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 MANGAN, C. V. Niagara Mohawk Power Corp.
 RECIP. NAME RECIPIENT AFFILIATION
 SCHWENCER, A. Licensing Branch 2

SUBJECT: Forwards update to Chapter 14 of FSAR reflecting that util
 will perform preliminary testing. Responses provided to
 Benedict questions re personnel qualifications. Info will
 be provided in Amend 16 to FSAR.

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Correspondence & Related

PSAR/PSAR AMDT & Related

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November 9, 1984
(NMP2L 0231)

Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Schwencer:

Re: Nine Mile Point Unit 2
Docket No. 50-410

Attached for your use and information is the update to Chapter 14 of the Final Safety Analysis Report. This submittal reflects the change in performance of preliminary testing, specifically the fact that Niagara Mohawk will be managing this effort. Additionally, we have provided responses to Mr. Benedict's recent questions regarding qualifications of personnel.

The attached information will be included in Final Safety Analysis Report Amendment 16.

Very truly yours,

C. V. Mangan

C. V. Mangan
Vice President
Nuclear Engineering & Licensing

DS:ja
Attachment
xc: R. A. Gramm, NRC Resident Inspector
Project File (2)

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The map shows the northern Adriatic coastline. A star marks the sampling station. Latitude lines are marked at 45°N and 46°N. Longitude lines are marked at 12°E, 13°E, and 14°E. Labels include 'Liguria', 'Emilia-Romagna', 'Toscana', 'Umbria', 'Marche', 'Abruzzo', 'Molise', 'Basilicata', 'Calabria', 'Sicilia', 'Sardinia', 'Trentino-South Tyrol', 'Veneto', 'Friuli-Venezia Giulia', 'Lombardy', 'Piedmont', 'Aosta Valley', 'Liguria', 'Emilia-Romagna', 'Toscana', 'Umbria', 'Marche', 'Abruzzo', 'Molise', 'Basilicata', 'Calabria', 'Sicilia', 'Sardinia', 'Trentino-South Tyrol', 'Veneto', 'Friuli-Venezia Giulia', 'Lombardy', 'Piedmont', 'Aosta Valley'.

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Abstract

Figure 1

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)

Niagara Mohawk Power Corporation)

(Nine Mile Point Unit 2))

Docket No. 50-410

AFFIDAVIT

C. V. Mangan, being duly sworn, states that he is Vice President of Niagara Mohawk Power Corporation; that he is authorized on the part of said Corporation to sign and file with the Nuclear Regulatory Commission the documents attached hereto; and that all such documents are true and correct to the best of his knowledge, information and belief.

C. V. Mangan

Subscribed and sworn to before me, a Notary Public in and for the State of New York and County of Onondaga, this 9 day of November, 1984.

James H. Maers
Notary Public in and for
Onondaga County, New York

My Commission expires:

Notary Public in the State of New York
Qualified in Onondaga County No. 4784555
My Commission Expires March 30, 1985

Nine Mile Point Unit 2 FSAR

14.2 SPECIFIC INFORMATION TO BE INCLUDED IN FSAR

14.2.1 Summary of Test Program and Objectives

The Unit 2 startup and test program is established to administratively and technically control all testing activities commencing with construction completion and ending with rated power warranty run for the station. This test program applies to all structures, systems, and components required to conduct normal commercial operation and is in compliance with the basic intent of Regulatory Guide 1.68.

The startup and test program provides properly documented assurances that the plant's structures, systems, and components operate in compliance with their design criteria and in a manner that does not endanger the health and safety of the public, plant personnel, or plant equipment.

To the extent practicable, all plant procedures are tested and evaluated during the execution of this program. The startup and test program assists in the training of the plant operating and maintenance staff by providing them with hands-on experience in the operation and maintenance of plant equipment utilizing plant procedures.

To facilitate a systematic approach in conducting the startup and test program, the program has been divided into three major phases: preliminary test, preoperational test, and initial startup test. Table 14.2-1 lists the tests and their starting dates. Tables 14.2-2 through 14.2-24 outline the acceptance tests. Tables 14.2-25 through 14.2-131 present the preoperational tests. Tables 14.2-201 through 14.2-244 and Table 14.2-301 outline the startup tests.

8

14.2.1.1 Preliminary Test Phase

The preliminary test phase begins as installation and/or construction of the individual structures, systems, and components nears completion. The prime objective of this phase is to verify that construction activities associated with the respective structure, system, or component have been completed and documented. Another function is to verify that the components within the system can be put into operation safely. The testing requirements associated with this phase verify installation integrity and component and system functional characteristics, and ensure that the structures, systems, and components are ready for preoperational testing. These tests, in general, include the following:



Nine Mile Point Unit 2 FSAR

1. Functional operation of major equipment.
2. Instrumentation and control loop tests including setpoint accuracy.
3. Testing, stroking and adjustment of remotely operated valves.
4. Initial setting and checking of trip setpoints.
5. Instrument calibration.
6. Pump and motor rotation and vibration checks.
7. Control circuit verification.
8. Relay testing and calibration.
9. Protective relay logic testing.
10. Thermal overload contact.
11. Megger testing.
12. High potential testing.
13. Circuit breaker operation.
14. Hydrostatic testing.
15. System flushing.
16. System flow balancing.
17. Annunciator and alarm testing.

14.2.1.2 Preoperational Test Phase

The preoperational test phase normally commences after preliminary testing on individual components and systems or subsystems is completed. This phase includes the tests required to demonstrate that structures, systems, and components perform satisfactorily in all modes of operation and that they are tested to quality standards commensurate with their importance to safety. These tests shall demonstrate integrated system and integrated logic string operation to the extent practicable and verify alarms, annunciators, and computer points as they are actuated during integrated system testing. Logic strings involved in protective relaying and thermal overload contact operation

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Nine Mile Point Unit 2 FSAR

as tested in the preliminary phase will not be retested in the preoperational testing phase. The preoperational test phase ends at the commencement of fuel loading; however, it is possible that some preoperational testing may be completed after fuel loading has occurred.

During the conduct of the preoperational test phase, two types of tests are performed: preoperational tests and acceptance tests. A preoperational test is defined using Regulatory Guide 1.68. The tests are listed on Table 14.2-1. Acceptance tests are similar to preoperational tests but are performed on nonsafety-related systems not specified in Regulatory Guide 1.68 (Table 14.2-1).

14.2.1.3 Initial Startup Test Phase

The initial startup test phase of the test program commences with preparation for fuel loading and extends through 100-percent rated power/100-hr warranty demonstration. The initial startup phase of testing is divided into five areas: fuel loading, open vessel, initial heatup, power ascension, and rated power warranty run. Testing performed during this phase of the program ensures that fuel loading is accomplished in a safe manner, confirms the plant design basis, demonstrates that the plant can withstand anticipated transients and postulated accidents, and ensures that the plant can be safely brought to rated power and sustain power operation.

14.2.2 Organization and Staffing

The Unit 2 organization for testing and interface between Niagara Mohawk, SWEC, and General Electric is shown in Figure 14.2-7 for the preoperational and preliminary testing phase and startup and testing.

The staffing plan for personnel assigned during the preoperational and startup testing phases is shown in Figure 14.2-6.

14.2.2.1 Principal Testing Personnel

The principal testing personnel have overall responsibility for the administrative and technical control and conduct of the test program. Testing and/or direction of testing will be performed by testing personnel. Principal testing personnel also have responsibility for development and writing of test procedures. These efforts are directed by the



Nine Mile Point Unit 2 FSAR

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Nine Mile Point Unit 2 FSAR

Station Superintendent, who reports directly to the General Superintendent Nuclear Generation. The Station Superintendent has the responsibility and authority to conduct the test program in conformance with the Unit 2 Project Manual and related documents associated with accomplishing the Startup and Test Department objectives. He has the authority to implement an organization to undertake the responsibilities assigned to start up and test the plant. Reporting directly to the Station Superintendent is the Supervisor of Operations and the Startup Manager.

The station organization for Startup and Testing is divided into two internal groups: the Startup and Test group and the Plant Operations group. These two groups are responsible for all matters relating to preliminary, preoperational, acceptance, and startup testing and operation of Unit 2.

Both groups consist of personnel drawn from various organizations such as SWEC, GE, outside consultants, NMPC Nine Mile Point Nuclear Site departments, and corporate engineering groups.

The test group consists of the Startup Manager, Test Group Managers, Test Engineers, and technical staff as required (Figure 14.2-7). The operations group includes the Supervisor of Operations, Assistant Supervisor of Operations, Station Shift Supervisors, Assistant Station Shift Supervisors, and operators, as discussed in Chapter 14 (Figure 14.2-7).

14.2.2.1.1 Station Superintendent

The Station Superintendent is responsible for the conduct of the startup and test program and operation of the station. Chapter 13 describes the Station Superintendent's operational responsibilities. The Station Superintendent manages the testing effort through the Startup Manager. The Station Superintendent is responsible for the technical adequacy of the test program and compliance with NRC regulations and licensing commitments.

14.2.2.1.2 Startup Manager

The direct responsibilities of the Startup Manager are:

1. Review and approve all staffing within the Startup and Test Department and appropriate procedures associated with the preliminary, preoperational,



Nine Mile Point Unit 2 FSAR

and initial startup test phases of the test program.

2. Report test program status and problems to the Project Director and Station Superintendent.
3. Serve as manager of the Unit 2 test staff and provide liaison with other NMPC departments.

Nine Mile Point Unit 2 FSAR

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Nine Mile Point Unit 2 FSAR

4. Coordinate with station department heads in job assignments of plant staff to accomplish test program objectives.
5. Ensure Startup and Test Department conformance to the Unit 2 quality assurance plan.
6. Serve as Chairperson of the Joint Test Group (JTG).
7. Accept the release and turnover of structures, systems and components to NMPC.

14.2.2.1.3 Test Group Managers

The Test Group Managers' direct responsibilities include:

1. Manage preliminary and preoperational test phases.
2. Permanent member of the JTG.
3. Supervise the startup and test program staff.
4. Coordinate training and qualification of NMPC test group personnel.
5. Evaluate test results.
6. Obtain necessary review and approval of test results.
7. Provide support as necessary during the startup test phase.
8. Direct the activities of test engineers.

14.2.2.1.4 Test Engineers

The direct responsibilities of the Test Engineers are:



Nine Mile Point Unit 2 FSAR

1. Develop testing activity milestones, target dates, and manpower requirements. Prepare Level III test schedule.

Nine Mile Point Unit 2 FSAR

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Nine Mile Point Unit 2 FSAR

2. Follow construction process to support test program requirements.
3. Ensure that preliminary, preoperational, and, as directed, startup test procedures are available for review and approval.
4. Identify special or temporary equipment or services needed to support testing.
5. Assure that testing identification tags are implemented to support testing and turnover.
6. Supervise test activities.
7. Evaluate test results.

14.2.2.1.5 Supervisor of Operations

The direct responsibilities of the Supervisor of Operations and operating staff are provided in Chapter 13.

14.2.2.2 NMPC Station Staff

The Unit 2 station staff consists of those employees who staff, maintain, and operate Unit 2. Chapter 13 details their duties and general responsibilities. The station staff, under the technical direction of the Station Superintendent, supports the test program by operating and maintaining all structures, systems, and components following turnover to NMPC. The station staff, to the maximum extent practicable, provides technical and manpower support to the Startup and Test Department during the test program. Following receipt of the operating license, the station staff assumes complete control and responsibility for the total operation and maintenance of the plant.



Nine Mile Point Unit 2 FSAR

14.2.2.3 SWEC Advisory Operations Support

14.2.2.3.1 Project Advisory Engineer

The Project Advisory Engineer (PAE) is the senior SWEC Advisory Operations Division (AOD) representative on site. The PAE reports to the Startup Manager. The responsibilities of the PAE include:

1. Provide technical support and liaison with AOD and SWEC engineering.
2. Represent SWEC on the JTG.
3. Manage the SWEC AOD Cherry Hill Operations Center (CHOC) support.

14.2.2.3.2 SWEC Advisory Operations Engineers

The SWEC Advisory Operations Engineers are directly responsible for:

1. Writing assigned test procedures.
2. Reviewing test procedures.
3. Supervising and performing testing as required.

11

Nine Mile Point Unit 2 ESAR

14.2.2.4 General Electric Company

14.2.2.4.1 GE Site Operations Manager

The GE Site Operations Manager (SOM) is responsible to the Startup Manager and Station Superintendent for technical directions during the preoperational and initial startup phases of the test program. Specific responsibilities are:

1. Act as liaison with GE on testing matters involving GE-supplied equipment.
2. Review preoperational and initial startup tests with emphasis on GE nuclear steam supply system (NSSS).
3. Assist in data reduction, analysis, and evaluation for preoperational and initial startup tests.
4. Act as permanent member of JTG.
5. Provide administrative support and supervision to GE onsite personnel involved in the test program.

14.2.2.4.2 Operations Superintendent

The GE Operations Superintendent is responsible to the GE Site Operations Manager for the administrative and technical supervision of GE Shift Superintendents. The Operations Superintendent works directly with the NMPC Supervisor of Operations and Startup Manager and provides GE technical direction to the operating organization.

14.2.2.4.3 GE Shift Superintendents

The GE Shift Superintendents provide technical direction to the Unit 2 Shift Operations personnel in the testing and operation of GE-supplied systems. They provide 24-hr/day shift coverage as required, beginning with fuel loading. They report to the GE Operations Superintendent. The responsibility of all operations of the assigned shift is maintained by the Station Shift Supervisor as described in Table 13.1-3.

14.2.2.4.4 GE Lead Engineer Startup Test, Design, and Analysis

The GE Lead Engineer Startup Test, Design, and Analysis is responsible to the GE SOM for supervising the GE startup test, design, and analysis engineers; for verifying core physics parameters and characteristics; and for documenting that the performance of the NSSS and its components conform to test acceptance criteria. He works with the



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Nine Mile Point Unit 2 FSAR

appropriate members of the station operating organization to coordinate and effect implementation of the startup test program instrumentation, including special test equipment required to confirm these acceptance criteria.

14.2.2.4.5 GE Startup Test, Design, and Analysis Engineers

The GE startup test, design, and analysis engineers assist in the execution of the initial startup test phase of the test program.

14.2.2.5 Consultants/Contractors

Services of consultants or contractors may be acquired to provide support for the test program. Such services are under the direct control of the Station Superintendent or Startup Manager.

14.2.2.6 Joint Test Group

The JTG is the primary review and approval organization during the preliminary and preoperational test program. The JTG consists of the following members:

1. NMPC Startup Manager (chairperson).
2. SWEC PAE.
3. GE SOM.
4. NMPC Test Group Manager.
5. NMPC Quality Assurance representative (not a voting member).
6. Site Technical Superintendent.
7. Supervisor of Operations.

The functions and responsibilities of the JTG are as follows:

1. Conduct activities in conformance with the Unit 2 Project Manual.
2. Review and approve selected preliminary, and all acceptance and preoperational, test procedures prior to testing (Section 1.10, TMI Task I.C.7).
3. Review, approve, and administer all revisions to JTG approved test procedures.

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Nine Mile Point Unit 2 FSAR

4. Review and approve the results of selected preliminary, and all acceptance and preoperational tests.
5. Determine the disposition of test deficiencies.
6. Determine retests or supplemental tests as required.

14.2.2.7 Other Review Groups' Support of Testing

Both the Site Operations Review Committee (SORC) and the Safety Review and Audit Board (SRAB) are utilized to review and approve startup test activities. The responsibilities and authorities of these groups are described in Chapter 13.

14.2.2.8 Qualification

The staffing and qualifications of the station staff are detailed in Chapter 13. The minimum qualifications of principal testing personnel involved in the preliminary test phase are in accordance with Regulatory Guide 1.58 and ANSI 3.1, 1978 (Tables 14.2-401 and 14.2-403).

14.2.3 Test Procedures

14.2.3.1 Preliminary Test Procedures

The Unit 2 Startup Administrative Procedures (SAPs) establish the methods for preparing, receiving, approving, revising and controlling preliminary test procedures. The SAPs specify procedure content, format and style guidelines.

14.2.3.2 Acceptance, Preoperational, and Initial Startup Test Procedures

The Unit 2 Startup Administrative Procedures (SAP) manual establishes the method for preparing, reviewing, approving, revising, and controlling acceptance and preoperational test procedures. The SAP manual specifies procedure content, format, and style guidelines. The Site Administrative Procedures (APNs) provide similar controls over the startup test procedures.

Test procedures are developed by the responsible Test Engineers and operations personnel. Each test procedure is prepared using pertinent reference material such as design and test specifications from GE, design documents from SWEC, safety analysis report, technical specifications, and applicable regulatory guides. Figure 14.2-1 shows the review cycle for selected preliminary and all preoperational



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Nine Mile Point Unit 2 FSAR

and acceptance test approval. Figure 14.2-2 shows the review cycle of initial startup test procedures.

14.2.4 Conduct of Test Program

14.2.4.1 Conduct of Preliminary Phase Testing

Preliminary phase testing begins after construction installation has been completed on systems or subsystems. Testing and administrative control of the preliminary testing program is in accordance with the Startup Administrative Procedures (SAPs). SAP and tests and procedures are controlled documents. These preliminary test procedures are generic in nature such that step-by-step testing details are determined by the test engineer during the conduct of the test. Such testing details are reviewed with the test results. Test results obtained during the preliminary testing phase may be used in place of retesting during the preoperational test phase provided that the preliminary test procedures and test results have been reviewed and approved in accordance with Figures 14.2-1 and 14.2-3, respectively. Such preliminary testing shall be identified in the preoperational test procedure.

To ensure that the preliminary test results are valid at the time of preoperational testing, work on equipment during the preliminary test phase will be authorized by the Test Group Manager and controlled in accordance with the SAPs. Control will be accomplished by the use of two mechanisms, a work-controlled document and equipment tagging. The work-controlled document establishes the scope, inspection and testing required by the additional work. Equipment tagging will ensure that personnel are alerted that work performed affecting this equipment will require Test Group Manager's authorization.

14.2.4.2 Conduct of Preoperational Phase Testing

Preoperational phase testing commences after preliminary testing on individual components, systems, and subsystems is complete. Testing is performed by the Startup and Test Department under administrative controls established in the SAP manual. Testing is performed in strict adherence to approved written test procedures. The test procedures and the SAP manual are controlled documents.

Nine Mile Point Unit 2 ESAR

Table 14.2-401

Qualifications of Principal Testing Personnel

| <u>Title</u> | <u>Minimum Qualifications</u> |
|---|--|
| Startup Manager | See ANSI N45.2.6-1978 Section 3
and ANSI 3.1 1978 - 4.2.4 |
| Test Group Manager | See ANSI N45.2.6-1978 Section 3
and ANSI 3.1 1978 - 4.3.2 |
| Test Engineers | See ANSI N45.2.6-1978 Section 3 |
| In addition, Level II and Level III test engineers will meet ANSI 3.1 1978
Section 4.3.2 minimum qualifications. | |



Nine Mile Point Unit 2 FSAR

TABLE 14.2-402

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Nine Mile Point Unit 2 ESAR

TABLE 14.2-402 (Cont)

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Nine Mile Point Unit 2 ESAR

TABLE 14.2-402 (Cont)

Nine Mile Point Unit 2 FSAR

TABLE 14.2-402 (Cont)



Nine Mile Point Unit 2 FSAR

TABLE 14.2-403

QUALIFICATION OF GE PRINCIPAL TESTING PERSONNEL

The GE Site Operations Manager meets the equivalent of ANSI N45.2.6, 1978, discussed for a Level III person. The Operations Manager is normally present for preoperational testing and will be SRO certified under the GE certification program.

The GE Operations Superintendent meets the equivalent of ANSI N45.2.6, 1978, discussed for a Level III person or a Level II person. The Operations Superintendent is normally present for preoperational testing and will be SRO certified under the GE certification program.

The GE Shift Superintendents meet the equivalent of ANSI N45.2.6, 1978, discussed for a Level II person. They will also be SRO certified under the GE certification program.

The GE Lead Startup Test Design and Analysis Engineer meets the equivalent of ANSI N45.2.6, 1978, discussed for a Level III person or a Level II person. He is qualified at the time of appointment to the position.

The GE Startup Test Design and Analysis Engineers meet the equivalent of ANSI N45.2.6, 1978, discussed for a Level II person.

The GE Startup Control and Instrumentation Engineers meet the equivalent of ANSI N45.2.6, 1978, discussed for a Level II person.

The GE Startup Chemist meets the equivalent of ANSI N45.2.6, 1978, discussed for a Level II person.

In addition, all G.E. personnel listed above will meet ANSI 3.1 - 1978 Section 4.3.2 minimum qualifications.

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TABLE 13.1-3 (Cont)

Supervisor Computer Operations and Maintenance Nuclear

This supervisor is responsible for the proper operation of the station process computer, the security computers, the document control computer, the outage management and scheduling computer, site applications on the Niagara Mohawk system computers and the operation and maintenance of the various mini and micro computers used on the site for process and results applications.

Supervisor Technical Support Nuclear

The Supervisor Technical Support Nuclear is in charge of the coordination of the activities of the General Site Technical Support Staff. This staff is composed of technical assistants of diverse training and experience, who are assigned on special projects within the Technical Department. The Supervisor Technical Support Nuclear is the Operations Assessment Coordinator and supervises the activities of the ISEG.

Supervisor Fire Protection Nuclear

The Supervisor Fire Protection Nuclear performs general planning, testing, inspection and overseeing of the station fire protection functional activities. Periodic testing of the systems and portable equipment is performed by shift fire brigade personnel or technicians under the direction of the Shift Supervisor or Supervisor Fire Protection.

Superintendent Chemistry and Radiation Management

The Superintendent Chemistry and Radiation Management is responsible for the chemistry, radiochemistry, radiation protection and emergency planning requirements of the stations. He is the "Radiation Protection Manager," defined in ANSI 18.1-1978. He also coordinates the chemical and radiochemical aspects of the effluent and environmental monitoring to ensure the maintenance of site criteria. Under his direction are the Supervisor Chemistry and Radiation Protection, Supervisor Radiological Support, and the Environmental Coordinator.

Supervisor Chemistry and Radiation Protection

The Supervisor Chemistry and Radiation Protection has direct responsibility for the Radiochemistry and Radiation Protection Technicians and for the operation of the Chemistry and Radiochemistry Laboratory, radiation



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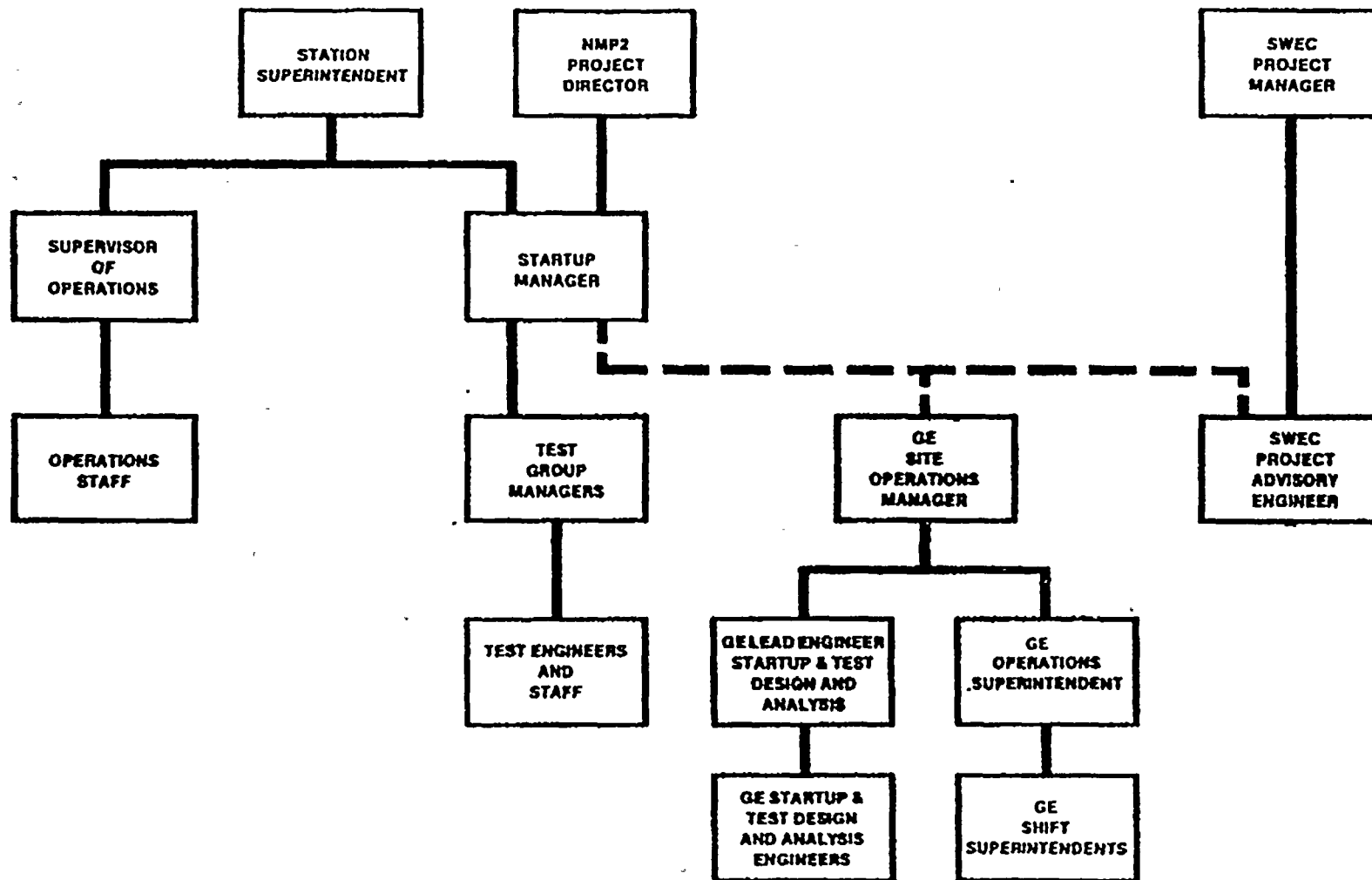


FIGURE 14.2-7

UNIT 2 STARTUP ORGANIZATION

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



TABLE 13.1-4

NUMBER AND QUALIFICATIONS OF SITE PERSONNEL

| <u>Title</u> | <u>No. Site Personnel</u> | <u>Section of ANSI/ANS 3.1-1978 Containing Qualifications</u> |
|--|---------------------------|---|
| General Superintendent | 1 | 4.2.1 |
| Nuclear Generation | 1 | NA |
| Administrative Assistant for Administration and Planning | | |
| Station Superintendent | 2 | 4.2.1 |
| Site Maintenance | 1 | 4.2.3 |
| Superintendent Nuclear | | |
| Technical Superintendent Nuclear | 1 | 4.2.4 |
| Superintendent Training Nuclear | 1 | 4.2.2 |
| Superintendent Chemistry and Radiation Management | 1 | 4.4.3 or 4.4.4 |
| Supervisor Operations Nuclear | 2 | 4.2.2 |
| Assistant Operations Supervisor Nuclear | 4 | 4.2.2 |
| Supervisor Radwaste Operations | 2 | 4.3.2 |
| Assistant Supervisor Radwaste Operations | 2 | 4.3.2 |
| Superintendent Training Nuclear | 1 | 4.2.2 |
| Supervisors Training Nuclear | 2 | 4.3.1 |
| Assistant Supervisors Training Nuclear | 14 | 4.3.1 |
| Asst. Supt. Training Nuclear | 1 | 4.2.2 |
| Supervisors Training Nuclear | 6 | 4.3.2 |
| Assistant Supervisors Training Nuclear | 5 | 4.3.2 |

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Nine Mile Point Unit 2 FSAR

TABLE 13.1-4 (Cont)

| <u>Title</u> | <u>No. Site
Personnel</u> | <u>Section of
ANSI/ANS 3.1-1978
Containing
Qualifications</u> |
|--|-------------------------------|---|
| Training Specialist
Nuclear | 11 | NA |
| Emergency Coordinator | 1 | NA |
| Supervisor Chemistry
and Radiation Protection | 1 | 4.4.3* or
4.4.4 |
| Unit Radiation Protection
Supervisor | 2 | 4.4.4 |
| Unit Chemistry Supervisor | 2 | 4.4.3 |
| Supervisor Instrument
Support | 1 | 4.7.2 |
| Supervisor Radiological
Support | 1 | 4.6.1* |
| Dosimetry Coordinator | 1 | 4.7.2 |
| ALARA Coordinator | 1 | 4.7.2 |
| Radiation Protection
Technicians | As needed | 4.5.2 |
| Chemistry and Radio-
chemistry Technicians | As needed | 4.5.2 |
| Environmental Protection
Coordinator | 1 | 4.7.2 |
| Respiratory Protection
Coordinator | 1 | 4.7.2 |

*When one of these individuals temporarily fills the position of Superintendent Chemistry and Radiation Management, the individual will meet the qualifications of ANSI 3.1-1979 (draft), Section 4.4.4.



Nine Mile Point Unit 2 FSAR

TABLE 13.1-4 (Cont)

| <u>Title</u> | <u>No. Site
Personnel</u> | <u>Section of
ANSI/ANS 3.1-1978
Containing
Qualifications</u> |
|---|-------------------------------|---|
| Radiological Engineer | 1 | 4.7.2 |
| Assistant Station
Shift Supervisor Nuclear | 16 | 4.3.1 |
| Station Shift
Supervisor Nuclear | 16 | 4.3.1 |
| Chief Shift Operator | 12 | 4.3.1 |
| Nuclear Axuiliary
Operator E | 24 | 4.5.1 |



Nine Mile Point Unit 2 FSAR

TABLE 13.1-4 (Cont)

| <u>Title</u> | <u>No. Site
Personnel</u> | <u>Section of
ANSI/ANS 3.1-1978
Containing
Qualifications</u> |
|--|-------------------------------|---|
| Superintendent Technical
Services Nuclear | 1 | 4.2.4 |
| Supervisor Computer
Operations and
Maintenance Nuclear | 1 | 4.7.2 |
| Assistant Supervisor
Computer Operations and
Maintenance Nuclear | 1 | 4.7.2 |
| Supervisor Reactor
Analysis | 1 | 4.4.1 |
| Unit Supervisor
Reactor Analysis | 2 | 4.4.1 |
| Supervisor Instrument
and Control Nuclear | 1 | 4.4.2 |
| Unit Supervisor
Instrument and Control
Nuclear | 2 | 4.4.2 |
| Supervisor Technical
Support Nuclear | 1 | 4.7.1 |
| Superintendent Inservice
Inspection Nuclear | 1 | 4.7.2 |
| Inservice Inspection
Specialist | 6 | 4.7.2 |
| Construction Engineer
Nuclear | 2 | NA |
| Superintendent Mechanical
Maintenance Nuclear | 1 | 4.2.3 |



Nine Mile Point Unit 2 FSAR

TABLE 13.1-4 (Cont)

| <u>Title</u> | <u>No. Site
Personnel</u> | <u>Section of
ANSI/ANS 3.1-1978
Containing
Qualifications</u> | |
|---|-------------------------------|---|---|
| Superintendent Electrical
Maintenance Nuclear | 1 | 4.2.3 | |
| Supervisor Mechanical
Maintenance Nuclear | 2 | 4.3.2 | |
| Technical Assistant | 7 | 4.7.1 | . |
| Supervisor Electrical
Maintenance Nuclear | 2 | 4.3.2 | |
| Assistant Supervisor
Mechanical Maintenance
Nuclear | 6 | 4.3.2 | |
| Assistant Supervisor
Electrical Maintenance
Nuclear | 3 | 4.3.2 | |
| Supervisor Fire
Protection Nuclear | 1 | 4.7.2 | |
| Assistant Supervisor
Fire Protection Nuclear | 2 | 4.7.2 | |
| Planning Coordinator
Nuclear | 1 | NA | |
| Supervisor Office Nuclear | 1 | NA | |



APPENDIX 13A
TYPICAL RESUMES



Nine Mile Point Unit 2 FSAR

APPENDIX 13A

TYPICAL RESUMES

This appendix contains typical resumes of the incumbents in representative site organizational positions listed in Table 13.1-3. The following resumes are typical for those personnel utilized for the operational and technical support functions. As indicated by the work experiences recorded on the resumes, personnel move through developmental assignments with increasing responsibility. It is not NMPC's intent to retain these personnel indefinitely in these positions.



NINE MILE POINT UNIT 2 FSAR

RESUME

STATION SUPERINTENDENT

EDUCATION:

High School: Jamesville-DeWitt

Major: Math/Science
Graduated - June 1967

Clarkson College of Technology
Potsdam, New York

Degree: Bachelor of Science
Mechanical Engineering
May 1971

MILITARY:

U.S. Army (Reserve)
Infantry/Drill Sgt.
7/71 - 2/72 Active

EXPERIENCE:

January 1, 1983 - Present

Station Superintendent - 9 Mile Point #2

Direction of the Operations Department and Test Group for the formulation and implementation of a preoperational and startup testing program. Interface with contractor organizations, Nuclear Construction, Nuclear Generation and Nuclear Licensing departments for design, construction, licensing and testing of 9MP#2. Ensure adequate staffing and training for station personnel. Responsible for the Startup and Test budget and control thereof.

November 1, 1981 - December 31, 1982

Supervisor Operations - Nuclear - 9 Mile Point #2

Direction of Operations Department activities for design reviews, procedure generation, licensing (FSAR) document reviews. Department staffing, promotion, normal department head administrative functions. Interface with contractor organizations, NMPC project organizations, site Nuclear Generation departments for design, construction, testing activities of 9 Mile Point #2.



NINE MILE POINT UNIT 2 FSAR

STATION SUPERINTENDENT(CONT.)

October 1, 1979 - November 1, 1981

Supervisor Operations - Nuclear - 9 Mile Point #1

Direction of the Operations Department in all activities related to the safe and efficient operation of the 9 Mile Point #1 Nuclear Station. Perform all administrative duties normally associated with the department head position.

June 1, 1976 - October 1, 1979

Superintendent Maintenance - Nuclear

Direction of Maintenance Department activities related to the mechanical and electrical maintenance of the 9 Mile Point #1 and James A. FitzPatrick Nuclear Stations. Perform all administrative duties normally associated with the department head position.

May 1975 - June 1, 1976

Assistant Maintenance Supervisor

Supervision of Maintenance activities at 9 Mile Point #1, Unit 1 and James A. FitzPatrick Nuclear Power Plant.

February 1972 - May 1975

Assistant to the General Superintendent Nuclear Generation

Supervisor of operation and maintenance activities of Radioactive Waste Disposal System at 9 Mile Point #1.

General engineering, supervision of maintenance related activities at 9 Mile Point #1.

Supervision of pre-operational testing activities at James A. FitzPatrick Nuclear Power Plant.

Start-Up test engineer for Start-Up Test Program at James A. FitzPatrick Nuclear Power Plant.

Supervision of Maintenance activities at 9 Mile Point #1 and James A. FitzPatrick Nuclear Power Plant.

PAST EXPERIENCE:

Hold current Senior Reactor Operator License at 9 Mile Point Nuclear Station #1 (since May, 1976).



Nine Mile Point Unit 2 FSAR

RESUME

GENERAL SUPERINTENDENT - NUCLEAR GENERATION

EDUCATION

Champlain College, Plattsburg, NY, 1946-1948.
University of Missouri, B.S., Physics, 1952.
Western New York Nuclear Research Center, University of
Buffalo, Isotopes Institute, June 1964.
Columbia University, Industrial Management Forum, January -
June 1965.

EXPERIENCE

March 1980 to Present

General Superintendent Nuclear Generation - Nine Mile Point
Nuclear Site.

February 1972 to March 1980

Station Superintendent - Nine Mile Point Unit 1.

September 1966 to February 1972

Assistant Superintendent - Nine Mile Point Unit 1.

November 1965 to September 1966

On-the-job training (4 months) Big Rock Point (4 months)
EVESR.

May 1964 to November 1965

Niagara Mohawk Power Corporation - Assigned to Project
Engineering Dept. to assist in design of Nine Mile Point
Nuclear Station and assist in the procurement and training
of plant staff and personnel.

1958 to May 1964

Niagara Mohawk Power Corporation - Superintendent Hydro and
Substations, Eastern Division. Responsible for operation
and maintenance of all hydroelectric generating plants and
the operation, maintenance and construction of all
substations.



Nine Mile Point Unit 2 FSAR

GENERAL SUPERINTENDENT - NUCLEAR GENERATION (Cont)

1956 to 1958

Niagara Mohawk Power Corporation - Assistant Superintendent of Hydro and Substations, Eastern Division.

1954 to 1956

Niagara Mohawk Power Corporation - Equipment Engineer. Design of cathodic protection system for gas transmission system; hydro and substation maintenance and construction and equipment inspection at vendor plants.

1952 to 1954

Niagara Mohawk Power Corporation - Student Engineer. Fourteen months' operation and maintenance training at Amsterdam Steam Station. Gas operations 3 months.

1948 to 1950

General Electric Company, General Engineering Lab - Laboratory Assistant. Radio noise and field strength measurements.

1943 to 1946

U.S. Navy, Electronics Mate 2/C - Maintenance of submarine radar, sonar and communications equipment.



Nine Mile Point Unit 2 FSAR

RESUME

TECHNICAL SUPERINTENDENT - NUCLEAR

EDUCATION

State University of New York Maritime College, Ft. Schuyler, NY (Nuclear), 170 credits: Engineering Degree - B.S. - (57 cr.) including thermal engineering; electrical, marine, and nuclear engineering; diesel engines; steam generators and turbines; Physics - (31 cr.) including engineering physics, electronic and solid state physics, atomic and nuclear physics, neutron physics, nuclear reactor physics, and nuclear reactor design; Mathematics - (21 cr.) calculus I, II & III, computers, differential equations, advance engineering math I and II; Chemistry and Radiochemistry - (11 cr.); Nuclear Metallurgy - (4 cr.); Naval Architecture - (3 cr.); Naval Science - (18 cr.); Humanities - (21 cr.); Phys Ed. - (4 cr.).

Scholastic Record - Graduated with an average of 2.9/4.0, Fourth semester (Admiral's list - 3.5/4.0), Fifth semester (Dean's list - 3.2/4.0), Eighth semester (Dean's list - 3.4/4.0).

G.E. Dresden Rx. Simulator training, General Physics Corporation training program, fire and respiratory equipment schools, and license regual. schools, Professional Engineering refresher course - 12 weeks (1975), G.E. Station Nuclear Engineering course - 5 weeks (1978), G.E. Core Manager training - 4 months (1978).

FEDERAL LICENSES

Third Assistant Engineer, No. 120410, Senior Reactor Operator (Nine Mile Point Nuclear Station), No. SOP 1992.

COMMISSION

Served in Naval Reserve 30 days/yr. in 1973, 1974, and 1975. Presently LT - inactive reserves.

PROFESSIONAL ORGANIZATIONS

American Nuclear Society



Nine Mile Point Unit 2 FSAR

TECHNICAL SUPERVISOR - NUCLEAR (Cont)

EXPERIENCE

1981 to Present

Technical Superintendent - Manages technical services groups, fire department, Planning and Modifications Department, Inservice Inspection Department, and general office, which includes Document Control.

1980 to 1981

Superintendent of Technical Services - Managed Instrument and Control, computer, Technical Support, and Reactor Analysis groups.

1978 to 1980

Supervisor of Reactor Analysis - Responsible for all reactivity manipulations within the reactor core. Worked three months in San Jose, California with General Electric Core Management Group. Experience gained involved reactor core licensing, day-to-day BWR core recommendations to several reactors in the United States and projects using G.E.'s 3-D reactor computer simulator.

1977

Refueling Outage - Supervised Feedwater Sparger replacement.

1973 to 1977

Station Shift Supervisor (Nuclear) - The SSS during his shift is responsible for all running machinery and the safety of the plant. He must be able to read and analyze construction, electrical, system prints, pump curves, etc. Personnel supervised range from nine men to 30 depending on reactor operating conditions.

Niagara Mohawk Power Corp., Lycoming, N.Y.

1972

Assistant to the Superintendent, jobs included:

- Writing operating procedures.
- Developed Rx. containment valve test procedure.



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Nine Mile Point Unit 2 FSAR

TECHNICAL SUPERVISOR - NUCLEAR (Cont)

- Revising and updating functional tests performed at Nine Mile.
- Converted Station chart system to proper engineering units.
- Shift Supervisor of reactor refueling operations, job entailed thorough knowledge of refueling tools, nuclear fuel, neutron instrumentation, and reactor core construction.

OPERATING EXPERIENCE

Practical experience with fossil fuel steam power plant - 1300 psi and 650 psi plants aboard Naval Ships, four six-week cruises aboard training ship Empire State IV. During latter two cruises, I received the rate of Cadet Division Officer and performed the duties of supervising groups of underclassmen during maintenance and operations. In the second six-week cruise, I was in charge of ship's water: directly responsible for records, storage, and chemical treatment of all potable, reserve feed, and boiler water. In the laboratory portions of the courses taken, experimental practice with: Computer - IBM 1130 digital computer operation and programming. Engineering - drafting, metal cutting and lathe operation, pumps and flow meters, D.C. and A.C. motors, power supplies, and circuits, vacuum tube and solid state electronic devices. Nuclear - solid state counting systems with various detectors, multichannel radiation analyzers, neutron activation analysis, Pu-Be sources, water moderated subcritical reactor measurements, reactor operation and control with Leeds and Northrup reactor simulator, radioisotope separation and identification, metallurgy of reactor materials, crystallography and photomicrography.



Nine Mile Point Unit 2 FSAR

RESUME

STATION SHIFT SUPERVISOR - NUCLEAR

EDUCATION

Fulton High School - Diploma - 1961 - 1965

USN Machinist Mate "A" School - 1965 - 1966 (5 Months)

US Naval Nuclear Power School - 1966 - 1967 (6 Months)

US Naval Nuclear Power Training Unit - 1967 (6 Months)

General Physics Basic Introduction Course - 1972 (2 Months)

General Electric BWR Technology Course - 1972 (1 Month)

General Electric Simulator Training - 1972 (1 Week)

Niagara Mohawk BWR Technology Course - 1973 (4 Weeks)

General Electric BWR Technology Course - 1973 (2 Weeks)

General Physics BWR Technology Course - 1974 (4 Weeks)

TVA BWR Simulator, Soddy-Daisy, Tennessee, 1977 - 3 days

Sept. 1980 - Present

Matriculated at Rochester Institute of Technology in a Bachelor of Technology Program in Mechanical Engineering Technology and have completed the following courses:

CTAM 201 - Tech Math

CTAM 202 - Tech Math

CTEM 420 - Intro to Solutions of Engineering Problems

CTEM 421 - Solutions of Engineering Problems

CTEM 422 - Solutions of Engineering Problems

CTIL 201/206 - Elements of Electricity and Electronics

CTIL 202/207 - Elements of Electricity and Electronics

CTIL 203/208 - Elements of Electricity and Electronics

CHGS 211 - Intro to Psychology

CTCP 301/306 - Physics Lecture/Lab

CTCP 302/307 - Physics Lecture/Lab

CTIE 321 - Digital Systems

CTID 201 - Engineering Drawing

CTID 202 - Engineering Drawing

CTID 203 - Engineering Drawing

CTIL 221 - Mechanical Components & Mechanism

CTIL 222 - Mechanical Components & Mechanism

CTIL 301/306 - Machines & Power Systems

CTIL 302/307 - Machines & Power Systems

Nine Mile Point Unit 2 FSAR

STATION SHIFT SUPERVISOR - NUCLEAR (Cont)

EDUCATION (Cont)

General Physics Corp. License Training Course, Sept. 1980 - Feb. 1981, 520 hours, Obtained RO License

TVA BWR Simulator, Soddy-Daisy, Tennessee, 7 days - Jan 1981, Hot License Certification Program

GE BWR Simulator, Morris, Ill., 3 day Requal Program, Nov. 1981

Past and Present

I have participated in the NRC approved Operator Requalification Program which consists of 32 hours of formal classroom instruction every five weeks, 3 days of Simulator Training, and a comprehensive written and oral examination once every year since licensing.

EMPLOYMENT

Niagara Mohawk Power Corporation, Syracuse, NY

1983 to Present

Position: Station Shift Supervisor

Duties: Working at Nine Mile Point Unit #2, as S.S.S. writing Pre-Operational Tests, Operating Procedures, Special Procedures and performing design reviews on plant systems for Nine Mile Point Unit #2, and directing others in the sample activities.

1978 to 1983

Position: Chief Shift Operator

Duties: Working at Nine Mile Point Unit #2 as CSO writing Pre-Operational Tests, Operating Procedures, Special Procedures and performing design reviews on plant systems for Nine Mile Point Unit #2.

1973 to 1978

Position: Chief Shift Operator - J.A.F.

Duties: As CSO, in charge of the operation of the Control Room. From this position, the CSO is able to control the starting and stopping of all major pieces of equipment and the control of the reactor and turbine. Other duties included the directing and training of operators of lower grade.

Nine Mile Point Unit 2 FSAR

STATION SHIFT SUPERVISOR - NUCLEAR (Cont)

EMPLOYMENT (Cont)

1970 to 1973

Position: Auxiliary Operator "C" and Nuclear Operator "E"

Duties: Proper operation of all equipment and systems: systems evaluation for proper performance, and directing the activities of the other operators on my shift.

1968 to 1969

Worked as a temporary switchboard operator at Oswego Falls Hydro Power Plant East in Fulton, New York, for Niagara Mohawk.

1967 to 1968

Black Clawson - Dilts Division

Worked as an assembler putting together large complex machinery which included all hydraulics and wiring installations.

1965 to 1967

U.S. Navy

Schooling and operating experience on steam plant aboard ship.

Nine Mile Point Unit 2 FSAR

RESUME

SUPERVISOR OPERATIONS - NUCLEAR

EDUCATION

Utica Free Academy
Utica, New York
Graduated 1965

State University New York
Maritime College, Fort Schuyler
Bronx, New York
Graduated 1969

B.S. Nuclear Science
Third Asst. Engineer License-Unlimited
Steam and Diesel
Ens. U.S. Naval Reserve

BWR Simulator Training or Requal
Annual 1973-1981
GE BWR Simulator, Morris
or
TVA BWR Simulator, Chattanooga

NMPC Management Training
3 One week modules
1974-1977

Project/2 School
Project Software Inc.
Feb. 1974

Project/2 Advanced School
Project Software Inc.
March 1974

Kepner Tregoe
Feb. 1982

Professional Management Training Seminar
Clarkson College for NMPC
May 1982-6 CEU Credits

MILITARY

USNR Retired LT.
REserve duty as X.O., C.O., Admin Asst. various
Units 1969 - 1980



Nine Mile Point Unit 2 FSAR

SUPERVISOR OPERATIONS - NUCLEAR (Cont.)

EMPLOYMENT

Niagara Mohawk Power Corporation
Syracuse, New York

January 1983 - Present

Operations Supervisor - Unit #2

Perform responsibilities as Department Head for Nuclear Operations at the Nine Mile Point Nuclear Station Unit #2. In this position I supervise the operation of the unit to insure activities performed are in accordance with approved procedures and that testing and operating evolutions are in conformance with NRC regulations and technical specifications. Duties also include coordination of maintenance, modification and design and operation review functions associated with this unit. The Ops Supervisor is also responsible for the selection, assignment, transfer, training, licensing and discipline of operations employees.

During the Startup Program for Unit #2 the Ops Supervisor is also responsible for the production and control of operations procedures including Admin., preoperational, operating, surveillance, preventive maintenance and emergency procedures.

The Ops Supervisor coordinates with the Supervisor of Testing to insure that the Startup Program is accomplished in a timely and cost effective manner.

I also fulfill duties of the Station Superintendent in his absence and hold and maintain an NRC Senior Reactor Operator License and Certification to ANSI 45.2.6.

November 1981 - January 1983

Supervisor Testing - Unit #2

At Nine Mile Point Nuclear Station Unit #2, formed and directed a new department to perform testing for the facility. In this position I was responsible for coordination of the Preliminary, Preoperational, and Initial Startup test phases. Acted as alternate chairman of the Joint Test Group. Supervised the Testing Coordinator, Test Engineers (31), and Schedule Group (5). Initiated and coordinated all outlines and procedures for the testing program, including Contract changes with SWEC, Admin procedures, training and certification programs. Total group will grow to 250 man force by 1984.

August 1980 - November 1981

Planning Coordinator - Unit 1

A new position in the organization with responsibility for the development of policies and procedures required for all scheduling efforts. Developed an Outage Control Plan, defining the extend,



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Nine Mile Point Unit #2 FSAR

SUPERVISOR OPERATIONS - NUCLEAR (Cont.)

content and distribution of all schedule and control information regarding conduct of outages at the Unit. This department grew to control all scheduled work at the Unit year-round.

October 1976 - August 1980

SSS - Acting Outage Coordinator

Same as above and acted as SRO on shift during non outage times.

August 1974 - October 1976

SSS

As SRO on shift, directed shift activities, ensured that plant was operated safely and within license and technical specification limits and in accordance with approved procedures. Acted as Refuel Coord. during refuel outages.

March 1972 - August 1974

Asst. to Superintendent

To assist the Operations Supervisor in scheduling of operators, etc. To perform investigations and evaluations of a technical nature concerning station or component performance. Design modification supervision as well as writing test and operation procedures. Coordinate changes to operating procedures. Acted as first Refuel Coordinator 1974.

June 1969 - March 1972

Third Asst. Engineer
American Export Lines
New York, New York

Watch standing Engineer on various vessels, in charge of engine room operations.

SS FLYING CLOUD

SS CONTAINER FORWARDER

SS CONTAINER DISPATCHER

Also acted as inport layup Engineer for 4 mo. period in which I was only person onboard vessel and responsible for equipment maintenance and operation, water tight integrity, etc.



Nine Mile Point Unit 2 FSAR

RESUME

UNIT SUPERVISOR REACTOR ANALYST - NUCLEAR

EDUCATION

Fayetteville Manlius High School, Manlius, New York, Regent's Diploma, 1975

University of Rochester, College of Engineering (Mechanical & Aerospace Science), B.S. in Mechanical Engineering, 1979

New York State E.I.T. Cert., 1980

G.E. Station Nuclear Engineer Course, 1981 - 6 weeks

NMPC Management Training, 1982 - 1 week

EMPLOYMENT

Niagara Mohawk Power Corp., Syracuse, New York

August 1984 to Present

Position: Unit Supervisor Rx Analyst

Duties: Supervise execution of various rx. physics tests, determine modifications to control rod pattern and core flow to make up for fuel depletion, monitor fuel thermal limits, provide backup calculations to process computer, oversee special nuclear material accounting, perform manual heat balance.

1980 to August 1984

Position: Reactor Analyst

Duties: Supervise execution of various rx. physics tests, determine modifications to control rod pattern and core flow to make up for fuel depletion, monitor fuel thermal limits, provide backup calculations to process computer, oversee special nuclear material accounting, perform manual heat balance.

1979 to 1980

Position: Jr. Engineer - Gas Engineering

Duties: Design natural gas regulating and metering stations, (16 months) design station and supply system modifications, perform computer flow simulation studies, define system capacity to supply Albany & Oswego Steam Stations for electricity generation, data collection and load forecasting, fuel cell locations.



Nine Mile Point Unit 2 ESAR

RESUME

SUPERVISOR MECHANICAL MAINTENANCE - NUCLEAR

EDUCATION

Seneca Vocational BFLO NV, 1939-1941.
High School Equivalence BFLO, 1963.

IBEW Union Nuclear Training School, First Aid, Nine Mile
Point School for Nine Mile Point startup.

Radiation Protection, Fire School Crane Mechanical Seals,
Limitorque Operators Crane Equipment.

EXPERIENCE

Maintenance-Nuclear (Maintenance B).
Supervisor Mechanical, Nine Mile Point Station.
Nine Mile Point, Dunkirk Station.
Nine Mile Point, Huntly Station BFLC.
Navy Reserves, 1948-1952.
Navy, 1944-1946 (1950-1952 Active Duty).
Air-Conditioning, Motor Repair Shop, 1941-1942.



Nine Mile Point Unit 2 FSAR

RESUME

SUPERVISOR REACTOR ANALYSIS

EDUCATION

Brooklyn Technical, Brooklyn, NY, Graduated - June 1969

U.S. Naval Academy, Annapolis, MD, B.S. - Oceanography (4 yrs), June 1973

Station Nuclear Engineer's Course, General Electric, 4 Weeks, Sept. 1981

BWR Core Management Training, General Electric, Feb. - April 1982

Navy Nuclear Power School, Bainbridge, MD, Nov. 1973 - May 1974, 6 Months

Prototype Training, Schenectady, NY, May 1974 - Nov. 1974, 6 Months

U.S.S. Bainbridge (CGN25), November 1974 - March 1977

Engineering officer of the Watch (EOW) during refueling overhaul and start-up testing. Machinery Division officer, Qualified Engineer Officer by Naval Reactors.

Damage Control Assistant School, Treasure Island, CA, March 1977 - May 1977

U.S.S. South Carolina CGN37, May 1977 - June 1978, Damage Control Assistant with collateral assignment as Nuclear Training Officer.

EMPLOYMENT

Niagara Mohawk Power Corporation, Syracuse, NY

January 1981 to Present

Position: Supervisor Reactor Analysis

Duties: Responsible for the safe and economical use of the reactor core and directing the Operations Dept. in achieving that objective.

Pennsylvania Power & Light Company, Allentown, PA

July 1979 to December 1980

Position: Senior Nuclear Support Engineer

Duties: Responsible for evaluating industry information applicable to the company's BWR; help direct the company's availability program; plus miscellaneous projects to support the Vice-President Nuclear (i.e. PRA, NPRDS & ASME Turbine Testing).

Air Products & Chemicals, Inc., Allentown, PA,

Position: Project Engineer

Duties: Managed the construction of two industrial gas plants including design, equipment procurement, mechanical & electrical construction & cost accounting.

Nine Mile Point Unit 2 FSAR

RESUME

SUPERVISOR TECHNICAL SUPPORT - NUCLEAR

EDUCATION

Greenville Central High School, Greenville, NY, Regent's Diploma, 1969.

Clarkson College of Technology, Potsdam, NY, Bachelor of Mechanical Engineering, 1973.

New York State E.I.T. Certification, 1973.

Babcock and Wilcox Simulator (1 wk) 1975.

R.O. Certified (not licensed) 1979 (16 wk) Yankee Rowe Course Average - 94%.

Surry Simulator (3 wk) 1980.

Fully Qualified Shift Technical Advisor, Yankee Rowe, 1980.

NMPC Management Training (1 wk) 1982.

EMPLOYMENT

February 1981 to Present

Niagara Mohawk Power Corporation, Syracuse, NY

Duties: Form and supervise an inplant engineering group to provide engineering services, including operational engineering assessment; performance improvement; conceptual design; design review; and support for maintenance, operations, instrumentation and control, and chemistry departments.

January 1980 to February 1981

Yankee Atomic Electric Company, Framingham, MA

Position: Senior Shift Technical Advisor (Yankee Rowe)
Duties: STA on shift, technical guidance and training of other STAs, along with responsibilities listed below under Reactor Engineer. Taught thermodynamics, Rx theory, fluid flow, and heat transfer for STA and RO/SRO requalification.



Nine Mile Point Unit 2 FSAR

SUPERVISOR TECHNICAL SUPPORT - NUCLEAR (Cont)

April 1977 to January 1980

Position: Staff Reactor Engineer (Yankee Rowe).

Duties: Supervision of startups, shutdowns, and refueling; ISI coordinator; physics testing; Appendix J testing; eddy current examination; review of design modifications.

June 1976 to April 1977

Position: Electrical Maintenance Engineer (Yankee Rowe).

Duties: Electrical maintenance engineering; conceptual design, procurement, and installation of electrical modifications.

November 1975 to June 1976

Position: Systems Engineer (Yankee Atomic Engineering Office)

Duties: System engineering in support of design modifications.

June 1973 to November 1975

Babcock and Wilcox, Inc., Lynchburg, VA.

Position: Transient Analysis Engineer

Duties: Perform hand and computer calculations of reactor transients for design input. Developed Btu limit curves used in all 177 fuel assembly B&W reactors. Performed steam generator tube rupture, loss of feedwater, and pressurizer sizing analyses.

Nine Mile Point Unit 2 FSAR

RESUME

EMERGENCY COORDINATOR - NUCLEAR

EDUCATION

Siena College, Loudonville, NY, B.S. in Biochemistry, 1972.
Class Standing: 4th in class of 350; GPA 3.70
Awards: Who's Who in American Universities, Alpha Kappa
Alpha - College Honor Society, 1972 Biology Award, Delta
Epsilon Sigma - National Honor Society for Catholic
Universities.

State University of New York at Upstate Medical Center,
Syracuse, NY, (30 credit hour of graduate studies).

Xerox Professional Selling Skills Program, 1975.

U.S. Naval Nuclear Propulsion Plant Qualification Program,
1976.

U.S. Naval Engineering Laboratory Technician Program, 1977.

Effective Writing and Presentation, 1978.

G.E. Sponsored Health and Safety Courses held at Harvard
School of Public Health:

Basics in Industrial Hygiene Measurements, 1979.

Fundamentals of Industrial Hygiene, 1979.

NRC/EPA Sponsored Radiological Emergency Response Co-
ordinators Training Program, 1980.

New York State Academy of Fire Science Sponsored
Scott Breathing Apparatus Maintenance Course, 1980.

EMPLOYMENT

Niagara Mohawk Power Corporation, Syracuse, NY

May 1980 to Present

Position: Nine Mile Point Emergency Coordinator

Duties: Ensure the coordination of the Nine Mile Point
Nuclear Station (NMPNS) Site Emergency Plan with NMPNS
Security Plan, NMPNS Fire Protection Plan and corresponding
Federal, State, and County Emergency Plans.

Ensure the Emergency Plan Implementing Procedures are
coordinated and properly interfaced with other procedures



Nine Mile Point Unit 2 FSAR

EMERGENCY COORDINATOR - NUCLEAR (Cont)

including administrative, fire, security, chemistry and radiation protection, special operating, and training.

Assist the Training Superintendent in coordinating emergency planning related specialty training.

Ensure the information, data, and procedures detailed in the NMPNS Unit 2 construction site Emergency Procedures and the James A. FitzPatrick Nuclear Power Plant Emergency Plan are consistent with the NMPNS Site Emergency Plan.

Coordinate the planning and scheduling of all emergency planning related drills and exercises.

Ensure the maintenance and inventory of all emergency planning-related equipment and supplies.

Maintain awareness of current and proposed federal regulations that may effect emergency planning.

Coordinate and provide interface with state and local governments with respect to:

Funding of state and local emergency planning efforts.

Accident assessment.

Public notification and education.

Emergency communications.

Exercises and drills.

December 1978 to May 1980

General Electric Company, Knolls Atomic Power Laboratory
Schenectady, NY

Position: Kesselring Site Industrial Hygienist

Duties: Provide technical information to Manager of Health and Safety concerning current health and safety standards. Inspect workplace environments for safe work practices, as well as monitoring atmospheres for levels of toxic materials, noise, radiation, and other physical agents. Administer company programs dealing with the control of asbestos, mercury, noise, eye protection, respiratory protection, and confined space entry. Review all requests



Nine Mile Point Unit 2 FSAR

EMERGENCY COORDINATOR - NUCLEAR (Cont)

for material purchases and subcontractor work specifications for health and safety concerns. Maintain a current listing of material safety data sheets for all potential toxic materials utilized. In addition, ensure the maintenance of all pertinent survey, equipment calibration, and medical records. Conduct an extensive employee education program to promote safety awareness among exempt, nonexempt, and hourly employees.

May 1976 to December 1978

Position: Chemistry and Health Physics Instructor

Duties: Instruct naval and civilian engineers in the areas of corrosion chemistry and health physics. Prepared, evaluated, and updated training programs and lessons to ensure a quality education for all trainees. Maintained qualifications as an engineering laboratory technician on one of the training prototypes. This ensured theoretical and practical knowledge in the areas of radiological controls, primary chemistry controls, and secondary chemistry controls. Assumed the responsibility of training group supervisor during the absence of immediate manager.

April 1974 to May 1976

American Cyanamid Company, Lederle Laboratories
Pearl River, NY

Position: Medical Representative

Duties: Personally contacted physicians and nurses to explain and expand upon products related to their practice, while constantly reeducating and maintaining new knowledge on products and medical theories. Maintained a total of 65 active retail and institutional accounts, with an annual budget in excess of \$400,000.00. Acted as a liaison between physicians and company research laboratory to resolve problems associated with their practice. Assisted immediate manager with the interviewing and training of prospective and new employees. Involved in the development and direction of quarterly sales meetings.



Nine Mile Point Unit 2 FSAR

RESUME

SUPERVISOR INSTRUMENT AND CONTROL - NUCLEAR

EDUCATION

Black River High School, Regents Diploma, 1957.
State University of New York at Canton, Canton, NY, A.T.C.,
A.A.S. in Electrical Technology.

Night Classes in surveying, building construction, and
strength of materials.

ADDITIONAL TRAINING/EDUCATION

"GE Mac" Instrumentation - West Lynn, MA.
BWR School, TIP Machine Equipment Class, and IRD Balancing
Class at Nine Mile Point.

MILITARY

United States Air Force, Air Navigation School (5 months)
1961.

EXPERIENCE

Niagara Mohawk Power Corporation, Syracuse, NY

March 1976 to Present

Position: Supervisor Instrument and Control (I&C)
Department-Nuclear

Duties: Establish departmental policies and practices.
Conduct interviews - hiring of I&C technicians and admin-
ister disciplinary action when appropriate.

April 1973 to March 1976

Position: Assistant I&C Supervisor

Duties: Assigned job functions to technicians. Generated
procedures. Reviewed records of completed work. Maintained
schedules.

January 1964 to April 1973

Position: Draftsman B - C, Stations Electrical Design Group
Duties: Created finished drawings/tracings of electrical
control systems for electrical substations and generation
facilities.



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Nine Mile Point Unit 2 FSAR

RESUME

SUPERVISOR INSTRUMENT AND CONTROL - NUCLEAR (Cont)

July 1963 to January 1964

Position: Draftsman B

Duties: Revised/updated (pole and secondary) electrical distribution maps.

November 1959 to July 1963

New York Air Brake Co., Watertown, NY

Position: Electronic Technician

Duties: Calibrated/repairs various instrumentation.
Assembled test equipment and performed tests on hydraulic pumps.

July 1959 to November 1959

Sperry Gyroscope Co., Long Island, NY

Performed electronic testing on prototype equipment and modified to meet specifications.

ADDITIONAL INFORMATION

United States Air Force, 1 1/2 yr, ground-to-air radio maintenance.

25 yr hobby/part-time work, home entertainment repair.

Heathkit microprocessor training (self-study).



Nine Mile Point Unit 2 FSAR

RESUME

SUPERINTENDENT TECHNICAL SERVICES - NUCLEAR

EDUCATION

Massena Central High School, Massena, New York, Regents Diploma - Math, Science and Language Honors - 1967.

Clarkson College of Technology, Potsdam, New York, B.S. in Electrical Engineering (Power Computers) May 1971

University of Southern California, Los Angeles, CA, M.S. in Systems Management - January 1975.

Presently in postgraduate study leading to PhD in Electrical Engineering at Syracuse University, Syracuse, New York.

National Science Foundation Grant in Geology, SUNY at Potsdam, New York (High School Summer Session) - June 1965 - August 1965.

Syracuse University, University College, Refresher Course for Professional Engineering examination - January 1976 - April 1976.

George Washington University, Washington, DC - Continuing Engineering Education in Minicomputers Short Course, April 14 - April 18, 1975.

George Washington University, Washington, DC - Machine and Assembly Language Programming Course (IBM 360, CDC), June - July 1975.

Niagara Mohawk Power Corporation - Dyl260 Programming July, 1976.

Niagara Mohawk Power Corporation/General Electric Joint Course in Electric Utility Systems and Practices Engineering Course, October 1976 - March 1977.

General Electric, BWR Services Computer Training in BUCLE (Back Up Core Limits Evaluation Pgm) Using Mark III Time Share, December 1976.

Microdata Corporation, Reality Computers for Data Base Management Applications, Irvine, CA.

Honeywell Process Control Division, Phoenix, AZ - Programming and Operating Systems Course in Process Assembly Language for a GE/PAC 4000 Series.

Data General, Nova 1200 Computer System TNG in Programming & Operating Systems and Nova 1200 Maintenance, Southboro, MA.

Zytron Data Systems - Document Control & Computer Retrieval Applications, Cupertino, CA

General Electric, Station Nuclear Engineering Course, at job location by General Electric.



Nine Mile Point Unit 2 FSAR

SUPERINTENDENT TECHNICAL SERVICES - NUCLEAR (Cont.)

General Physics Operator Training for Senior Operator License.

Kepner-Trego Training - 1982

Professional Management Skills Training - 1982

MILITARY SERVICE

Presently Cpt. USAR, Signal Corps.

U.S. Army Infantry Officer Tactics and Training, Indiantown Gap, PA - June - July, 1971.

U.S. Army Signal Officer Advanced Course - 1 year - 1981.

U.S. Army Signal Officer Basic Course (Communication - Electronics), Fort Gordon, GA - October, 1971 - December, 1971.

U.S. Army Communication Center Operations Course, Fort Monmouth, New Jersey - December, 1971 - February, 1972.

U.S. Army Safety Management Correspondence Courses, Fort Benjamin Harrison, In. - March, 1972 - May, 1972.

PROFESSIONAL SOCIETIES

Institute of Electrical and Electronic Engineers - Member IEEE Computer Society & Industrial, Electronics & Control Instrumentation Society, Association of Computing Machinery - Member.

Member Honeywell USER Group-Process Control & Data General USER Group, General Electric BWR Process Computer Group.

HONORS, AWARDS, TECHNICAL PAPERS AND LICENSES

Eagle Scout, 1964

United States Army 4 years ROTC Scholarship 1967

National Science Foundation Grant 1965

New York State Regents Scholarship 1967

Clarkson College Kaplan Scholarship 1967-1970

United States Meritorious Service Medal (U.S. Army) 1974

New York State License #022192 - Intern Engineer

Technical Paper presented to Honeywell USER Group Symposium, 1978

Technical Paper, GE, BWR Process Computer Conference, June 1979

Technical Paper, GE, BWR Process Computer Conference, June 1980

Technical Paper to Honeywell DMS USER Mtg., June 1980

Senior Reactor Operators License - 1982 - #SOP 4262

Technical Moderator, Honeywell PMS Conference - June 1982



Nine Mile Point Unit 2 FSAR

SUPERINTENDENT TECHNICAL SERVICES - NUCLEAR (Cont.)

SPECIAL SKILLS (COMPUTER SYSTEMS & POWER SYSTEMS)

Computer Programming Knowledge of:

Fortran IV, Basic, Data/Basic, Several Assembly Languages
Dylacor FYL 260, IBM JCL
Honeywell/GE PAC 4040, 4060, 440 computers-Mini (Process Control), 4500 Dual System
Data General Nova 1200-Mine Dual System
Microdata, Reality Computer-Mini (Data Base Management Use)
IBM 360, 370 Time Share, Prime 750, Honeywell level 6
Data 100 Remote Job Entry, Modicon 484 Programmable Controller
GE Mark III Time Share Systems

Experience with Software House Proprietary Programs From:

General Electric - Nuclear Applications
Signatron-Security Systems Applications
Honeywell - SEER/SCADA
Data General - Nova Systems/Eclipse
Zytron Data Systems - Data Base Mgmt. & Computer Retrievals
Project 2 - PERT/Project Mgmt.
Microdata - Reality

Hardware Knowledge of Digital and Analog Systems (real time)

EMPLOYMENT

Site Nuclear Group, Niagara Mohawk Power Corporation
Nine Mile Point Unit #1, Lycoming, New York 13093

1982 - Present

Position: Technical Services Superintendent - Nuclear

Duties: Under the general direction of the Tech. Supt. - Nuclear generation

The T.S. Supt. manages and coordinates the overall activities of the Instrument and Control, Technical Support, the Results and Reactor Analysts and the Computer Operations and Maintenance Departments which provide all of the technical and professional services for all nuclear stations on the Nine Mile Point Site. Participates as a member of the Site Operating Review Committee responsible for reviewing all site activities, problems and corrective actions. Reviews all technical matters providing guidance. Examines appropriate methodologies on techniques to maintain state of the art technologies to obtain greater plant performance. Insures compliance to all regulations, standards and policies established by company, state and federal regulatory agencies. Maintains a Senior Operator License for each plant at Nine Mile Point. Required to be on call for the plants at least one week every month.



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Nine Mile Point Unit 2 FSAR

SUPERINTENDENT TECHNICAL SERVICES - NUCLEAR (Cont.)

1979 - 1982

Position: Computer Supervisor - Nuclear

Duties: Responsible department manager for all Computer and Communications Systems & Applications for all Nuclear related activities at Niagara Mohawk's nuclear facilities, Nine Mile Point Unit #1 (operating) and Unit #2 (under construction). Plans, directs and controls a professional staff of hardware and software computer engineers as well as a technician staff of electronics personnel. Project manager for Process Computer Replacement for Unit #1 plant. Project leader for security systems upgrade as well as NMPC project rep for Unit #2 Design Reviews of Computer Systems. Work with several AE, NSSS Vendors and other corporate personnel on Tech. Support Center, new plant designs, INPO, NRC and other governmental commitments.

1976 - 1979

Duties: Performed duties as supervisor responsible for all computer related activities, hardware and software at Unit #1 and Unit #2, Nine Mile Point Nuclear Generation Stations. Worked as an analyst, programmer and application engineer for nuclear-related activities which would be effectively utilized on the available Computer Systems. The Honeywell Process Computer monitored all nuclear activities of the reactor as well as performed interactive calculations and corrections to all plant processed. The Data General/Signatron Security Computer monitored all personnel activities throughout the plant and plant grounds.

The Microdata/Reality Computer served as the on-site data base/reports generating system for all plant records and reports. GE, Mark III Time Share, IBM Time Share System Data 100 Remote Job Entry Systems and HP Microprocessing System were under my supervision. In addition to being responsible for maintaining these systems, consultation was given appropriate supervisors on additional software applications and capabilities of computer equipment available on the market for future use. Served as a project leader of a team to establish secondary applications of the data base management computer consolidate all nuclear-related computer requirements. Project Leader for process computer changeout of entire system to be installed in summer of 1980. Develop several user systems utilizing DYL 260 programming to fulfill Nuclear Regulatory commitments. Assist the Instrumentation and Control Supervisor with technical matters as they develop. Act as time share representative for the station in corporate activities related to the IBM time sharing peripherals and remote job entry station which are data linked to the corporate headquarters. Provide assistance as an alternate Site Operation Review Committee Secretary when the primary Secretary is unavailable. Presently working towards Doctorate in Electrical Engineering at Syracuse University and also Cpt. U.S. Army Reserve as electronics engineer in Communications, Electronics and Computer Systems.



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Nine Mile Point Unit 2 FSAR

SUPERINTENDENT TECHNICAL SERVICES - NUCLEAR (Cont.)

1975 - 1976

Position: Assistant to the General Superintendent of Nuclear Generation.

Duties: Performed duties as Station Modification Coordinator for all additions and design changes to Nine Mile Point #1 Nuclear Station. Verified design implementation by reviewing on-site changes with electrical, piping and instrument drawings. Provided corrections to actual design work in coordination with engineering personnel in the Corporate offices. Complied with NRC Regulatory Guides, Final Safety Analysis Reports, Station Technical Specifications and ANSI Guides to maintain project control of all phases of station modifications. Implemented Station Administrative Procedures for compliance with Nuclear Regulatory requirements of design control. Prepared reports on equipment analysis failure, nuclear plant reliability data and engineering scheduling. Assisted in the investigation and implementation of automating maintenance work requests, work status updating and reporting requirements of work utilizing IBM 370 computer software programming. Prepared modification maintenance procedures, pre-operational test procedures and portions of the plant annual report dealing with design changes and maintenance work.

Acted as Site Operations Review Committee Secretary in the absence of the principal designee. Performed duties assigned relative to special technical projects as they occurred. Also participated in the U.S. Army Reserve as a Captain.

1975

USACEEIA-CONUS, 1000 Independence Ave. S.W., Washington, DC 20314

Position: Automatic Data Processing Officer, ILT

Duties: Performed duties as project control officer for a telecommunications development group for consolidating the communication centers in the Pentagon. Monitored software development, systems engineering and system implementation in controlling the schedule taskings. Provided evaluations and analyzed test plans in consideration of management information systems. Prepared updates for the project manager on the status of all project tasks. Directed preparation of reports affecting the systems. Worked in conjunction with programmers for system design. Served as Technical Advisor for management informations system relating to the project.

1972 - 1975

Donnersberg Radio Station, 298th Signal Company, APO NY 09227

Position: Officer in Charge, Communication-Electronics System



Nine Mile Point Unit 2 FSAR

SUPERINTENDENT TECHNICAL SERVICES - NUCLEAR (Cont.)

Duties: Served as Officer in Charge of Donnersberg Radio Station Consisting of 17 microwave/tropospheric scatter systems. 1000 line primary technical control, 1 Automatic Voice Switching Center and 2-500KW Uninterruptible power generators. Reviewed and analyzed higher command communication recommendations and developed operational standards to implement design requirements. Prepared System Engineering Plans and Procedures. Received recognition for developing a Fast Plan in Autovon Circuit Restoral. Evaluated procedural impacts on the DSC in the European Theater of operation. Received the Meritorious Service Medal for my efforts.

1971 - 1972

Officer Training Schools (See educational background)

Position; Student - ILT

Duties: Upon entrance of United States Army Military Service, I completed training in infantry tactics and leadership, signal officer training in the operations of AM, FM, SSB, HF, VHF, and LOS communications and communication center operations (ADP and Message Processing). Additional training in Communication Security and Audio-Visual techniques was also required.

1969 - 1971

Student final year of college

Clarkson College of Technology, Potsdam, New York

Duties: While completing the last year of four years of college in electrical Engineering, I participated in the study of a special four man project in Simulation of High Voltage Direct Current Transmission through use of a special inverter system as well as an analog computer. I also attended the New York State Power Pool for orientation of their operation and the Leroy High Voltage Insulator Plant for orientation. I utilized the IBM-360 Digital Computer for college studies w/FORTRAN language.

1969

Position: Student Engineer

Duties: During this summer employment period, system planning and load forecasting techniques were utilized in the system studies department by me. Projects in substation design and generation capabilities were developed. Implementation of future systems was checked by utilization of Digital and Analog Computers as well as GE Time-Sharing Systems. Orientation in transmission Design Techniques was accomplished. Computer aided decision making methods and power system analysis was used greatly utilizing Ansi Fortran & Basic.



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Nine Mile Point Unit 2 FSAR

RESUME

Supervisor Testing - Nuclear

EDUCATION

BSEE - January 1972, Syracuse University

AAS - June 1970 Mohawk Valley Community College

9 graduate hours in Electrical Engineering Syracuse University

Professional Management Development Class - 1982

New York State E.I.T.

EMPLOYMENT

January 1983 to Present

Position: Supervisor Testing - Niagara Mohawk Power Corporation, Nine Mile Pt. Nuclear Station Unit #2. Responsible for testing and preparation for testing of the preoperational and startup test phases of the Unit. This includes development of administrative and testing procedures, scheduling testing activities, supervising the test group and coordinating and interfacing with various individuals from NMPC, SWEC Advisory Operations, and General Electric Operations.

July 81 to December 1982

Position: Test Coordinator - Niagara Mohawk Corporation, Nine Mile Point Nuclear Station Unit #2. Responsibilities primary involved direct supervision of the test engineers familiarizing them with specifications, drawings, and other project documentation. Reviewed project contracts and commitments on specific items required for the performance of preliminary, preoperational and startup testing and developed a responsibility matrix to help coordinate activities between SWEC, NMPC and General Electric. Helped develop Startup Administrative procedures required to provide administrative and project direction to Startup and Test Organization during preoperational and certain phases of preliminary testing.

June 1980 to June 1981

Position: Staff Engineer - Niagara Mohawk Power Corporation, Syracuse New York. Primary responsibilities included direction and control of all modification work required on the Nine Mile Point Unit #1 security system. This included CCTV, access control and perimeter detection system upgrades. Provided design and startup support for a new security facility on the site. Developed specifications for a replacement system for Unit #1 with future expansion capability for Unit #2. Provided direction to design engineering and field supervision to I & C technicians and others during modification and installation work.



Nine Mile Point Unit 2 FSAR

Supervisor Testing - Nuclear (Cont.)

December 1976 to May 1980

Position: Electrical Design Engineer - Niagara Mohawk Corporation, Syracuse New York. Designed, procured and provided limited installation and Startup support on various Fossil and Nuclear Generation Projects. Worked on many projects such as ILRT system, security system, process computer and lighting systems. Specified many components such as motors starters, control equipment, transformers and computer equipment.

October 1975 to June 1976

Position: Electrical Engineer - Creative Electric Inc.- Auburn, New York. Involved in prototype and testing of electronic equipment. This included design specification and environmental performance testing. Have worked with and to military specifications and drawings. Have written reports, submitted to the Government, concerning maintainability prediction maintainability demonstration, reliability and non-standard components. Have written a major portion of the technical manual on a radiation indicator being built for the Government.

May 1975 to September 1975

Position: Diagnostic Programmer - Cogar (Subsidiary of Singer Corp.) Utica, N.Y. Have written and modified test programs to aid in troubleshooting and verifying the operation of computer peripheral devices to include CRT screen, keyboard, line printer and magnetic tape units. These programs were written in Cogar assembler language and are used by both manufacturing and Field Service Personnel.

May 1973 to July 1975

Position: Electrical Test Engineer - General Electric Company Syracuse, New York. Cabinet Test Engineer responsible for assembly and testing of a digital signal processor radar cabinet. Have developed special interface test equipment necessary for computer controlled cabinet test. Have done extensive digital systems simulations using both assembly level and fortran languages. I have written highly structured system test programs as well as special purpose system control programs. Held position of maintenance director for two Varian 73 mini-computers, responsible for maintenance and facility requirements.

July 1972 to May 1973

Position: General Electric Company Utica, New York. Have designed, built and tested UHF power amplifier circuits to be used in a power combiner. Evaluated and tested prototype memory devices and developed test equipment, to include basic logic and timing circuits to facilitate testing. Performed written evaluation of various methods of feeding a phased array antenna, which included evaluation of a single large power amplifier, several smaller amplifiers with their outputs combined together and individual amplifiers feeding



Nine Mile Point Unit 2 FSAR
Supervisor Testing - Nuclear (Cont.)

each element of a phase array antenna. Presented findings at IEEE conference.

1968 - 1969

Position: Engineering Technician, Summer Employment - Carrier Corporation Syracuse, New York. Assisted engineers in setting up tests for compressors, valves, and other air conditioning equipment. Designed and constructed a device to test durability of a compressor seal. Prepared written report of test for project engineer.



NINE MILE POINT UNIT 2 FSAR

RESUME

SITE SUPERINTENDENT-MECHANICAL MAINTENANCE-NUCLEAR

EDUCATION

Oswego High School, Oswego, NY 13126, Graduated: 1968

S.U.N.Y. at Alfred, Alfred, NY 14802, Major: Mechanical Technology, Degree: Associate of Applied Science, 1970

Rochester Institute of Technology, Rochester, NY 14623, Major: Mechanical Technology, Degree: Bachelor of Technology, 1973

EMPLOYMENT

Niagara Mohawk Power Corporation, Syracuse, NY

Nine Mile Point Nuclear Station #1

January 1983 to Present

Position: Superintendent Mechanical Maintenance

Duties: To administer all mechanical maintenance programs, construction activities and janitorial activities for any generation station, facility or structure associated with Nine Mile Point.

March 1981 to January 1983

Position: Supervisor Mechanical Maintenance

Duties: To supervise and coordinate all mechanical maintenance programs, construction activities and janitorial activities for any generating station, facility or structure associated with Nine Mile Point.

September 1980 to March 1981

Position: Senior Technical Assistant

Duties: On assignment to the Site Maintenance Department, responsible for special projects, construction activities and various mechanical maintenance problem areas associated with the generating station.

October 1979 to September 1980

Position: Technical Assistant to General Superintendent

Duties: On assignment to the Site Maintenance Department, responsible for special projects, construction activities and various mechanical maintenance problem areas associated with the generating station.



NINE MILE POINT UNIT 2 FSAR

SITE SUPERINTENDENT-MECHANICAL MAINTENANCE-NUCLEAR (Cont)

EMPLOYMENT (Cont)

September 1978 to September 1979

Project Engineer; System Project Management Dept.
Construction Engineer; System Project Management Dept.

Rochester Gas & Electric Corporation, 89 East Avenue, Rochester, NY 14646

September 1970 to August 1977

Duties: Exposed to all phases of Mechanical Engineering in the Gas Division.

Northern Steep Corporation, Oswego, NY

Summer 1970

Duties: Employed as welder in a metal fabricating shop.



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Nine Mile Point Unit 2 FSAR

RESUME

SUPERVISOR MECHANICAL MAINTENANCE - NUCLEAR

EDUCATION

Rochester Institute of Technology, Rochester, NY, Bachelor of Technology in Mechanical Technology, (High Honors, 3.52).

State University of New York at Alfred, Alfred, NY, Associate of Applied Science in Mechanical Technology.

WORK EXPERIENCE

September 1977 to Present

Niagara Mohawk Power Corporation, Syracuse, NY

Position: Project Engineer, System Project Management Department; Construction Engineer, System Project Management Department; Technical Assistant to General Superintendent of Nuclear Generation, Electric Operations Department.

September 1970 to August 1977

Rochester Gas and Electric Corporation, Rochester, NY

Exposed to all phases of Mechanical Engineering in the Gas Division.

1970 (Summer)

Northern Steel Corporation, Oswego, NY

Employed as a welder in a metal fabricating shop.

September 1969 to June 1970

State University of New York, Alfred, NY

Employed as a Resident Advisor in a co-ed dormitory.

1969 (Summer)

M. Falise Excavating, Oswego, NY

As a heavy equipment operator, I had the opportunity to observe some of the phases of large scale construction.



Nine Mile Point Unit 2 ESAR

SUPERVISOR MECHANICAL MAINTENANCE - NUCLEAR (Cont)

February 1966 to August 1969

Key Drug Store, Oswego, NY

Clerk, Stockboy.



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Nine Mile Point Unit 2 FSAR

RESUME

SITE ELECTRICAL MAINTENANCE SUPERINTENDENT - NUCLEAR

Joined Niagara Mohawk Power Corporation as an Electrical Design Engineer in March 1979. Offers experience as an Electrical Maintenance Superintendent, Electrical Design Engineer, Electrical Startup Test Engineer, and a Nuclear Plant Engineer. College education emphasize power engineering.

EMPLOYMENT

January 1982 - Present

Niagara Mohawk Power Corporation, Syracuse, NY

Employed as Electrical Maintenance Superintendent at Nine Mile Point Nuclear Station Unit #1 and Unit #2. Responsibilities include directing the electrical maintenance work to insure safe and efficient operation at Unit #1 and following preoperational testing at Unit #2. The Electrical Maintenance Department responsibilities includes preventative maintenance, corrective maintenance and plant modifications. Position responsibilities include budgeting, procedure development and review, department planning, scheduling, interfacing and monitoring of electrical contractors, and department emergency response. For a one year period, was on a special assignment as a Test Engineer at General Electric, San Jose, California, on Nine Mile Point Unit #2 Control Room Complex.

March 1979 to January 1982

Joined Niagara Mohawk Power Corporation as an Electrical Design Engineer at its engineering headquarters in Syracuse and was promoted to Lead Startup Quality Assurance Engineer in July 1981. Major responsibilities in electrical design included fire protection modifications at Nine Mile Point Unit #1 and electrical design review of architect-engineer drawings and specifications for the Radwaste Solidification and Storage Building at Nine Mile Point Unit #1. Responsibilities of the design of the fire protection system included the procurement of nine control panels, procurement of fire detection equipment, layout of the fire detection, supervision of designers and drafting technicians and installation drawings and specification for the above equipment.

March 1976 to March 1979

Employed by the Long Island Lighting Company as an Electrical Startup Test Engineer at the Shoreham Nuclear Power Station. Responsible for specific systems from initial construction to the point where the system is demonstrated under all design conditions and operational modes. Responsibilities include coordinating and supervising the completion of construction, individual component testing, initial system operation, development and implementation of engineering changes, preparation and

22
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Nine Mile Point Unit 2 FSAR

SITE ELECTRICAL MAINTENANCE SUPERINTENDENT - NUCLEAR (Cont)

performance of preoperational and acceptance tests, analyzing system test results and supervision of technicians and operators. System responsibilities include battery power system, motor control centers, low voltage switchgear, emergency diesel generators, and main generator exciter. Was certified as a Level III Test Engineer in accordance with ANSI N45.2.6.

June 1973 to March 1976

Employed by Bettis Power Laboratory (division of Westinghouse) as a Nuclear Plant Engineer at the A1W Naval nuclear prototype plant. Completed Engineering Officer of the Watch, Nuclear Plant Engineer, and Shift Supervisor qualification at the A1W prototype. These programs consisted of training in the theory and operation of a reactor plant, in plant administration, and in operations supervision. Responsibilities as a Nuclear Plant Engineer include reliable, safe and effective operation of a reactor plant, personnel scheduling and training, directing special tests, supervision and coordination of plant, corrective and preventive maintenance. Particular operations performed included reactor and steam plant startups, shutdowns, heatups and cooldowns, plant casualty training, individual component operations.

EDUCATION

Completed a three-month summer program designed to cover various aspects of utilities including system studies, distribution engineering, transmission systems, utility operation, and organization.

BSEE (with distinction), Clarkson College of Technology, 1973: Special emphasis in areas related to power engineering included studies in transmission and distribution engineering, power control, and power system analysis. Received the A. Raymond Powers Award for the outstanding senior in power engineering field.

MEMBERSHIP

Institute of Electrical and Electronic Engineers (Power Section, Industry Applications Section)
Alpha Epsilon Pi (Social Fraternity)
Phi Kappa Phi (National Academic Honor Society)
Tau Beta Pi (National Engineering Honor Society)
Eta Kappa Nu (Electrical Engineering Honor Society)
IEEE Generating Station Design Subcommittee

LICENSE

Professional Engineers License (New York)



Nine Mile Point Unit 2 FSAR

SITE ELECTRICAL MAINTENANCE SUPERINTENDENT - NUCLEAR (Cont.)

SPECIAL TRAINING

| <u>Type of Training</u> | <u>Year Taken</u> | <u>Duration</u> | <u>Administered By</u> |
|--|-------------------|---|---------------------------|
| Bettis
Atomic Power
Laboratory
Nuclear
Plant
Engineering
School | 1973 | 6 months at
40 hour weeks
(Full Time) | Westinghouse |
| Navy AIW
Prototype
Engineering
Officer of
the Watch
Qualification | 1974 | 6 months at
60 hour weeks
(Full Time) | Westinghouse |
| Westinghouse
AIW
Prototype
Nuclear
Plant
Engineering
Qualification | 1974 | 3 months
(Part Time) | Westinghouse |
| Westinghouse
AIW
Prototype
Shift
Supervisor
Qualification | 1975 | 3 months
(Part Time) | Westinghouse |
| General Electric
Alterrex
Excitation
System
Training | 1976 | 4 Day
Seminar | General Electric |
| IRD
Vibration
Analysis | 1976 | 2 Day | IRD Mechanalysis,
Inc. |



Nine Mile Point Unit 2 FSAR

SITE ELECTRICAL MAINTENANCE SUPERINTENDENT - NUCLEAR (Cont.)

| <u>Type of Training</u> | <u>Year Taken</u> | <u>Duration</u> | <u>Administered By</u> |
|--|-------------------|-----------------------|---------------------------|
| Limatorque
Motor
Operated
Valves | 1977 | 1 Day
Seminar | Limatorque |
| GE BWR
Desgin
Orientation | 1977 | 3 week
Seminar | General Electirc |
| National
Electrical
Coil Motor
and Generator
Seminar | 1978 | 5 Day
Seminar | National Electric
Coil |
| Niagara
Mohawk
Engineering
Economics | 1979 | 50 hours
Classtime | Niagara Mohawk |

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Nine Mile Point Unit 2 FSAR

RESUME

SUPERVISOR CHEMISTRY AND RADIATION MANAGEMENT - NUCLEAR

EDUCATION AND TRAINING

Phoenix High School, 1960.

West Virginia University - Chemistry curriculum, 1961-1963.

Onondaga Community College, physics and chemistry courses, training courses in particle characteristics, gas chromatography, C.D. radiological monitoring, statistical quality control and sewage treatment plant operation.

Vallecitos Nuclear Center - 12-wk radiochemistry training course, Pleasanton, California, 1973.

EXPERIENCE

August 1980 to Present

Position: Supervisor of Chemistry and Radiation Protection at Nine Mile Point Nuclear Station - Reevaluation and title change of former position.

1972 to 1980

Position: Assistant Radiation Protection-Radiochemistry Supervisor

Duties: Supervision of five to ten radiation protection-chemistry technicians, supervision of station personnel in radiation protection, assisting in day-to-day station operation, and training of station personnel in radiation protection.

1968

Position: Radiation Protection Chemistry Technician

Duties: Commenced employment at Nine Mile Point Unit 1 as radiation protection chemistry technician with job duties including chemistry, radiochemistry, radiological monitoring, instrument calibrations and dosimetry.

1963 to 1968

Position: Chemical Technician

Duties: Employed as plant chemical technician at Alcan Aluminum Corporation where responsibilities were plant chemical analyses, analytical procedures development, and lubricant development.



Nine Mile Point Unit 2 FSAR

RESUME

SUPERVISOR COMPUTER OPERATIONS AND MAINTENANCE - NUCLEAR

EDUCATION

Elmira Free Academy High School, Elmira, NY, graduate, 1960.
Rochester Institute of Technology, B.S., 1965.
Clarkson College of Technology, post graduate courses.

Bell and Howell Digital Electronics Correspondence Course,
1978-1979.

LICENSES AND REGISTRATIONS

Professional Engineer (New York) 1973.

EMPLOYMENT

Niagara Mohawk Power Corporation, Syracuse, NY, Nine Mile
Point Unit 1, Lycoming, NY.

1982 to Present

Position: Supervisor-Site Computer Department
Duties: Supervise/manage computer department manpower and
budget resources.

1980 to 1982

Lead Project Electrical Engineer

1975 to 1980

Position: Associate Senior Project Electrical Engineer
Duties: Review and comment at a conceptual level on the
design of the auxiliary power system, instrument and control
systems and to provide technical input to project management
regarding purchasing and budget activities.

1970 to 1975

Position: Electrical Department Design Engineer
Duties: Performed electrical design activities, (material
procurement, design calculations, supervised drafting
activities and review design drawings) for various NM
transmission and generation projects. Design activities
were primarily related to power systems, instrumentation and
control areas.

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Nine Mile Point Unit 2 FSAR

SUPERVISOR COMPUTER OPERATIONS AND MAINTENANCE - NUCLEAR (Cont)

1965 to 1970

Position: Electrical Substation Design Engineer

Duties: Function as a Project Electrical Engineer, coordinated the design activities of structural, transmission, distribution engineering departments in the construction and design of distribution and bulk power switchyards. Also, participated in the design of bus structures, relay protection, control systems, equipment procurement, etc. for these projects.

1963 to 1965

Position: Electrician/Electrical Maintenance Department

Duties: Repair and installation of industrial machinery, troubleshooting of machinery control systems, power circuits, motor testing, preventive maintenance, etc. Machinery was of a general industrial nature, large punch presses, automatic drill presses, automatic milling machines, time clocks, battery chargers M-G sets and various assembly line test equipment (including test equipment used in military supplied items). Duties included general supervision of other maintenance department personnel, crew schedules, etc.



Nine Mile Point Unit 2 FSAR

RESUME

SUPERVISOR SCHEDULING - NUCLEAR

EDUCATION

Notre Dame High School, Utica, NY, graduate.
Graduated Mohawk Valley Community College, Utica, NY, A.A.S.
in Electrical Technology, 1973, included courses in Basic
Electronics, Industrial Electronics, and Electrical Cir-
cuitry. Additional Studies included Computer Science -
COBOL, RPG, Basic, Fortran, and Basic Assembler Language.

MILITARY BACKGROUND

Member of New York State Army National Guard - Military
Policy Company for 12 years.

Duties and responsibilities include training NCO for which
scheduling and coordination of yearly training activities
must be planned and carried out to enhance unit members
growth pattern. Additional duty of unit career counselor.

WORK EXPERIENCE

January 1975 to Present

Mohawk Data Sciences Corp., Herkimer, NY

Position: Supervisory Systems Programmer (6/77 to Present)
Duties: Duties and responsibilities of the position include
but are not limited to: supervising 5 systems programmers
for software support, scheduling work assignments to meet
varying working hours, generating emergency fixes to
customer problems, preparing and circulating software
support bulletins and highlight reports, coordinating
installation planning for field test accounts, evaluating
field test results, staff leader for training support staff,
and coordinating for all onsite support activities. Solely
responsible for supervising systems programmers for problem
resolution by scheduling and coordinating corporate
resources and channeling those activities towards one or two
major areas of concern to maximize corporate facilities.
Recently implemented problem reporting and resolution plan
which the company has adopted as part of the corporate level
policy which has increased the corporate fix capability by
more than 45 percent in the past year.



Nine Mile Point Unit 2 FSAR

SUPERVISOR SCHEDULING - NUCLEAR (Cont)

September 1975 to June 1977

Position: SQA Technical Programmer

Duties: Duties and responsibilities of a software QA programmer included creating test programs to evaluate new developmental software and related documentation, evaluating related hardware functionality using newly developed software, generating performance testing whenever related, and developing recommendations for increased software stability.

January 1975 to September 1975

Position: Manufacturing Technician I

Duties: Duties and responsibilities included troubleshooting and repairing logical circuitry for key-to-disc data entry systems with a basic knowledge of programming. Can read and understand Top Hat and Mill Spec logics.

February 1974 to November 1974

Stereo Center - New Hartford, NY

Position: Service Manager/Technician

Duties: Duties and responsibilities included scheduling and coordinating the repair work with customers, factory and store providing quick turnover time on sophisticated stereo amplifiers, pre-amps, mixers, PA systems, speakers, turntables, receivers, and varied tape player units. Troubleshoot and repair all types of above mentioned units. Schedule sufficient work load for 1 other technician. Coordinate warranty repairs and parts orders with various stereo vendors.

April 1971 to April 1974

Mohawk Data Sciences Corporation, Herkimer, NY

Position: Manufacturing Technician I

Duties: Duties and responsibilities included troubleshooting and repairing logical circuitry for varied data entry systems, multiplex key entry systems, asynchronous and bisynchronous communications interfacing units, and numerous computer peripherals. Can read and understand Top Hat and Mill Spec Logics.



Nine Mile Point Unit 2 FSAR

SUPERVISOR SCHEDULING - NUCLEAR (Cont)

June 1970 to April 1971

Kelsey Hayes Corporation, Utica, NY

Position: Machine Operator

Duties: Duties and responsibilities included working with close tolerances on varied types of milling machines and grinders in the production of steam and turbine engine blades.



NINE MILE POINT UNIT 2 FSAR

RESUME

OFFICE SUPERVISOR - NUCLEAR

EDUCATION:

Elmira Southside, Elmira, N. Y., Regents Diploma

State University of New York, Agriculture and Technical College at Alfred,
A.S. - Agriculture Engineering, 1954-1956

Clarkson College, Professional Management Development Program, 6 credit hours

Non-credit courses

Kepner - Tregoe

Oral communications - Clarkson College

Human Relations - Dale Carnegie

Motivation of employees - SUCO

Niagara Mohawk Power Corp. Night School - Industrial Electrical Distribution;
Theory of combustion; Gas Distribution and Transmission

Niagara Mohawk Power Corp. sponsored school - General Electric Commercial and
Industrial Lighting

Service Schools

Construction foreman - 29 weeks - Germany

Welding - Aberdine Proving Grounds - 8 weeks

Chemical, Biological and Radiological Warfare School, Fort Meade

MILITARY:

Branch: U.S. Army

Battalion: 432 Engineer Construction

Dates: 1950-1953

Wheel Vehicle Mechanic 9 months

Welding-Blacksmith 6 months

Heavy Equipment Operator 6 months

Construction Inspector - 1 year - includes time spent in school
(Asst. Platoon Sergeant)

EMPLOYMENT

Niagara Mohawk Power Corporation, Syracuse, NY

1983 to present

Position: Supervisor, Site Administrative Services-Nuclear



NINE MILE POINT UNIT 2 FSAR

OFFICE SUPERVISOR - NUCLEAR (Cont)

EMPLOYMENT (Cont)

1974 to 1983

Position: Office Supervisor - 9 Mile Point - JAFNPP Site

Duties: Responsible for all general office functions at the 9 Mile Point Nuclear Station and the James A. FitzPatrick Nuclear Power plant.

Member of NMPC Document Control Group.

Instituted Central File Concept, Micrographics and Computer aided indexing for Document Retrieval and Retention.

1973 to 1974

Position: Administrative Asst. to Superintendent at James A. FitzPatrick Nuclear Power Plant

Duties: Coordinated procedure writing between NMPC Operating and Stone and Webster Engr. Corp. Check Pre-operational Test Procedures as required by Plant Superintendent.

Coordinated Operating Procedure writing between NMPC Operating and Engineering. Checked Tech. Specs. and made sure all Surveillance Tests were written. Researched and organized the Original Security Procedure for JAF Nuclear Power Station.

1969 to 1973

Position: Supervisory Marketing Representative

Duties: Responsible for all the governmental accounts in Oswego district for negotiating contracts, answering questions or solving problems. Made street lighting layouts, proposals and billing negotiated with architects, consulting engineers and plant engineers on any large electric or gas loads they proposed to add to our lines.

Made necessary arrangements with the proper N.M.P.C. departments for any meeting required: example - new substations or additional large loads.

Maintained files for all correspondence on any large jobs along with dates of all meetings, what was discussed, who was present.

Furnish any assistance needed by sales representatives or customer service representatives working out of the Oswego Office.

Made studies, generated required reports on any special projects assigned to me - example-load shedding; voltage reductions; load studies; kept records of all voltage complaints and made necessary status reports. Made sure all justified complaints were corrected and customers were informed of the status of their complaint.

NINE MILE POINT UNIT 2 FSAR

OFFICE SUPERVISOR - NUCLEAR (Cont)

EMPLOYMENT (Cont)

Kept all departments informed of the progress of large projects assigned to me so our service was ready when they needed it. Issued progress reports if they were needed. Prepared and presented feasible studies on electric heating for all new industrial construction to architects, consulting engineers or owners. Made industrial lighting proposals and layouts for any customers and helped plant engineers assigned to me with any electrical or gas problem.

Have been assigned acting District Manager of Pulaski and Oswego when assigned managers were out of the district. In emergencies - contacted large customers, expedited orders to operating crews and made arrangements for meals and lodging for out of town crews.

Supervised the Marketing Dept. file to see that they were current and contained proper information. Also to see that proper reports were submitted on time.

1964 to 1969

Position: Commercial Sales Rep.

Duties: Negotiated with commercial customers, contractors, consulting engineers, etc. who were planning gas or electric installations. Made heating and lighting proposals to customers, their architects and engineers. Made rate studies and consulted with customers on electric or gas problems.

Assembled information from customer's prints and specifications and forwarded proper information so that our electric and gas engineering departments could design our facilities. Set up Sales Dept. files in the new Midtown office. Followed large jobs so that our service was available at the proper time. Checked electric heat jobs for proper installation of insulation.

1963 to 1964

Position: Sales Rep. - Potsdam

Duties: Electric heating layouts, proposals, cost estimates for customers. Called on trades to educate them to the proper application of electric heat. Negotiated extension of lines.

1956 - 1963

Position: Rural Representative - Potsdam

Duties: Promoted farm electrification. Gave technical assistance to farmers; material handling; building design for farmstead mechanization, wiring layouts, lighting layouts, heating applications, electrical safety. Represented the company with organizations interested in rural electrification; gave demonstrations and lectures; worked with trade allies; rural line extension-picking up R.O.W.



NINE MILE POINT UNIT 2 FSAR

OFFICE SUPERVISOR - NUCLEAR (Cont)

EMPLOYMENT (Cont)

Harding Lathe Co.

1953-1954

Position: Machine tool demonstrator

1949

Farming

1947 - 1949

Gray Drug Stores

Position: sales and stock clerk



Nine Mile Point Unit 2 FSAR

RESUME

SUPERVISOR TRAINING - NUCLEAR

EDUCATION

Remsen Central School, Remsen, New York, Graduate, 1972

U.S. Navy

Machinist Mate "A" School, Great Lakes, Illinois, 1972

Machinists Mate "B" School, Great Lakes, Illinois, 1972

Nuclear Power School, Bainbridge, Maryland, 1973

Nuclear Training Power Unit, West Milton, New York, 1974

Other Military Schools - Jan. 1975 - Sept. 1976

EMPLOYMENT

Niagara Mohawk Power Corporation, Syracuse, New York

September 1983 to Present

Position: Training Supervisor

Duties: Under the general direction of the Superintendent Training-Nuclear, plans, develops, implements and documents nuclear training and retraining programs for all Nine Mile Point nuclear site personnel as well as any contractor and offsite support agency personnel to insure reliable, efficient and safe power generation in accordance with mandated rules and regulations and applicable licensing requirements.

November 1981 to September 1983

Position: Assistant Training Supervisor (Nuclear)

Duties: Assist in the development and implementation of training and retraining programs conducted for licensed personnel at the Nine Mile Point Nuclear Site; prepare lesson plans, conduct classes, prepare and administer annual operator examinations; develop and present general interest and special classes; maintain documented training and testing records. Develop and conduct training sessions for non-licensed personnel at the site including semi-annual steam and mechanical fundamental classes.

January 1981 to November 1981

Position: Nuclear Auxiliary Operator E

Duties: Under general supervision on a shift in a Nuclear Station to perform any of the duties of Auxiliary Operators of lower grade and to assist in their training; and at times, as required, to be responsible for the operation of the reactor turbo-generator unit and related equipment from the Control Room.



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Nine Mile Point Unit 2 FSAR
SUPERVISOR TRAINING - NUCLEAR

(Cont)

EMPLOYEMENT (Cont)

March 1980 to January 1981

Position: Nuclear Auxiliary Operator C

Duties: Under direct supervision on a shift in a Nuclear Station to be responsible for the operational care of main turbo-generator and reactor units; to operate or direct the operation of the highest types of auxiliary equipment; to execute safe and effective mark-ups on equipment within the station and to assist in the detailed training of Auxiliary Operators of lower grade.

December 1979 to March 1980

Position: Auxiliary Operator "B"

Duties: As an AOB, under direct supervision on shift, to be responsible for the operation and care of various types of complicated auxiliary equipment and be responsible for the safe handling of waste products and other equipment associated with turbo-generator or boiler units and with casual supervision to start and stop such equipment.

U.S. Navy

Naval Nuclear Power Training Unit S3G Prototype

October 1977 to December 1978

Position: Mechanical Operator Staff Instructor

Duties: Helped in training of assigned students in system knowledge and operational concepts of the S3G Prototype. Directed personnel in both corrective and preventive maintenance associated with all mechanical systems. Responsible for major repairs to Service and Control Air Systems. Chosen for Advance Qualifications. Assigned the task of self-motivated training in the area of Engineering Watch Supervisor and Engineering Officer of the Watch.

U.S.S. James K. Polk (SSBN645)
Fleet Ballistics Missile Submarine

August 1974 to October 1979

Qualified as Engine Room Supervisor of the Mechanical Division. Assisted in maintenance required to keep the submarine operationally ready. Assigned as Training Petty Officer for the Mechanical Division. During this time I reorganized the training system to a more efficient program. I was responsible for the testing, upgrading and qualification of qualified and unqualified personnel. Assigned as Diesel Expert at which time I was responsible for the trend analysis, preventive maintenance and a complete overhaul of the diesel engine. I received a Squadron Accommodation for this task. Assigned as Nuclear Administrative Petty Officer for the Mechanical Division. I was responsible for maintaining all Technical Manuals up to date.



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Nine Mile Point Unit 2 FSAR
SUPERVISOR TRAINING - NUCLEAR (Cont)

EMPLOYEMENT
U.S. Navy (Cont)

U.S.S. Simon Lake AS19
Submarine Tender

June 1973 to August 1974

Assigned to the Radiological Control Division. Qualified as Radiological Control Supervisor.

Naval Nuclear Power School a Prototype
Bainbridge, Maryland

March 1973 to June 1974

Completed six months of college level courses, covering all aspects as Reactor Core Construction, operation theory, and related chemistry control. This was followed by six months of training at the D1G Prototype at the Knolls Atomic Power Laboratory, West Milton, New York. The qualification program included theoretical routine maintenance and casualty aspects of reactor and propulsion plant operation.

U.S.S. Yosemite AD19

January 1973 to March 1973

Assigned to Evaporator Division of the Engineering Department. Responsible for the maintenance and operation of two triple-effect evaporators.

Rochester Institute of Technology
Accumulated 55 credit hours towards a degree in Mechanical Engineering



Nine Mile Point Unit 2 FSAR

RESUME

SUPERINTENDENT CHEMISTRY AND RADIATION MANAGEMENT

EDUCATION

Baldwin High School, Baldwin, NY, 1957.

Massachusetts Institute of Technology. Courses in Mechanical Engineering, 1957-1959.

U.S. Navy Basic Nuclear Training, Vallejo, CA, 1961.

AlW Naval Nuclear Power Prototype Training, Idaho Falls, ID, 1962.

New Mexico State University, Las Cruces, NM. B.S. in Chemistry, 1969 (attended under AEC Technician Scholarship Program).

New Mexico State University, Las Cruces, NM. M.S. in Chemistry, 1972.

New Mexico State University, Las Cruces, NM. Completed course work required for doctoral program, 1972.

EXPERIENCE

Niagara Mohawk Power Corporation, Syracuse, NY

August 1980 to Present

Superintendent Chemistry and Radiation Management.

January 1976 to July 1980

Radiochemistry and Radiation Protection Supervisor.

July 1972 to December 1975

Radiochemistry and Radiation Protection department at Nine Mile Point nuclear site.



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Nine Mile Point Unit 2 FSAR

SUPERINTENDENT CHEMISTRY AND RADIATION MANAGEMENT

OTHER EXPERIENCE

January 1969 to June 1972

New Mexico State University, Las Cruces, NM. Teaching Assistant for General Chemistry, Analytical Chemistry, Physical Chemistry, and Instrumental Analysis Laboratories.

June 1965 to September 1967

Los Alamos Scientific Laboratory, Los Alamos, NM. Reactor Operator and Technician at the Omega West Research Reactor.

March 1964 to May 1965

Nuclear frigate U.S.S. Bainbridge. Engineering Laboratory Technician, onboard chemistry and radiological duties.

January 1962 to February 1964

AlW Reactor Facility. On staff as operator/instructor. Qualified as Engineering Laboratory Technician (June 1962). Chemistry and radiological surveillance and training facility personnel.

May 1959 to May 1965

U.S. Navy, MM1 (E-6).



Nine Mile Point Unit 2 FSAR

RESUME

SITE MAINTENANCE SUPERINTENDENT - NUCLEAR

EDUCATION

High School: Penn Yan Academy, Major: Science and Mathematics, Regents Diploma, 1968.

College: Clarkson College of Technology, B.S. in Electrical Engineering, 1972.

Job - CPM Planning Seminar, Fire Training School,
Sponsored First Aid Class, Woodward Governor School,
Classes: Radiation Protection Training, WPS School,
Kepner-Tregoe School.

Honors: Honorary Society Eta Kappa Nu (1972).

Activities: Member of First United Methodist Church, Fulton,
NY.
Stewardship and Finance Committee Chairman.
Junior Achievement Advisor (1973).
International Management Council Member.
Pooled Inventory Management (PIM) Equipment
Committee.
Nuclear Operations and Maintenance Information
Services (NOMIS) - Contact Member.

EXPERIENCE

Site Maintenance Superintendent (October 1979 to Present)
Electrical Maintenance Supervisor, Nine Mile Point
(June 1976 to October 1979)
Assistant Maintenance Supervisor, Nine Mile Point
(July 1975 to June 1976)
Startup Tester, James A. FitzPatrick (October 1974 to July
1975)
Outage Coordinator, James A. FitzPatrick (Spring 1974 to
Fall 1975)
Outage Coordinator, Nine Mile Point (May 1972 to June 1973)
Supervisory Training Program with Nine Mile Point (May 1972
to June 1973)
Clarkson College Training Program Associated with Nine Mile
Point (June 1971 to August 1971)



Page

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Nine Mile Point Unit 2 FSAR

RESUME

SUPERVISOR ELECTRICAL MAINTENANCE - NUCLEAR

EDUCATION

76 - 80, Completed several in-plant courses including:

Allen-Sherman-Hoff Oil Soot Handling
Bussmann Fuseology
Modern Management
Westinghouse 7300 Control Series
Westinghouse WTA Voltage Regulator
Westinghouse Turbine E.H. Fluid & Lube Oil
Centac Service Air Compressor
Fisher Porter 3000 Computer
Environmental Data Corp. Flue Gas Monitor
Graver Demineralizer
Westinghouse Digital Electro-Hydraulic
Supervisory Operations Seminar
Digital Troubleshooting
Rochester Instrument Systems Plant Monitoring
Cyberex Uninterruptible Power

9/76, Foxboro Spec 200 System, The Foxboro Co., Foxboro, Mass

9/73, G.E. MAC School, Bailey 5000 Series, Bailey Meter Co,
Cleveland, Ohio.

1/67 - 3/67, State Univeristy College at Oswego, Introduction
to Semi-conductors.

10/63-1/64m Dale Carnegie Course, Effective Speaking &
Human Relations, Syracuse, N.Y.

9/63-5/64, Central Tech. Adult Evening School, Syracuse,
N.Y., Electricity & Electronics for Power.

9/60-6/62, Associate in Applied Science, Electrical
Technology, State University Agricultural & Technical College
at Canton, N.Y.

EXPERIENCE

April 1981 - Present

Supervisor, Electrical Maintenance, Nine Mile Point No. 1, Lycoming,
N.Y., Niagara Mohawk Power Corp.

June 1979 - April 1981

Assistant Supervisor, Instrumentation & Control, Oswego Steam
Station, NMPC, Oswego, NY.

Nine Mile Point Unit 2 FSAR

SUPERVISOR ELECTRICAL MAINTENANCE - NUCLEAR (Cont)

February 1978 - April 1981

Assistant Supervisor, Electrical Maintenance, Oswego Steam Station.

June 1972 - February 1978

Chief Technician, Instrumentation & Control, Oswego Steam Station.

January 1968 - June 1972

Test Specialist A, Electrical Maintenance, Oswego Steam Station.

November 1966 - January 1968

Tester D, Electrical Maintenance, Oswego Steam Station.

February 1965 - November 1966

Tester C, Electrical Maintenance, Oswego Steam Station.

March 1963 - February 1965

Draftsman B, (3/63-1/64), Property Records, NMPC, 300 Erie Blvd. W, Syracuse, N.Y., (1/64-2/65), Substation Engineering, NMPC, Syracuse.

January 1963 - March 1963

Janitor, NMPC, Potsdam, N.Y.



Nine Mile Point Unit 2 FSAR

RESUME

ASSISTANT SUPERVISOR MAINTENANCE - NUCLEAR

EDUCATION

Attended schools for instruction in welding, backhoe, lineman A, lineman B, lineman C, hotstick lineman, forklift, and certified crane operator, 1958-1977.

EXPERIENCE

Niagara Mohawk Power Corporation Nine Mile Point Unit 1

1. Assistant Maintenance Supervisor, responsible for maintenance department supervision.

2. Mechanic and Welder, NMP1 (10 yr).

Lineman and hotstick welder, Oswego, Fulton (12 yr).

General maintenance, Oswego Gas Department (1 yr).

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Nine Mile Point Unit 2 FSAR

RESUME

ASSISTANT SUPERVISOR OPERATIONS - NUCLEAR

EDUCATION

Gouverneur Central High School, Gouverneur, NY, Graduate, 1955.

Canton ATC, Canton, NY, Part-time, Electrical I,II,III, 1956.

I.C.S. Course, Industrial Electronics, 1957.

Niagara Mohawk Sponsored Training, Nine Mile Point Nuclear Station, 1967-1968 (2 months), courses included Reactor Physics Radiation Protection, Math, Chemistry, Electricity, Heat Transfer, and time on Minneapolis Honeywell Simulator.

NMPC Fire School (1 wk) 1968

General Physics Basic Introduction Course, January - March 1972.

G.E. BWR Technology Course (4 wks) April 1972

G.E. BWR Technology Course (2 wks) May 1973

G.E. Simulator Training, Morris, IL (1 wk) November 1972

General Physics Corporation, Training Course (100 hr) March - April 1974

General Physics Corporation, SRO License Preparation (320 hr) 1976

TVA BWR Simulator, Soddy-Daisy, TN (3 days) 1977.

TVA BWR Simulator, Soddy-Daisy, TN (3 days) 1978.

EMPLOYMENT

1978 to Present

Position: Station Shift Supervisor, Niagara Mohawk Power Corporation, Syracuse, NY

Duties: Writing preoperational tests, operating procedures, and special procedures and performing design reviews on plant systems for Nine Mile Point Unit 2, and writing major portions of Sections 13 and 14 of the FSAR for Unit 2.



Nine Mile Point Unit 2 ESAR

ASSISTANT SUPERVISOR OPERATIONS - NUCLEAR (Cont)

Acted as the Turbine Building coordinator during the Unit 1 refuel outage, 1979 and participated in the testing of pipe restraints for NMP-1 during the outage.

1976 to 1978

Position: Station Shift Supervisor, James A. FitzPatrick,
Nuclear Power Plant

Duties: As senior man on shift, functions include direction of shift activities, ensurance that the plant is operated safely within the license and technical specifications and that plant operations are conducted in accordance with approved procedures. Obtained SRO License.

1972 to 1976

Position: Shift Operating Foreman, James A. FitzPatrick
Nuclear Power Plant

Duties: As SOF, in charge of the operation of the Control Room. From this position, the SOF is able to control the starting and stopping of all major pieces of equipment and the control of the reactor and turbine. Other duties included the directing and training of operators of lower grade.

1967 to 1972

Position: Nuclear Operator E, Nine Mile Point Unit 1

Duties: As an NOE, responsible for the care and operation of all plant equipment, including the main turbo-generator unit and reactor unit. Also to direct the operation of auxiliary equipment by operators of lower grade. Included duties of the rescue and fire brigade. Obtained RO License.

1964 to 1967

Position: Travelling Operator B - Gouverneur

Duties: Responsible for a large area and more complicated auto equipment. Responsible for distribution of power to major industry in the area.

1961 to 1964

Position: Travelling Operator A - Star Lake

Duties: Responsible for the auto-operation of the hydro-units in the area, and distribution of power to sub-stations.

Nine Mile Point Unit 2 FSAR

ASSISTANT SUPERVISOR OPERATIONS - NUCLEAR (Cont)

1957 to 1961

Position: Switchboard Operator A - South Edwards

Duties: Responsible on a shift for the generators at a hydro-station, loading and unloading of the units, and synchronizing to the system. Doing light maintenance of the units and plant in a clean and orderly condition. Responsible for the breakers, switchyard, and for markups to the equipment.

1956 to 1957

Position: Switchboard Operator A - Malone

Duties: Same as above.

1956

Position: Janitor

Duties: General janitorial duties.



Nine Mile Point Unit 2 FSAR

RESUME

ASSISTANT SUPERVISOR - RADWASTE OPERATIONS

EDUCATION

Clarkson College of Technology, Potsdam, NY, B.S. in Chemical Engineering, 1982, supporting courses included Process Systems Control, Chemical Process Calculations, Design, Chemical Engineering Lab, Thermodynamics, Mass Transfer and Stagewise Operations, Fluid Mechanics, Chemical Reactor Kinetic, Heat Transfer, Physical Chemistry I and II

Mohawk Valley Community College, Utica, NY, A.A.S. in Engineering Science, 1980.

Sagamore Conference, 1982, developed skills in communication, supervision, and managing organizational behavior.

EXTRACURRICULAR ACTIVITIES AND INTERESTS

American Institute of Chemical Engineers; intramural basketball and softball; running, hiking, motorcycle riding.

EXPERIENCE

June 1982 to Present

Niagara Mohawk Power Corporation, Nine Mile Point, Oswego, NY
Assistant Supervisor of the Radioactive Waste Department.

1980

Clarkson College, Potsdam, NY

Worked in the Computer Center after classes and weekends as a proctor and debugger.

1980 and 1981 (Summer)

A.A.K. Delivery Service, Solvay, NY

Drove a truck and delivered material for Allied Chemical Corporation and Royal Chemical. Also delivered furniture and appliances for major department and furniture stores.

1979 (Summer)

R.E. Diets and Co., Syracuse, NY

Material handler and worked with various metal machines.



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Nine Mile Point Unit 2 FSAR

RESUME

ASSISTANT TRAINING SUPERVISOR - NUCLEAR

EDUCATION

St. Andrew's High School
Middletown, Delaware
Graduated - 1969

Carnegie-Mellon Univ.
Pittsburgh, PA
Physics Major, Mathematics Minor - 4 years
B.S. - 1973

Penn State University
University Park, PA
Nuclear Engineering, 2 years
M.S. 1977

MILITARY

U.S. Army
Signal Officer Basic Course
Ft. Gordon, GA
Oct/ 1976.- Jan. 1977

Communication Electronics
Staff Officer Course
Ft. Sill, OK
Jan - May 1977

August 1979 - February 1980

U.S. Army, Ft. Polk, LO
Battalion Maintenance Officer
To provide the battalion commander with information and advice on the maintenance of motor vehicles in the unit, and to institute new maintenance procedures and oversee their implementation so as to increase vehicle reliability.

January 1979 - August 1979

Division Radio Officer
Responsible for allocating radio frequencies for the entire Army Post. Also responsible for ensuring the reliability of division-level, multichannel, (VHF) communications using transmission path analysis.



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Nine Mile Point Unit 2 FSAR

ASSISTANT TRAINING SUPERVISOR - NUCLEAR (Cont.)

May 1977 - January 1979

Communication-Electronics Officer
Responsible for maintaining reliable communications in the unit.
As the C-E Officer, supervised the activities of a ten-man platoon
and advised the battalion commander on communications matters.

TEACHING EXPERIENCE

June 1979 - December 1979

Northwestern State University of Louisiana,
Natchitoches, Louisiana
Part-Time

Taught Computer Science 101 (Introduction to Computer Science), a
course which introduced students to the types and components of
computer systems, binary, octal and hexadecimal number systems, flow-
charting and elementary programming language. Also taught the bus-
iness statistics course sequence, Bus. As. 212-213, which included
elementary probability theory, probability theory, and hypothesis
testing.

EMPLOYMENT

July 1984 - Present

Nine Mile Point Unit 2
Assistant Training Supervisor
Develop and instruct non-licensed operator training programs and
design familiarization courses for Unit 2 staff personnel, and other
special instructional programs for startup/test and fire protection
personnel at Unit 2.

January 1984 - July 1984

Rochester Institute of Technology
Fochester, New York

I taught courses in basic nuclear reactor theory and advanced
reactor theory/control theory to power plant operators and staff.

January 1981 - July 1983

Columbia College (Hancock Field Campus)
Hancock Field, N.Y. 13212

I was responsible for teaching virtually all of the college level
Mathematics courses taught at Columbia College up until the time
the airbase closed in December 1983. I developed and taught courses



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Nine Mile Point Unit 2 FSAR

ASSISTANT TRAINING SUPERVISOR - NUCLEAR (Cont.)

in college algebra, differential and integral calculus, and differential equations.

June 1981 - July 1984
Part-Time

Nine Mile Point Nuclear Station Unit #1
Assistant Station Shift Supervisor

Assist the Shift Supervisor in the performance of supervisory, administrative and technical functions. During off normal events provide the shift supervisor with an assessment of station conditions and advised actions to terminate and/or mitigate the consequences of off normal conditions.

February 1980 - June 1981

Assistant Nuclear Engineer
Perform safety evaluations for proposed nuclear plant modifications; make core management recommendations.

September 1974 - August 1975

Pennsylvania State University Nuclear Engineering Dept.
Research Assistant

Assisted faculty in setting up experiments to measure neutron spectra of sources and fast-reactor sub-assemblies.



NINE MILE POINT UNIT 2 FSAR

RESUME

ASSISTANT SUPERVISOR - FIRE PROTECTION

EDUCATION

High School: Perry Hall
Address: Ebenezer Rd., Balt., No. 21236
Date of Graduation: May 1976

College: University of Maryland
Address: College Park, Maryland
Number of Years: Four
Major: Fire Protection Engineering
Degree/Date of Grad.: B.S./May 1980

Basic Fossil Power Plant Systems, Gilbert/Commonwealth, 1980

National Foam Engineering Seminar, National Foam, 1981

EMPLOYMENT

Niagara Mohawk Power Corporation, Syracuse, NY

August 1, 1983 to Present

Position: Assistant Supervisor - Fire Protection
Duties: Engineering Review of NMP-2 Fire Protection Systems. Supervise
NMP-2 Fire Department

Gilbert/Commonwealth

1980 to August 1983

Position: 1980 to present/Fire Protection Engineer
Duties: Involved in the design, review, engineering, and/or specification
preparation of fire protection systems for several power generating stations
and related facilities, including:

South Carolina Electric Gas Company's Emergency Operations Facility/Nuclear
Training Center.

Allis/Chalmers Corporation's KILnGAS Coal Gasification Demonstration Plant

McDonnell Douglas Astronautics Corporation's EBT-P Facility, Fusion Project

South Carolina Electric and Gas Company's V.C. Summer Nuclear Power Plant,
Unit 1



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NINE MILE POINT UNIT 2 FSAR

ASSISTANT SUPERVISOR - FIRE PROTECTION (Cont)

EXPERIENCE (Cont)

Cleveland Electric Illuminating Company's Perry Nuclear Power Plant, Units 1 and 2

Rochester Gas and Electric Corporation's Robert E. Ginna Nuclear Power Plant, Unit 1

Pennsylvania Electric Company's Conemaugh Station, Fossil Fueled Power Plant.

Experience also includes all necessary design, engineering, and specification preparation for the Chesapeake Divison, Naval Facilities Engineering Command's Aircraft Systems Integration Laboratory.

Responsible for hazardous area identification for installed electrical devices created by process equipment handling flammable gases or combustibile dust for the following facilities:

Pennsylvania Electric Company's Homer City Station, Fossil Fueled Power Plant.

Allis/Chalmers Corporation's KILnGAS Coal Gasification Demonstration Plant.

Additional engineering tasks required of the position include proposal preparation, manhour estimates, bid review and engineering studies. Written and verbal communications with clients and vendors were also necessary to perform many of the required tasks.

General Services Administration, Atlanta, Ga.

1979 Summer

Position: Engineering Technician for Accident and Fire-Prevention Department

Duties: System design, Federal Office Building inspection, specification review, and research on high-rise fire safety.

REGISTRATION

Engineer-in-Training-Maryland (1980)

SOCIETIES

Salamander, National Fire Protection Honor Society, Beta Chapter



Nine Mile Point Unit 2 FSAR

RESUME

ASSISTANT SUPERVISOR MECHANICAL MAINTENANCE - NUCLEAR

EDUCATION

Oswego High School, Industrial Arts/Mechanical Drawing ; graduated January 1957.

Steam Turbine Orientation presented by G.E., November 26 - 30, 1979

Steam Turbine Orientation presented by G.E., April 26 - 28, 1982

Supervisory Training presented in Sagamore by Clarkson College in May, 1982

Personnel Carrier Driving Training "N.G.", July, 1979 - Class I Chauffer License

MILITARY

N.Y.S. National Guard

EMPLOYMENT

January 1, 1980

Assistant Supervisor of Maint. - Nuclear, Nine Mile Point #1 & 2
Duties include writing and generating procedures , supervising men on various jobs, and ordering spare parts.

January 1979 - January 1980

Foreman "A", Nine Mile Point - Duties include repairing equipment, supervising a crew of men on various jobs, etc.

February 1973 - January 1979

Mechanic "C" , Nine Mile Point #1 - Duties include the repairing of equipment, etc.

April 1972 - February 1973

Mechanic "B", Nine Mile Point #1 - Duties include the repairing of equipment, etc.

1970

Lineman "C" Hotstick, NMPC - Hotstick work on line 115kw and below.



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Nine Mile Point Unit 2 FSAR

ASSISTANT SUPERVISOR MECHANICAL MAINTENANCE - NUCLEAR (Cont.)

1967

Lineman "C", NMPC - Work on primary and secondary lines and poles.

1965

Lineman "B", NMPC - Same as "C" lineman.

1964

Lineman "A", NMPC - Climbing poles with "C" & "B" lineman.

1962

Driver-Groundsman, NMPC - Drive truck for line crew, and send up any equipment a lineman needs on a pole.

1959

Gas Mechanic A & B, NMPC - Work on gas mains, house services, etc.

December 1957

Janitor, Oswego Steam Plant - Clean offices, shops, and locker-rooms.

March 1957

Laborer, NMPC - Cut lawns, shovel snow.

February 1957

Clean up liquid press, refinery departments, and paint walls.



Nine Mile Point Unit 2 FSAR

RESUME

ASSISTANT SUPERVISOR - COMPUTER ELECTRICAL MAINTENANCE

EDUCATION

Oswego High School, Oswego, NY, graduate, 1961.
Onondaga Community College, Syracuse, NY (no degree).

EXPERIENCE

March 1979 to Present

Position: Assistant Supervisor Electrical Maintenance, Nine
Mile Point Nuclear Station, Syracuse, NY
Duties: Direct a group of 15 electricians.

November 1977 to March 1979

Position: Chief Electrician A, Foreman for Electrical
Maintenance
Duties: Direct small group of men doing electrical
maintenance work.

March 1974 to November 1977

Position: Electrician C
Duties: Work as Journeyman Electrician doing electrical
maintenance work.

April 1968 to March 1974

Position: Relay Tester
Duties: Electrical testing on various power transmission
facilities.

1964

Stockhandler, Goldbergs Furniture Store Delivery.

1963 to 1964

Warehouse Stockhandler - W. T. Grants, Co.

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Nine Mile Point Unit 2 FSAR

RESUME

ASSISTANT SUPERVISOR MAINTENANCE - NUCLEAR

EDUCATION

Saint Mary's School, K-6.
Kingsford Park School, 7-9.
Fitghugh Park Welding School, 1958.
Backhoe School, 1959.
A Linemen School, 1960.
B Linemen School, 1961.
C Linemen School, 1963.
Hotstick Linemen School, 1966.
Fork Lift School, 1974.
Certified Crane Operators School, 1977.

WORK EXPERIENCE

Presently employed at Niagara Mohawk, Nine Mile Point Nuclear Power Plant Unit 1, Oswego, New York. Present position is Assistant Maintenance Supervisor. My goals are to better the maintenance department and save the company money whenever possible.

PREVIOUS EXPERIENCE

Nine Mile Point Nuclear Power Plant Unit 1, Mechanic and Welder, 10 yr.
Linemen and Hotstick Linemen, Oswego, Fulton, 12 yr.
Oswego Gas Department, General Maintenance, 1 yr.



Nine Mile Point Unit 2 FSAR

RESUME

ENVIRONMENTAL PROTECTION COORDINATOR - NUCLEAR

EDUCATION

State University of New York at Oswego, Oswego, NY, B.A. in
Biology Concentrations in Aquatic Ecology and Cellular
Physiology with related work in Radiation Biology, 1973.

JOB RELATED EXPERIENCE

Basic Seamanship - United States Coast Guard.
First Aid - Red Cross.
Radiation Protection - Niagara Mohawk Power Corporation.

EXPERIENCE

May 1980 to Present

Niagara Mohawk Power Corporation, Nine Mile Point Nuclear
Station, Lycoming, NY

Position: Environmental Protection Coordinator
Responsible to the Superintendent of Chemistry and Radiation
Management for the Ecological and Radiological Environmental
Protection Program at NMP-1. Responsibilities include
management of the program for airborne sampling and
analysis, collection and analysis of ecological and
radiological samples via three contractors (ecological and
radiological contracting firms) for compliance with USNRC
Technical Specifications, USEPA, and NYSDEC SPDES Permits.
In addition, responsible for the evaluation, negotiation,
and awarding of contracts, establishment, and management of
the quality assurance program, annual radiological report to
USNRC, monthly SPDES and operating "401" reports to the
State of New York. Primary interface with USNRC, USEPA, and
NYSDEC environmental staff, written responses and actions
concerning NRC Inspection and Enforcement Bulletins,
investigation and reporting of unusual environmental events;
continual evaluation of data concerning select implant
systems for possible environmental release, yearly audits
and reports concerning ecological and radiological
contractors, revision and implementation of station
procedures, presentation and resolution of environmental
matters with the Site Operations Review Committee
(S.O.R.C.), and Radiation Protection Supervisor on shift
during refueling outages.



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Nine Mile Point Unit 2 FSAR

ENVIRONMENTAL PROTECTION COORDINATOR - NUCLEAR (Cont)

April 1977 to May 1980

Texas Instruments Incorporated, Oswego, NY

Technical Leader - Responsible for the initiation of an entrainment and entrainment viability program at the James A. FitzPatrick Nuclear Power Plant for ichthyoplankton, microzooplankton, and phytoplankton (using carbon 14 determinations). Also responsible for the initiation and supervision of fish impingement sampling and analysis at Nine Mile Point and James A. FitzPatrick Nuclear Power Stations. Documented and implemented a quality assurance program for viability collections and laboratory procedures. Coordinated a training program for viability field sampling. Developed a cost analysis study for the 1978 NMPC/PASNY proposal bid and maintained the inplant program budget.

Laboratory activities detailed the setup of process procedures and equipment for phytoplankton (carbon 14 and chlorophyll determinations), microzooplankton identification and viability and routine water quality analysis as determinations for turbidity, free carbon dioxide, BOD, conductivity, alkalinity, CCE, etc.

May 1975 to April 1977

Lawler, Matusky and Skelly Engineers, Pearl River, NY

Position: Inplant Coordinator

Responsible for all inplant sampling programs at Nine Mile Point and James A. FitzPatrick Nuclear Power Stations and Oswego Steam Station Units 1-4 and Unit 5 under specific USNRC Technical Specifications. Programs included fish impingement and impingement viability, entrainment and entrainment viability of phytoplankton (using carbon 14 and chlorophyll determination), microzooplankton, macrozooplankton and ichthyoplankton. Other responsibilities included: effect and maintain inplant quality assurance program, inplant data systems, operations reports and personnel appraisals, design and maintenance of inplant sampling equipment and specifications, and coordinated an inplant training program. Development and maintenance of inplant cost analysis. Development of inplant work plans. Quality assurance reviews of monthly and yearly inplant reports to the client.



Nine Mile Point Unit 2 FSAR

ENVIRONMENTAL PROTECTION COORDINATOR - NUCLEAR (Cont)

May 1973 to May 1975

Lawler, Matusky and Skelly Engineers

Engineer-Scientist Aide - Technician entry level work that included fish impingement and entrainment sampling at Nine Mile Point Nuclear Station and Oswego Steam Station Units 1-4, and gill netting and trawling on Lake Ontario. Designed entrainment sampling setup at Oswego Steam Station Units 1-4.

Laboratory activities included fish speciation, preliminary and secondary analysis, and macrozooplankton analysis.



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Nine Mile Point Unit 2 FSAR

RESUME

PLANNING COORDINATOR - NUCLEAR

EDUCATION

Elementary - Kingsford Park, Oswego, NY, 1945-1952.

Junior and Senior High School - Baldwinsville Academy and Central, 1953-1959.

Paul Smith's College, A.A.S., Forestry, 1961.
Onondaga Community College, architectural drafting courses.

PROFESSIONAL SOCIETIES

Member of Construction Specification Institute

PAST EXPERIENCE

Construction Planning and Scheduling Working drawings, Specifications, Field Observation, Project Administration, Land Surveying for Housing Developments, Highways, Utility Lines, Commercial Buildings, etc.

EMPLOYMENT

1978 to Present

Niagara Mohawk Power Corporation, Syracuse, NY.
Supervisor of Planning/Modification Coordination at Nine Mile Point Unit 1.

PART I - DEFINITION OF POSITION

A. This position is intended to encompass the functions of several required positions. The ultimate goal of the position is to increase plant availability and to assure the safety and reliability of operation of the unit. This is accomplished by fulfilling the following functions:

1. Outages - reduce the overall duration of all unit outages by exercising effective planning and manpower utilization.
2. Modifications - to fulfill the intent of administrative procedures in the providing of coordination of all station modifications and to



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Nine Mile Point Unit 2 FSAR

PLANNING COORDINATOR - NUCLEAR (Cont)

supervise the scheduling of the required modification efforts of various departments. Also to assure that this work is completed within requirements set forth by other regulatory agencies.

3. Operations Experience Assessment - to perform functions required by administrative procedures to comply with NRC regulations to evaluate outage planning, modifications and corrective maintenance with dedicated concern for the safety of the plant.
 4. Maintenance and Testing - to assure the efficient scheduling of maintenance, testing and surveillance functions so that there is optimum utilization of manpower and material resources both during outages and during normal plant operating periods.
- B. The coordinator function is responsible to the Technical Superintendent to supervise and assure the required documentation of all station modifications is complete. It is also within the responsibilities of the Coordinator to assist in obtaining the engineering safety evaluation and design review for all proposed plant modifications. The Coordinator directly supervises the personnel required to perform the data acquisition and to operate the data processing equipment.

PART II - RESPONSIBILITIES AND AUTHORITY

- A. Duties performed can best be described in four (4) major breakdowns for specific concentrations of work.

During Normal Station Operating Periods Between Major Outages

1. Supervise identification of items for outage work package, coding and loading this information to the computer system. This includes the evaluation of the scope of work requests and modifications, commitments for work to the NRC, etc., and determination of the scope of required prerequisites, testing, inspections, other modifications, etc.

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Nine Mile Point Unit 2 ESAR

PLANNING COORDINATOR - NUCLEAR (Cont)

2. Coordinate manpower and material planning for all outage work efforts.
3. Coordinate station staff, Engineering and contractors in the development of work packages for the outage including coding and loading this information into the schedule program.
4. Coordinate all modifications. Supervise and act as contact for all information exchange between the plant and Engineering Department.
5. Review and generate schedules for all modification work including manpower usage.
6. Supervise and assist in the control and generation of the work request schedule, including the definition of parts, materials, procedures, manpower requirements, safety considerations. This includes work to be completed in between outages as well as during outages.
7. Supervise and assist in the generation and control of the modification control log for all station modifications and proposals.
8. Coordinate and control all documentation, prints and procedures associated with modifications and associated major orders, including the design review and safety evaluation of station modifications.
9. Attend various meetings including the following - Engineering Quarterly Review, Plant Operations, Pre-Bid and Contractor Outage Planning Meetings.

Period In Preparation for Major Outages

1. Supervise the identification of work items to be included in the outage work package and including all information necessary to schedule and control these work efforts.
2. Develop the operational sequence plan for the outage.
3. Develop the precedence diagrams for the outage.



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Nine Mile Point Unit 2 FSAR

PLANNING COORDINATOR - NUCLEAR (Cont)

4. Generate and review planning schedules for various departments and supervisors.
5. Coordinate and control all documentation, drawings, prints, procedures, etc. associated with various modifications and major orders.
6. Coordinate station staff, Engineering and Contractor efforts in the inclusion of work packages in the outage planning.

During Major Outages

1. Prepare daily schedules and reports for planning and supervision.
2. Modify logic and PDM Diagrams, schedules and planning networks based on progress and outage problems and changes.
3. Supervise and approve progress reporting, supervise input to schedule system.
4. Provide upper level management with schedules and projections.
5. Coordinate, expedite and update records for all modifications, including information exchange between the plant and engineering staff. Supervise the completion of required documentation for close out of all modifications.
6. Supervise and control updates of work requests and modification logs.

Post Outage

1. Generate detailed and summary level outage reports and special reports for reviewers.
2. Coordinate and supervise the close out of various completed modifications and major orders, assisting the Office Supervisor and Supervisor Central Files. Submit this completed documentation to SORC and SRAB and effect any corrections.



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Nine Mile Point Unit 2 FSAR

PLANNING COORDINATOR - NUCLEAR (Cont)

3. Review, plan and schedule any work for future short outages in conjunction with supervision of work request log and modification log.

Occasional, Infrequent

1. Prepare and submit outage information to agencies such as licensing, budget, and Public Service Commission.
2. Attend conferences on outage planning, outage control, preventative maintenance and unit availability improvement presented by groups as PSC, EPRI, GE and P/2 utility users group.
3. Assist and support various other departments within the Corporation with the use of the P/2 schedule system.

My prior position with the Company was a Construction Planner and Coordinator under the Manager of the System Project Management Construction Services Department. This position included planning, scheduling and coordinating all work in connection with Fossil Generation Plants, Nuclear Generation Plants, and Area Service Centers. The job duties for this position are as follows:

1. Provide input for conceptual planning and cost estimates.
2. Initiate and continue construction planning during the concept and design phases of a project.
3. Develop detailed construction plans for manpower staffing, equipment requirements, receipt and storage of material, work procedures and requirements for inspection and quality.
4. Prepare bid specifications for field construction services or concur with those specifications prepared by others prior to processing.
5. Assist in the preparation of qualified bidders' lists.
6. Provide cost and quantity estimates for the construction phase of projects.
7. Prepare field construction schedules, labor and cost estimates, or concur with those prepared by others prior to processing.
8. Represent owner's field personnel in the development stages of assigned projects.



Nine Mile Point Unit 2 FSAR

PLANNING COORDINATOR - NUCLEAR (Cont)

9. Participate in the evaluation of bids for field construction services or concur with the evaluation and recommendation prepared by others prior to processing and approval by the Project Manager.
10. Participate in the preparation of all field quality control programs.
11. Participate in the review and concurrence of all invoices, purchase requisitions, change orders, contract changes, and similar commitments pertaining to field construction activities prior to processing and approval by the Project Manager.
12. Document preconstruction and construction progress meetings and distribute minutes to appropriate project personnel.
13. Determine and maintain a construction working file for the duration of the project.
14. Provide contract administration for the construction phase of the project, including the following:
 - a. Evaluate, negotiate, make recommendations, document and process changes initiated by owner's field forces, engineering or the contractor.
 - b. Make recommendations on contract administration procedures.
 - c. Provide interface with construction supervision, project-related Niagara Mohawk Departments, outside agencies, and the contractor relative to construction matters.
15. Participate and assist in resolution of site construction and labor problems.
16. Participate in owner's field forces meetings.
17. Assess contractors' construction schedules.
18. Consider and evaluate suggestions and recommendations to Project Management for resolution.
19. Serve as liaison between the contractor's home office and the owner's Superintendent-Construction.
20. Assist the Superintendent-Construction in the resolution of construction problems.
21. Coordinate matrix support from participating departments for the owner's field forces as required.
22. Participate in the development and input data required by Project Management for the preparation and updating of construction schedules and any



Nine Mile Point Unit 2 FSAR

PLANNING COORDINATOR - NUCLEAR (Cont)

- other schedules required to monitor construction progress.
23. Develop and provide procurement identification, and other lists, reports, charts and graphs necessary for the monitoring of construction phases of the project.
 24. Identify and ensure that the documentation required by the specification is provided by the contractor, reviewed and approved by the appropriate department(s), and distributed to concerned project personnel.
 25. Obtain, process, and distribute to concerned project site personnel all pertinent data relative to construction, including instructions to contractors.
 26. Provide administrative support to owner's field forces as required by the Superintendent-Construction.
 27. During the course of the project, ensure that guarantees, certificates, maintenance and operations manuals, and other data required to be assembled and furnished by the contractor are applicable to the items actually installed and process these items for review prior to final acceptance of the project.
 28. Maintain log of record drawing data in the construction working files.
 29. During the project close-out phase, assist the Superintendent-Construction with the following:
 - a. Initial checklist inspection and the determination of those areas still requiring correction or other remedial work, as indicated by a preliminary punch list.
 - b. Final inspection of all work on the project.
 - c. Check of the contractor's record drawing set (as-built) drawings to verify all changes and variations from the original contract drawings as required by the terms of the contract.
 - d. Processing of the contractor's request for final progress payment.
 - e. Processing of the contractor's request for retainage funds upon final completion of the project.



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Nine Mile Point Unit 2 FSAR

PLANNING COORDINATOR - NUCLEAR (Cont)

1965 to 1978

Sargent-Webster-Crenshaw & Folley, Syracuse, NY - I started as an architectural draftsman and remained there for approximately two years. I then transferred to the Specification Department where I remained until 1978, approximately eleven years. I wrote general construction specifications, including the legal section in the front of every spec book. I also coordinated the specs to include heating, ventilation, electricity and plumbing. Specification writing requires research and determination of materials proposed for use on a project, how they should be put to use, and also a check of the drawings to be sure the project can be built as shown.

Some of the areas covered in the general construction specifications are: concrete work, masonry, structural steel metal decks, rough and finish carpentry, building insulation of various types, built-up roofing, sheet metal, sealants, doors and windows, metal studs, finishes for interiors and elevators. All of the above are part of the Standard Divisions for the Construction Specification Institute Specification Format, with which I am very familiar.

The following is a partial list of some of the projects for which I have written specifications.

Carrier Corporation, Building TR-4, Syracuse, NY
United States Post Office Mail Facility, Utica, NY
NYS Electric & Gas Service Center, Brewster, NY
Clinton Street Plaza Housing, Syracuse, NY
New York Telephone, Massena, NY
Oneida Savings Bank, Hamilton, NY

1962 to 1965

Employed by O'Brien and Gere Land Surveyors of Syracuse, New York I was hired as an instrument man for a survey party which did surveys for utility lines (including water and sewer), building layouts, proposed highways. After two and one half years in the field as an instrument man, and then Party Chief, I transferred to an inside job working as a draftsman putting the field work on finished drawings. It was at this time that I took some additional architectural drafting courses at Onondaga Community College.

Nine Mile Point Unit 2 FSAR

PLANNING COORDINATOR - NUCLEAR (Cont)

1961 to 1962

Following college graduation, employed by the NYS Division of Lands and Forest, Cortland, New York, as Party Chief of a survey party of three. Our job was to survey property lines of existing and newly acquired state land in the Cortland district. The survey meant determining and establishing the exact property line from conditions which ranged from a pipe at a property corner to the remains of a fence line or a stone hedge row. After considerable measuring, turning of angles, and tying down existing evidence, property lines were plotted on maps, staked out in the field and recorded.



Nine Mile Point Unit 2 FSAR

RESUME

UNIT SUPERVISOR INSTRUMENTATION AND CONTROL - NUCLEAR

EDUCATION

Red Creek Central High School
Red Creek, New York
Regents Diploma - 1962

Onondaga Community College
Syracuse, New York
A.A.S. in Electrical Technology - 1969
Differential Calculus - 1 Semester - 1968
Advanced Electronics - 1 Semester - 1981

Air Force Schools

Ground Radio Equipment Repairman School
Keelsler Air Force Training Center - 42 Weeks - 1963
Basic Electricity, Basic Electronics, Motors and Generators
Servo Systems, Amplifiers, Power Supplies, Semiconductor Theory
Receivers, Transmitters, Antenna Systems, Transmission Lines,
and Waveguides.

Airborne Long Range Inputs - 3 weeks - 1965
F.M. Multiplexing, High Gain Antennas, Digital Logic

Niagara Mohawk Sponsored

General Physics Corporation Course
Academic Program for Nuclear Power Plant Personnel
March 1972 - 3 weeks

NMPC I&C Dept. Course
GIMAC Controls
1973 - Seven, 1 Hour Modules

NMPC I&C Dept. Course
Neutron Instrumentation
Including: SRM's, IRM's, LPRM's, and APRM's
1973 - Three, 2 Hour Modules

International Research and Development Corp.
Vibration Analysis Training Program
1974 - 16 Hours

Hewlett Packard Video Training
Transistor Basics
1975 - 14 Modules



14-21

Nine Mile Point Unit 2 FSAR

UNIT SUPERVISOR INSTRUMENTATION AND CONTROL - NUCLEAR (Cont.)

Hewlett Packard Video Training
Digital Logic
1975 - Two, 2 Hour Modules

General Physics Corporation Course
Nuclear Instrumentation and Control Technician
A. Nuclear Power Plant Fundamentals 40 Hours 1976
B. Nuclear Instrumentation 40 Hours 1976
C. Nuclear Control Systems 56 Hours 1976

NMPC I&C Dept. Course
Surveillance Testing Techniques, Problems, and Procedures
1976 - 6 Hours

Signatron Corporation Course
Security Systems and RCA Video Cameras
1979 - 16 Hours

Sierra Scientific Corporation Course
Video Cameras
1979 - 16 Hours

Rosemount Analog Trip System
Technician Orientation
1979 - 2.5 Hours

Canberra Industries, Inc.
Meriden, Connecticut
8100/8180 Multi-Channel Analyzer
Hardware Maintenance Course
A. ADC
B. Core Memory, Semiconductor Memory
C. Control Logic
D. Address
E. Display, Character Generator
F. Integration and I/O Basic
1980 - 40 Hours

General Electric Company
Rod Position Indication System
1981 - 16 Hours

NMPC Nuclear Training
Mitigation of Core Damage
A. Process Instruments
B. Recognizing Core Damage
C. Mitigating Core Damage
1981 - 16 Hours

Nine Mile Point Unit 2 FSAR

UNIT SUPERVISOR INSTRUMENTATION AND CONTROL - NUCLEAR (Cont.)

NMPC System Training Dept.
Management Communication Skills
1981 - 32 Hours

NMPC System Training Dept.
Introduction to Management
1982 - 16 Hours

Management Institute - Clarkson College
Professional Management Development Program
A. Communications I and II
B. Decision Making
C. Leadership
D. Management
1982 - 60 Hours

NMPC Nuclear Training
Technical Support
A. TSC Staff 3 Hours 1981
 5 Hours 1982

B. OSC Staff 3 Hours 1981

Analysis and Measurement Services Corp.
Knoxville, Tenn.
The Fundamental Technology of Sensor Response Time Testing
1982 - 16 Hours

Kepner - Tregoe, Inc.
Executive Problem Analysis and Decision Making
A. Decision Analysis
B. Problem Analysis
C. Potential Problem Analysis
1982 - 32 Hours

EMPLOYMENT

Niagara Mohawk Power Corporation
Syracuse, NY

1981 - Present.

Unit Supervisor Instrument and Control
Nine Mile Point Unit #2

Duties: The Supervisor responsible for the direct supervision of all instrument and control personnel on a station unit, receives work assignments from the Station Superintendent and technical and administrative guidance from the site Instrument and Control Supervisor. Responsible to the Station Superintendent that all instrument and control maintenance and surveillance under my supervision on safety related systems is completed as scheduled and in accordance with approved procedures. Responsible for the development of preliminary instrument calibration and maintenance procedures for the Unit #2 I&C Group.



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Nine Mile Point Unit 2 FSAR

UNIT SUPERVISOR INSTRUMENTATION AND CONTROL - NUCLEAR (Cont.)

January 1980 - 1981

Assistant Supervisor Instrument and Control
Nine Mile Point Unit #1

Duties: Assisted with the supervision and guidance of technical developments related to the maintenance, calibration and testing of instrumentation and control systems. Participated in the design installation and testing of instrument system additions and modifications. Served as a backup Supervisor to the Unit Supervisor I & C during the 1981 major unit overhaul outage.

1979 - January 1980

Technician "E"
Nine Mile Point Unit #1

Duties: Under general supervision, to be responsible for special training schemes, non-routine reports, complex investigations assisted in the development of new procedures for Rosemount Analog Trip System and ATWS. Directed and worked with the Technicians installing instrumentation for the Analog Trip System and ATWS. Performed the calibration and checkout testing on the Analog Trip System and ATWS during the initial acceptance testing program.

1976 - 1979

Technician "E"
Niagara Mohawk Power Corp.
James A. Fitzpatrick Nuclear Power Plant

Duties: Under general supervision, to be responsible for special testing schemes, non-routine reports, complex investigations. Provided direction and was responsible for small groups of Technicians on assigned tasks. Performed routine and non-routine surveillance tests on safety related systems. Maintained and repaired Nuclear instrumentation and controls. Major assignments included problems on Reactor Manual Control, Rod Sequence Control, Trip System, Rod Block Monitors, Neutron Monitoring, Reactor Recirculation Flow System and Process Radiation.

1973 - 1976

Technician "D",
Niagara Mohawk Power Corp.
James A. Fitzpatrick Nuclear Power Plant

Duties: Under general supervision, to carry on important types of investigations and tests of and analytical nature within the limits of established procedures, to prepare reports and to check, calibrate and maintain a wide variety of intricate controls and /or instruments. Provided direction to a small group Technicians during the preliminary and start-up phases of the Fitzpatrick start-up. Major assignments included the initial calibration of many plant instruments without established procedures; the initial implementation and revision of safety surveillance tests.



Nine Mile Point Unit 2 FSAR

UNIT SUPERVISOR INSTRUMENTATION AND CONTROL - NUCLEAR (Cont.)

1972 - 1973

Technician "C"

Nine Mile Point Unit #1

James A. Fitzpatrick Nuclear Power Plant

Duties: Under direct supervision, to carry on important types of investigation, to prepare technical records and to perform complex tests; to check, calibrate and maintain various controls and/or instruments, and to perform work of progressively increasing variety and complexity. Performed tests and calibrations on Emergency Diesel Generators, Make-up Water Treatment, Condensate, Aux Boilers, Service Water, Main Steam, and Control Rod Drive without direct supervision.

1969 - 1972

Draftsman "B"

Syracuse, NY

Property Records Engineering

Duties: To draw and revise pole and secondary maps in ink. To draw and revise underground distribution, high voltage transmission, single line transmission on linen, cellum, and milar.

June 1969 - October 1969

Technician "B"

Nine Mile Point Unit #1

Niagara Mohawk Power Corp.

Duties: Under direct supervision, to perform investigations, tests and/or calculations of a technical nature, and to prepare simple technical reports, and to perform work of progressively increasing variety and complexity. Assisted higher grade Technicians perform tests and calibrations on neutron instrumentation process radiation instrumentation during Nine Mile Point Unit #1 start-up.

1966 - 1967

Quality Control Tester "B"

Heavy Military Electronic Division

General Electric Co., Syracuse, NY

Duties: Performed acceptance tests on electronic sub-assemblies trougle shot and initiated repairs on defective units for SQ-26 Sonar Systems.

1962 - 1966

U.S. Airforce, Ground Radio Equipment Repairman, Air Command.

Bomarc Nuclear Anti-Aircraft Missile Shift Leader for F.M. multiplexed midrange guidance equipment. Shift Leader of Ground to Air Transmitter-Receiver Site responsible for multi and single channel UHF transmitters and receivers, digital multiplexed data

Nine Mile Point Unit 2 FSAR

UNIT SUPERVISOR INSTRUMENTATION AND CONTROL - NUCLEAR (Cont.)

systems, and 10kw Klystron Amplifiers including all maintenance, repair, and alignment. Honorable discharge at pay rating E-4.



24

25

Nine Mile Point Unit 2 FSAR

RESUME

CHIEF SHIFT OPERATOR - NUCLEAR

EDUCATION

Mexico Academy and Central School, Mexico, New York 13114, Graduate; 1972

U.S. Navy, Great Lakes, Illinois, Machinists Mate "A" School, Jan. 1973 - April 1973

Prep School Graduate, Great Lakes, Illinois, Math Courses - 3 weeks, April 1973 - May 1973

U.S. Naval Nuclear Power School, Bainbridge, Maryland, Nov. 1973 - May 1974

Engineering Laboratory Technician School, Nuclear Power Training Unit, Ballston Spa, New York, Nov. 1974 - Feb. 1975

Nuclear Prototype (S3G), Ballston Spa, New York, Operational Propulsion Plant Training and Qualification, 6 month course, May 1974 - Nov. 1974

Carrier Air Conditioning Plant School, New London, Connecticut, Air Conditioning Plant Operations, 2 Week Course, August 1977

Quality Assurance School, New London, Connecticut, 1 Week Course, October 1977

EMPLOYMENT:

Niagara Mohawk Power Corporation, Syracuse, NY

Nine Mile Point Nuclear Station, Lycoming, NY

October 1983 to Present

Position: Chief Shift Operator (Unit #2)

Duties: Under general supervision, on a shift, to direct and perform the work of, and to assist in the training of all personnel engaged in the operation of major steam-electric generating units, including electrical and mechanical equipment, auxiliaries, controls and associated transmission facilities.

November 1981 to October 1983

Position: Nuclear Operator "E" (Unit #1 & #2)

Duties: Under general supervision, on a shift, to perform any of the duties of Auxiliary Operators of lower grade and to assist in their training; and at times, as required, to be responsible for the operation of the reactor turbo-generator unit and related equipment from the Control Room.



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100



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Nine Mile Point Unit 2 FSAR

CHIEF SHIFT OPERATOR - NUCLEAR (Cont)

EMPLOYMENT (Cont)

April 1980 to November 1981

Position: Nuclear Auxiliary Operator "C" (Unit #1)

Duties: Under direct supervision, on a shift, to be responsible for the operational care of main turbo-generator and reactor units; to operate or direct the operation of the highest types of auxiliary equipment; to execute safe and effective mark-ups on equipment within the station and to assist in the detailed training of Auxiliary Operators of lower grade.

May 1979 to April 1980

Position: Auxiliary Operator "B" (Unit #1)

Duties: Under direct supervision on a shift, to be responsible for the operational care of various types of complicated auxiliary equipment associated with one or more main turbo-generator or boiler units and with only casual supervision to start and stop such equipment under normal and emergency situations.

February 1979 to May 1979

Position: Utility Mechanic

Duties: Responsible for general plant cleanliness.

MILITARY

Navy

U.S.S. Archerfish (SSN678) (March 1976 - October 1978)

Mechanical Operator/ELT

- Qualified as Leading Engineering Laboratory Technician (Nov. 1977)
- Qualified on all subordinate watchstations up to and including Engine Room Supervisor (Senior Mechanical Watchstation), qualified in submarines. (Dec. 1977)
- Performed underway and refit maintenance on primary and secondary systems and components
- In charge of all personnel radiation monitoring and all radiac gear

U.S.S. Simon Lake (AS-33) (March 1975 - March 1976)

Rad-Con Monitor

- Assigned to Rad-Con Division (R-5) where qualified all subordinate watchstations up to and including Radiological Controls Monitor
- Responsible for all divisional Damage Control Gear including all radiacs



Nine Mile Point Unit 2 FSAR

CHIEF SHIFT OPERATOR - NUCLEAR (Cont)

MILITARY (Cont)

U.S.S. Edward McDonnell (DE-1043) (June 1973 - Sept. 1973)

M. Division Watchstander

- Qualified as Messenger, Engine Room Lower Level and Engine Room Upper Level on 1200# Steam Plant

Nuclear Power Plant Operator - S3G Prototype, Class 7403

Nuclear Power Training Unit (May 1974 - Feb. 1975)

Ballston Spa, New York

- Completed qualification as Mechanical Operator and ELT on operating nuclear Power plant, earned 3356 NEC
- Instructed trainees in operational phases of power plant qualifications

Nine Mile Point Unit 2 FSAR

RESUME

ALARA COORDINATOR - NUCLEAR

EDUCATION

- 1976 - 1979 Bachelor of Science
Rochester Institute of Technology
One Lomb Memorial Drive
Rochester, New York 14623
- Studies included biology, analytical chemistry, organic chemistry, biochemistry, radiation physics, introductory nuclear physics, radiation biology and radiation protection. Cum. Ave. 3.02
- 1974 - 1976 Associate of Applied Science, Radiologic Technology
SUNY Upstate Medical Center
716 E. Adams Street
Syracuse, New York 13210
- Studies included radiological technology and radiation physics. Cum. Ave. 3.25, Honors.
- May 1983 Radiological Health Physics
Two week intensive Radiological Health Physics course sponsored by the University of Lowell. ABHP Approved.
- Sept. 1982 Radiation Protection Technology
One week radiation protection technology course sponsored by Rockwell International. NRRPT Approved.
- May 1982 Professional Management Development Program
A one week company-sponsored course presented by Clarkson College of Technology. The course was designed to introduce and develop management skills.
- Sept. 1981 Nuclear Power Plant Mechanical Fundamentals
A 120 hour course presented by the company Training Department. The course was designed as an introduction to operator training with topics covering BWR power plant systems.
- Oct. 1980 Radiation Safety Specialist Training Program
A five-day course sponsored by Oklahoma State University. Program concentrated on industrial application of radiation safety, dose and shielding calculations and government regulations.



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Nine Mile Point Unit 2 FSAR
ALARA COORDINATOR - NUCLEAR (Cont.)

EXPERIENCE

March 1984 - Present

Alara Coordinator - NMPC Nine Mile Point, Lycoming, NY 13093

Duties include establishing and implementing a formalized Alara Program at Nine Mile Point and coordinating efforts to maintain occupational radiation exposures Alara during NMP 1 operational phase and NMP 2 construction phase.

November 1982 - March 1984

Assistant Health Physicist, Corporate - NMPC, 300 Erie Blvd. West
Syracuse, NY 13202

Duties include construction design review (ALARA), ALARA Review Committee, radiation monitoring engineering, Health Physics assistance to projects, projects ALARA review, radwaste licensing and assistance, Nine Mile Point Radwaste Management Committee, and Health Physics licensing.

October 1981 - November 1982

Assistant Supervisor Chemistry and Radiation Protection - NMPC,
Nine Mile Point, Lycoming, NY 13093

Duties include design review, chemistry and radiation protection procedure development, ALARA Review Committee, document review and Startup and Test at the Nine Mile Point Unit #2, scheduled to be complete in 1986. Additionally, direct supervision of 38 radiation protection technicians at Nine Mile Point Unit #1.

March 1981 - October 1981

Chemistry and Radiation Protection Technician - NMPC, Nine Mile
Point, Lycoming, NY 13093

Duties included monitoring high radiation work during a major refueling outage, instrument calibration, radiologic surveillance and routine plant chemistry.

May 1980 - March 1981

Radiation Safety Officer - Crouse-Irving Memorial Hospital, Syracuse, NY

Duties included monitoring the use of radioactive materials, radioactive waste disposal, personnel monitoring and radiation safety education of hospital staff.



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13

Nine Mile Point Unit 2 FSAR
ALARA COORDINATOR - NUCLEAR (Cont.)

September 1979 - March 1981

Nuclear Medicine Technologist - Crouse-Irving Memorial Hospital
Syracuse, NY

Duties included diagnostic nuclear medicine and radiopharmacy

SOCIETY MEMBERSHIPS & LICENSES

| | |
|------|---|
| 1982 | National Registry of Radiation Protection Technologists (NRRPT) |
| 1981 | American Nuclear Society |
| 1979 | Society of Nuclear medicine Technology Certification |
| 1979 | American Registry of Radiologic Technology/Nuclear Medicine |
| 1976 | New York State Department of Health License/Radiologic Technology |
| 1976 | American Registry of Radiologic Technology |

PAPERS AND PRESENTATIONS

| | |
|------|--|
| 1982 | Radiation Levels Due to CRUD Deposition in Boiling Water Reactors, Hazzen, M.J., Stocknoff, M.S., Irving, T.L. Barcomb, D.W. Present at ANS 1983 Winter Meeting October 30 - November 3, 1983. |
|------|--|



Nine Mile Point Unit 2 FSAR

RESUME

DOSIMETRY COORDINATOR

EDUCATION

BA in Physics - Temple University, 1971
BS in Bible - Philadelphia College of Bible, 1976

Further professional development

International Workshop of Panasonic TLD System Users, Aug. 1982
International Symposium on Beta Dosimetry, Feb. 1983
Professional Management Development Program, Jul. 1982

EXPERIENCE

1981 - Present

Niagara Mohawk Power Corp.

Responsibilities:

- Supervision of radiation records staff
- Review of radiation exposure reports
- Development of procedures relating to exposure monitoring and ALARA
- Coordination of ALARA Committee information
- Development of exposure monitoring systems
- Dosimetry department coordination with reference to:
 - scheduling
 - staffing
 - legal reporting requirements
 - individual exposure request information
 - training
 - investigation of specific exposure discrepancies
- Interfacing with contractors in developing radiological access control system

1971 - 1981

Radiation Management Corp.
3508 Market St.
Philadelphia, PA 19104

Responsibilities:

- Radiation Monitoring Laboratories
 - environmental
 - personnel
- Environmental Sciences Division
 - agricultural survey program implementation
- Whole Body Counting Division
 - Assistant Manager
 - operations implementation of mobile and fixed units



Nine Mile Point Unit 2 FSAR

DOSIMETRY COORDINATOR (Cont.)

- design, development, and documentation of in vivo monitoring systems
- phantom design
- Quality Assurance and Calibration studies
- Data analysis programming
 - CDC 6400 Temple University
 - IBM 360/70 University of Pennsylvania, UNICOL
 - Data General RMC
 - DEC 10 Medical School of University of Pennsylvania
 - PDP 11/05 General Electric Nuclear Fuels Division, Wilmington, NC
 - Nuclear Data 6600 Brunswick Steam Electric Station, Carolina Power and Light, NC
- Radiation Engineering and Quality Assurance
 - Rockwell International/USATHAMA contract
- Respirator Fit Test Operations and Training
 - Frontier Model FE560A (NaCL)

1969 - 1971

Temple University

- Laboratory Instructor - Physics

Summer 1968

Radio Corp. of America

- Thule, Greenland Service Support Shop at Ballistic Missile Early Warning System (BMEWS)



Nine Mile Point Unit 2 FSAR

RESUME

RESPIRATORY PROTECTION COORDINATOR

EDUCATION

Rochester Institute of Technology, Rochester, NY, B.S., Nuclear Medicine Technology, September 1978 to May 1981, included the following courses: Radiation Physics, Radiation Biology, Senior Project-Thermoluminescent Dosimetry, Organic Bio-Chemistry, General and Analytical Chemistry, Calculus, Fortran Computer Programming, Electronics, and Nuclear Medicine Internship Radioimmunoassay.

Grades: September 1978 - May 1980, 3.0 Academics,
May 1980 - June 1981, 4.0 Internship.

State University of New York, Upstate Medical Center, Syracuse, NY, A.A.S. Radiologic Technology, September 1976 to August 1978 (Grade 3.46).

WORK EXPERIENCE

Niagara Mohawk Power Corporation, Lycoming, NY

November 1981 to Present

Radiation Protection Technician A

December 1980 to November 1981

St. Joseph's Hospital Health Center, Syracuse, NY
Radiologic Technologist - Emergency Room, Medical Personnel Pool, Syracuse, NY.

September 1980 to December 1980

SUH-Upstate Medical Center, Syracuse, NY
Radiologic Technologist (Part Time).

June 1979 to September 1979

University of Rochester Medical Center, Rochester, NY.
Radiologic Technologist, Emergency Room

October 1978 to April 1979

Radiologic Technologist - Emergency/Operating Room, Full/
Part Time.



Nine Mile Point Unit 2 FSAR

RESPIRATORY PROTECTION COORDINATOR (Cont)

LICENSES/PROFESSIONAL AFFILIATIONS

N.Y.S. Licensed Radiologic Technologist (January 1979).
ARRT-Registered Radiologic Technologist (December 1978).
ARRT-Registered Nuclear Medicine Technologist (July 1981).



Nine Mile Point Unit 2 FSAR

RESUME

TRAINING SPECIALIST - NUCLEAR

EDUCATION

High School Graduate.

Draughtons Business College (no degree).

BOCES night schools (carpentry and machine shop).

Correspondence school (forestry).

New York State Sponsored Fire Schools: Pump Operator, Single Company Operations, and Essentials of Firemanship.

Niagara Mohawk Sponsored Schools and Courses: Fire School Multi-Media First Aid, Annual Radiation Protection Qualification, Clarkson College - Professional Management, and Cornell University - Train the Trainer.

MEMBERSHIPS

Past Member Volunteer Fireman (5 yr).

Past Member Volunteer Ambulance Corps (5 yr).

EMPLOYMENT

October 1982 to Present

Position: Training Specialist - Maintenance
Responsible for the fabrication and administration of job-related training programs to meet established standards for both Maintenance Electricians and Mechanics.

March 1974 to September 1982

Position: Maintenance Mechanic
Varied experience as Mechanic A, B, and C in generation station maintenance, both nuclear and oil fueled.

June 1966 to February 1974

Nuclear and oil fueled generation plants, product transmission pipelines including underwater, pumping stations, booster stations, hot tie-ins, road and river crossings.



Nine Mile Point Unit 2 FSAR

TRAINING SPECIALIST - NUCLEAR (Cont)

November 1964 to May 1966

Position: Equipment Operator, Payroll and Cost Analysis
Clerk

Started as payroll clerk, cost analysis for electrical transmission and distribution construction company, then field equipment operator including hot-stick maintenance and repair operations.

October 1962 to October 1964

Position: Office and Credit Manager
Retail outlet and consumer finance corporation.

September 1958 to October 1962

Position: Military Service, U.S. Marine Corps



Nine Mile Point Unit 2 ESAR

RESUME

TRAINING SPECIALIST - NUCLEAR

EDUCATION

Watertown High School, Watertown, NY, graduate, 1963.
State University College at Oswego, Oswego, NY, B.S., 1968.
U.S. Army Reserve, 1967 to present.

EMPLOYMENT

Niagara Mohawk Power Corporation, Syracuse, NY, Nine Mile
Point Unit 1, Lycoming, NY.

January 1982 to Present

Position: Fire Training Specialist - Nuclear.
Duties: Fire Training - to develop and implement programs
concerning Fire Protection and Fire Department Training.

June 1968 to January 1982

New York State Department of Transportation

Right of Way Agent, Real Property Acquisition, Real Estate
Appraisal.

EXPERIENCE

Fayetteville Fire Department (10 yr).
Fin Opns Chief - 1,209th USAG (USAR).
N.Y.S.E.M.T., 1973 to present.

Nine Mile Point Unit 2 FSAR

RESUME

NUCLEAR AUXILIARY OPERATOR - C

EDUCATION

Oswego High School, graduate 1967

State University College at Oswego, B.S. in Elementary Ed., 1975

Auburn Comm. College, A.A. in Gen. Education, 1970

MILITARY

1968-1974 U.S. Army Reserve Co. D 479th En Bn
Disc Apr. 74 E-6 Squad Leader

1975-1983 Same Unit - Platoon Sgt., 2 yr; Operations & TNC
Sgt. 7 yrs. Promoted to SFC E7 1982
Advanced Combat Engineer Correspondence Course

1983 Transferred to Control (IRR) Feb. 1983

EXPERIENCE

February 1984

Nuclear Auxiliary Operator C, NMPC - Assist in operation of Nuclear Plant Mark Ups.

August 1983

Auxiliary Operator B, NMPC - Assist in operation of Nuclear Plant.

May 1981

Nuclear Armed Guard, NMPC - Prevent Nuclear Sabotage.

1976 - 1981

Groves, J & K Boiler, Bouley, Cowper, Laborers Local 214 - Concrete crew, clean up, rock driller, carpenter helper, mason tender.

1975 - 1976

Mexico Acad. & Cent. School Dist., Permanent Substitute Teacher - Under contract to school dist. to replace absent teachers in grades K - 12.



Nine Mile Point Unit 2 FSAR

RESUME

CONSTRUCTION ENGINEER - 1

EDUCATION

Fitzhugh Park Jr. High School, Oswego, NY, graduate, 1966.

Oswego High School, Oswego, NY, 1966-1970.

Bradley University, Peoria, IL, B.S. College of Engineering and Technology - Department of Construction, 1974.

Rochester Institute of Technology, Rochester, NY, Part-time, pursuant to M.S. in Statistics, 1975.

Technical Seminars, Inc., Albany, NY, Piping Design and Fabrication in accordance with ASME Sections III and IX, 1979.

Technical Seminars, Inc., Albany, NY, Welding Design and Fabrication in accordance with ASME Section IX, 1980.

HONORS OR SOCIETIES

OSHA - Occupational Safety Health Act, course certification.

MESA - Mine Engineering Safety Association certification.

WORK EXPERIENCE

Niagara Mohawk Power Corporation, Nine Mile Point Unit 1, Lycoming, NY

August 1981 to Present

.. Construction Engineer (Nuclear) - Overall responsibility of contracted installation of design modifications.

February 1981 to August 1981

Construction Engineer (Acting Superintendent Construction Nuclear) - Overall responsibility of contracted installation of design modifications.

October 1979 to February 1981

Supervisor Mechanical Maintenance (Nuclear) - Installation of design modifications to existing plant systems and general plant maintenance.



Nine Mile Point Unit 2 FSAR

CONSTRUCTION ENGINEER - 1 (Cont)

February 1977 to September 1979

Technical Assistant to Station Superintendent - Design, installation, and management of mechanical and structural modifications to existing plant.

February 1976 to February 1977

John B. Pike & Son, Inc., Oswego, NY

Field Engineer - Intake and Discharge Tunnels for new power generation station located in Oswego, NY.

June 1974 to February 1976

FL Heughes & Co., Inc., Rochester, NY

Assistant to Structural Steel Erection Superintendent on \$30 million First Federal Plaza located in Rochester, NY.



Nine Mile Point Unit 2 FSAR

RESUME

AUXILIARY OPERATOR - B

EDUCATION

Oswego Public High, graduated 1963

State University College at Oswego, Industrial Arts (no degree)

E.C.P.I. Syracuse, Computer Programming

Syracuse University College of Engineering , QA Waste Treatment Operators License

EXPERIENCE

1982

Auxiliary Operator B, NMPC, - Make rounds in plant, learn plant and attend schools.

Senior Shift Supervisor, City of Oswego, - Responsible for testing and supervising of personell. Records keeping and chemical analysis of waste samples.

Territorial Manager, Gintzler Graphic Communications, - Responsible for P.R. in Syracuse area.

Estate Manager, Letchfield Park Corp., - Responsible for running of 28,000 acre logging operations.

Nine Mile Point Unit 2 FSAR

RESUME

Nuclear Operator - E

EDUCATION

St. Mary's - Ryken High School, Leonard Town , Maryland - graduated May 7, 1974.

U.S. Navy Nuclear Propulsion Training Unit, Bainbridge, MD. & Windsor.

Air Conditioning & Refrigeration & Lithium Bromide A/C Systems School, Locks. Conn.

MILITARY

US Navy 8 years

Sept 1974 - Machinist Mate A School, Great Lakes, Ill. (student)

Jan. 1975 - Navy Nuclear Propulsion School , Bainbridge, Maryland

Aug. 1975 - Nuclear Power Training Unit, Windsor Locks, Conn.

Apr. 1976 - USS Spadefish (SSN 668), Norfolk, VA - duties were engine room supervisor and engineering watch supervisor.

Apr. 1981 - USS Yellowstone (AD 41), Norfolk, VA - duties include nuclear repair coordinator, in charge of planning nuclear related propulsion plant repairs and modifications.

Experience

January 1984

Nuclear Auxiliary Operator E, NMPC, - Control room operator

August 1982

Nuclear Auxiliary Operator, NMPC, - Learning the plant

Nine Mile Point Unit 2 FSAR

QUESTION F640.06 (14.2.7, 1.8)

Delete the reference to Regulatory Guide 1.80 in FSAR Subsection 14.2.7 and substitute a statement of conformance to Regulatory Guide 1.68.3 (Preoperational Testing of Instrument and Control Air Systems) as in FSAR Section 1.8.

RESPONSE

See revised Section 14.2.7.

See revised Table 14.2-43.

14



Nine Mile Point Unit 2 FSAR

TABLE 14.2-43

SERVICE AND INSTRUMENT AIR SYSTEM

System 19

Preoperational Test (N2-POT-19)

Test Objectives

1. To demonstrate the reliable operation of the service and instrument air systems and components.
2. To ensure the system is properly designed and constructed.
3. To evaluate the service and instrument air systems operating procedures.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.
3. All valve lineups are completed.

Test Procedure

1. The test procedure will verify that the instrument and service air system is capable of supplying the plant's compressed air requirements during normal operation.
2. The autostart feature of the compressors will be demonstrated.
3. The air compressor trip modes will be verified for various transients, simulated during testing.
4. Air compressor capacity and load time will be verified.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-43 (Cont)

5. The test will ensure that the effluent dryers and associated instrumentation operate according to design.
6. System control instrumentation, alarms, interlocks, and annunciators will be demonstrated for correct response.
7. A loss-of-air-supply test (Regulatory Guide 1.68.3) will be conducted on those portions of the instrument air system which interface with safety-related systems to verify that the air-controlled components supplied directly from the instrument air system will respond as designed.
8. The test procedure will verify there are no crossties between the service air and instrument air systems which will degrade system operation.

Acceptance Criteria

1. The air compressors operate according to design specifications outlined in Equipment Specification No. NMP2-P261C.
2. The trip and autostart modes for the air compressors function as outlined in applicable SWEC logic diagrams.
3. System control instrumentation, alarms, annunciators, and interlocks will operate according to design as illustrated in applicable SWEC logic diagrams.
4. The system meets its design functions as described in Section 9.3.1.
5. The air operated safety related valves listed in Table 14.2-43A fail in their fail-safe positions on a loss of air.



LOSS OF AIR TEST

TABLE 14.2-43A

1 of 2

| VOLUME | ESK/GE | GE # | FALLS | LOCATION | FSK |
|-------------------|---------------|------|-------|----------|----------|
| 2 SWP: AOV20A,B | ESK-7SWP03 | NA | F.O. | AB | 9-10B, F |
| *AOV22A,B | -7SWP03 | | | ↓ | 9-10B, F |
| *AOV97A,B | -7SWP10 | | | RB | 9-10D, K |
| *AOV571 | -7SWP16 | | | ASB | 9-10J |
| *AOV572 | -7SWP05 | | | ↓ | 9-10E |
| *AOV573 | -7SWP05 | | | CC | 9-10M |
| *AOV574 | -7SWP16 | | | ↓ | |
| *AOV581 | -7SWP18 | | | ↓ | |
| *AOV154A,B | -7SWP05 | | | CC | ↓ |
| ↓ *AOV78A,B | -7SWP20 | ↓ | ↓ | CC | 9-10AJ |
| | | | | | |
| 2HVR: AOD1A,B | ESK-7HVR06 | NA | F.O. | RB | 22-1A |
| *AOD6A,B | -7HVR01,02 | | F.O. | ↓ | 22-1M |
| *AOD9A,B | -7HVR06 | | F.O. | ↓ | |
| *AOD10A,B | -7HVR06 | | ↓ | ↓ | |
| *AOD34A,B | -7HVR01 | | ↓ | ↓ | |
| ↓ *AOD204 | -7HVR08 | ↓ | ↓ | ↓ | ↓ |
| | | | | | |
| 2HVP: AOD4A,B,C,D | ESK-7HVP01,02 | NA | F.O. | DG | 22-7 |
| ↓ *AOD5A,B | -7HVP03 | ↓ | ↓ | ↓ | ↓ |
| | | | | | |
| 2HUY: AOD54A,B | ESK-7HUY08 | NA | F.O. | SW | 22-8B |
| | | | | | |
| 2HVC: AOD61A,B | ESK-7HVC01,02 | NA | F.O. | CB,CC | 22-9A, J |
| *AOD117 | -7HVC08 | | F.O. | CB | 22-9B |
| *AOD120 | -7HVC08 | | | ↓ | ↓ |
| *AOD6A,B | -7HVC01,02 | | | CC, CB | 22-9C |
| *AOD12A,B | -7HVC01,02 | | | CB | 22-9D |
| *AOD145 | -7HVC08 | | | ↓ | ↓ |
| *AOD142 | -7HVC08 | | | ↓ | ↓ |
| *AOD148 | -7HVC08 | | ↓ | CC | 22-9C |
| *AOD54A,B | -7HVC03 | | F.O. | CB | 22-9D |
| *AOD182 | -7HVC19 | | F.O. | ASB | 22-9E |
| *AOD183 | -7HVC05 | ↓ | F.O. | ASD | ↓ |



| VALUE # | ESK/GE | GE # | FAILS | LOC | FSK |
|--|--------------------|----------|-------|-----|---------|
| 2AC * ADD 192 | ESK - 7HVC20 | NA | F.C. | ASA | 22-9E |
| * ADD 193 | - 7HVC05 | | F.O. | " | ↓ |
| * ADD 169 | - 7HVC19 | | | CB | 22-9F |
| * ADD 170 | - 7HVC05 | | | CB | |
| * ADD 171 | - 7HVC19 | | F.C. | CB | |
| * ADD 177 | - 7HVC20 | | ↓ | " | |
| * ADD 178 | - 7HVC05 | | F.O. | " | |
| * ADD 179 | - 7HVC20 | | F.C. | " | |
| * ADD 212 | - 7HVC19 | | F.O. | " | |
| * ADD 213 | - 7HVC20 | | | " | |
| * ADD 214 | - NA? | | | " | |
| ↓ * ADD 215 | - 7HVC20 | ↓ | ↓ | " | ↓ |
| 2PCS * CTU 102
(Runic) | ESK - 7PLS (Latin) | 235-F020 | F.C. | RB | 25-1A |
| 2PCS * ADV 104 | ESK - 7CPS01 | NA | F.C. | RB | 22-23 |
| * ADV 105 | - 7CPS01 | | | " | |
| * ADV 110 | - 7CPS02 | | | " | |
| ↓ * ADV 111
(Pug) | - 7CPS02 | ↓ | ↓ | " | ↓ |
| 2PCS * ADV 109 | 807E173TY(14) | EST-F004 | F.C. | RB | 27-6C |
| * ADV 110 | | EST-F005 | | | ↓ |
| * ADV 130 | | EST-F025 | | ↓ | 27-6D |
| ↓ * ADV 131
(RSC) | | EST-F020 | ↓ | SC | ↓ |
| 2CTS * ADV 101
(Shanty Gas Treatment) | ESK - (Latin) | | F.C. | ? | 27-15A |
| 2SFC * ADV 19A,B | ESK - 7SFC01,02 | NA | F.C. | RG | 34-2D |
| * ADV 33A,B | - 7SFC01,02 | | | | 34-2A,B |
| * ADV 153 | - 7SFC09 | | | | 34-2C |
| ↓ * ADV 154
(Fuel Pool Cor.) | - 7SFC010 | ↓ | ↓ | ↓ | ↓ |
| 2RDS * ADV 123
(Control not drive) | 807E159TY(2) | C12-F011 | F.O. | RB | 36-1F |



Nine Mile Point Unit 2 FSAR

QUESTION F640.08 (14.2.7)

To meet the regulatory position stated in Regulatory Guide 1.108 (Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Plants):

1. Delete your current exception to Regulatory Guide 1.108 in FSAR Subsection 14.2.7 and commit to conducting all diesel generator preoperational tests with the diesel generators installed in-plant, or provide expanded technical justification to provide assurance that vendor testing will accomplish the same test objectives as in-situ testing.
2. Delete your current exception to Regulatory Guide 1.108 (position c.2.a(3)) in FSAR Section 1.8 and commit to testing the diesel generator for two hours at a load equivalent to the 2 hour rating, not the 2000-hour rating as listed in FSAR Section 1.8.
3. Modify Preoperational Test Abstract Number 14.2-47 (Diesel Generator Mechanical System) to include testing to ensure the satisfactory operability of all check valves in the flow path of cooling water for the diesel generators from the intake to the discharge (see I&E Bulletin No. 83-03: Check Valve Failures in Raw Water Cooling Systems of Diesel Generators).
4. Modify Preoperational Test Abstract Number 14.2-97 (Emergency A-C Distribution Load Carrying Capability System) and/or Number 14.2-98 (Loss of Power/ECCS Functional Test) to demonstrate proper diesel generator operation during load shedding, including a test of the loss of the largest single load and complete loss of load, and verify that the voltage requirements are met and that the overspeed limits are not exceeded. Your testing should, in addition, provide assurance that any time delays in the diesel generator's restart circuitry will not cause the supply of compressed air used to initially rotate the engine to be consumed in the presence of a safety injection signal (see I&E Information Notice Number 83-17, March 31, 1983).



Nine Mile Point Unit 2 FSAR

RESPONSE

1. See response to Question F430.17.
2. See Section 1.8.
3. See revised test abstract in Table 14.2-36.
4. See revised test abstract in Table 14.2-125.

14 |



Nine Mile Point Unit 2 FSAR

Regulatory Guide 1.9 See Section 8.3.

Regulatory Guide 1.20 The alternative approved for vibration testing of reactor internals will be in accordance with the provisions of Regulatory Guide 1.20 for nonprototype Category I plants.

Regulatory Guide 1.22 See Chapter 7.

Regulatory Guide 1.30 See Chapter 17.

Regulatory Guide 1.52 The standby gas treatment system (SGTS) will be tested in accordance with Regulatory Guide 1.52 as described in Table 14.2-74. The design of the SGTS is described in Section 6.5.1. Alternative methods used to meet the intent of the Regulatory Guide are discussed in Section 1.8.

Regulatory Guide 1.58 The NMPC Quality Assurance Program for Unit 2 is currently in compliance with Regulatory Positions C.5, C.6, C.7, C.8, and C.10 of Regulatory Guide 1.58.

The SWEC Quality Assurance Program for Unit 2 is currently in compliance with Regulatory Positions C.5, C.7, C.8, and C.10. Alternatives to Regulatory Position C.6 are discussed in Section 1.8.

GE startup operations personnel qualifications meet the requirements of this Regulatory Guide as discussed in Section 1.8.

Regulatory Guide 1.68 Unit 2 complies with Regulatory Guide 1.68 except for the format of the test procedures which may differ from that described in Regulatory Guide 1.68, Appendix C; however, all required elements are included. This change is not an exception but a clarification to the regulatory guide.

Regulatory Guides 1.68.1 and 1.68.2 Unit 2 complies with Regulatory Guides 1.68.1 and 1.68.2 (Tables 14.2-53 and 14.2-90, respectively).

Regulatory Guide 1.68.3 Unit 2 complies with Regulatory Guide 1.68.3 as described in Section 1.8.

Regulatory Guide 1.108 Unit 2 complies with Regulatory Guide 1.108.



Nine Mile Point Unit 2 FSAR

Regulatory Guide 1.128 See Section 8.3.2.

14.2.8 Utilization of Reactor Operating and Testing Experiences in Development of Test Program

Since every reactor/plant in a GE BWR product line is an evolutionary development of the previous plant in the product line (and each product line is an evolutionary development from the previous product line), it is evident that the current plants have the benefits of experience associated with successful and safe starting of 25 or more previous BWR plants. The operational experience and knowledge gained from these plants and other reactor types has been factored into the procedures related to the preoperational and startup test program.

Additionally, a committee of NMPC operations technical staff and staff engineers (technical services review) reviews reactor operating and testing experiences. This group reviews the preoperational and startup test procedures. The group routinely reviews Licensee Event Reports, information from the Nuclear Plant Reliability Data System (NPRDS), NRC I.E. Bulletins, NRC Circulars, and NRC, INPO, and NSAC Information Reports. These same individuals continue to provide input to operations management after commercial operation.

14.2.9 Trial Use of Plant Operating and Emergency Procedures

Throughout the preoperational and initial startup test program, test procedures utilize operating and emergency procedures where applicable in the performance of tests. The use of these procedures is intended to achieve the following:

1. Prove the specific procedure or identify changes that may be required.
2. Provide training of plant personnel in the use of these procedures.
3. Increase the level of knowledge of plant personnel of the systems being tested.

Test procedures may use these operating and emergency procedures by referencing the procedure directly or by



Nine Mile Point Unit 2 FSAR

TABLE 14.2-126

HPCS DIESEL GENERATOR MECHANICAL

System 100

Preoperational Test (N2-POT-100B)

Test Objectives

1. To demonstrate the reliable operation of the HPCS diesel generator systems and components.
2. To ensure the system is properly designed and constructed.
3. To evaluate the HPCS diesel generator systems operating procedures.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.
3. All valve lineups are completed.

Test Procedure

1. The engine jacket water system is verified to function as designed and verified that it maintains engine temperature within design limits.
2. The HPCS diesel generator lubrication oil systems will be tested to verify their ability to supply oil to necessary engine components and maintain the engine in a warm prelubricated standby condition.
3. Proper diesel generator operation will be verified for a loss of offsite power and LOCA conditions.



TABLE 14.2-126 (Cont)

4. The test will demonstrate the operation of the diesel generator during load shedding, including complete loss of load, with verification of voltage requirements and overspeed limits.
5. The ability to synchronize the generator, while under load, with offsite power sources will be demonstrated.
6. The reliability of the diesel generator will be demonstrated by means of 69 consecutive starts.
7. All applicable alarms and annunciators will be verified for proper operation.
8. Full load carrying capability will be demonstrated during a 24 hour test run, 22 hours of which will be at the load equivalent of the continuous rating and two hours at the two hour rating of the diesel generator.
9. Functional capability of the diesel generator at full load temperature conditions will be demonstrated by running automatic start and load sequencing tests immediately following the 24 hour run.

Acceptance Criteria

1. The HPCS diesel generator starts, accelerates to rated speed, voltage, and frequency within 27 sec of receipt of a start signal.
2. Diesel generator voltage requirements are maintained, and overspeed limits are not exceeded during a complete loss of load on the generator.
3. With the generator connected to the emergency load, it can be synchronized and load transferred to the offsite power source.
4. Diesel generator reliability has been proven by means of 69 consecutive starts with no failures.
5. The engine jacket water system functions as designed to maintain engine temperature within design limits in both standby and operating conditions.
6. The diesel generator lubrication oil system functions as designed to lubricate engine bearings and other moving parts and maintain the engine in a warm prelubricated standby condition.
7. All alarms and annunciators function as designed in accordance with Sections 9.5.5.3, 9.5.7.3, and 8.3.1.1.2.



Nine Mile Point Unit 2 FSAR

QUESTION F640.10 (14.2.12)

Preoperational and acceptance test abstracts use an identical format for describing what will be done and, for many of the tests, either reference an FSAR subsection that only in vague generalities discusses how the system is designed to perform, or reference an incorrect or nonexistent FSAR subsection. Startup test abstracts often do not list sources of acceptance criteria. For any of the following tests subject to FSAR Chapter 17 Quality Assurance Program requirements, modify the abstract to include specific acceptance criteria or identification of the sources for the acceptance criteria to be used when test procedures are prepared. This information is necessary for the NRC inspectors who review test procedures and evaluate test results. The test description should provide "traceability" to acceptance criteria sources such as: other FSAR subsections which contain specific detail as to the expected system performance, Technical Specifications, topical reports, vendor-furnished test specifications, and/or accident analysis assumptions.

1. Preoperational Test Abstract Numbers 14.2-45 through 51, 66, 68, 74, 76, 78, 84, 85, 92, 100, 102 through 105, 108, and 109.
2. Startup Test Abstract Numbers 14.2-110, 112 through 115, 117 through 126, 128 through 137, and 139 through 144.

RESPONSE

Revised preoperational and acceptance test abstracts are provided in Section 14.2. Revised startup test abstracts are provided in Tables 14.2-202 through 14.2-227.

| 12



Nine Mile Point Unit 2 FSAR

TABLE 14.2-74

SCREENWELL BUILDING, DIESEL FIRE PUMP ROOM,
AND MISCELLANEOUS VENTILATION SYSTEMS

Systems 58 and 59

Preoperational Test (N2-POT-58)

Test Objectives

1. To demonstrate the reliable operation of these ventilation systems and components.
2. To demonstrate that the system's interlocks, controls, and protective functions operate in accordance with design requirements.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.
3. All valve and damper lineups are completed.
4. All electrical lineups are complete.

Test Procedure

1. Fans, dampers, heaters, and unit coolers will be operated to ensure proper interlock and control functioning.
2. Flow switches, temperature switches, differential pressure switches, and limit switches will be overridden to test automatic protective and control functioning of system components.
3. After all subsystem testing has been completed, the system will be started, allowed to stabilize,



Nine Mile Point Unit 2 FSAR

TABLE 14.2-74 (Cont)

temperature controllers adjusted, and data taken to ensure performance in accordance with specifications.

Acceptance Criteria

1. All protective functions operate in accordance with applicable SWEC documents.
2. System parameters have met or exceeded design requirements in accordance with applicable SWEC documents.
3. For the systems listed below, system control and interlock functions operate in accordance with the appropriate logic diagrams.
 - a) Screenwell Building HVAC - LSK 22-8A, LSK 22-8B
 - b) Diesel and Electric Fire Pump Rooms HVAC - LSK 22-8C, LSK 22-8F, LSK 22-8H
 - c) Service H₂O Pump Bays HVAC - LSK 22-8D, LSK 22-8H, LSK 22-8J
 - d) Electric Bay Ventilation - LSK 22-8K
 - e) Condensate Storage Building Vent - LSK 22-8G, LSK 22-8L



Nine Mile Point Unit 2 FSAR

TABLE 14.2-63

FIRE PROTECTION CO₂

System 45

Preoperational Test (N2-POT-45)

Test Objectives

1. To demonstrate the reliable operation of the fire protection CO₂ system and components.
2. To ensure the system is properly designed and constructed.
3. To evaluate the fire protection CO₂ system operating procedures.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation.
3. All valve lineups are completed.
4. The fire computer, fire detection, and ventilation systems are available to support testing.

Test Procedure

1. The CO₂ storage tank is filled.
2. The CO₂ hose reels are verified for proper operation.
3. The CO₂ hazard valves are puff tested, with the CO₂ tank isolated and its bypass open, from the local fire panel, main fire panel, and associated detection zones in both manual and automatic modes of operation. Concentration tests are performed on total flooding systems.



TABLE 14.2-63 (Cont)

4. The generator hydrogen and CO₂ subsystems are tested for CO₂ flow and associated alarms and annunciators.

Acceptance Criteria

1. Valves, annunciators, computer points and alarms are designed and operated according to SWEC design drawings LSK 15-3A-G. |
2. The generator hydrogen and CO₂ valves function according to SWEC design drawings LSK 15-3A-6. |
3. CO₂ concentrations for total flooding systems are as per NFPA Codes - Volume I; Code 12: Carbon Dioxide Systems.
4. System design and operation is as described in FSAR Section 9.5.1. |



Nine Mile Point Unit 2 FSAR

TABLE 14.2-19

CONTROL BUILDING DRAIN SYSTEM .

System 66

Acceptance Test (N2-AT-66F)

Test Objectives

1. To demonstrate the reliable operation of the control building drain systems and components.
2. To ensure the system is properly designed and constructed.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.
3. All valve lineups are completed.
4. Service water or fire system water is available to support testing.

Test Procedure

1. Service water or fire system water will be used to fill the sump for test purposes.
2. The capacity of the sump will be verified.
3. The test will verify that the control building drains system will collect and discharge drainage to the storm sewer system.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-19 (Cont)

Acceptance Criteria

1. Sump pumps 20FM-P5A and P5B alternately start as lead and backup pumps per LSK 23-12D.
2. Sump 20FM-SUMP4 has a total capacity of 1,150 gallons per FSK 23-12F.
3. The system meets its design functions as described in FSAR Section 9.3.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-83

AUXILIARY BOILER BUILDING DRAINS

System 66

Preoperational Test (N2-POT-66G)

Test Objectives

1. To demonstrate the reliable operation of the auxiliary boiler building drain system and components.
2. To ensure the system is properly designed and constructed.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.
3. All valve lineups are completed.
4. Service water or fire system water is available to supply a volume of water for this test.

Test Procedure

1. Service water or fire system water will be used to fill the sump.
2. The capacity of the sump is checked to ensure proper design.
3. The lead-lag alternating control circuit for both sump pumps is checked for proper operation.

Acceptance Criteria

1. Aux. boiler building sump has a nominal total capacity of 2400 gallons with an active capacity greater than 1150 gallons.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-83 (Cont)

2. The sump pumps sequentially start and discharge water to the liquid radwaste system per LSK 23-12C and LSK 31-1.24D. |
3. The system meets its design functions as described in FSAR Section 9.3. |



Nine Mile Point Unit 2 FSAR

TABLE 14.2-102

STATION AND EMERGENCY LIGHTING SYSTEM

System 75

Preoperational Test (N2-POT-75)

Test Objectives

1. To demonstrate the reliable operation of the station and emergency lighting system and components.
2. To ensure the system is properly designed and constructed.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power are available.

Test Procedure

1. The normal lighting subsystem is checked to ensure adequate illumination is provided.
2. The emergency lighting subsystem is verified to provide adequate illumination in areas required for operating the safety-related equipment during emergency conditions.
3. The essential lighting subsystem is checked to ensure partial illumination is provided for certain critical areas of the station requiring continuous lighting, such as the control room by UPS systems.
4. The egress lighting subsystem is verified to provide adequate illumination for all egress signs and egress routes.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-102 (Cont)

Acceptance Criteria

1. All station lighting systems will be shown to provide
adequate lighting in accordance with Table 9.5-2.
2. The system meets its design functions as described in FSAR Section 9.5.3. |



Nine Mile Point Unit 2 FSAR

TABLE 14.2-105

AREA RADIATION MONITORING SYSTEM

System 79

Preoperational Test (N2-POT-79)

Test Objectives

1. To demonstrate the reliable operation of the area radiation monitoring system and components.
2. To ensure the system is properly designed and constructed.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to control circuits and instrumentation are available.

Test Procedure

1. System alarms, detectors, indicators, and annunciators are checked to ensure they detect and measure ambient gamma radiation levels at various locations.
2. Alarms and set points are verified by simulated signals to ensure alarms provide audible and visual indication in monitored areas and in the main control room if gamma radiation exceeds a specified limit.

Acceptance Criteria

1. The system functions as designed per FSAR Section 12.3.4
2. All alarms and annunciators function as designed.



Nine Mile Point Unit 2 ESAR

TABLE 14.2-106

PROCESS AND AIRBORNE
RADIATION MONITORING SYSTEM

System 80

Preoperational Test (N2-POT-80)

Test Objectives

1. To demonstrate the reliable operation of the process and airborne radiation monitoring system and components.
2. To ensure the system is properly designed and constructed.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.
3. All valve lineups are completed.

Test Procedure

1. Annunciators, alarms, and trip functions for the digital radiation monitoring and nondigital radiation monitoring subsystems are verified to ensure that monitors provide warning of increasing radiation levels, power failures, or component malfunction.
2. Alarms and set points are verified by simulated signals or parameter variation.
3. System isolations which are initiated by the process radiation monitoring system will be demonstrated, including off-gas, radwaste, and reactor building ventilation isolations.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-106 (Cont)

Acceptance Criteria

1. The process radiation systems provide continuous indication of selected radiation levels in the control room.
2. Alarms and annunciators function as designed to provide indication of increasing radiation levels.
3. All automatic actions initiated by the process radiation monitoring system, including system isolations, function as designed.
4. The system meets its design functions as described in FSAR Section 11.5.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-59

SOLID RADWASTE HANDLING SYSTEM

System 41

Preoperational Test (N2-POT-41)

Test Objectives

1. To demonstrate the reliable operation of the solid radwaste handling system and components.
2. To ensure the system is properly designed and constructed.
3. To evaluate the solid radwaste handling system operating procedures.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.
3. All valve lineups are completed.

Test Procedure

1. The WSS program is verified to ensure it controls mechanical process sequence.
2. Valves, interlocks, set points, and controls are verified for proper operation.
3. Capability of pump to transfer waste to and from desired destination using simulated waste variation is verified.
4. Vital alarms and annunciators are verified by simulated signals or actual parameter variation.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-59 (Cont)

5. The steam supply from the WSS electric boiler is checked to ensure it is adequate for proper operation of equipment.
6. Using a simulated waste stream, waste will be processed via the extruder evaporator to ensure proper mixing and no freestanding water.

Acceptance Criteria

1. All parameters affecting the processing of solid radwaste meet design flows, temperatures and pressures per Werner and Pfleiderer Corp. instruction manual.
2. Valve interlocks, setpoints and controls function according to system logic drawings contained in the Werner and Pfleiderer Corp. instruction manual.
3. Alarms and annunciators associated with this system function as designed per system logic drawings contained in the Werner and Pfleiderer Corp. instruction manual.
4. Valve interlocks, trips, alarms and controls associated with electric boiler function as designed.
5. The solidified product should be a homogeneous mixture with no freestanding water.



Nine Mile Point Unit 2 ESAR

TABLE 14.2-62

FOAM FIRE PROTECTION SYSTEM

System 44

Preoperational Test (N2-POT-44)

Test Objectives

1. To demonstrate the reliable operation of the foam fire protection system and components.
2. To ensure the system is properly designed and constructed.
3. To evaluate the foam fire protection system operating procedures.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.
3. All valve lineups are completed.
4. The foam concentrate tanks are filled to \leq half normal level.

Test Procedure

1. The test procedure ensures all controls, interlocks, and valves are checked for proper operation to ensure performance in accordance with specifications.
2. The test will demonstrate the auto start and trip features of the foam pumps and the actuation of automatic valves upon receipt of a signal from the fire detection system or a control switch.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-62 (Cont)

3. All computer alarms and annunciators associated with the foam fire protection system will be tested for proper operation.

Acceptance Criteria

1. The auto-start and trip features of fixed hazard foam pumps and hose reel foam function as designed according to SWEC design drawings - LSK 15-4A-F. |
2. Automatic valves, annunciators and computer alarms function as designed per LSK 15-4A-F. |
3. Foam concentrate utilized is acceptable per NEPA requirements.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-103

PLANT COMMUNICATION SYSTEM

System 76

Preoperational Test (N2-POT-76)

Test Objectives

1. To demonstrate the reliable operation of the plant communication systems and components.
2. To ensure the system is properly designed and constructed.
3. To verify that the plant communication systems can provide proper intraplant and plant-to-offsite communications.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.

Test Procedure

1. The test will verify the proper operation of the plant page party/public address communication system.
2. The system's emergency evacuation alarm and other emergency alarms will be demonstrated.
3. The test will verify that plant communication systems provide adequate site coverage both indoors and outdoors.
4. Verification of power supplies for communication equipment will be performed.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-103 (Cont)

Acceptance Criteria

1. The system's emergency evacuation alarm and other emergency alarms function as designed and provide adequate alarm signals throughout the plant.
2. Adequate area coverage is provided by the several subsystems of the plant communication system.
3. The intraplant and plant-to-offsite communications operate as designed.
- 4. The plant communication systems function as designed per FSAR Section 9.5.2. |



TABLE 14.2-39

TURBINE BUILDING CLOSED LOOP COOLING WATER SYSTEM

System 14

Preoperational Test (N2-POT-14)

Test Objectives

1. To demonstrate the reliable operation of the turbine building closed loop cooling water system and components.
2. To ensure the system is properly designed and constructed.
3. To evaluate the turbine building closed loop cooling water system operating procedures.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.
3. All valve lineups are completed.
4. The instrument air, service water, and makeup water transfer systems are operable.
5. The TBCLCW system is operating in a two-pump, two-heat exchanger mode with the third pump and heat exchanger vented and in standby.

Test Procedure

1. Switches, signals, and interlocks are verified for the three system pumps.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-39 (Cont)

2. System surge and makeup tank level is monitored and verified for proper operation.
3. System control valves are modulated to verify proper operation.
4. The automatic response for the off-gas condenser outlet valves is checked for proper response.
5. With the TBCLCW system in a two-pump mode, the baseline operating data is collected and recorded.

Acceptance Criteria

1. The automatic trip and start features for the TBCLCW pumps operate according to FSAR Section 9.2.7 and ESK 5CCS01, 02, 03. |
2. Temperature control valves operate as per FSAR Section 9.2.7. |
3. The system supplies water to different plant components in accordance with Table 9.2-9.
4. In a two-pump mode, the TBCLCW system is capable of meeting the maximum design flow rate (16,000 gpm) in accordance with Section 9.2.7.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-42

POST-ACCIDENT SAMPLE SYSTEM

System 17

Preoperational Test (N2-POT-17B)

Test Objectives

1. To demonstrate the reliable operation of the post-accident sample system and components.
2. To ensure the system is properly designed and constructed.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.
3. All valve lineups are completed.

Test Procedure

1. The sample line solenoid valves are verified for proper operation.
2. The sample line solenoid valve permissive switch is verified for proper operation.
3. The control logic of the sample panel is tested by manipulating switches and valves.
4. Simulated signals are used to verify that valves respond properly and sample panel functions according to design.

Acceptance Criteria

1. All applicable parameters meet design specifications per G.E. Test Specification 22A22718A: Appendix B - Section 31-5.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-42 (Cont)

- 8
2. All applicable alarms and annunciators function as designed.
 3. The system meets its design functions by delivering representative samples at design pressures and temperatures.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-28

CONDENSATE STORAGE AND TRANSFER SYSTEM

System 4

Preoperational Test (N2-POT-4)

Test Objectives

1. To demonstrate the reliable operation of the condensate storage and transfer systems and components.
2. To ensure the system is properly designed and constructed.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.
3. All valve lineups are completed.
4. Makeup water storage and transfer system is operable.

Test Procedure

1. The capability of the makeup water storage system to supply water to the condensate storage tanks is verified.
2. Full flow tests of both condensate transfer pumps will be conducted to verify pump operability.
3. Pump autostart and trip features are verified for both pumps.
4. Condenser hotwell level control system is tested for proper operation of makeup and drawoff valves and alarms associated with hotwell level.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-28 (Cont)

Acceptance Criteria

1. Condensate transfer pumps auto start on low discharge header pressure or high pump discharge header flow demand per FSAR Sec. 9.2.6. |
2. The condenser hotwell can be maintained at the normal level automatically by the normal makeup and drawoff valves per FSAR Sec. 9.2.6. |
3. The condensate emergency makeup valve opens automatically on low hotwell level as described in FSAR Section 9.2.6. |
4. The condensate transfer system is capable of supplying water to the appropriate plant systems as listed in FSAR Section 9.2.6. |



TABLE 14.2-129

LOSS OF POWER/ECCS FUNCTIONAL TEST

Preoperational Test (N2-POT-110)

Test Objectives

1. To demonstrate the reliable operation of the loss of power/ECCS system and components.
2. To ensure the system is properly designed and constructed.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.
3. All valve lineups are completed.
4. The following systems must be available to support testing: service water, diesel generators, diesel generator HVAC, RHR, RCIC, HPCS, LPCS, process computer, control building HVAC, RPS, reactor recirculation, and reactor building HVAC.

Test Procedure

1. A LOCA signal with subsequent loss of offsite power will be simulated to demonstrate that during accident conditions the electrical buses are capable of supplying power to safety-related loads when powered by the diesel generators.
2. A loss of offsite power signal with a subsequent LOCA will be simulated to demonstrate that during accident conditions electrical buses are capable of supplying necessary power to safety-related loads when powered by the diesel generators.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-129 (Cont)

3. Simultaneous signals for LOCA and loss of offsite power are simulated to demonstrate that during accident conditions the electrical buses are capable of supplying necessary power to safety-related loads when powered by the diesel generators.

Acceptance Criteria

1. Systems required to operate during LOCA and/or loss of off-site power conditions operate within time and load requirements of their design per FSAR Section 8.3.
2. In the event one diesel generator becomes unavailable, the remaining two diesels will be capable of feeding the loads necessary for safe plant shutdown per FSAR Section 8.3.
3. Emergency divisions I, II and III are electrically independent from each other per FSAR Section 8.3.



TABLE 14.2-109

PRIMARY CONTAINMENT ISOLATION SYSTEM

System 83

Preoperational Test (N2-POT-83)

Test Objectives

1. To demonstrate the reliable operation of the primary containment isolation system and components.
2. To ensure the system is properly designed and constructed.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.
3. All valve lineups are completed.

Test Procedure

1. The test procedure ensures that the system automatically isolates appropriate lines penetrating the primary containment when predetermined plant limits are reached.
2. All set points, alarms, and annunciators related to this system will be tested for proper operation.
3. The drywell-to-suppression pool vacuum breakers will be verified for proper operation.
4. Specific sections of the primary containment isolation system preoperational test may be performed in other preoperational tests.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-109 (Cont)

Acceptance Criteria

1. Interlocks and system logic have been demonstrated to be in accordance with applicable design drawings LSK 27-19A-J. |
2. All alarms and annunciators function as designed.
3. The system meets its design objectives per FSAR Section 6.2.4. |



TABLE 14.2-107

CONTAINMENT LEAKAGE MONITORING

System 81

Preoperational Test (N2-POT-81)

Test Objectives

1. To demonstrate the reliable operation of the containment leakage monitoring system and components.
2. To ensure the systems are properly designed and constructed.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.
3. All valve lineups are completed.
4. No primary containment isolation signals present.

Test Procedure

1. The drywell and suppression chamber manometer isolation valves are tested by checking all annunciators, interlocks, and controls.
2. All drywell electrical penetrations are pressure tested.
3. Associated annunciators and computer alarms will be verified by simulated signals or actual parameter variation.

Acceptance Criteria

1. Each leakage monitoring valve must be operable from the individual switches and isolated in pairs from their respective isolation switches.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-107 (Cont)

Proper valve and off normal status display indication functions as required per LSK 33-1A, 1B. .

2. The isolation valves must isolate on a containment isolation signal. The isolation valves must provide proper computer response as to their respective positions per LSK 33-1A, 1B.
3. All electrical penetrations must maintain pressure and all annunciators and computer alarms function as designed when a low pressure condition exists.



TABLE 14.2-82

DIESEL GENERATOR BUILDING DRAINS

System 66

Preoperational Test (N2-POT-66C)

Test Objectives

1. To demonstrate the reliable operation of the diesel generator building drains system and components.
2. To ensure the system is properly designed and constructed.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All preliminary tests are satisfactorily completed.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.
3. All valve lineups are completed.
4. Service water system or the fire system is available to supply a volume of water for this test.

Test Procedure

1. The oil holding compartment is filled.
2. The diesel generator oil separator is tested to verify that it can handle flow from the three sumps and applicable monitors respond as designed.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-82 (Cont)

Acceptance Criteria

1. The oil holding compartment will hold 300 gallons of oil in accordance with Purchase Specification No. NMP2-W014S.
2. The oil separator 2DFM-SP1 can handle hydraulically flow from 2DFD-Sump 1, 2DFD-Sump 2, and 2DFD-Sump 3 individually, and applicable monitors respond as designed.
3. Level switches, computer alarms and annunciators function as designed per LSK 23-11.
4. The diesel generator building drain system meets its design requirements per FSAR Section 9.3.3.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-114

CONTAINMENT INERTING SYSTEM

System 88

Preoperational Test (N2-POT-88)

Test Objectives

1. To demonstrate the reliable operation of the containment inerting system and components.
2. To ensure the system is properly designed and constructed.
3. To evaluate the containment inerting system's operating procedures.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.
3. All valve lineups are completed.

Test Procedure

1. The test procedure ensures all controls, interlocks, and valves are checked for proper operation so that performance is in accordance with specifications.
2. All alarm and set points are verified by simulated signals or actual parameter variation.
3. The test procedure will verify the system's ability to inert the containment and maintain the oxygen concentration at or below 4 percent.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-114 (Cont)

Acceptance Criteria

1. All applicable parameters meet design specifications, i.e., flows, temperatures, and pressures.
2. All remote-operated valves operate as designed.
3. All alarms and annunciators function as designed.
4. All interlocks and controls operate in accordance with design.
5. The system is capable of supplying nitrogen gas for inerting the primary containment when required and maintaining an inert atmosphere in the containment during normal operations per FSAR Sec. 9.3.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-77

STANDBY GAS TREATMENT AND SECONDARY
CONTAINMENT LEAKAGE TEST

12

System 61

12

Preoperational Test (N2-POT-61B)

Test Objectives

1. To demonstrate the reliable operation of the standby gas treatment system and components.
2. To verify that the standby gas treatment system can maintain the proper reactor building pressure and that reactor building leakage rate is within design limits.

12

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.
3. All valve lineups are completed.
4. Reactor building ventilation system is operable, and all reactor building doors and hatches are closed.

12

Test Procedure

1. The test procedure will verify that the two gas treatment filter trains operate according to design specifications under normal and transient conditions.
2. Various system auto initiations will be demonstrated.
3. System annunciators, control instrumentation, and interlocks will be tested.
4. Standby gas treatment fan operation will be verified.

12



Nine Mile Point Unit 2 FSAR

TABLE 14.2-77 (Cont)

5. The test will verify that the SGTS will accomplish its design objective of reestablishing the Reactor Building pressure equal to or below -0.25 in W.G. within the required time interval.
6. With the standby gas treatment system in operation and all doors and hatches controlled in the closed position, secondary containment leakage rate will be verified as within allowable limits.

Acceptance Criteria

1. Each standby gas treatment system train and its associated equipment; valves, motors, filters, etc., will function as designed per SWEC logic drawings LSK 27-15A-H.
2. System interlocks, control instrumentation and annunciators function as designed per SWEC design drawings LSK 27-15A-H.
3. Reactor Building ventilation system isolation functions as designed per system logic drawings LSK 27-15A-H.
4. Each standby gas treatment system train can maintain reactor building pressure equal to or below -0.25 wg.
5. The reactor building leakage rate is not greater than 3,160 cfm.
6. The secondary containment drawdown time to -0.25 in. W.G. is less than 90 seconds, at a maximum of 3600 cfm.



TABLE 14.2-225

MAXIMUM FEEDWATER RUNOUT CAPABILITY

Startup Test (SUT-23D)

Test Objective

To determine that the maximum feedwater runout capability is compatible with licensing assumptions and to calibrate the feedwater flow.

Prerequisites

The appropriate preoperational tests have been completed; the SORC has reviewed and approved the test procedures and initiation of testing. Instrumentation has been checked or calibrated as appropriate.

Test Procedure

The test is divided into two parts: 1) the initial calibration of the speed controllers and 2) verification of calibration by measured data, which includes a verification that the maximum feedwater flows do not exceed the flows (different flows at different vessel pressures) in the FSAR Section 10.4.7.2

1. The speed controller calibration is done by first obtaining vendor pump performance curves. The pump performance curves are then used to determine the turbine speed corresponding to the maximum allowable flow at rated vessel pressure specified by the FSAR and the minimum speed which corresponds to 0 percent flow at 865 psia. Additionally, for good level control system performance, it is desirable to be able to reach 115 percent NBR flow at 1,075 psia and 68 percent NBR flow at 1,025 psia in the one-pump-tripped condition. Adjustable equipment (i.e., feed pump turbine speed control loops, mechanical limiters, feedwater control system function generators, etc) are set to prevent the feedwater pumps from exceeding their maximum allowed output, and yet allow the desirable performance.
2. During the data collection and verification of calibration portion of the test, pressure, flow, and controller data will be collected between 60 and 100 percent power. Measured data will be compared against expected values to ensure proper calibration. The measured maximum flow will be adjusted to the FSAR



Nine Mile Point Unit 2 FSAR

TABLE 14.2-225 (Cont)

12 pressures using the measured data. The maximum flows stated in the FSAR are used as licensing assumptions; therefore, the FSAR maximum flows should not be exceeded. If, however, the FSAR maximum flows are exceeded, there exist two options: 1) the system can be adjusted so that the licensing assumption is not exceeded or 2) an additional penalty can be applied to the Δ CPR. The Δ CPR can be revised by applying a 0.01 adder for each 5 percent of rated feedwater flow difference (between the determined actual maximum flow and the FSAR maximum flow).

The following tests are performed:

| <u>Action</u> | <u>Test Conditions</u> |
|---|--|
| 1. Record master controller output; feedwater pump suction, discharge, and reactor pressures; feedwater flow rate; feedwater turbine speed or flow control valve positions; and actual locations of high- and low-speed stops or valve position limiting stops. | a. Four equally spaced feedwater flow points. This can be done at TC-3 or any high-power point achieved prior to commercial operation.
b. All systems in NORM mode.
c. Maximum number of condensate and feedwater pumps normally operated at 100 percent power shall be running. |
| 2. Determine sensitivity of feedwater flow to reactor pressure over a 30-psi range in 5-psi increments. | a. Reactor power between 80 and 90 percent rated.
b. All systems in NORM mode.
c. Maximum number of condensate and feedwater pumps normally operated at 100 percent power shall be running. |



TABLE 14.2-225 (Cont)

Acceptance Criteria

Level 1:

Maximum speed attained shall not exceed the speeds which will give the following flows with the normal complement of pumps operating.

1. F percent NBR at P psia.
2. $[F \text{ percent} + A(P - P_{\text{rated}})]$ percent NBR at P rated psia.

The maximum flow, F, the pressure, P, and the slope of the flow variation with pressure, A, should be specified in the FSAR. If any questions remain, contact NSSS Transient Analysis Engineering.

Level 2:

1. The feedwater flow runout capability must not exceed the assumed value in the FSAR Sec. 10.4.7.2.
2. With the flow control valve position limiters set, the feedwater system should still meet the following controllability requirements:
 - a. 115 percent NBR transient flow capacity at 1,075 psia vessel pressure with the normal pumping configuration.
 - b. 68 percent NBR flow capacity at 1,025 psia vessel pressure with no feed pump tripped.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-301



Nine Mile Point Unit 2 FSAR

QUESTION F640.11 (14.2.12)

In accordance with the regulatory positions C.2 and C.3 of Regulatory Guide 1.41 (Preoperational Testing of Redundant On-Site Electric Power Systems to Verify Proper Load Group Assignments),

1. Modify Preoperational Test Abstract Number 14.2-16 (125 V D-C Distribution) to incorporate testing to verify that at the minimum and maximum design battery voltages, required Class 1E loads can be started and operated. The battery chargers should not be in use until after the 1E loads have started (IEEE 308-1978). For more information on problems with maximum battery voltage conditions, see I&E Information Notice 83-08, March 9, 1983.
2. Modify Preoperational Test Abstract Number 14.2-18 (115-kV Switchyard and Station Electric Feed System) and/or Number 14.2-19 (Normal A-C Distribution High Voltage System) to demonstrate the proper operation of transformer cooling under rated load or describe how data from testing under available load will be extrapolated to verify cooling capability under design loading.
3. Modify preoperational test abstracts involving sources of power to vital a-c buses to ensure that full-load testing, or extrapolation to full-load testing conditions, is accomplished.
4. Modify any preoperational test abstract associated with d-c and on-site a-c buses to ensure that during such testing the d-c, on-site a-c, and related loads not under test will be monitored to verify absence of voltage at these buses and loads.
5. Modify any preoperational test abstract associated with d-c and on-site a-c buses where testing on Unit-2 may be dependent on Unit-1 components to ensure that independence is maintained and verified during testing.



RESPONSE

- 1) See Revised Preop Test Abstract - Table 14.2-101
- 2, 3, 4) See Revised Preop Test Abstract - Table 14.2-90
- 5) There is no dependence between Unit 1 and Unit 2 dc or on site ac busses. Therefore, no testing is necessary



Nine Mile Point Unit 2 FSAR

TABLE 14.2-101

EMERGENCY DC SYSTEMS

System 74

Preoperational Test (N2-POT-74)

Test Objectives

1. To demonstrate the reliable operation of the emergency dc systems and components.
2. To ensure the system is properly designed and constructed.

Safety Precaution

1. Follow all NMPC safety rules and proper procedures during testing.
2. Protective apron, gloves, and face shield shall be worn when measuring specific gravities.
3. Fresh water shall be available in case acid is splashed on skin or eyes.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.
3. Control building ventilation or portable ventilation is available to exhaust the battery rooms.

Test Procedure

1. A programmable load bank system will be used to establish desired loads during discharge test.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-101 (Cont)

2. The batteries will be subjected to a 2-hr service test discharge in accordance with a precalculated load profile.
3. The battery chargers will be tested to demonstrate their ability to recharge the batteries with a simulated maximum steady state load connected.
4. The batteries will be subjected to a capacity test performed in accordance with the applicable surveillance test procedure.
- 5.

With the batteries in a low voltage condition, the test will verify that the voltage applied to designated Class 1E loads is within the required operating range for that equipment. This verification will be performed on equipment that has been identified by an engineering review as potential voltage-drop problem cases.

Acceptance Criteria

1. Each battery will demonstrate a capacity equal to or greater than that required during the two hour service discharge test evidenced by the terminal voltage remaining above 105-V in accordance with Section 8.3.2.
2. Each Battery charger is capable of supplying the combined demands of steady state loads while recharging the batteries to a fully charged state within 24 hours from the design minimum charge state as demonstrated by the applicable surveillance test.
3. Ground detection indication and annunciation for Batteries 2A, 2B and 2C functions are designed in accordance with ESK 8BYS06.
4. 2BYS*BAT2A dc bus undervoltage relays and associated alarms function as designed in accordance with ESK 7BYS01 and 8BYS12.
5. 2BYS*BAT2B dc bus undervoltage relays and associated alarms function as designed in accordance with ESK 7BYS01 and 8BYS13.
6. 2BYS*BAT2C dc bus undervoltage relays and associated alarms function as designed in accordance with ESK 7BYS01.
7. Battery capacities are $\geq 90\%$ of rated capacity, as demonstrated by the surveillance test for each individual battery.



Nine Mile Point Unit 2 FSAR

QUESTION F640.13 (14.2.12)

For compliance with Regulatory Guide 1.68, Appendix A.1.h, provide or reference preoperational test abstract descriptions in FSAR Subsection 14.2.12 that ensure that the emergency ventilation systems are capable of maintaining all Engineered Safety Features (ESF) equipment within their design temperature range with the equipment operating in a manner that will produce the maximum heat load in the compartment. If it is not practical to produce maximum heat loads in a compartment, describe the methods that will be used to develop acceptance criteria that verify design heat removal capability of emergency ventilation systems.

(Note that it is not apparent that post-accident design heat loads will be produced in ESF equipment rooms during the scheduled test phase; therefore, simply assuring that area temperatures remain within design limits during this period will not demonstrate the design heat removal capability of these systems. It will be necessary to include measurement of air and cooling water temperatures and flows, and the extrapolations used to verify that the ventilation systems can remove the postulated post-accident heat loads.)

RESPONSE

During the station test program when final ventilation system balancing is performed, it will be verified that the temperatures in ESF equipment rooms can be maintained within design specifications during normal operation and abnormal conditions. A balance of plant test abstract is presently being developed and will be submitted by March 1985.



Nine Mile Point Unit 2 FSAR

QUESTION F640.17 (14.2.12)

For compliance with Regulatory Guide 1.68, Appendix A.1.h.(1)(c), modify Preoperational Test Abstract Number 14.2-48 (Residual Heat Removal System) to state that all five modes of operation will be tested.

RESPONSE

See revised preoperational test abstract, Table 14.2-49, for the residual heat removal system in Section 14.2. It includes all modes of RHR operation, excluding the steam condensing mode. This mode will be tested during the power ascension test when reactor steam is available. See Table 14.2-244. |



Nine Mile Point Unit 2 FSAR

QUESTION F640.27 (14.2.12)

Startup Test Abstract Number 14.2-124 (System Expansion) states that certain information will be provided later. Either provide this information or state when it will be made available.

RESPONSE

A revised test abstract has been provided (see Table 14.2-216).

12



TABLE 14.2-216

SYSTEM EXPANSION

Startup Test (SUT-17)

Test Objectives

To demonstrate that:

1. The piping system during system heatup and cooldown is free to expand and move without unplanned obstruction or restraint.
2. The piping does shake down after a few thermal expansion cycles.
3. The measured values of displacement are within the limits specified by the responsible piping design engineer.

Prerequisites

The appropriate preoperational tests have been completed, and the SORC has reviewed and approved the test procedures and initiation of testing.

Test Procedure

Hanger positions of major equipment and piping in the nuclear steam supply and auxiliary systems are recorded after each major thermal cycle until a shakedown has taken place (normally about three cycles). During initial heatup, a visual inspection is made at an intermediate reactor water temperature to ensure that components are free to move as designed. Corrections are made as necessary. Devices for measuring continuous pipe deflections are mounted on main steam and recirculation lines, and motion during heatup is compared with calculated values. Final sensor locations are determined at the site and based on generic recommendations. After receipt of the installed transducer locations, the plant piping design subsection will supply to the startup engineer the expected thermal displacements (Level 2 limits) and the allowable thermal displacements (Level 1 limits) for the above piping and related conditions. These displacements will be specific to each transducer for each coordinate direction.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-216 (Cont)

| <u>Action</u> | <u>Test Conditions</u> |
|---|---|
| 1. Visual inspection and hanger readings. | a. All control systems in NORM mode.
b. Approximately 250°F at accessible locations.
c. At ambient and rated temperature.
d. After 3 to 5 complete heatup and cooldown cycles. |
| 2. Record displacement sensor readings. | a. At approximately 250°F.
b. At rated recirculation temperature.
c. Repeat after MSIVs are first opened if they were closed for 2.b above.
d. At rated feedwater temperature. |

Acceptance Criteria

Level 1:

- 1) As described in response to FSAR question F210.37

Level 2:

As described in response to FSAR question F210.37



Nine Mile Point Unit 2 FSAR



Nine Mile Point Unit 2 FSAR

QUESTION F640.29 (14.2.12)

Startup Test Abstract Number 14.2-134 (Relief Valves) states that SRV minimum capacity contains significant conservatism in design (15-25%). We have noted on other plant startups that the capacities of the SRVs (Startup Test Abstract Number 14.2-134) and turbine bypass valves (Startup Test Abstract Number 14.2-131) are sometimes in excess of the values assumed in the accident analyses for inadvertent opening or failure of these valves. Modify the appropriate test abstracts to provide a description of the testing that demonstrates that the capacity of these valves is consistent with your accident analysis assumptions, for both the minimum and maximum capacity conditions.

RESPONSE

Test abstracts for relief valves (Table 14.2-230) and turbine bypass valves (Table 14.2-231) have been modified to describe the combined testing which will provide flow verification and demonstrate the capacity of the valves consistent with accident analysis assumptions.

ADDITIONAL INFORMATION

QUESTION 1

Update referenced test abstracts to verify that individual relief valve capacity is within the bounds assumed by FSAR subsection 15.1.4.3.2.

RESPONSE

The valve capacity is based on certification by ASME code stamp and the applicable documentation being available in the onsite records. This information has been previously excepted on other dockets in the recent past.

Nine Mile Point Unit 2 FSAR

QUESTION F640.32 (14.2.12)

To demonstrate the objectives of Regulatory Guide 1.68, Appendix A.5.j.j are met, modify Startup Test Abstract Number 14.2-139 (Loss of Turbine Generator and Offsite Power) to ensure that the loss of power is maintained long enough for the plant conditions to stabilize (>30 minutes).

RESPONSE

The test abstract for loss of turbine generator and offsite power has been modified (see Table 14.2-240) to ensure that the loss of power is maintained long enough for plant conditions to stabilize (≥30 min unless plant design limits will be exceeded and power must be restored).

|¹²



Nine Mile Point Unit 2 FSAR

TABLE 14.2-240

LOSS OF TURBINE GENERATOR AND OFFSITE POWER

Startup Test (SUT-31)

Test Objective

To determine the electrical equipment and reactor transient performance during the loss of auxiliary power.

Prerequisites

The appropriate preoperational tests have been completed, and the SORC has reviewed and approved the test procedures and initiation of testing. Instrumentation has been checked or calibrated as appropriate.

Test Procedure

The loss of auxiliary power test is performed at 20 to 30 percent of rated power. The proper response of reactor plant equipment, automatic switching equipment and the proper sequencing of the diesel generator load are checked. Appropriate reactor parameters are recorded during the resultant transient. The loss of power will be maintained long enough for plant conditions to stabilize (≥ 30 min).

Systems which do not affect vessel level and pressure may be manually started and operated as necessary.

The following test is performed:

Action

After transferring auxiliary loads to the unit auxiliary transformer and starting main and feedwater turbine's dc oil pump, use trip main generator. (SUT-33, Action Item 1, can be done in conjunction with this test.)

Test Conditions

- a. At TC-2.
- b. Recirculation system in POS mode. All other systems in NORM mode.



TABLE 14.2-240 (Cont)

Acceptance Criteria

Level 1:

- 12 | 1. All safety systems such as the RPS, diesel generators,
and HPCS must function properly without manual
12 | assistance, and HPCS and/or RCIC system action, if
necessary, shall keep the reactor water level above the
initiation level of the LPCS, LPCI, ADS, and MSIV
closure. Diesel generators shall start automatically.
- 12 | 2. If any safety/relief valves open, no more than one valve
shall reopen after the first blowdown.

Level 2:

- 12 | 1. Proper instrument display to the reactor operator shall
be demonstrated, including power monitors, pressure,
water level; control rod position, suppression pool
temperature, and reactor cooling system status.
Displays shall not be dependent on specially installed
instrumentation.
- 12 | 2. If the low-low set pressure logic functions, the
open/close actions of the SRVs shall occur within
 ± 15 psi and ± 20 psi of their design setpoints,
respectively.
- 12 | 3. If safety/relief valves open, the temperature measured
by thermocouples on the discharge side of the
safety/relief valves must return to within 10°F of the
temperature recorded before the valve was opened.



Nine Mile Point Unit 2 FSAR

QUESTION F640.34 (14.2.12)

Our review of your test program description disclosed that the operability of several of the systems and components listed in Regulatory Guide 1.68 (Revision 2) Appendix A may not be adequately demonstrated by your initial test program. Expand FSAR Subsection 14.2.12 to address the following items or explain why such preoperational or startup testing is not applicable to your facility:

NOTE: Inclusion of a test description in FSAR Chapter 14 does not necessarily imply that the test becomes subject to FSAR Chapter 17 Quality Assurance Program controls. Certain tests, performed prior to fuel loading to verify system operability, may be referred to as "acceptance tests" to distinguish them from "preoperational tests" subject to FSAR Chapter 17 test control.

Acceptance and Preoperational Tests

| <u>R.G. 1.68
Appendix A</u> | <u>FSAR
Section</u> | <u>Description</u> |
|---------------------------------|-------------------------|--|
| 1.b(1) | | Rod Block Monitors |
| 1.d(3) | 5.2.2 | Relief Valves |
| 1.d(4) | 5.2.2 | Safety Valves |
| 1.e(3) | 5.4.5 | Main Steam Isolation Valves |
| 1.e(6) | 10.4.4 | Turbine Bypass Valves |
| 1.h | 5.4.4 | Main Steam Line Flow Restrictors |
| 1.h(8) | 6.3.2.2.5 | ECCS Discharge Line Fill System |
| 1.h(10) | 9.2.5 | Ultimate Heat Sink |
| 1.i(10) | 6.2.1.1.2 | Containment and Suppression
Pool Vacuum-breaker Tests |
| 1.j(7) | 7.6.1.3 | ECCS Leak Detection System |
| 1.j(12) | | Failed Fuel Detection System |
| 1.j(13) | 7.2.1.2 | Source Range Monitors |



Nine Mile Point Unit 2 FSAR

| | | |
|---------|------------|---|
| 1.j(21) | 7.7.1.1.2 | Reactor Mode Switch and Associated Functions |
| 1.j(23) | 6.2.5.2.5 | Hydrogen and Oxygen Analyzer System |
| 1.1(5) | 11.5.2.1.4 | Condenser Offgas Isolation |
| 1.1(7) | 11.5.2.1.3 | Liquid Radwaste Effluent Isolation |
| 1.n(3) | 9.4.10.2 | Ventilation Chilled Water System |
| 1.m(3) | 9.1.4 | Operability and leak tests of sectionalizing devices and drains and leak tests of gaskets or bellows in the refueling canal and fuel storage pool |
| 1.m(4) | 9.1.4.2 | Dynamic (100%) and static (125%) load tests of cranes, hoists, and associated fuel storage and handling systems |
| 1.m(5) | 9.1.4.2 | Fuel Transfer Devices |
| 1.0(1) | 9.1.4.2.2 | Polar crane dynamic (100%) and static (125%) loading tests |

Startup Tests

| | | |
|-----|-------|--|
| 2.1 | | Partially Loaded Core Shutdown Margin Calculation |
| 2.c | | Final Test Reactor Protection System |
| 2.d | | Final Reactor Leakrate Tests |
| 5.g | | Rod Block Monitor |
| 5.k | | High Pressure Coolant Spray Tests |
| 5.s | 9.2.6 | Hotwell Level Control System, Reactor Coolant Makeup and Letdown Systems |



Nine Mile Point Unit 2 FSAR

5. w

Containment Penetration Coolers. Provide a test description or, on those penetrations where coolers are not used, include a test description for a containment penetration concrete temperature survey to assure that penetrations will not subject concrete to temperatures over 200°F.

5.i.i

15.3

Demonstrate that the dynamic response of the plant is in accordance with design for limiting closure of reactor coolant system flow control valves. The method for initiating control valve closure should result in the fastest credible coastdown in flow.

5.9.9

15.8

ATWS Test

RESPONSE

The test program testing abstracts are being modified in response to Question 640.10. Tests will be described to distinguish which are subject to Chapter 17 test control. The following response outlines how abstracts comply with Regulatory Guide 1.68, Appendix A:

Regulatory
Guide
Section

1.b(1) The rod block monitor subsystem is tested in the rod block monitoring preoperational test (FSAR Table 14.2-118).

1.d(3), The relief valves and safety valves are tested as
1.d(4) follows:

Safety/relief mode has been factory tested offsite.

Set point verification for open/closure will be verified for the SRVs in the relief mode during the main steam system preoperational testing (FSAR Table 14.2-2).



Nine Mile Point Unit 2 FSAR

14 | 1.e(3) The MSIVs are tested during the main steam system preoperational testing (FSAR Table 14.2-25).

1.e(6) The turbine bypass valves are tested as follows:

14 | Controls are verified as part of the EHC system preoperational testing (FSAR Table 14.2-44).

14 | Capacity/response time testing is performed during the power test program (FSAR Table 14.2-231).

14 | 1.h The main steam flow restrictors themselves will not be tested. Associated instrumentation is tested as part of the main steam system preoperational testing (FSAR Table 14.2-25).

14 | 1.h(8) The ECCS discharge line fill systems are tested as part of each ECCS system preoperational testing (FSAR Tables 14.2-49, 14.2-50, and 14.2-51).

1.h(10) The ultimate heat sink, Lake Ontario, will not be tested. All safety-related components of the service water system necessary to transfer lake water into or out of the plant will be tested as a portion of the service water system preoperational testing.

14 | 1.i(10) The containment and suppression pool vacuum breakers will be tested as part of the containment isolation system preoperational testing (FSAR Table 14.2-109).

1.j(7) ECCS leak detection systems will be tested as follows:

14 | Leak detection systems as described in FSAR Section 7.6.1.3 will be tested in the leak detection system preoperational testing (FSAR Table 14.2-112).

Leak detection associated with each ECCS system will be tested as a portion of each system preoperational testing.

1.j(12) A failed fuel detection system is not provided as an independent system. Instrumentation to detect failed fuel is tested within appropriate system preoperational testing.



Nine Mile Point Unit 2 FSAR

- 1.j(13) Source range monitors are tested as part of the neutron monitoring preoperational testing (FSAR Table 14.2-117). | 14
- 1.j(21) Reactor mode switch and associated functions are tested as part of the reactor protection system preoperational testing (FSAR Table 14.2-123). | 14
- i.j(23) The hydrogen and oxygen analyzer system is tested as part of the containment monitoring system preoperational testing (FSAR Table 14.2-108). | 14
- 1.L(5) Condenser off gas isolation - instrumentation and logic associated with this feature is tested as part of process radiation monitoring system preoperational testing (FSAR Table 14.2-106). | 14
- 1.L(7) Liquid radwaste effluent isolation - instrumentation and logic associated with this feature is tested as part of process radiation monitoring system preoperational testing (FSAR Table 14.2-106). | 14
- 1.n(3) Ventilation chilled water system - will be tested during the normal switchgear building HVAC system preoperational testing (FSAR Table 14.2-70). | 14
- 1.m(3) Leak tests of sectionalizing devices and drains, gasket leak tests, or bellows in refueling canal will be tested as part of the fuel handling and vessel service preoperational testing (FSAR Table 14.2-57). | 14
- 1.m(4) Dynamic and static load testing of cranes, hoists, and associated fuel storage and handling systems except the polar crane will be performed in the fuel handling and vessel servicing equipment system preoperational testing (FSAR Table 14.2-57). | 14
- 1.m(5) Appropriate tests for fuel transfer devices will be performed in the fuel handling and vessel servicing equipment system preoperational testing (FSAR Table 14.2-57). | 14
- 1.o(1) Polar crane and hoist dynamic and static load tests will be performed as part of the polar crane preoperational testing (FSAR Table 14.2-110). | 14



Nine Mile Point Unit 2 FSAR

- 2.a A shutdown margin calculation will be performed as part of the startup test program for a partially loaded core (FSAR Table 14.2-203).
- 2.c Final test of reactor protection system is not planned as system design features are verified during the reactor protection system preoperational testing and cold functional testing (FSAR Table 14.2-123).
- 2.d Final reactor leakrate tests during pressurizations of the RPV leak rates within the containment are monitored to be within technical specification limits.
- 5.g Rod block monitor testing is performed during the rod block monitoring preoperational testing (FSAR Table 14.2-118).
- 5.k High pressure coolant spray tests are not scheduled to be performed during startup testing. HPCS to RPV injection tests will be conducted during the preoperational testing program (FSAR Table 14.2-51).
- 5.s Startup test abstracts for the feedwater system will be modified to verify performance of the control system at test conditions 2, 3, 4, 5, and 6. The hotwell level control system performance is tested during the preoperational testing program (FSAR Tables 14.2-28 and 14.2-222).
- 5.w A sample of containment penetration concrete temperatures will be verified by survey to assure that the penetrations will not be subject to temperatures over 200°F. The sample will be chosen from the worst case temperature conditions to conservatively bound all installed containment penetrations.
- 5.i.i Startup testing of the recirculation system will demonstrate response of the plant in accordance with design limits specified by General Electric (FSAR Tables 14.2-233, 14.2-234, 14.2-235, 14.2-236, and 14.2-237).
- 5.g.g The operability of equipment provided for ATWS is tested during preoperational testing of systems within which the equipment is provided (FSAR Tables 14.2-47, 14.2-48, 14.2-54, and 14.2-123).



Question 1: The Service Water System test (FSAR Table 14.2-36) should include testing which demonstrates the operability (adequate NPSH and absence of vortexing) of the service water pumps under the worst postulated conditions (minimum water level and maximum water temperature) (1.h.10).

Response: The following is provided in response to your concern.

Service Water Pump NPSH

Min Lake Elevation = 236.2 Ft. USLS (FSAR Pg. 2.4-16)

* NPSH Required = 21 Ft. (From Gould Catalog Pg. 145
(9000 GPM at 185 Ft.) Model 3415
14 X 16 - 22H at 1180 RPM)

NPSH Required \leq NPSH Available at Critical Condition

NPSH = $H_a + H_z - H_f - H_{vp} =$

= H_a Atmospheric Pressure = 33.7 Ft.

= H_z Elevation Head (236.2 - 226.17) = 10.03

= H_f Friction Head (Assume 2.0 Ft.) (1 Ft./100' of
24 inch pipe at 10,000 GPM Cameron Hydraulic
Data + 0.6 Feet from Clow Valve Data)

= H_{vp} = Vapor Pressure (At 100°F Max S.W. Temp.)

= 2.2 (Daugherty & Franziny Pg. 557).

NPSH = $H_a + H_z - H_f - H_{vp}$

= 33.7 + 10.03 - 2.0 - 2.2

= 43.73 - 4.2

= 39.53

Conclusion

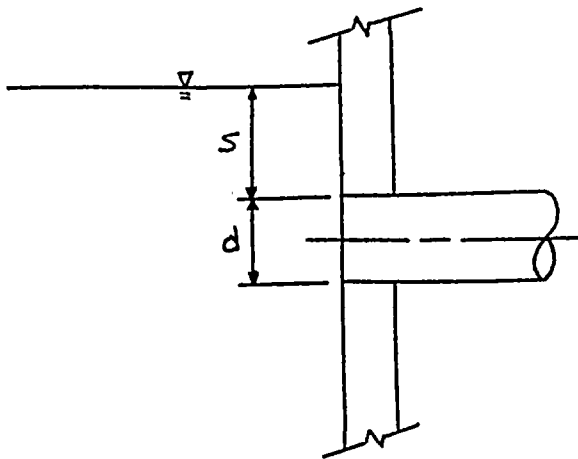
21 Feet \leq 39.53 Feet therefore NPSH is not of concern.

* (Note that this is conservative considering that actual LOCA requirements are less than 7000 GPM/Pump)



DEPTH REQUIRED TO AVOID VORTEXING

From: J. L. Gorden, "Vorticities at Intakes"
Water Power - 1970



$$0.3 \, v d^{\frac{1}{2}} \leq s \leq 0.4 \, v d^{\frac{1}{2}}$$

$$D = 2.0'$$

$$Q = 10,000 \text{ GPM} = 22.28 \text{ CFS}$$

$$V = Q/A = 22.28 / \frac{\pi (2)^2}{4} = 7.0 \text{ FPS}$$

$$0.3 \times 7.0 \times \sqrt{2} \leq s \leq 0.4 \times 7.0 \times \sqrt{2}$$

$$S = 4.0$$

Pump Center line at 226.17

Min Water Surface Elev. = $226.17 + \frac{d}{2} + S$
(Pump Bay)

$$= 226.17 + 1.0 + 4 = 231.17 \text{ Say } \boxed{231.0'}$$

Conclusion

$231' \leq 236.2$ (min water elevation during PMF) therefore
vortexing is not a concern.



A-25939-A

CHARACTERISTIC CURVE



CERTIFIED TEST DATA
GOULDS PUMPS, INC.
SENECA FALLS, N.Y.

J. J. Lail 5-23-79

M. W. Wagner 5/25/79



GOULDS PUMPS, INC.

ENGINEERED PRODUCTS DIV.
SENECA FALLS, N.Y. 13148

CUSTOMER NIAGARA MOHAWK POWER CORP.

P. O. NO. NMP2-P222X ITEM NO. 2SWP-P1A

GOULDS SER. NO. N239B505-1

MODEL 3415 SIZE 14x16-22H

R. P. M. 1180 IMPLR. DIA. 22-3/8"

BRAKE HORSEPOWER

EFFICIENCY - PERCENT

TOTAL HEAD - FT.

90
80
70
60
50
40
30
20
10
0

240
200
160
120
80
40
0

HEAD-CAPACITY

EFFICIENCY

TYPICAL NPSH_R

BHP AT 1.0 S.G.

40
20
0
NPSH_R - FEET

CAPACITY - U.S. GALLONS PER MINUTE

0 2000 4000 6000 8000 10000 12000

0040-34



Question 2: The Normal Switchgear Building Ventilation System test (FSAR Table 14.2-70) should provide acceptance criteria relating to the ventilation chilled water system (1.n.3).

Response: See revised preop test abstract 14.2-70

Question 3: The Fuel Handling & Reactor Service Equipment System test (FSAR Table 14.2-57) and the Reactor Building - polar crane (FSAR Table 14.2-110) to specify that dynamic and static load tests are accomplished at 125% and 100% of rated load, respectively (1.m.4, 1.0.1).

Response: See revised preop test abstracts 14.2-57 and 14.2-110.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-70

NORMAL SWITCHGEAR
BUILDING VENTILATION SYSTEM

System 54

Preoperational Test (N2-POT-54)Test Objectives

1. To demonstrate the reliable operation of the normal switchgear building ventilation system and components.
2. To ensure the system is properly designed and constructed.
3. To evaluate the normal switchgear building ventilation system operating procedures.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.

Test Procedure

1. Ventilation equipment penthouse ventilation is verified for proper operation of logic controls.
2. The L.F. MG penthouse ventilation is verified for proper operation of logic controls.
3. The battery room exhaust is verified.
4. The normal switchgear supply and exhaust ventilation logic controls are verified for proper performance.
5. Unit heater controls are verified for the normal switchgear building.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-70 (Cont)

6. Ventilation system chilled water system chillers, pumps, valves and associated controls are verified to operate in accordance with applicable SWECC and vendor design drawings.
7. A system performance test for the normal switchgear ventilation system is conducted to ensure that all temperatures, pressures, and hydrogen concentrations meet design specifications.

Acceptance Criteria

1. All instruments, controls, protective devices, interlocks, and mechanical equipment are properly installed as shown on elementary and logic diagrams.
2. System will maintain building temperatures between 65°F and 104°F in accordance with Table 9.4-1.
3. System maintains less than 2 percent hydrogen in battery rooms in accordance with IEEE 484 1975.
4. System maintains battery room pressure slightly lower than general area pressure in accordance with Section 9.4.1.2.7.
5. The Ventilation Chilled Water System supplies chilled water during normal operation to the Turbine Building, Normal Switchgear Building and Radwaste Building Ventilation systems per FSAR Sec. 9.4.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-57

FUEL HANDLING AND REACTOR SERVICE EQUIPMENT SYSTEM

System 39

Preoperational Test (N2-POT-39)Test Objectives

1. To demonstrate the reliable operation of the fuel handling and reactor service equipment system and components.
2. To ensure the system is properly designed and constructed.
3. To evaluate the fuel handling and reactor service equipment system operating procedures.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

8

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.

Test Procedure

1. All interlocks and logic associated with the refueling platform and service platform are verified.
2. All refueling equipment, including service tools and platform equipment, is tested for proper operation.
3. All in-vessel servicing equipment, such as peripheral orifice servicing, control rod assembly servicing, instrument servicing, and in-vessel fuel bundle servicing, is checked for correct installation and operability.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-57 (Cont)

4. All reactor vessel servicing equipment is checked for proper assembly and operation.
5. All fuel service equipment is checked for proper installation and operation.
6. All under reactor vessel servicing equipment, including control rod drive servicing equipment and in-core instrumentation servicing equipment, is tested for correct installation and operation.
7. Dynamic testing at 100 percent of rated load will be performed on the refueling grapple and platform auxiliary hoists.
8. The results of the Static Head Pressure Test of Rx Head Cavity, Fuel and Rx Internals Storage Pools will be reviewed to verify integrity of sectionalizing devices, drains, and gasket leak tests.

Acceptance Criteria

All applicable parameters meet design specifications in accordance with GE Test Specification 22A2271BA, Appendix B, Section 11.5.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-110

REACTOR BUILDING - POLAR CRANE

System 84

Preoperational Test (N2-POT-84A)

Test Objectives

1. To demonstrate the reliable operation of the reactor building - polar crane and components.
2. To ensure the system is properly designed and constructed.

Safety Precaution

Follow all NMPC safety rules and proper procedures during testing.

Prerequisites

1. All applicable preliminary tests are completed and approved.
2. All applicable motor control centers to supply electric power to motors, control circuits, and instrumentation are available.
3. Manual main line supply breaker and manual disconnect switch operates satisfactorily.

Test Procedure

1. All pendant and radio controls are verified for proper operation.
2. The operation of all locking and safety devices is verified.
3. The restrictive path operation with both pendant and radio controls is verified.
4. Dynamic and static load tests, at 100 percent and 125 percent of rated load, will be performed to verify the crane's ability to function as designed.



Nine Mile Point Unit 2 FSAR

TABLE 14.2-110 (Cont)

Acceptance Criteria

1. All limit switches, interlocks, and locking and safety devices function as designed.
2. The polar crane responds correctly to all pendant and remote control functions.
3. The polar crane functions as described in Section 9.1.4.2.

