

A Deficiency Report is a form used by the Operator Training Branch and the Simulator Technical Support Group to record all identified deficiencies and ensure that the requirements of ANSI/ANS 3.5 are satisfied. A current copy of the Millstone 3 Simulator Open Deficiency Report is attached.

DRs are resolved in accordance with NSEM-5.01 Simulator Modification Control Procedure and NSEM-6.04 Major Plant Modification Procedure.

13. Next 4-Year Schedule, (November 1994 to October 1998)

The entire MP3 performance test will be repeated over a four-year interval as described in Attachment 9. The schedule shown in Attachment 9 has been written based on the guidance provided in NSEM Procedure 4.07, "Master Test Schedule". This 4-year interval will start on the date of this submittal.

The following tests must be performed each year:

- Annual Operability Testing
- Physical Fidelity Verification

The following tests must be performed over a 4-year interval:

- Normal Plant Evolutions and Surveillance Testing
- All Certified Malfunctions
- Instructor Station Testing
- Real Time Testing

ATTACHMENT 1

OPEN DEFICIENCY REPORT (DR) LIST

This attachment is referenced by section 12 of the Performance Test Summary

Bill

Unit 3 S[illegible]ator Database CMS STATUS REPORT 10/11/94 09:18:59
Month and year of interest: October 1994

Date of last DR database update is 10/11/94

Total number of open DR's is 42

Total number of DR's written in October 1994 is 6

Total number of DR's closed in October 1994 is 6

Date of last SDC database update is 10/11/94

Total number of SDC's closed in October 1994 is 1

Unit 3 Simulator Database

DEFICIENCY TRACKING SUMMARY
(OPEN DR'S BY PRIORITY/DUE DATE/SIMSYS)

ORIGIN	DR NO	SDC NO	DATE	DUE DATE	ORIGINATOR	SIM SYS	DISCI PLINE	TITLE	DISPOSITION
** STATUS(OPEN=O) = O									
* PRIORITY = 2									
SF	94-3-0105	94-3-0105	10/07/94	/ /	W LANDON	IAS	S	IMPROPER OP CHILL WATER VALVES DURING LOSS OF INSTRUMENT AIR	TO C TAN FOR ANALYSIS ON 10-7-94
SF	94-3-0106	94-3-0106	10/07/94	/ /	W LANDON	IAS	S	IMPROPER OP OF CHILL WATER VALVES DURING LOSS INSTRUMENT AIR	TO C TAN FOR ANALYSIS ON 10-11-94
SF	94-3-0104	94-3-0104	10/07/94	/ /	W LANDON	TMB	S	IMPROPER OP EHC PANEL INDICATING LIGHT DURING LOAD LIMIT OPS	TO C TAN FOR ANALYSIS ON 10-7-94
OTH	90-3-0026	90-3-0026	06/26/90	09/30/92	W.LANDON	RC	S	RCS PRESS AND TEMP RESPONSE TO SMALL BREAK LOCAS	TO GEORGE FOR EVALUATION 10-6-92
PDC	94-3-0107	94-3-0107	10/07/94	04/07/96	W LANDON	SWP	S	CHG CTRL LOGIC 3SWP*MOV130A & B 3SWP*P3A & B / MP3-94-099	TO C TAN FOR ANALYSIS ON 10-11-94
* PRIORITY = 3									
OTH	92-3-0066	92-3-0066	12/02/92	/ /	W LANDON	CCP	S	CONVERSION OF RPPCW SYSTEM TO FLOWNET	TO CHI FOR ANALYSIS ON 12-7-92
SF	94-3-0092	94-3-0092	09/23/94	/ /	W LANDON	CCP	S	ERROR IN RESPONSE OF 3CCP-FCV66B TO LOSS OF VIAC-2	TO C TAN FOR ANALYSIS ON 9-26-94
SF	94-3-0100	94-3-0100	09/30/94	/ /	W LANDON	CDS	S	ERROR IN CTRL POWER SUPPLY FOR CDS SYSTEM COMPONENTS	TO C TAN FOR ANALYSIS ON 9-30-94
SF	94-3-0087	94-3-0087	09/09/94	/ /	W LANDON	CES	S	MAIN BOARD LAMP TEST PUSH BUTTONS DO NOT FUNCTION	TO C. TAN FOR ANALYSIS ON 9-12-94
SF	94-3-0098	94-3-0098	09/30/94	/ /	W LANDON	CHS	S	IMPROPER RESPONSE OF ANNUNCIATOR MB3A(4-9) TO BATTERY 1 LOSS	TO C TAN FOR ANALYSIS ON 9-30-94
OTH	94-3-0014	94-3-0014	02/11/94	/ /	W LANDON	CNM	S	INCONSISTENT RESPONSE OF HOTWELL MASS	TO TAN FOR ANALYSIS ON 2-14-94
SF	94-3-0099	94-3-0099	09/30/94	/ /	W LANDON	CWS	S	ADD AMPERAGE OSCILLATION MAIN CIRC H20 PUMPS ON HI SCREEN DP	TO C TAN FOR ANALYSIS ON 9-30-94
SF	94-3-0083	94-3-0083	09/02/94	/ /	W LANDON	DGS	S	INCORRECT OPERATION OF 3DGS*CTV24 MB1 CONTROL SWITCH	TO C. TAN FOR ANALYSIS ON 9-6-94

DEFICIENCY TRACKING SUMMARY
(OPEN DR'S BY PRIORITY/DUE DATE/SIMSYS)

ORIGIN	DR NO	SDC NO	DATE	DUE DATE	ORIGINATOR	SIM SYS	DISCI PLINE	TITLE	DISPOSITION
SF	94-3-0057	94-3-0057	07/22/94	/ /	W LANDON	EHS	S	IMPROPER OP EMERGENCY POWERED EQUIPMENT BREAKERS	TO C. TAN FOR ANALYSIS ON 7-22-94
SF	94-3-0093	94-3-0093	09/23/94	/ /	W LANDON	FWS	S	ERROR IN THE PRESSURE RESPONSE OF MAIN FEED HEADER	TO C TAN FOR ANALYSIS ON 9-26-94
SF	94-3-0094	94-3-0094	09/23/94	/ /	W LANDON	FWS	S	ERROR RESPONSE MAIN CONDENSER VACUUM L/O GLAND SEALING STM	TO C TAN FOR ANALYSIS ON 9-26-94
SF	94-3-0097	94-3-0097	09/30/94	/ /	W LANDON	FWS	S	UPDATE OF TDMFW PUMPS TO LOSS OF DAHL CONTROLLERS	TO C TAN FOR ANALYSIS ON 9-30-94
SF	94-3-0103	94-3-0103	10/07/94	/ /	W LANDON	HVC	S	ERROR IN OPERATION OF 3HVC*SOV74B	TO C TAN FOR ANALYSIS ON 10-7-94
SF	94-3-0095	94-3-0095	09/23/94	/ /	W LANDON	HVK	S	ERROR IN OPERATION CTRL BLDG CHILL WATER PUMPS FOLLOWING LOP	TO C TAN FOR ANALYSIS ON 9-26-94
SF	94-3-0078	94-3-0078	09/02/94	/ /	W LANDON	IHA	S	RESPONSE OF MB4D PERMISSIVE ANNUN INCORRECT BATTERY 1 LOSS	TO C. TAN FOR ANALYSIS ON 9-6-94
OTH	94-3-0084	94-3-0084	09/09/94	/ /	W LANDON	IHA	S	ANNUNCIATOR IO OVERRIDES DO NOT FUNCTION	TO C. TAN FOR ANALYSIS ON 9-12-94
OTH	94-3-0085	94-3-0085	09/02/94	/ /	W LANDON	IHA	S	IMPROPER OPERATION OF THE MASTER SILENCE FEATURE	TO C. TAN FOR ANALYSIS ON 9-12-94
SF	94-3-0086	94-3-0086	09/09/94	/ /	W LANDON	IHA	S	MISOPERATION OF ANNUNCIATOR SILENCE PUSH BUTTONS	TO C. TAN FOR ANALYSIS ON 9-12-94
OTH	94-3-0089	94-3-0089	09/09/94	/ /	W LANDON	IHA	S	ERRORS IN THE OPERATION OF MB8 ANNUNCIATORS	TO C. TAN FOR ANALYSIS ON 9-12-94
SF	94-3-0091	94-3-0091	09/16/94	/ /	W LANDON	IHA	S	ERROR IN OPERATION OF MAIN BOARD SILENCE PUSH BUTTONS	TO C TAN FOR ANALYSIS ON 9-19-94
SF	94-3-0096	94-3-0096	09/30/94	/ /	W LANDON	IHA	S	OPERATIONAL ERROR IN ANNUNCIATORS FOR MASTER SILENCE	TO C TAN FOR ANALYSIS ON 9-30-94
SF	94-3-0102	94-3-0102	10/07/94	/ /	W LANDON	IHA	S	ERROR IN OPERATION COMPUTER FAILURE ANNUNCIATOR (MB4C(1-11))	TO C TAN FOR ANALYSIS ON 10-7-94
OTH	93-3-0083	93-3-0083	09/24/93	/ /	W. LANDON	IHC	S	CONDUCT ANNUAL UPGRADE (TAPE SAVE) OF SIMULATOR MODCOMP	TO TAN FOR ANALYSIS ON 9-28-93

DEFICIENCY TRACKING SUMMARY
(OPEN DR'S BY PRIORITY/DUE DATE/SIMSYS)

ORIGIN	DR NO	SDC NO	DATE	DUE DATE	ORIGINATOR	SIM SYS	DISCI PLINE	TITLE	DISPOSITION
OTH	92-3-0083	92-3-0083	12/02/92	/ /	W. LANDON	MSS	S	CONVERSION OF THE MAIN STEAM SYSTEM TO FLOWNET	TO CHI FOR ANALYSIS ON 12-7-92
PDC	94-3-0045	94-3-0045	07/01/94	/ /	W LANDON	MSS	H	ADD SWITCH COVER MB5 MAIN STEAM LINE ISOLATION PUSH BUTTON	HW MR# A0424
SF	94-3-0068	94-3-0068	08/19/94	/ /	W LANDON	NA	H	CORRECT METER LABELING ERRORS ON MB2 & MB4	TO ART FOR ANALYSIS ON 8-22-94
OTH	93-3-0121	93-3-0121	12/10/93	/ /	W LANDON	NHS	H	REPLACEMENT OF DEFECTIVE DIGITAL VOLTMETER	HW MR# 6779
SF	94-3-0081	94-3-0081	09/02/94	/ /	W LANDON	NMI	S	METER FACES FOR INTERMEDIATE RANGE METERS ON MB4 ARE REVERSE	TO C. TAN FOR ANALYSIS ON 9-6-94
SF	94-3-0082	94-3-0082	09/02/94	/ /	W LANDON	RCS	S	INCORRECT POWER SUPPLY PRESSURIZER LEVEL & RECORDER SEL SWCH	TO C. TAN FOR ANALYSIS ON 9-6-94
SF	94-3-0080	94-3-0080	09/02/94	/ /	W LANDON	RMS	S	SOURCE CHK DURATION DFCT VALUE LWS70 INCORRECT IN RMS PRGRM	TO C. TAN FOR ANALYSIS ON 9-6-94
SF	94-3-0088	94-3-0088	09/09/94	/ /	W LANDON	RMS	S	IMPROPER RESPONSE OF MSS-RE79 TO C SG TUBE RUPTURE	TO C. TAN FOR ANALYSIS ON 9-12-94
OTH	93-3-0069	93-3-0069	08/12/93	/ /	W. LANDON	RPS	S	ERROR IN OPERATION OF CONTROL BUILDING ISOLATION LOGIC	TO TAN FOR ANALYSIS ON 8-12-93
OTH	93-3-0073	93-3-0073	08/25/93	/ /	W. LANDON	RPS	S	ERROR RESPONSE B/S STATUS LTS MB2D MB4F MB4G LOSS OF VIAC-4	TO TAN FOR ANALYSIS ON 8-30-93
SF	94-3-0090	94-3-0090	09/16/94	/ /	W LANDON	RPS	S	ERROR STM FLOW MEASUREMENT IN RESPONSE TO LOSS OF COMP PRESS	TO C TAN FOR ANALYSIS ON 9-19-94
SF	94-3-0101	94-3-0101	09/30/94	/ /	W LANDON	RPS	S	ERROR IN OPERATION OF CTRL BUILDING ISOLATION ANNUNCIATOR	TO C TAN FOR ANALYSIS ON 9-30-94
PDC	93-3-0036	93-3-0036	07/12/93	10/30/93	W. LANDON	FWA	B	MDAFW PP TRIP CIRCUIT MODIFICATION PDCR MP3-92-109	TO TAN FOR ANALYSIS ON 7-16-93 - HW MR# 6414
PDC	94-3-0072	94-3-0072	08/19/94	02/19/96	W LANDON	CCS	S	MODIFICATION OF TPCCW PUMP TRIP CIRCUIT	TO C. TAN FOR ANALYSIS ON 8-22-94

ATTACHMENT 2

SCHEDULE FOR NEXT FOUR YEARS OF TESTING

This attachment is referenced by section 13
of the Performance Test Summary

ATTACHMENT 8.3

Millstone Unit 3

PERFORMANCE TEST

SCHEDULE

	START	END
Performance Test:		
Year One:	11/1/94	10/31/95
Year Two:	11/1/95	10/31/96
Year Three:	11/1/96	10/31/97
Year Four:	11/1/97	10/31/98

APPROVED: ____________________
ASOT

YEAR ONE

TEST	DATE	INITIALS
Annual Operability NSEM-4.09		
* 75% Steady State Accuracy	______	______
100% Steady State Accuracy	______	______
100% Stability	______	______
Transient #1: Manual Reactor Trip	______	______
Transient #2: Simultaneous Trip of All Feed Water Pumps	______	______
Transient #3: Simultaneous Closure of All Main Steam Isolation Valves	______	______
Transient #4: Simultaneous Trip of All Reactor Coolant Pumps	______	______
Transient #5 Trip of Any Single Reactor Coolant Pump	______	______
Transient #6 Main Turbine Trip at Power Less than P9	______	______
Transient #7 Large Load Rejection	______	______
Transient #8 Maximum Size LOCA with a Loss of Offsite Power	______	______
Transient #9 Maximum Size Main Steam Line Rupture Inside Containment	______	______
Transient #10 Reactor Coolant System Depressurization to Saturation Conditions Using PORV	______	______
Physical Fidelity Verification NSEM-4.12	______	______

* Approximately 25% Steady State Accuracy

YEAR ONE

TEST		DATE	INITIALS
Remote Functions NSEM-4.03			
o	RPCCW System Remote Function Test	______	______
o	RHR System Remote Function Test	______	______
o	SI System Remote Function Test	______	______
o	SW System Remote Function Test	______	______
o	TPCCW System Remote Function Test	______	______
Major Malfunctions NSEM-4.04			
o	ED01	______	______
o	FW10A(B)(C)(D)	______	______
o	MS01A(B)(C)(D)	______	______
Malfunctions NSEM-4.05			
o	CC System Malfunctions		
	CC01 - RPCCW Pump Trip	______	______
	CC02 - RHR HX CC VV Failure	______	______
	CC03 - Loss of RCP Cooling Water Supply	______	______
	CC04 - RPCCW Pipe Leak	______	______
	CC05 - RPCCW Surge Tk M/U VV Failure	______	______
	CC06 - RPCCW HX Outlet TCV Failure	______	______

YEAR ONE

TEST	DATE	INITIALS
CC07 - Safety Injection PP Clr Blockage	______	______
CC08 - Charging PP Clg Wtr Sys Blockage	______	______
o CH System Malfunctions		
CH02 - CTMT Air Recirculation Fan Trip	______	______
CH03 - Chilled Wtr Circulating PP Trip	______	______
CH04 - Loss of CTMT Vacuum	______	______
CH05 - Breach of CTMT Integrity	______	______
CH06 - Control Rod Drive Cooling Fan Trip	______	______
CH07 - Loss of Reactor Plant Chilled Water	______	______
o CR System Malfunctions		
CR01 - Fuel Cladding Failure	______	______
o CS System Malfunctions		
CS01 - Quench Spray PP Trip	______	______
CS02 - RWST Chem Add Tk Disch VV Fails to Open in Automatic	______	______
CS03 - CTMT Recirc PP Trip	______	______
CS04 - RWST Leak	______	______

YEAR ONE

TEST	DATE	INITIALS
o CV System Malfunctions		
CV01 - Letdown Leak Inside CTMT		
CV02 - Letdown Leak Outside CTMT		
CV03 - Letdown HX Tube Leak to RPCCW		
CV04 - Letdown Temp Transmitter Failure		
CV05 - Letdown Press Transmitter Failure		
CV06 - M/U Control Failure		
CV07 - RCS Uncontrolled Dilution		
CV08 - M/U Water PP Trip		
CV09 - Volume Control Tank Leak		
CV10 - VCT Lvl Transmitter Failure		
CV11 - Charging Pump Trip		
CV12 - Charging Line Leak Inside CTMT		
CV13 - RCP #1 Seal Failure		
CV14 - RCP #2 Seal Failure		
CV15 - RCP #3 Seal Failure		
CV16 - RCP Thermal Barrier Tube Failure		
CV18 - Charging Flow Control VV Failure		

YEAR ONE

TEST	DATE	INITIALS
CV19 - BTRS TCV Failure	______	______
o CW System Malfunctions		
CW01 - Circulating Water PP Trip	______	______
CW02 - Main Condenser Tube Leak	______	______
CW03 - Station Vacuum Priming PP Trip	______	______
CW04 - Traveling Screen High DP	______	______
CW05 - Condenser Tube Sheet Plugging	______	______
CW06 - Main Condenser Tube Rupture	______	______
o ED System Malfunctions		
ED02 - Unit Service Transformer Failure	______	______
ED03 - Loss of 6.9 KV Bus	______	______
ED04 - Loss of 4160 V Bus	______	______
ED05 - Loss of 480 V Load Center	______	______
ED06 - Loss of Emergency Bus MCC	______	______
ED07 - Automatic Bus Fast Transfer Failure	______	______
ED08 - Loss of Instrument Bus	______	______
ED09 - Loss of Battery Bus	______	______
ED11 - EDG Sequencer A Failure	______	______

YEAR ONE

TEST	DATE	INITIALS
ED12 - EDG Sequencer B Failure	______	_______
ED13 - Loss of Selected Non-Vital MCC	______	_______
ED14 - Loss of Annunciator Panel Power Bus	______	_______

Normal Plant Evolutions NSEM-4.10

o	Plant Startup Normal Ops Test	______	_______
o	Nuclear Startup Normal Ops Test	______	_______

YEAR TWO

TEST	DATE	INITIALS
Annual Operability NSEM-4.09		
* 75% Steady State Accuracy	______	______
100% Steady State Accuracy	______	______
100% Stability	______	______
Transient #1: Manual Reactor Trip	______	______
Transient #2: Simultaneous Trip of All Feed Water Pumps	______	______
Transient #3: Simultaneous Closure of All Main Steam Isolation Valves	______	______
Transient #4: Simultaneous Trip of All Reactor Coolant Pumps	______	______
Transient #5 Trip of Any Single Reactor Coolant Pump	______	______
Transient #6 Main Turbine Trip at Power Less than P9	______	______
Transient #7 Large Load Rejection	______	______
Transient #8 Maximum Size LOCA with a Loss of Offsite Power	______	______
Transient #9 Maximum Size Main Steam Line Rupture Inside Containment	______	______
Transient #10 Reactor Coolant System Depressurization to Saturation Conditions Using PORV	______	______
Physical Fidelity Verification NSEM-4.12	______	______

* Approximately 25% Steady State Accuracy

YEAR TWO

TEST	DATE	INITIALS
Remote Functions NSEM-4.03		
o CVCS System Remote Functions Test	______	______
o FW System Remote Functions Test	______	______
Major Malfunctions NSEM-4.04		
o MS02A(B)(C)(D)	______	______
o MS03	______	______
o RC02A(B)(C)(D)	______	______
Malfunctions NSEM-4.05		
o EG System Malfunctions		
EG01 - Main Generator Trip	______	______
EG02 - Main Generator Voltage Regulator Fails to Manual	______	______
EG03 - Main Generator Output Bkr Fail to Open	______	______
EG04 - Main Generator Exciter Bkr Trip	______	______
EG05 - SBO Diesel Output Bkr Trip	______	______
EG06 - Diesel Generator Trip	______	______
EG07 - Diesel Generator Fail to Start	______	______
EG08 - Diesel Generator Load Limiter Failure	______	______
EG09 - Main Gen Auto Voltage Regulator Swing	______	______

YEAR TWO

TEST	DATE	INITIALS
EG10 - Main Gen Manual Voltage Regulator Failure	______	______
EG11 - Diesel Generator Fuel Oil Transfer PP Trip	______	______
EG12 - SBO Diesel Supply Bkr Trip	______	______
o FW System Malfunctions		
FW01 - Lowering Condenser Vacuum	______	______
FW02 - Condenser Hotwell Lvl Xmtr Failure	______	______
FW03 - Condensate PP Trip	______	______
FW04 - Condensate Recirc VV FV48 Failure	______	______
FW05 - Condensate Demin DP Increase	______	______
FW06 - LP Htr Byp VV MOV88 Fail open	______	______
FW07 - Feed Water PP Trip	______	______
FW08 - Feed Water Regulating VV Failure	______	______
FW09 - Feed Water Line Rupture Outside CTMT	______	______
FW11 - Feed Water Line Leak Inside CTMT	______	______
FW13 - LP Heater Tube Rupture	______	______
FW14 - HP Heater Tube Rupture	______	______
FW15 - LP Heater Hi-Hi Lvl Switch Actuates	______	______

YEAR TWO

TEST	DATE	INITIALS
FW16 - Fourth Point Htr Drn PP Trip	______	______
FW17 - Moisture Separator Drn PP Trip	______	______
FW18 - MDAFW Pump Trip	______	______
FW19 - TDAFW Pump Trip	______	______
FW20 - AFW Pump Fails to Auto Start	______	______
FW21 - AFW PP Discharge VV Closed	______	______
FW22 - AFW Pipe Rupture Inside CTMT	______	______
FW23 - DWST Rupture	______	______
FW24 - Condensate Storage/Surge Tk Leak	______	______
FW25 - Condenser Air Removal PP Trip	______	______
FW26 - LP Htr Byp VV MOV88 Leakage	______	______
FW27 - Main FW PP Spd Control Fails in Auto	______	______
FW28 - Main Feed PP Recirc VV Fails Open	______	______
FW29 - Main Feed PP Recirc VV Fails Closed	______	______
FW31 - Main Feed Reg VV Byp VV Failure	______	______
FW32 - MSR Drn Tank Dump VV Failure	______	______
FW33 - Condensate PP Coupling Shear	______	______
FW34 - Hotwell Leakage	______	______

YEAR TWO

TEST	DATE	INITIALS
FW35 - Main Feed Reg VV Seat Leakage	______	______
o IA System Malfunctions		
IA01 - Service Air Compressor Trip	______	______
IA02 - Instrument Air Compressor Trip	______	______
IA03 - Loss of Instrument Air	______	______
IA05 - CTMT Instrument Air Supply VV PV15 Fails Closed	______	______
IA06 - Shutdown Instrument Air Compressor Trip	______	______
o MS System Malfunctions		
MS04 - Reheater Stm Sply Press Controller Fail	______	______
MS05 - Moisture Separator Reheater Tube Leak	______	______
MS06 - Main Steam Isolation VV Trip	______	______
MS07 - Main Steam Safety VV Failure	______	______
MS08 - Gland Seal Regulator Failure	______	______
MS09 - Pressure Relieving VV Failure	______	______
MS10 - Extraction Stm NRV Fails In Position	______	______
o NI System Malfunctions		
NI01 - Source Range Channel Failure	______	______

YEAR TWO

TEST	DATE	INITIALS
NI02 - Source Range Channel Noisy	______	______
NI03 - Incorrect Source Range Channel Response	______	______
NI04 - Source Range High Voltage Fails to De-Energize	______	______
NI05 - Intermediate Range Channel Failure	______	______
NI06 - IRNI Channel Improper Compensation	______	______
NI07 - Power Range Channel Failure	______	______
NI08 - PRNI Upper Detector Failure	______	______
NI09 - PRNI Lower Detector Failure	______	______
NI10 - P6 Bistable Failure	______	______
NI11 - P10 Interlock Failure	______	______
NI12 - Power Range Channel Random Noise	______	______

Normal Plant Evolution Tests NSEM-4.10

	DATE	INITIALS
o Turbine Startup and Generator Synchronization Normal Ops Test	______	______
o Power Ascension Normal Ops Test	______	______
o Reactor Trip and Recovery Normal Ops Test	______	______
Real Time Simulation Verification NSEM-4.11	______	______

YEAR THREE

TEST	DATE	INITIALS
Annual Operability NSEM-4.09		
75% Steady State Accuracy *	______	______
100% Steady State Accuracy	______	______
100% Stability	______	______
Transient #1: Manual Reactor Trip	______	______
Transient #2: Simultaneous Trip of All Feed Water Pumps	______	______
Transient #3: Simultaneous Closure of All Main Steam Isolation Valves	______	______
Transient #4: Simultaneous Trip of All Reactor Coolant Pumps	______	______
Transient #5 Trip of Any Single Reactor Coolant Pump	______	______
Transient #6 Main Turbine Trip at Power Less than P9	______	______
Transient #7 Large Load Rejection	______	______
Transient #8 Maximum Size LOCA with a Loss of Offsite Power	______	______
Transient #9 Maximum Size Main Steam Line Rupture Inside Containment	______	______
Transient #10 Reactor Coolant System Depressurization to Saturation Conditions Using PORV	______	______
Physical Fidelity Verification NSEM-4.12	______	______

* Approximately 25% Steady State Accuracy

YEAR THREE

TEST	DATE	INITIALS
Remote Functions NSEM-4.03		
o TC System Remote Functions Test	______	______
o IA System Remote Functions Test	______	______
o RX System Remote Functions Test	______	______
o RP System Remote Functions Test	______	______
Major Malfunctions NSEM-4.04		
o RC03A(B)(C)(D)	______	______
o RC09A(B)(C)(D)	______	______
o RC10A(B)(C)(D)	______	______
Malfunctions NSEM-4.05	______	______
o PC System Malfunctions		
PC01 - Loss of Plant Computer	______	______
o RC System Malfunctions		
RC01 - RCS Crud Burst	______	______
RC04 - Reactor Vessel Head Flange Leak	______	______
RC05 - Reactor Vessel Head Vent Leak	______	______
RC06 - Pressurizer Safety Valve Leakage	______	______
RC07 - Pressurizer PORV Leakage	______	______

YEAR THREE

TEST	DATE	INITIALS
RC08 - Pressurizer PORV Fails Closed	______	______
RC12 - RCP Oil Leak, Upper Reservoir	______	______
RC13 - RCP Oil Lift PP Failure	______	______
RC14 - RCP Upper Oil Reservoir Clg Wtr Leak	______	______
RC15 - Pressurizer Safety VV Fails to Open	______	______
o RD System Malfunctions		
RD01 - Rod Bank Continuous Withdrawal	______	______
RD02 - Rod Bank Continuous Insertion	______	______
RD03 - Dropped Control Rod	______	______
RD04 - Stuck Control Rod	______	______
RD05 - Control Rods Fail to Move in Auto	______	______
RD06 - Control Rods Fail to Move in Manual	______	______
RD07 - Controlling Rod Bank Moves Opposite to Auto Demand Signal	______	______
RD08 - Control Rod Speed Failure in Auto	______	______
RD09 - Control Rod Block Failure to Block	______	______
RD10 - Control Rod Position Failure Data A	______	______
RD11 - Control Rod Position Failure Data B	______	______

YEAR THREE

TEST	DATE	INITIALS
RD13 - Broken Control Rod	______	______
RD14 - Group Rod Position Failure	______	______
RD15 - Step Cntrs Move One Half Normal Spd	______	______
o RH System Malfunctions		
RH01- Residual Heat Removal PP Trip	______	______
RH02 - Loss of RHR PP Suction	______	______
RH03 - RHR Flow Transmitter Failure	______	______
RH04 - RHR Heat Exchanger Tube Failure	______	______
RH05 - RHR PP Seal Failure	______	______
o RM System Malfunctions		
RM01 - Area Rad Mon Failure (CTMT)	______	______
RM02 - Area Rad Mon Failure (Aux & ESF Bldg)	______	______
RM03 - Area Rad Mon Failure	______	______
RM04 - Process Rad Mon Failure (Aux Bldg)	______	______
RM05 - Process Rad Mon Failure	______	______
o RP System Malfunctions		
RP01 - RCS Flow Transmitter Failure	______	______

YEAR THREE

TEST	DATE	INITIALS
RP02 - Reactor Trip Actuation	______	______
RP03 - Phase A CTMT Isolation Actuation	______	______
RP04 - CTMT Spray Actuation	______	______
RP05 - Safety Injection Actuation	______	______
RP06 - CTMT Spray Auto Actuation Failure	______	______
RP07 - Safety Injection Auto Actuation Failure	______	______
RP08 - Main Steam Line Auto Actuation Failure	______	______
RP09 - Manual Reactor Trip Failure	______	______
RP10 - Auto Reactor Trip Failure	______	______
RP11 - Failure of Safety Systems to Auto Actuate	______	______
RP12 - C5 Interlock Failure	______	______
RP13 - P12 Interlock Failure	______	______

Normal Plant Evolutions NSEM-4.10

o Surveillance Testing Normal Ops Test	______	______
o Plant Operations with Less Than Full Reactor Coolant Flow Normal Ops Test	______	______

YEAR FOUR

TEST	DATE	INITIALS
Annual Operability NSEM-4.09		
* 75% Steady State Accuracy	______	______
100% Steady State Accuracy	______	______
100% Stability	______	______
Transient #1: Manual Reactor Trip	______	______
Transient #2: Simultaneous Trip of All Feed Water Pumps	______	______
Transient #3: Simultaneous Closure of All Main Steam Isolation Valves	______	______
Transient #4: Simultaneous Trip of All Reactor Coolant Pumps	______	______
Transient #5 Trip of Any Single Reactor Coolant Pump	______	______
Transient #6 Main Turbine Trip at Power Less than P9	______	______
Transient #7 Large Load Rejection	______	______
Transient #8 Maximum Size LOCA with a Loss of Offsite Power	______	______
Transient #9 Maximum Size Main Steam Line Rupture Inside Containment	______	______
Transient #10 Reactor Coolant System Depressurization to Saturation Conditions Using PORV	______	______
Physical Fidelity Verification NSEM-4.12	______	______

* Approximately 25% Steady State Accuracy

YEAR FOUR

TEST	DATE	INITIALS
Major Malfunctions NSEM-4.04		
o RC11A(B)(C)(D)	______	______
o RC17	______	______
o RD12	______	______
o SG01A(B)(C)(D)	______	______
Malfunctions NSEM-4.05		
o RX System Malfunctions		
RX01 - RCS Wide Range Press Xmtr Failure	______	______
RX02 - RCS WR Cold Leg Temp Xmtr Failure	______	______
RX03 - RCS WR Hot Leg Temp Xmtr Failure	______	______
RX04 - RCS NR Cold Leg Temp Xmtr Failure	______	______
RX05 - RCS NR Hot Leg Temp Xmtr Failure	______	______
RX06 - Pressurizer Spray VV Auto Cont Failure	______	______
RX07 - Pressurizer Heaters Fail	______	______
RX08 - Failure of RCS Loop Isol VV Temp Interlock to Prevent Opening	______	______
RX09 - Pressurizer Press Xmtr Failure	______	______
RX10 - Pressurizer Lvl Xmtr Failure	______	______

YEAR FOUR

TEST	DATE	INITIALS
RX11 - Steam Generator Press Xmtr Failure	______	_______
RX12 - Steam generator NR Lvl Xmtr Failure	______	_______
RX13 - Steam Generator Feed Flow Xmtr Fail	______	_______
RX14 - Steam Generator Stm Flow Xmtr Fail	______	_______
RX15 - Main Stm Hdr Press Xmtr Failure	______	_______
RX16 - Turbine 1st Stage Press Xmtr Failure	______	_______
RX17 - Loss of Condenser Available Permissive	______	_______
RX18 - Spurious Noise Pickup by RPS Xmtr	______	_______
RX19 - Failure of 3FWS-PT508	______	_______
o SG System Malfunctions		
SG02 - SG Blowdown Isol VV Fails As Is	______	_______
SG03 - Steam Generator Tube Leak	______	_______
o SI System Malfunctions		
SI01 - Safety Injection Accumulator Level Inc	______	_______
SI02 - Safety Injection Accumulator Level Dec	______	_______
SI03 - SI Accumulator N2 Press Dec	______	_______
SI04 - Safety Injection PP Trip	______	_______
SI05 - Safety Injection Accumulator Press Inc	______	_______

YEAR FOUR

TEST	DATE	INITIALS
o SW System Malfunctions		
SW01 - Service Water PP Trip	______	______
SW02 - Service Water PP Failure to Auto Start	______	______
SW03 - Loss of Cooling To Emergency Diesel	______	______
SW06 - Service Water System Break	______	______
SW07 - Service Water Heat Exchanger Fouling	______	______
o TC System Malfunctions		
TC01 - Turbine Trip	______	______
TC02 - Turbine Runback	______	______
TC03 - Turbine Fails to Trip	______	______
TC04 - Turbine Fails to Runback	______	______
TC05 - EHC PP Trip	______	______
TC06 - Turbine Stop VV Fails in Position	______	______
TC07 - Turbine Control VV Failure	______	______
TC08 - Load Shed	______	______
TC09 - Turbine Rate Failure	______	______
TC10 - EHC Input Transmitter Failure	______	______

YEAR FOUR

	TEST	DATE	INITIALS
o	TP System Malfunctions		
	TP01 - TPCCW PP Trip	______	______
	TP02 - TPCCW PP Failure to Auto Start	______	______
	TP03 - Turbine Lube Oil TCV Failure	______	______
	TP04 - Mn Gen Hydrogen Cooling Failure	______	______
	TP05 - Mn Gen Stator Coolant PP Trip	______	______
o	TU System Malfunctions		
	TU01 - Loss of Turbine Lube Oil Supply	______	______
	TU02 - Turbine Bearing High Vibration	______	______
	TU03 - Turbine Oil PP Trips	______	______
	TU04 - Shaft Driven Oil PP Failure	______	______
Normal Plant Evolutions NSEM-4.10			
o	Plant Shutdown Normal Ops Test	______	______
o	Plant Cooldown to Cold Shutdown Normal Ops Test	______	______
Instructor Station Verification NSEM-4.11		______	______

ATTACHMENT 3

PHYSICAL FIDELITY SUMMARY REPORT

This attachment is referenced by section 6
of the Performance Test Summary

Form 7.5

SIMULATOR PHYSICAL FIDELITY/HUMAN FACTORS REPORT

UNIT: MILLSTONE 3

REVISION: 2

Approved By: [signature] Date: 6/21/94
SOT

Concurrence: [signature] Date: 6/30/94
MOT

Concurrence: [signature] (for) Date: 9-29-94
Unit Operations Manager

SCCC Mtg. No. 94-014

Form 7.1

EXCEPTIONS - CONTROL ROOM LAYOUT

UNIT: MP3

1. The emergency plan communications console (radiopager), Tech Support Center (TSC) phone, Waterford Police phone, Operational Support Center (OSC) phone, Berlin phone, Emergency Operations Facility (EOF) phone, NRC red phone, Security phone and the Unit 1 phone are not present on the simulator. Push buttons are provided on the simulator control room SCO console and main board phones for all these lines except security and Waterford Police. As all communications from the operators will be to a limited number of simulator instructors in the instructor booth, there is no significant training impact on whether they communicate through the phone console at the SCO console or main boards versus the real TSC/EOF/NRC/Unit 1 phones on the communications console. The simulator is not used to provide training on the radiopager. Radiopager operation is not a licensed operator task and is therefore not considered as a needed part of the simulator scope. Large scale emergency plan exercises are now done on the simulator but the necessary communications equipment is provided by mobil stations which support all 4 units. The absence of this console does not represent a hinderance to licensed operator training activities.

2. The Shift Supervisor's (SS) office and the Plant Equipment Operator (PEO) room are not included in the simulator control room. There is no training value and therefore no training impact to the omission of these areas on the simulator as they play no active part in control room licensed operator activities.

3. The key locker on the simulator is not identical to the reference plant. The reference plant key locker is located in the SS office. The key locker in the simulator is located on the wall near the door to the instructor console. The key numbers are not the same as the reference plant and none of the keys required for locks outside the control room (except for keys for the ASP) are included in the simulator. Location of the keys in the key locker is not an identified licensed operator task and therefore the differences in the two key lockers has no training impact.

4. The auxiliary shutdown panel (ASP) on the simulator has no doors on the front of the panels. The reference plant ASP has removable doors for ease of access. There is no training value in having doors on the simulator ASP and there is no room for them to be safely stored when they are removed. This difference has no training impact.

5. The Seismic Monitor and Fire Protection (Simplex) panels on the B train end of the Main ventilation panel (VP1) in the reference plant control room are not modeled in the simulator control room. There are no licensed operator tasks selected for training on these panels and therefore there is no significant training impact caused by their exclusion.

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Reviewed by: [signature] Date: 6/14/94
ASOT

Rev.: 4
Date: 6/6/94
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Form 7.1

EXCEPTIONS - CONTROL ROOM LAYOUT

UNIT: MP3

6. The B train Safeguards Test Cabinet and B train Emergency Diesel Generator Sequencer panels are located in the instrument rack room in the reference plant and behind main boards 4 and 5 in the simulator. These components are located behind the control boards in the simulator to preclude the unreasonable expense of duplicating the instrument rack room. There are no differences in the panels on the simulator from the panels in the reference plant and therefore no significant training impact from the differences in location is deemed to exist.

7. The two oscillograph cabinets on the train A end of the main ventilation panel (VP1) are not modeled on the simulator. There are no licensed operator tasks identified for training associated with these panels and therefore their exclusion represents no significant training impact.

8. The simulator and reference plant have chairs of different styles, manufacturers and colors. This difference has no training impact.

9. There is a small space between the Kaman RMS panels and the nuclear instrument (NI) panels and also between the NI panels and the flux mapping panels in the reference plant. This space does not exist in the simulator control room. This difference has no training impact.

10. The plant process computer (PPC) printers in the SCO console in the reference plant are Texas Instruments printers. The simulator uses Dataproducts printers. This difference represents no training impact as the operation of these printers by licensed operators is not an identified training task.

11. The reference plant control room has 3 five drawer file cabinets next to the RMS console while the simulator control room has 2 five drawer file cabinets. This difference represents no training impact.

12. The reference plant control room has 3 desks which the simulator control room does not have. These desks play no active part in the performance of licensed tasks at the main control boards and therefore represent no training impact.

13. The reference plant control room has one storage cabinet while the simulator has two storage cabinets. The reference plant cabinet is located next to the flux mapping console while the cabinets in the simulator control room are located behind the RMS console. These cabinets are not used in training and therefore this difference involves no training impact.

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Form 7.1

EXCEPTIONS - CONTROL ROOM LAYOUT

UNIT: MP3

14. The 2 PPC printer cabinets behind the SCO console in the reference plant control room in the reference plant control room are brown; in the simulator these cabinets are gray. The color of these printer cabinets has no impact on training.

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ASOT

Form 7.2

EXCEPTIONS - PANEL LAYOUT

UNIT: MP3

1. The rear of main board 8 has electrical protection relays for the main generator and transmission lines, the simulator does not have these relays. These relays are not part of any licensed operator tasks identified for training. This difference has no significant training impact.

2. The right hand maintenance jack phone on the SCO console in the reference plant control room is located approximately 6" to the right of the same phone in the simulator control room. The difference in location is minor and therefore has no significant training impact.

3. The turbine supervisory panel at the plant is contained in 4 cabinets. The simulator turbine supervisory panel is in one cabinet. This difference does not effect the operator's ability to use the supervisory panel and therefore this difference does not represent a significant impact on training.

4. The reference plant main board 7 rear contains the transmission line protection audio tone unit. This unit is not included on the simulator control panel. This equipment is not operated by the licensed operators in conjunction with any of the tasks identified for training. This difference does not represent an adverse impact to training.

5. The recorder for outfall pH (3CWS-AR56) is located on the rear of main board 2 in the reference plant. This recorder is not included in the scope of simulation. The use of this recorder is not required for any of the licensed operator tasks selected for training and therefore this difference has no training impact.

6. The control switch and indicating lights for the steam generator drain pump (3BDG-P2) are located on the rear of main board 1 in the reference plant. This control switch and associated lights are not included in the scope of simulation. The draining of steam generators on the simulator is done by the use of remote functions (SGR01 - SGR04). This pump is not required to be operated in conjunction with any of the licensed operator tasks selected for training, therefore this difference has no training impact.

7. In the reference plant, the safeguards test cabinet has large purple gravoply labels on the right and left sides of both panels with the letter "B" on them. These labels are to prevent confusion at the plant as to which train cabinet the operator or technician is in. The simulator does not have these labels. The absence of these labels have no impact on training on the simulator and serve no function in the simulator environment as only the B train cabinet is installed.

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Form 7.2

EXCEPTIONS - PANEL LAYOUT

UNIT: MP3

8. On the system monitoring section of the turbine supervisory panel in the reference plant, the lower portion of the panel has a mimic of the 125 VDC and 24 VDC tripping circuits. On the same panel on the simulator there is no mimic and the space is occupied by DC volt meters. The mimic and the volt meters are not used in training and therefore this difference has no training impact.

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Reviewed by: [signature] Date: 6/14/94

ASOT

Form 7.3

EXCEPTIONS - COMPONENTS

UNIT: MP3

1. The reference plant has an annunciator panel (MB1F) on the rear of main board 1 that is not modeled on the simulator. This panel provides alarms for the loss of control power to various auxiliary circuits. As these auxiliary circuits are not modeled and no identified training tasks exist for these annunciators, there is no training impact caused by the absence of this alarm panel.

2. In the reference plant control room, the plant emergency alarm switch on the SCO console is of different appearance from the same switch in the simulator control room. Both switches are identical in operation and function and therefore this difference represents no significant impact on training.

3. The pressure indicator controllers 3HVR*PIC104A and 3HVR*PIC104B on main ventilation panel VP1 in the reference plant control room do not have green pointers on the left hand side of the indicator face. These controllers on the simulator have green pointers which do not indicate any value (always at 0). These pointers are not used by the operators and as they never indicate a value their presence has no training impact.

4. The hot water heating valves 3HVK*TV68A through 3HVK*TV75A and 3HVK*TV68B through 3HVK*TV75B have different control switch handles on the simulator ventilation panel VP1 than the same switches have in the reference plant. The switch style used in the plant is no longer available. The switches on the simulator function identically to the ones in the plant and therefore there is no significant training impact represented by the switch handle difference.

5. There are numerous General Electric type CR2940 switches on the reference plant control boards which have hexagonal collars. All of these type switches on the simulator have round collars. The hexagonal collars are no longer an available stock item. The difference represented by these different collars results in no significant training impact.

6. The knob for the rod group selector switch on main board 4 in the reference plant is larger than the same knob on the simulator. The switch positions and functions of the switches in the plant and on the simulator are identical. This difference represents no significant training impact.

7. The control valve position meters on main board 5 for the turbine driven main feed water pumps A & B in the reference plant are General Electric meters. On the simulator these meters are Sigma meters. These meters are the same size and have the same scales, therefore this difference represents no significant training impact.

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Form 7.3

EXCEPTIONS - COMPONENTS

UNIT: MP3

8. The reference plant control room has a Tracor Westronics recorder on the back of main board 7 to monitor the main normal and reserve transformers for hot spots (3STX-TR20). This recorder is not included on the simulator. There are no licensed operator tasks selected for training which require the use of this recorder. Because this recorder is not used in training its absence represents no significant training impact.

9. In the reference plant, the switches S913, S935 and S947 on the safeguards test cabinet are not installed. These switches are installed on the simulator's safeguards test cabinet. As these switches are not referenced in any procedures used to operate the test cabinet, their presence in the simulator's cabinet does not represent a significant impact on training.

10. In the reference plant, the Westinghouse Operator Interface Modules (OIMs) have white back lit increase and decrease push buttons. On the simulator, a number of these OIMs have red back lit increase push buttons and green back lit decrease push buttons as follows:

MB1 - 3BDG-PIC24 - B/D tk pressure controller	MB5 - 3FWS-FK510 - SG 1 Fd reg VV controller
MB1 - 3BDG-LIC25 - B/D tk level controller	MB5 - 3FWS-FK520 - SG 2 Fd reg VV controller
MB1 - 3CDS-FIC77 - RP chill wtr recirc flow cont	MB5 - 3FWS-FK530 - SG 3 Fd reg VV controller
MB2 - 3RHS-FK618 - RHR Trn A flow controller	MB5 - 3FWS-FK540 - SG 4 Fd reg VV controller
MB2 - 3RHS-FK619 - RHR Trn B flow controller	MB5 - 3FWS-LK550 - SG 1 Byp VV controller
MB3 - 3RCS-LK459 - PZR master level controller	MB5 - 3FWS-LK560 - SG 2 Byp VV controller
MB3 - 3CHS-LK185 - VCT level controller	MB5 - 3FWS-LK570 - SG 3 Byp VV controller
MB3 - 3CHS-TK381A - LD rtn HX out temp cont	MB5 - 3FWS-LK580 - SG 4 Byp VV controller
MB3 - 3CHS-TK381B - LD rtn HX out temp cont	MB5 - 3MSS-HV28A - MSIV A byp VV controller
MB3 - 3CHS-TK386 - CHS rtn hdr temp controller	MB5 - 3MSS-HV28B - MSIV B byp VV controller
MB3 - 3CHS-FK375 - BTRS chlr hdr flow cont	MB5 - 3MSS-HV28C - MSIV C byp VV controller
	MB5 - 3MSS-HV28D - MSIV D byp VV controller

These push buttons are clearly labeled with up and down arrows and the OIM configuration is the same as the plant's. The difference in back lighting color does not represent any significant impact on training.

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Form 7.4

EXCEPTIONS - AMBIENT ENVIRONMENT

UNIT: MP3

1. The reference plant computer console (to the right of the SCO console) has a phone monitor for the SNET control room phones. The simulator does not have this monitor. This does not represent an item of training impact as this device is not needed for the use of any of the plant procedures selected for simulator training.

2. The desk set phone on the SCO console in the reference plant is a different model from the one on the simulator SCO console. The operation of this phone is not an identified training task for licensed operators, therefore this difference does not represent a significant training impact.

3. In the reference plant there is a steady background noise of the control building ventilation (HVC). Any change in the status of HVC equipment is reflected in a change in this background noise. At the simulator there is no appreciable background noise and therefore no audio cue of deliberate or non-deliberate changes to HVC. This difference does not represent a significant training impact.

4. The phone system in the simulator has no background noise as is experienced at the reference plant. The absence of this background noise does not represent a significant adverse training impact.

5. The outside speaker indicating lights, controls, switch and labels on the SCO console in the reference plant are not simulated. These devices are not used in any of the licensed operator tasks selected for training. Therefore the absence of these components does not represent a significant impact on training.

6. The maintenance jack phone volume control on the SCO console in the reference plant control room is of different appearance from the same volume control in the simulator control room. The volume controls are identical in function and operation. Therefore the difference in the volume control does not represent a significant training impact.

7. The radio phone speaker on the SCO console in the reference plant control room is not simulated. This equipment is not used in any licensed operator tasks selected for training. Therefore this difference represents no significant training impact.

8. The maintenance jack phone line selector switch on VP1 at the reference plant control room has a different label plate from the one on the simulator VP1 panel. This difference represents no significant training impact.

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ASOT

Form 7.4

EXCEPTIONS - AMBIENT ENVIRONMENT

UNIT: MP3

9. The SNET (dial) phone at the ASP in the reference plant is not included at the ASP on the simulator. This equipment was not deemed to be cost effective based on the following considerations: (1) the relatively small amount of training done on this panel, (2) the small amount of communications with remote locations required for the students to perform the training tasks at the ASP and (3) the sufficiency of the existing maintenance jack phone already installed on the simulator ASP. The absence of this phone does not represent a significant training impact.

10. Control room lighting - the following lighting level values (in foot candles) show the differences between the reference plant control room and the simulator control room. The students recognize the difference but do not find these differences to constitute a problem (based on the responses of the students in the simulator physical fidelity survey). These differences have only a minimal training impact.

Reference Plant	Simulator
o MB1 - Illumination level = 25 foot candles	o MB1 - Illumination level = 33 foot candles
o MB2 - Illumination level = 25 foot candles	o MB2 - Illumination level = 36 foot candles
o MB3 - Illumination level = 25 foot candles	o MB3 - Illumination level = 48 foot candles
o MB4 - Illumination level = 35 foot candles	o MB4 - Illumination level = 45 foot candles
o MB5 - Illumination level = 40 foot candles	o MB5 - Illumination level = 48 foot candles
o MB6 - Illumination level = 50 foot candles	o MB6 - Illumination level = 64 foot candles
o MB7 - Illumination level = 40 foot candles	o MB7 - Illumination level = 55 foot candles
o MB8 - Illumination level = 40 foot candles	o MB8 - Illumination level = 42 foot candles
o VP1 - Illumination level = 45 foot candles	o VP1 - Illumination level = 30 foot candles
o NI - Illumination level = 30 foot candles	o NI - Illumination level = 37 foot candles

NOTE: All light readings were taken at the surface of the bench board section for each main board and at 3 feet in front and 3 feet from the floor for the NI cabinets and VP1.

11. The carpeting in the reference plant control room has been changed to a pale blue (general area) and a vibrant red (control area). The original carpet in the simulator control room was not changed. The difference in colors between the two control rooms does not represent a significant training impact. 2

Completed by: [signature] Date: 6/10/94

Reviewed by: [signature] Date: 6/14/94

ASOT

NSEM 4.12

- Summary of Revision 1 Changes -

(1 **Form 7.1, page 1 item 1** - Reworded the last sentence of item one to reflect the new practice of running emergency plant drills from the simulator control room vice the plant control room. Also eflecting the addition of the mobile communications equipment on the simulators to support emergency plant drills.

(2) **Form 7.1, page 2 item 8** - Revision 0 item eight deleted - the installation of carpeting has eliminated the differences between the simulator and plant control room tile. Remaining items on form 7.1 renumbered.

(3) **Form 7.1, page item 14** - Revision 0 item fourteen deleted - the simulator has installed three more 'Planhold' cabinets to store the reference drawings (ESKs, LSKs, EEs and P&IDs) in the same manner as the plant. Remaining items on form 7.1 renumbered.

(4) **Form 7.3, page 2 item 10** - Added item ten to make note of the difference between the simulator and the plant caused by the presence of colored back lit push buttons on some of the simulator's OIMs (red and green "UP" and "DOWN" push buttons). These push buttons in the plant are all white back lit. It was decided to take this difference as an exception rather than correct the difference due to the following factors:

- o Cost - the push buttons are of such a design that conversion from colored back lighting to white back lighting requires the complete replacement of the push buttons. This represents a significant capital outlay (46 push button units), and

- o Training impact - Because the buttons on the simulator are engraved with "UP" and "DOWN" arrows (as are the plant's) and because the back lighting enhances the recognition of the function of the push buttons (green - close/decrease and red - open/increase) this difference is not viewed as having significant training impact. This is further supported by the fact that the push buttons on the simulator are in the same location, are the same size and have the same spring return action as the push buttons on the controllers in the plant.

- Summary of Revision 2 Changes -

(1) **Form 7.4, page 2 item 11** - Item 11 was added to disposition the difference in carpeting colors between the simulator and the reference plant control room. This difference arose as a result of the change of the reference plant's carpet from the original installation.