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NOV 27 1985

FCUP:MLH
70-2948Niagara Mohawk Power Corporation
ATTN: Mr. C. V. Mangan
Senior Vice President
300 Erie Boulevard West
Syracuse, New York 13202

Gentlemen:

Enclosed is the Nuclear Regulatory Commission (NRC) Special Nuclear Materials License No. SNM-1895, which has been revised in its entirety. This license authorizes the receipt, possession, inspection, and storage of uranium enriched in the U-235 isotope contained in fuel assemblies. Activities authorized prior to this revision were the receipt, storage and installation in the reactor vessel, and preoperational testing of neutron detectors which contain uranium enriched in the U-235 isotope. All materials are for eventual use at Nine Mile Point Nuclear Station, Unit 2.

In addition, the license authorizes the packaging of fuel assemblies and neutron detectors for delivery to a carrier for transport. This latter authority enables you to return fuel assemblies and neutron detectors to another location, e.g., return to the manufacturer. The delivery of the assemblies to a carrier must be in accordance with 10 CFR Part 71, "Packaging and Transportation of Radioactive Material," copy enclosed. Your attention is directed to 10 CFR 71.12(b) of Part 71 which provides a general license under specified conditions for the use of certain shipping packages which have been licensed for use by another licensee.

Also enclosed are six copies of Amendment No. 15 to Indemnity Agreement No. B-36, for your review and acceptance. Please return one signed copy.

The NRC uses an electronic data processing system to record the location, by licensee, of special nuclear material. The system uses a three-letter Reporting Identification Symbol (RIS) to identify licensees who submit material transfer reports and periodic material status reports in accordance with 10 CFR Part 70.53 and 10 CFR Part 70.54 of the Commission's regulations. For this purpose, you should continue to use the RIS: XZU, previously assigned to you. The symbol is to be used in completing the transfer reports and the periodic material status reports and should be used in any other correspondence with the NRC relative to such reports. You should also note the requirements of 70.51(b), (c), and (d) regarding records, material control, accounting procedures, and physical inventories. Your cooperation will be appreciated.

Your application requested an exemption from the provisions of 10 CFR Part 70.24. Such an exemption would relieve you from the requirements of having a criticality

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alarm system. Because of the inherent features associated with the storage and inspection of unirradiated fuel and the neutron detectors, the NRC staff has determined that you have shown good cause for being granted the exemption, that such exemption is authorized by law, and that granting such an exemption will not endanger life or property or the common defense and security and is otherwise in the public interest.

The license conditions were discussed with your Mr. D. Hill and Mrs. Merri Horn of my staff.

This license is issued following the preparation of an Environmental Assessment related to the proposed action. Based on this Assessment, a Finding of No Significant Impact has been prepared and approved pursuant to 10 CFR Part 51. Copies of this Finding, which was published in the Federal Register on November 8, 1985, and the supporting Environmental Assessment are enclosed. Also enclosed is our Safety Evaluation Report in support of this license.

Sincerely,

ORIGINAL SIGNED BY
GLENN A. TERRY

 W. T. Crow, Acting Chief
Uranium Fuel Licensing Branch
Division of Fuel Cycle and
Material Safety, NMSS

Enclosures:

1. Special Nuclear Materials
License No. SNM-1895,
revised in its entirety
2. 10 CFR Part 71
3. Indemnity Agreement No. B-36
(six copies)
4. Finding of No Significant Impact
5. Environmental Assessment
6. Safety Evaluation Report

DISTRIBUTION

Docket Nos. 70-2948,
50-410

NMSS R/F	PDR
FCUP R/F	DWeiss, LFMB
VLTharpe	RGraham, Res. Insp.
MHorn	GBennington, SGMT
NKetzlach	WBrown, SGFF
LCobb, IE	SHO
Region I	MHaughey, NRR
JSaltzman, SP	RFonner, ELD
	BBordnick, ELD

OFC: FCUP	:FCUP	:FCUF	:NRR	:ELD	:ELD	:SP	:SG	:FCUF
NAME:MHorn/as	:NKetzlach	:VLTharpe	:MHaughey	:RFonner	:BBordnick	:JSaltzman	:WBrown	:WTCrow
DATE:11/26/85	:11/26/85	:11/26/85	:11/26/85	:11/26/85	:11/26/85	:11/26/85	:11/26/85	:11/26/85



MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee Niagara Mohawk Power Corporation Central Hudson Gas and Electric Corporation		COPY
1. Long Island Lighting Company New York State Electric and Gas Corporation Rochester Gas and Electric	3. License number SNM-1895, revised in its entirety	
2. 300 Erie Boulevard West Syracuse, New York 13202	4. Expiration date November 30, 1990, or*	
	5. Docket or Reference No. 70-2948	
6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Uranium enriched in the U-235 isotope	A. In unirradiated reactor fuel assemblies	A. 2800 kg of U-235 in uranium enriched to no more than 3.05 w/o in U-235
B. Uranium enriched in the U-235 isotope	B. Contained in sealed neutron detectors	B. One (1) gram of U-235 at any enrichment
9. Authorized Use		
The materials are for use in accordance with statements, representations, and conditions specified in the licensee's application dated March 23, 1982, and its supplements dated April 17, May 1, June 12, September 27, October 22, October 29, and November 18, 1985.		
10. Authorized Place of Use		
The licensee's Nine Mile Point Nuclear Station, Unit 2, located in the Town of Scriba, Oswego County, New York, as described in the aforesaid application.		
11. The minimum technical qualifications for the General Superintendent Nuclear Generation shall be in accordance with Section 4.2.1, "Plant Manager," ANSI/ANS 3.1-1978.		

*Upon conversion of Construction Permit No. CPPR-112 to an operating license, whichever is earlier.

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**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License number

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12. The minimum technical qualifications for Station Superintendent shall be in accordance with Section 4.2.1, "Plant Manager," ANSI/ANS 3.1-1978.
13. The minimum technical qualifications for the Reactor Analyst Supervisor shall be in accordance with Section 4.4.1, "Reactor Engineer," ANSI/ANS 3.1-1978.
14. The minimum technical qualifications for the Superintendent of Chemistry and Radiation Management shall be in accordance with the requirements for "Radiation Protection Manager," Regulatory Guide 1.8, September 1975.
15. The minimal technical qualifications for the Supervisor of Chemistry and Radiation Protection shall be in accordance with the requirements for "Radiation Protection Manager," Regulatory Guide 1.8, September 1975.
16. The following training shall be completed by each individual prior to participation in the radiation safety and/or fuel handling programs:
 - (a) All radiation safety personnel involved in fuel handling shall be trained in radiation safety and in NMP Unit 2 radiation protection procedures related to fuel assembly handling.
 - (b) All operations personnel involved in fuel handling shall receive training in proper fuel handling procedures, including the related health and safety aspects of the activities.
17. Fuel assemblies, when stored in their shipping containers, shall be stacked no more than three containers high.
18. All fuel assemblies shall be in their shipping containers or storage racks in the New Fuel Vault or in the Spent Fuel Storage Facility except for the following:
 - a. No more than three assemblies shall be allowed above the refueling floor.
 - b. No more than one fuel assembly shall be below the refueling floor outside the storage racks.
19. The above four fuel assemblies shall maintain a minimum edge-to-edge spacing of twelve (12) inches from the shipping container array and approved storage rack locations.
20. All preoperational testing of fuel handling equipment shall be completed prior to use for handling the new fuel shipment.
21. The New Fuel Storage Vault shall have no more than 10 fresh fuel assemblies uncovered at any one time.
22. The licensee is hereby exempted from the provisions of 10 CFR 70.24 insofar as this exemption applies to materials held under this license only.
23. Records of the weekly visual surveillance of the shipping containers with the neutron detectors shall be maintained and a copy of each surveillance submitted to the Superintendent Chemistry and Radiation Management and the Nine Mile Point, Reactor Analyst Supervisor.

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**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License number

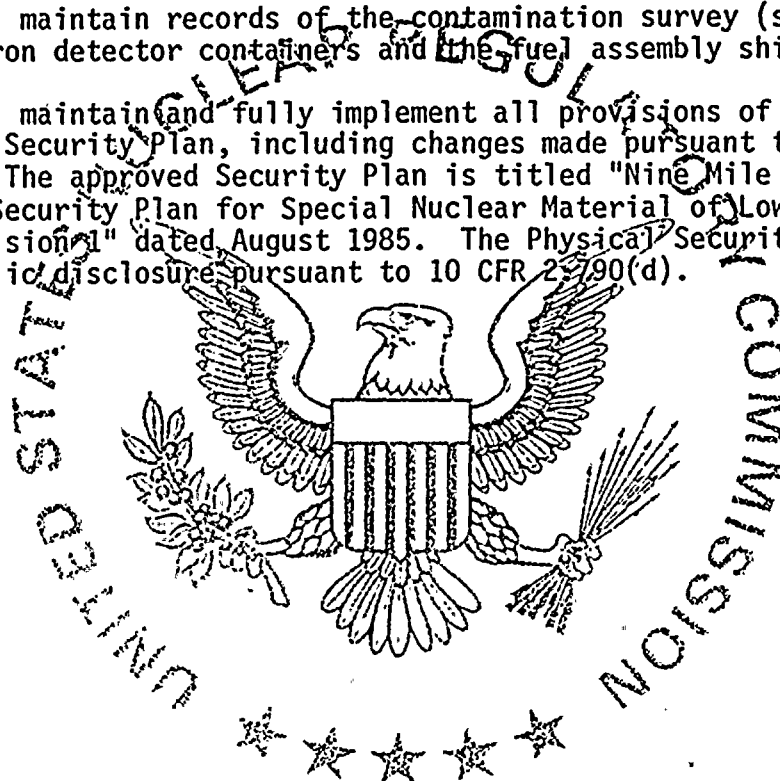
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24. The licensee shall repackage fuel in accordance with 10 CFR Part 71 prior to delivery to a carrier for transport.
25. Procedures for the handling and installation of the neutron detectors in the reactor vessel shall be approved by the Superintendent, Chemistry and Radiation Management.
26. A member of the Chemistry and Radiation Management staff shall be present during all neutron detector handling operations and shall monitor these activities.
27. The licensee shall maintain records of the contamination survey (smear survey) results for both the neutron detector containers and the fuel assembly shipping crates.
28. The licensee shall maintain and fully implement all provisions of the Commission approved Physical Security Plan, including changes made pursuant to the authority of 10 CFR 70.32(e). The approved Security Plan is titled "Nine Mile Point Nuclear Station Unit #2, Security Plan for Special Nuclear Material of Low Strategic Significance, Revision 1" dated August 1985. The Physical Security Plan shall be withheld from public disclosure pursuant to 10 CFR 2.290(d).



FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date:

NOV 27 1985

By:

ORIGINAL SIGNED BY
GLENN A. TERRY
FOR W. T. CROW

Division of Fuel Cycle and
Material Safety, NMSS
Washington, D.C. 20555

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DOCKET NO: 70-2948

APPLICANT: Niagara Mohawk Power Corporation
Central Hudson Gas and Electric Corporation
Long Island Lighting Company
New York State Electric and Gas Corporation
Rochester Gas and Electric

FACILITY: Nine Mile Point Nuclear Station (NMP), Unit 2

SUBJECT: SAFETY EVALUATION REPORT - REVIEW OF LICENSE APPLICATION DATED
JUNE 12, 1985, AND SUPPLEMENTS THERETO DATED SEPTEMBER 27,
OCTOBER 22, OCTOBER 29, AND NOVEMBER 18, 1985

I. INTRODUCTION

A. General

By application dated June 12, 1985, and supplements dated September 27, October 22, October 29, and November 18, 1985, Niagara Mohawk, acting on its own behalf and as agent for the above co-owners, requested an amendment to its License No. SNM-1895 to authorize the receipt, possession, inspection, and storage of fuel assemblies containing uranium enriched up to 3.05 w/o. The present license only authorizes the receipt, storage and installation in the reactor vessel and preoperational testing of neutron detectors.

The fuel assemblies will be supplied by General Electric Corporation. Each fuel assembly contains 62 fuel rods and 2 nonfuel rods called water rods. The rods are spaced and supported in a square 8X8 array, by the upper and lower tie plates, and by 7 fuel spacer grids. Table 1 gives general fuel rod parameters that describe the fuel that will eventually be used at Nine Mile Point, Unit 2. The materials license was requested to allow early receipt of the fuel for reactor loading. The license will automatically terminate upon issuance of the Part 50 operating license for Unit 2.

Table 1
Parameters

Fuel Assembly Data:

Overall Length 176.16"
Nominal Active Fuel Length 150.0"
Fuel Rod Pitch 0.640"
Rod Array 8X8
Rods/Assembly 64 (includes 2 water rods)

Fuel Rod Data:

Fuel Pellet Material	UO ₂ + UO ₂ /Gd ₂ O ₃
Clad Outside Diameter	0.483"



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Table 1 (CONTINUED)

Clad Thickness	0.032"
Clad Inside Diameter	0.419"
Fuel Pellet Immersion Density	95.0% theoretical
Fuel Pellet Diameter	0.410"
Maximum Pin Enrichment	3.05 w/o U-235
Maximum Quantity U-235	4.01 kg U-235/183.2 kg U @ 2.19 w/o

B. Location Description

The NMP, Unit 2, is a Boiling Water Reactor located on the southwest shore of Lake Ontario in Oswego County, New York. The construction permit, CPPR-112, was issued in June 1972 (Docket No. 50-410).

II. AUTHORIZED ACTIVITIES

The applicants' request authorization to receive, possess, and store 800 finished fuel assemblies with a maximum pin enrichment of 3.05 w/o in U-235. Fuel assemblies will be stored in the New Fuel Storage Facility and/or the Spent Fuel Storage Facility in the Reactor Building. The designated fuel storage areas in each are the New Fuel Storage Vault in the New Fuel Storage Facility and the Spent Fuel Storage Pool racks in the Spent Fuel Storage Facility. The fuel assemblies, in their shipping containers, will be temporarily stored in the receiving area and on the refueling floor. The applicants also request authorization to repackaging any assembly, if necessary, for delivery to a carrier. It should be noted that the license does not authorize insertion of a fuel assembly into the reactor vessel. The licensee is currently authorized to receive, store, install, and pretest neutron detectors.

III. SCOPE OF REVIEW

The safety review of the Niagara Mohawk request for a materials license amendment includes an evaluation of Nine Mile Point's organization, administration, nuclear criticality safety, radiation protection, physical security, and fire protection programs. During the review, discussions were held with the NRR Project Manager, the Resident Inspector, Region I, and with staff members of the applicant. The NMP Security Plan was evaluated by the Safeguards Material Licensing and International Activities Branch, Division of Safeguards, Office of Nuclear Material Safety and Safeguards.

IV. POSSESSION LIMITS

Conditions 6, 7, and 8 of the license specify the type, form, and quantity of material the licensee may possess at any one time under this license and shall read as follows:



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6. <u>Material</u>	7. <u>Form</u>	8. <u>Quantity</u>
A. Uranium enriched in the U-235 isotope	A. In unirradiated reactor fuel assemblies	A. 2800 kg of U-235 in uranium enriched to no more than 3.05 w/o in U-235
B. Uranium enriched in the U-235 isotope	B. Contained in sealed neutron detectors	B. One (1) gram of U-235 at any enrichment

V. ORGANIZATION

A. Nuclear Criticality Safety and Radiation Protection Responsibilities

1. General Superintendent Nuclear Generation

The General Superintendent is directly responsible for the safe and efficient operation of the plant and its equipment. He is responsible for compliance with all NRC regulations and license conditions.

2. Station Superintendent

All receipt, shipment, and internal transfer of special nuclear material in the form of fuel assemblies will be performed in accordance with approved fuel handling procedures, under the control of the Station Superintendent. He is responsible for preparation and approval of fuel handling procedures.

3. Reactor Analyst Supervisor

The Reactor Analyst Supervisor approves the fuel handling procedures. He provides guidance for fuel management and maintains performance and fuel accountability records.

4. Superintendent of Chemistry and Radiation Management

The Superintendent of Chemistry and Radiation Management (Radiation Protection Manager - RPM) is responsible for establishing the Health Physics Program and developing health physics procedures for NMP-2 that are designed to assure compliance with applicable regulations, licenses, and regulatory guides. In addition, he provides technical guidance for conducting this program, audits the effectiveness and the result of the program, and modifies it as required.

5. Supervisor of Chemistry and Radiation Protection

The Supervisor of Chemistry and Radiation Protection is responsible for conducting the Health Physics Program for NMP, Unit 2. His duties include the training of personnel in radiation safety, control of radiation exposures to personnel to maintain exposure levels that are as low as reasonably achievable, to continuously evaluate and review the radiological status of the station, and to make recommendations for control or elimination of radiation hazards.



B. Minimum Qualifications

The qualifications of the aforementioned personnel have been reviewed and the staff finds they meet the minimum qualifications specified in Regulatory Guide 1.8, "Personnel Selection and Training" or ANSI/ANS 3.1-1978, "Selection and Training of Nuclear Power Plant Personnel" or both; however, the applicants have not clearly specified minimum qualifications for these positions. Accordingly, Condition Nos. 11-15 are recommended to correct this deficiency and shall read as follows:

- Condition 11. The minimum technical qualifications for the General Superintendent Nuclear Generation shall be in accordance with Section 4.2.1, "Plant Manager," ANSI/ANS 3.1-1978.
- Condition 12. The minimum technical qualifications for Station Superintendent shall be in accordance with Section 4.2.1, "Plant Manager," ANSI/ANS 3.1-1978.
- Condition 13. The minimum technical qualifications for the Reactor Analyst Supervisor shall be in accordance with Section 4.4.1, "Reactor Engineer," ANSI/ANS 3.1-1978.
- Condition 14. The minimum technical qualifications for the Superintendent of Chemistry and Radiation Management shall be in accordance with the requirements for "Radiation Protection Manager," Regulatory Guide 1.8, September 1975.
- Condition 15. The minimal technical qualifications for the Supervisor of Chemistry and Radiation Protection shall be in accordance with the requirements for "Radiation Protection Manager," Regulatory Guide 1.8, September 1975.

C. Training

Training is conducted to ensure that all personnel involved in fuel handling participate in a formal training program. The overall training program for the plant staff is the responsibility of the General Superintendent Nuclear Generation. All persons entering the restricted area of the station receive training pursuant to 10 CFR 19.12. This training is the responsibility of the Supervisor of Chemistry and Radiation Protection. Radiation Protection Technicians receive training in the use of equipment and procedures for dealing with radiological concerns and job-related accidents. All personnel involved in fuel receipt receive basic training in radiation protection and the site emergency plan. In order to ensure that all persons involved in fuel handling receive training in all fuel handling operations, the staff recommends that License Condition 16 be added to supplement Niagara Mohawk's training program.

- Condition 16. The following training shall be completed by each individual prior to participation in the radiation safety and/or fuel handling programs:

- (a) All radiation safety personnel involved in fuel handling shall be trained in radiation safety and in NMP's Unit 2, radiation protection procedures related to fuel assembly handling.
- (b) All operations personnel involved in fuel handling shall receive training in proper fuel handling procedures, including the related health and safety aspects of the activities.

D. Administrative Procedures

Procedures for the control and handling of nuclear fuel are reviewed by the Chemistry and Radiation Management and Operations departments. These procedures are approved by the General Superintendent, the Station Superintendent, and the Reactor Analyst Supervisor.

The Superintendent of Chemistry and Radiation Management establishes the Health Physics Program and develops the health physics procedures for NMP-2. The Supervisor of Chemistry and Radiation Protection is responsible for conducting the Health Physics Program, and the Radiation Protection Technicians perform the required radiation monitoring and exposure control work in accordance with radiation protection instructions prepared by the Radiation Protection Supervision.

VI. NUCLEAR CRITICALITY SAFETY

A. General

The fuel assemblies will be stored in their shipping containers in the fuel receiving area, on the refueling floor, in the New Fuel Storage Vault, and in the Spent Fuel Storage Facility of the Reactor Building. The New Fuel Storage racks can accommodate up to 270 new fuel assemblies utilizing all storage rack positions. The Spent Fuel Storage Pool racks have positions for approximately 4,000 fuel assembly storage spaces. In both the New Fuel Storage Vault and the Spent Fuel Storage Facility, spaces between the fuel storage positions are designed so it is not possible to insert a fuel assembly in any array position not intended for fuel.

B. Shipping Containers

The fuel assemblies may be temporarily stored in their shipping containers on the refueling floor of the Reactor Building and in the fuel receiving area. On the refueling floor, the assemblies will be stored in their inner metal containers only, i.e., without their wooden overpacks. Niagara Mohawk requests authorization to store fuel assemblies in these containers in arrays stacked up to three high. The staff has previously confirmed the nuclear criticality safety of an infinite shipping container storage array stacked 3 high*. Accordingly, the staff recommends the following condition for emphasis:

*Reference Amendment No. 5 to General Electric's Materials License No. SNM-1097, dated June 6, 1978, Docket No. 70-1113.



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Condition 17. Fuel assemblies, when stored in their shipping containers, shall be stacked no more than three containers high.

C. Fuel Handling

The applicants' application states that no more than four fuel assemblies will be out of their containers or storage rack locations at a given time. A maximum of three assemblies will be above the refueling floor and the fourth assembly shall be below the refueling floor in the Spent Fuel Pool confines. Calculations have indicated that three assemblies out of storage cannot be made critical under any conditions. In addition, the applicants are committed to maintaining a minimum edge-to-edge distance of >12 inches between fuel assemblies out of storage and fuel assemblies in their shipping container array and the storage rack arrays.

It is recommended that the following conditions be added to emphasize nuclear criticality safety for fuel assemblies out of authorized storage locations or shipping containers by: (1) limiting the number of fuel assemblies out of approved storage locations, and (2) maintaining a minimum edge-to-edge distance between fuel out of storage and from all other fuel.

Condition 18. All fuel assemblies shall be in their shipping containers or storage racks in the New Fuel Vault or in the Spent Fuel Storage Facility except for the following:

- a. No more than three assemblies shall be allowed above the refueling floor.
- b. No more than one fuel assembly shall be below the refueling floor outside the storage racks.

Condition 19. The above four fuel assemblies shall maintain a minimum edge-to-edge spacing of twelve (12) inches from the shipping container array and approved storage rack locations.

In order to be sure the fuel handling equipment is ready to safely handle the fuel assemblies, the applicants have stated that prior to use for handling new fuel, preoperational testing of fuel handling equipment will be performed in accordance with approved procedures. To emphasize the applicant's commitment and to ensure testing prior to use, the following condition has been added:

Condition 20. All preoperational testing of fuel handling equipment shall be completed prior to use for handling the new fuel shipment.

D. New Fuel Storage Vault

The New Fuel Storage Vault has the capacity to provide dry storage for 270 channeled and/or unchanneled new fuel assemblies. The vault contains 27 sets of racks constructed of aluminum guidetubes. Each storage rack provides support



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and storage for a row of 10 fuel assemblies. The minimum center-to-center spacing for fuel assemblies between rows is 11 inches. The minimum center-to-center spacing within rows is 7.00 inches.

Criticality analysis of the above new fuel storage vault indicates it can be made critical at optimum water density moderation. To maintain criticality safety of the New Fuel Storage Vault, the applicants propose to eliminate sources of water moderation from the New Fuel Storage Vault. This is accomplished by the presence of 32 aluminum cover plates over the new fuel assembly racks. Each cover plate covers 10 fuel assemblies. Administrative controls limit the maximum number of fuel assemblies that will be uncovered at any one time to 10.

The staff has determined that 10 fresh fuel assemblies in a single row, based upon the above spacing between fuel assemblies, cannot be made critical under any degree of water moderation. It is recommended that the following license condition be added to highlight the importance of having only a maximum of 10 fresh fuel assemblies uncovered at any one time in the New Fuel Storage Vault.

Condition 21. The New Fuel Storage Vault shall have no more than 10 fresh fuel assemblies uncovered at any one time.

E. Spent Fuel Storage Pool

The spent fuel storage racks are composed of a honeycomb array of identical stainless steel cells. The cells are spaced on a 6.180 inch center and are lined with 0.110-inch thick stainless steel. Each cell has an inside clearance of 5.854 inches to accommodate an 8X8 fuel assembly channeled in 0.100-inch thick zircaloy.

Subcriticality of the spent fuel storage pool is maintained by the presence of neutron poison sheets (Boraflex) placed on all four sides of each storage cell. In addition, in the east west direction, each storage rack has a sheet of neutron poison placed between it and the adjacent rack. In the north south direction, a 3-inch water gap having an equivalent effect is present between adjacent storage racks. The staff has reviewed the applicant's quality assurance program to ensure that the neutron poison meets design specifications and is positioned securely to the walls of the storage cells. The program was found to be adequate.

An independent nuclear criticality safety analysis of the spent fuel storage pool performed by the staff indicates a k-infinity of 0.91 for an infinite array of fresh fuel assemblies at an enrichment of 3.05 w/o U-235 and at full water density (optimum moderation). Therefore, the array is safe.

F. Exemption from 10 CFR Part 70.24

The applicants have requested, pursuant to 10 CFR 70.24 (d), an exemption from the provisions of 10 CFR 70.24. Because the assemblies are handled as discrete items, they are stored with engineered controlled spacing, they are normally stored dry (cannot be made critical independent of quantity), and even under accident conditions involving flooding with water, administrative controls limit the number of assemblies that can be moderated at one time. The limited

quantities of sealed incore monitoring detectors cannot be made critical under any conditions. Therefore, the staff determines that granting such an exemption will not endanger life, property, or the common defense and security, is otherwise in the public interest, and is authorized by law. The staff recommends that pursuant to 10 CFR 70.14, Condition 22 shall read as follows:

Condition 22. The licensee is hereby exempted from the provisions of 10 CFR 70.24 insofar as this exemption applies to materials held under this license only.

VII. RADIATION SAFETY

All the materials requested in this application are sealed or contained sources. Therefore, the potential for generating airborne radioactivity from the material is minimal and the principal pathway for radiation exposure to an individual is via the external radiation. Personnel external exposures are monitored as required by 10 CFR 20.202. This is done by using thermoluminescent dosimeters, film badges, and self-reading pocket dosimeters.

The external radiation dose to personnel is determined on a daily basis by means of self-reading pocket dosimeters. Personnel monitoring badges (film badges and TLD's) are processed at least twice per month. Records of radiation exposure history and current occupational exposure are maintained for each individual for whom personnel monitoring is required. Portable radiation survey and monitoring instruments for routine use are calibrated quarterly. Proofs of calibration are also maintained. Neutron exposure is monitored in accordance with Regulatory Guide 8.14 through the use of dose rate/stay time calculations or neutron/gamma dose rate ratios.

The staff has concluded that the Nine Mile Point, Unit 2, Health Physics Program is adequate for the protection of Nine Mile Point, Unit 2 personnel, the public, and the environment.

Condition Nos. 11-15 of the original license are to be incorporated into the revised license as Condition Nos. 23-27. These conditions were discussed in the Safety Evaluation Reports (related to the original license) dated April 19, 1982, and May 8, 1985.

Condition 23. Records of the weekly visual surveillance of the shipping containers with the neutron detectors shall be maintained and a copy of each surveillance submitted to the Superintendent Chemistry and Radiation Management and the Nine Mile Point, Reactor Analyst Supervisor.

Condition 24. The licensee shall repackage fuel in accordance with 10 CFR Part 71 prior to delivery to a carrier for transport.

Condition 25. Procedures for the handling and installation of the neutron detectors in the reactor vessel shall be approved by the Superintendent, Chemistry and Radiation Management.



Condition 26. A member of the Chemistry and Radiation Management staff shall be present during all neutron detector handling operations and shall monitor these activities.

Condition 27. The licensee shall maintain records of the contamination survey (smear survey) results for both the neutron detector containers and the fuel assembly shipping crates.

VIII. ENVIRONMENTAL PROTECTION

The Final Environmental Statement related to the operation of Nine Mile Point, Unit 2, dated May 1985 has been prepared and issued by the NRC as NUREG-1085. An environmental assessment has also been prepared for the 10 CFR Part 70 Fuel Storage License in accordance with 10 CFR 51.21. This assessment supports a Finding of No Significant Impact which was published in the Federal Register on November 8, 1985.

IX. FIRE SAFETY

There is a manual fire fighting system in the New Fuel Storage Vault. Dry chemical or CO₂ and halon fire extinguishers are provided and the area is normally free of combustible material. However, hose stations are provided for fighting fires which could occur in the fuel receiving area. Training and administrative controls will preclude the fire fighting crews from using the hose stations to spray water into the new fuel vault or from spraying the fuel receiving areas if new fuel is being transferred from the shipping container to its storage location. The staff has concluded that the Nine Mile Point, Unit 2 Nuclear Station, fire protection measures are adequate for the facility.

X. PHYSICAL PROTECTION

The Division of Safeguards, NMSS, has reviewed Niagara Mohawk's Physical Security Plan and has determined that it meets the requirements of 10 CFR 73.67. To ensure that the Physical Security Plan shall be fully implemented and remain in effect whenever fresh fuel is stored onsite, the staff recommends Condition 28.

Condition 28. The licensee shall maintain and fully implement all provisions of the Commission approved Physical Security Plan, including changes made pursuant to the authority of 10 CFR 70.32(e). The approved Security Plan is titled "Nine Mile Point Nuclear Station Unit #2, Security Plan for Special Nuclear Material of Low Strategic Significance, Revision 1" dated August 1985. The Physical Security Plan shall be withheld from public disclosure pursuant to 10 CFR 2.790(d).

XI. CONCLUSIONS

1. After reviewing the application and its supplement, the staff finds that:

- a. The application meets the requirements of the Atomic Energy Act, as amended, and of the regulations of the Commission,



- b. Issuance of the license would not be inimical to the common defense and security, and
 - c. Issuance of the license would not constitute an unreasonable risk to the health and safety of the public.
2. With the recommended license conditions, the NRC staff finds that:
- a. The applicants are qualified by reason of training and experience to use the material for the purpose requested in accordance with the regulations in 10 CFR 70.23.
 - b. The applicants' proposed equipment and facilities are adequate to protect health and minimize danger to life or property.
 - c. The applicants' proposed procedures to protect health and to minimize danger to life or property are adequate.

XII. RECOMMENDATIONS

The staff recommends approval of the application and its supplements subject to the following conditions which the staff finds are appropriate to protect health or to minimize danger to life or property:

- Condition 11. The minimum technical qualifications for the General Superintendent Nuclear Generation shall be in accordance with Section 4.2.1, "Plant Manager," ANSI/ANS 3.1-1978.
- Condition 12. The minimum technical qualifications for Station Superintendent shall be in accordance with Section 4.2.1, "Plant Manager," ANSI/ANS 3.1-1978.
- Condition 13. The minimum technical qualifications for the Reactor Analyst Supervisor shall be in accordance with Section 4.4.1, "Reactor Engineer," ANSI/ANS 3.1-1978.
- Condition 14. The minimum technical qualifications for the Superintendent of Chemistry and Radiation Management shall be in accordance with the requirements for "Radiation Protection Manager," Regulatory Guide 1.8, September 1975.
- Condition 15. The minimum technical qualifications for the Supervisor of Chemistry and Radiation Protection shall be in accordance with the requirements for "Radiation Protection Manager," Regulatory Guide 1.8, September 1985.
- Condition 16. The following training shall be completed by each individual prior to participation in the radiation safety and/or fuel handling programs:



- (a) All radiation safety personnel involved in fuel handling shall be trained in radiation safety and in NMP's Unit 2, radiation protection procedures related to fuel assembly handling.
- (b) All operations personnel involved in fuel handling shall receive training in proper fuel handling procedures, including the related health and safety aspects of the activities.

Condition 17. Fuel assemblies, when stored in their shipping containers, shall be stacked no more than three containers high.

Condition 18. All fuel assemblies shall be in their shipping containers or storage racks in the New Fuel Vault or in the Spent Fuel Storage Facility except for the following:

- a. No more than three assemblies shall be allowed above the refueling floor.
- b. No more than one fuel assembly shall be below the refueling floor outside the storage racks.

Condition 19. The above four fuel assemblies shall maintain a minimum edge-to-edge spacing of twelve (12) inches from the shipping container array and approved storage rack locations.

Condition 20. All preoperational testing of fuel handling equipment shall be completed prior to use for handling the new fuel shipment.

Condition 21. The New Fuel Storage Vault shall have no more than 10 fresh fuel assemblies uncovered at any one time.

Condition 22. The licensee is hereby exempted from the provisions of 10 CFR 70.24 insofar as this exemption applies to materials held under this license only.

Condition 23. Records of the weekly visual surveillance of the shipping containers with the neutron detectors shall be maintained and a copy of each surveillance submitted to the Superintendent Chemistry and Radiation Management and the Nine Mile Point, Reactor Analyst Supervisor.

Condition 24. The licensee shall repackage fuel in accordance with 10 CFR Part 71 prior to delivery to a carrier for transport.

Condition 25. Procedures for the handling and installation of the neutron detectors in the reactor vessel shall be approved by the Superintendent, Chemistry and Radiation Management.



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- Condition 26. A member of the Chemistry and Radiation Management staff shall be present during all neutron detector handling operations and shall monitor these activities.
- Condition 27. The licensee shall maintain records of the contamination survey (smear survey) results for both the neutron detector containers and the fuel assembly shipping crates.
- Condition 28. The licensee shall maintain and fully implement all provisions of the Commission approved Physical Security Plan, including changes made pursuant to the authority of 10 CFR 70.32(e). The approved Security Plan is titled "Nine Mile Point Nuclear Station Unit #2, Security Plan for Special Nuclear Material of Low Strategic Significance, Revision 1" dated August 1985. The Physical Security Plan shall be withheld from public disclosure pursuant to 10 CFR 2.790(d).

Original Signed By:

Merri Horn

Merri Horn
 Uranium Process Licensing Section
 Uranium Fuel Licensing Branch
 Division of Fuel Cycle and
 Material Safety, NMSS

Original Signed by

Approved by:

N. Kotzlach

W. T. Crow, Section Leader

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NAME: MHorn/as	: NKetzlach	: VLTharpe	: WTCrow	:	:	:
DATE: 11/26/85	: 11/26/85	: 11/26/85	: 11/26/85	:	:	:

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U.S. NUCLEAR REGULATORY COMMISSION
FINDING OF NO SIGNIFICANT IMPACT
ISSUANCE OF SPECIAL NUCLEAR MATERIAL LICENSE NO. SNM-1895
NIAGARA MOHAWK POWER CORPORATION, ET. AL;
OSWEGO COUNTY, NEW YORK
DOCKET NO. 70-2948

The U.S. Nuclear Regulatory Commission (the Commission) is considering the amendment of Special Nuclear Material License No. SNM-1895 to permit the receipt, possession, inspection, and storage of unirradiated nuclear fuel assemblies at the Nine Mile Point Nuclear Station in Oswego County, New York. The unirradiated fuel assemblies will be for eventual use in the Nine Mile Point Nuclear Station (NMP), Unit 2, once its operating license is issued.

ENVIRONMENTAL ASSESSMENT

Identification of Proposed Action

The proposed action would authorize the applicants to receive, possess, inspect, and store special nuclear materials in the form of unirradiated fuel assemblies.

The Need for the Proposed Action

The proposed license will allow the applicants to receive and store fresh fuel prior to issuance of the Part 50 operating license in order to inspect the fuel and to finalize fuel preparation needed to load the fuel into the reactor vessel. Actual core loading, however, will not be authorized by the proposed license.

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Environmental Impacts of the Proposed Action

A. Nuclear Criticality and Radiation Safety

Once at Nine Mile Point, Unit 2, the new fuel may be temporarily stored in shipping containers prior to placement in the designated storage locations: the new fuel storage vault and the spent fuel storage pool. Previous analysis of a shipping container array stacked three high and of infinite extent in the horizontal plane, with no separation between containers, and independent of the degree of water moderation and/or reflection has been determined to be critically safe. This analysis envelops the proposed NMP, Unit 2, shipping container array and thus assures nuclear criticality safety for such an array.

Upon removal of the fuel assemblies from the shipping containers, they are inspected and surveyed for any external contamination. Assuming no contamination is found, the assemblies are transferred to their designated storage location. Criticality safety in storage locations is assured by the use of engineered safeguards and administrative controls. This is accomplished by use of neutron poisons in the spent fuel pool and by eliminating sources of water moderation in the new fuel storage vault. Therefore, nuclear criticality safety of the storage racks is assured.

Since the fresh fuel assemblies are sealed sources, the principal exposure pathway is via external radiation. For low-enriched uranium fuel (< 4 percent U-235 enrichment), the exposure level to an individual standing 1 foot from the surface of the fuel would be less than 25 percent of the maximum

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exposure as low as reasonably achievable. Therefore, the staff has concluded that the applicants' requested operations can be carried out with adequate radiation protection of the public and environment.

Only a small amount, if any, of radioactive waste (e.g., smear papers and/or contaminated package materials) is expected to be generated as a result of fuel handling and storage operations. Any waste that is produced will be properly stored onsite until it can be shipped to a licensed disposal facility.

B. Transportation

In the event the applicants must return the fuel to the fuel fabricator, all packaging and transport of fuel will be in accordance with 10 CFR Part 71. No significant external radiation hazards are associated with the unirradiated fuel because the radiation level from the clad fuel pellets is low and because the shipping packages must meet the external radiation standards in 10 CFR Part 20. Therefore, shipment of unirradiated fuel by the applicants is expected to have an insignificant impact upon the environment.

C. Accident Analysis

In the unlikely event that an assembly (either within or outside its shipping container) is dropped during transfer, the fuel cladding is not expected to rupture. Even if the fuel rod cladding were breached and the pellets were released, an insignificant environmental impact would result.

The fuel pellets are composed of a ceramic UO_2 that has been pelletized

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and sintered to a very high density. In this form, release of UO_2 aerosol is unlikely except under conditions of deliberate grinding. Additionally, UO_2 is soluble only in an acid solution so dissolution and release to the environment are extremely unlikely.

D. Conclusion

The environmental impacts associated with the handling and storage of new fuel at NMP, Unit 2, are expected to be insignificant. Essentially no effluents, liquid or airborne, will be released, and acceptable controls will be implemented to prevent a radiological accident. Therefore, the staff concludes that there will be no significant impacts associated with the proposed action.

Alternative to the Proposed Action

The principal alternative would be to deny the requested license. Assuming the operating license will eventually be issued, denial of the storage only license would merely postpone new fuel receipt at NMP, Unit 2. Although denial of the Special Nuclear Materials License for NMP, Unit 2, is an alternative available to the Commission, it would be considered only if significant issues of public health and safety could not be resolved to the satisfaction of regulatory authorities involved.

Alternative Use of Resources

This action does not involve the use of resources not previously considered in connection with the Commission's Final Environmental Statement (NUREG-1085) dated May 1985, related to this facility.

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Agencies and Persons Consulted

The Commission's staff reviewed the applicants' request of June 12, 1985, and its amended request dated September 27, 1985, and did not consult other agencies or persons.

Finding of No Significant Impact

The Commission's Division of Fuel Cycle and Material Safety has prepared an Environmental Assessment related to the issuance of Special Nuclear Materials License No. SNM-1895. On the basis of this assessment, the Commission has concluded that the environmental impact created by the proposed licensing action would not be significant and does not warrant the preparation of an Environmental Impact Statement. Accordingly, it has been determined that a Finding of No Significant Impact is appropriate. The Environmental Assessment and the above documents are available for public inspection and copying at the Commission's Public Document Room, 1717 H Street, NW., Washington, DC. Copies of the Environmental Assessment may be obtained by calling (301)427-4510 or by writing to the Uranium Fuel Licensing Branch, Division of Fuel Cycle and Material Safety, U.S. Nuclear Regulatory Commission, Washington, DC, 20555.

Dated at Silver Spring, Maryland this 4th day of November 1985.

FOR THE NUCLEAR REGULATORY COMMISSION

Original Signed By:
W. T. Crow

W. T. Crow, Acting Chief
Uranium Fuel Licensing Branch
Division of Fuel Cycle and
Material Safety, NMSS

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DATE	10/28/85	10/28/85	10/28/85	11/4/85			

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DOCKET NO: 70-2948

LICENSEE: Niagara Mohawk Power Corporation
Central Hudson Gas and Electric Corporation
Long Island Lighting Company
New York State Electric and Gas Corporation
Rochester Gas and Electric

FACILITY: Nine Mile Point Nuclear Station, Unit 2

SUBJECT: ENVIRONMENTAL ASSESSMENT - LICENSE APPLICATION
TO RECEIVE NEW FUEL

Background

By letter dated June 12, 1985, and as amended September 27, 1985, Niagara Mohawk, acting on its own behalf and as agent for the above co-owners, applied for an NRC license to permit the receipt, possession, inspection, and storage of special nuclear materials contained in unirradiated nuclear fuel assemblies. The materials are for eventual use in the Nine Mile Point Nuclear Station, Unit 2. In accordance with 10 CFR 51.21, the NRC has prepared this assessment of environmental impacts that may be caused by issuing the requested license.

The Proposed Action

The proposed action is issuance of a special nuclear materials license pursuant to 10 CFR 70 that will authorize the applicant to receive, possess, inspect, and store 800 fresh fuel assemblies for eventual use in the Nine Mile Point Nuclear Station. The license would be effective until it can be superseded by Niagara Mohawk's operating license for Unit 2 under 10 CFR 50. The fuel assemblies contain uranium dioxide (UO_2) pellets that have a maximum uranium-235 enrichment of 3.05 percent by weight and are encapsulated in zircaloy tubing. Issuance of the license would result in receipt, possession, inspection, and storage of the unirradiated fuel at Nine Mile Point. The transport of new fuel to Nine Mile Point will be the responsibility of the fuel fabricator. However, the license would authorize the applicant to transport or deliver to a carrier for transport the assemblies in approved packages if this should become necessary (e.g., to return fuel to the manufacturer). In addition, authorization to use sealed sources in monitoring devices, which is currently authorized by an existing license, would also be incorporated into the Unit 2 license.

Need for the Proposed Action

The applicant proposes to receive and store fresh fuel prior to issuance of the Part 50 operating license in order to inspect the assemblies and to finalize fuel preparation (e.g., add necessary hardware) needed to load the fuel into the reactor core vessel. Actual core loading, however, will not be authorized by the proposed license. Early completion of this fuel handling stage will help avoid delays in Nine Mile Point's startup once its operating license is issued.

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Alternatives to the Proposed Action and Their Environmental Impacts

Alternatives to the proposed action include complete denial of Niagara Mohawk's application. Assuming the operating license will eventually be issued, denial of the storage only license now would merely postpone the new fuel receipt. Such action, as well as any other alternative that can be imagined, would not present an environmental advantage because, as discussed below, no environmental impacts are expected to result from the proposed action.

Environmental Impacts of the Proposed Action

A Final Environmental Statement (FES) related to the full-scale operation of the Nine Mile Point Nuclear Station has already been prepared and issued by the NRC¹. Based on the evaluation in this statement, the environmental impacts of plant operation, subject to proposed conditions for environmental protection, are expected to be small. Plant operations will eventually include the storage and handling of irradiated fuel which is significantly more hazardous than unirradiated fuel. Therefore, the environmental impact from handling unirradiated fuel is expected to be very minor.

Once at Nine Mile Point, the new fuel will be received in the fuel receiving area and stored temporarily prior to being removed from the shipping containers. The fuel may also be stored within its shipping container on the refueling floor or in its shipping crate in the fuel receiving area. Smear surveys will be performed on the transport vehicle and on the new fuel shipping crates. The new fuel will then be removed from its shipping container, surveyed for external contamination, inspected, and transported to a storage location. Only a small amount, if any, of radioactive waste may be generated during this handling (e.g., smear papers or contaminated package material) and any waste that is produced will be properly stored onsite until it can be shipped to a licensed disposal facility. The fuel will be stored in the New Fuel Storage Vault or the Spent Fuel Storage Pool. Administrative controls combined with the design of these storage locations will ensure acceptable protection of the fuel assemblies from excessive physical damage under normal or abnormal conditions.

In the event the applicant must return assemblies to the fuel manufacturer, all packaging and transport of fuel will be in accordance with 10 CFR 71. The package will meet NRC approval requirements for normal conditions of transport and hypothetical accident conditions. No significant external radiation hazards are associated with the unirradiated assemblies because the radiation level from the fuel is low (the exposure rate at 1 foot from the surface is normally less than 1 mr/hr) and because the shipping packages must meet the external radiation standards in 10 CFR 71. Therefore, any shipment of unirradiated fuel by the applicant is expected to have an insignificant environmental impact.

OFFICE	1 U.S. Nuclear Regulatory Commission, "Final Environmental Statement Related to.....
SURNAME	the Operation of Nine Mile Point Nuclear Station, Unit 2, Docket No. 50-410,.....
DATE	Niagara Mohawk Power Corporation, "NUREG-1085, May 1985.

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In the unlikely event that an assembly (either within or outside its shipping container) is dropped during transfer, the fuel cladding is not expected to rupture. Even if the fuel rod cladding were breached and the pellets were released, an insignificant environmental impact would result. The fuel pellets are composed of a ceramic UO_2 that has been pelletized and sintered to a very high density. In this form, the generation of UO_2 aerosol is unlikely except under conditions of deliberate grinding. Additionally, UO_2 is soluble only in acid solution so dissolution and release to the environment is extremely unlikely.

All fuel handling activities will be in accordance with approved procedures to assure nuclear criticality and radiation safety. Fuel assemblies are handled individually, not disassembled into single fuel rods, and are stored as full assemblies. No single assembly can be made critical independent of the degree of water moderation and/or reflection. Safety of the stored assemblies is assured by several engineered safeguards (see the Safety Evaluation Report supporting this license). Moreover, the fuel assemblies are normally stored dry and under these conditions, cannot be made critical (< 5.0 percent U-235 enrichment) independent of the number of assemblies and spacing between them. Therefore, the proposed fuel handling and storage activities are critically safe and no environmental impacts from an accidental criticality are expected.

Conclusion

Based upon the information presented above, the environmental impacts associated with new fuel storage at Nine Mile Point Nuclear Station are expected to be insignificant. Essentially no effluents will be released and acceptable controls will be implemented to prevent a radiological accident. Therefore, in accordance with 10 CFR 51.31, a Finding of No Significant Impact is considered appropriate for this action.

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Original Signed By:
W. T. Crow

Approved by:
W. T. Crow, Section Leader

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