

## 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, 36, 39, 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.

301877

Licensee		3. License Number	21-26757-01
1. Michigan Limestone Operations, Ltd.		4. Expiration Date	October 31, 2001
2. 1035 Calcite Road Rogers City, MI 49779		5. Docket or Reference No.	030-34252
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. Cesium-137	A. Sealed Source (Texas Nuclear Model 57157C)	A. Two sources not to exceed 500 millicuries each	

## 9. Authorized Use:

- A. To be used in Texas Nuclear Model 5204 source holder for density measurements.

CONDITIONS

10. Licensed material shall be used only at the licensee's facilities located at 1035 Calcite Road, Rogers City, Michigan.
11. The Radiation Safety Officer for this license is John A. Nordin.
12. Licensed material shall be used by, or under the supervision of, John A. Nordin or Steve S. Truran.
13. A. Sealed sources and detector cells shall be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals as specified by the certificate of registration referred to in 10 CFR 32.210.
- B. Notwithstanding Paragraph A of this Condition, sealed sources designed to emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed 3 months.

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**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**

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- C. In the absence of a certificate from a transferor indicating that a leak test has been made within 6 months prior to the transfer, a sealed source or detector cell received from another person shall not be put into use until tested.
- D. The leak test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission in accordance with 10 CFR 30.50(b)(2), and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within 5 days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region III, ATTN: Chief, Nuclear Materials Safety Branch, 801 Warrenville Road, Lisle, Illinois 60532-4351. The report shall specify the source involved, the test results, and corrective action taken.
- E. The licensee is authorized to collect leak test samples for analysis by Texas Nuclear. Alternatively, tests for leakage and/or contamination may be performed by persons specifically licensed by the Commission or an Agreement State to perform such services.
14. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.
15. The licensee shall conduct a physical inventory every 6 months to account for all sources and/or devices received and possessed under the license.
16. Installation, initial radiation survey, relocation, or removal from service of devices containing sealed sources shall be performed by John A. Nordin, Steve S. Truran or by persons specifically licensed by the Commission or an Agreement State to perform such services. Maintenance and repair of devices and installation, replacement, and disposal of sealed sources shall be performed only by persons specifically licensed by the Commission or an Agreement State to perform such services.
17. Prior to initial use and after installation, relocation, dismantling, alignment, or any other activity involving the source or removal of the shielding, the licensee shall assure that a radiological survey is performed to determine radiation levels in accessible areas around, above and below the gauge with the shutter open. This survey shall be performed only by persons authorized to perform such services by the Commission or an Agreement State.
18. The licensee shall operate each gauge within the manufacturer's specified temperature and/or environmental limits such that the shielding and shutter mechanism of the source holder are not compromised.

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19. The licensee shall assure that the shutter mechanism is locked in the closed position during periods when a portion of an individual's body may be subject to the direct radiation beam. The licensee shall review and modify as appropriate its "lock-out" procedures whenever a new gauge is obtained to incorporate the device manufacturer's recommendations.
20. Each gauge shall be tested for the proper operation of the on-off mechanism and indicator, if any, at no longer than 6-month intervals or at such longer intervals as specified by the manufacturer and approved by NRC.
21. The licensee may not possess and use materials authorized in Items 6, 7, and 8 until:
  - A. The licensee has constructed the facilities and obtained the equipment described in the application and supporting documentation; and
  - B. The U. S. Nuclear Regulatory Commission, Region III, ATTN: Chief, Materials Licensing Branch, 801 Warrenville Road, Lisle, IL 60532-4351 has been notified that activities authorized by the license will be initiated.
22. Within 30 days of the date of a decision not to complete the facility, acquire equipment, or possess and use authorized material, the licensee must notify the Commission in writing, of the decision.
23. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The U.S. Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.
  - A. Application dated September 23, 1996; and
  - B. Letters dated October 18, 1996 and October 22, 1996.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date

10/27/96

By

Michael F. Weber

Materials Licensing Branch, Region III

**COPY**

(FOR LFMS USE)  
INFORMATION FROM LTS

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BETWEEN:

License Fee Management Branch, ARM  
and  
Regional Licensing Sections

Program Code: \_\_\_\_\_  
Status Code: 3  
Fee Category: \_\_\_\_\_  
Exp. Date: 0  
Fee Comments: \_\_\_\_\_  
Decom Fin Assur Req'd: \_\_\_\_\_  
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LICENSE FEE TRANSMITTAL

A. REGION

1. APPLICATION ATTACHED

Applicant/Licensee: MI LIMESTONE OPERS.LTD.PARTNERSHIP  
Received Date: 960926  
Docket No: 3034252  
Control No.: 301877  
License No.:  
Action Type: New Licensee

2. FEE ATTACHED

Amount: 550  
Check No.: 2151

3. COMMENTS

Signed D. Hershey  
Date 9-27-96

B. LICENSE FEE MANAGEMENT BRANCH (Check when milestone 03 is entered /\_\_/) )

1. Fee Category and Amount: 3P \$550

2. Correct Fee Paid. Application may be processed for:

Amendment \_\_\_\_\_  
Renewal \_\_\_\_\_  
License /

3. OTHER

Signed SC  
Date 10/4/96

OCT 09 1996

Log	<u>OCT 1 7M</u>
Remitter	_____
Check No.	<u>2026</u>
Amount	<u>\$550</u>
Fee Category	<u>3P</u>
Type of Fee	<u>App</u>
Date Check Rec'd	<u>10/3/96</u>
Date Completed	<u>10/4/96</u>
By:	<u>SC</u>

1996 OCT -3 AM 11:08



## APPLICATION FOR MATERIAL LICENSE

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 9 HOURS. SUBMITTAL OF THE APPLICATION IS NECESSARY TO DETERMINE THAT THE APPLICANT IS QUALIFIED AND THAT ADEQUATE PROCEDURES EXIST TO PROTECT THE PUBLIC HEALTH AND SAFETY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0120), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

## APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

DIVISION OF INDUSTRIAL AND MEDICAL NUCLEAR SAFETY  
OFFICE OF NUCLEAR MATERIALS SAFETY AND SAFEGUARDS  
U.S. NUCLEAR REGULATORY COMMISSION  
WASHINGTON, DC 20555-0001

## ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:

## IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND,  
MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA,  
RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

LICENSING ASSISTANT SECTION  
NUCLEAR MATERIALS SAFETY BRANCH  
U.S. NUCLEAR REGULATORY COMMISSION, REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PA 19406-1415

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO  
RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA,  
SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING SECTION  
U.S. NUCLEAR REGULATORY COMMISSION, REGION II  
101 MARIETTA STREET, NW, SUITE 2900  
ATLANTA, GA 30323-0199

## IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, ✓  
SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING SECTION  
U. S. NUCLEAR REGULATORY COMMISSION  
REGION III  
801 WARRENVILLE ROAD  
LISLE, IL 60532-4351

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW  
MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING,  
SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING SECTION  
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV  
611 RYAN PLAZA DRIVE, SUITE 400  
ARLINGTON, TX 76011-8064

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S.  
TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:

RADIOACTIVE MATERIALS SAFETY BRANCH  
U.S. NUCLEAR REGULATORY COMMISSION, REGION V  
1450 MARIA LANE  
WALNUT CREEK, CA 94596-5368

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTIONS.

## 1. THIS IS AN APPLICATION FOR (Check appropriate item)

- ☒ A. NEW LICENSE  
☐ B. AMENDMENT TO LICENSE NUMBER \_\_\_\_\_  
☐ C. RENEWAL OF LICENSE NUMBER \_\_\_\_\_

## 2. NAME AND MAILING ADDRESS OF APPLICANT (Include Zip code)

MICHIGAN LIMESTONE OPERATIONS LTD, PTNSHP.  
1035 CALCITE ROAD  
ROGERS CITY, MICHIGAN 49779

## 3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

1035 CALCITE ROAD  
CALCITE PLANT  
ROGERS CITY, MICHIGAN 49779

## 4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

JOHN A. NORDIN, P.E.,  
MANAGER - ENGINEERING  
TELEPHONE NUMBER \_\_\_\_\_

SUBMIT ITEMS 5 THROUGH 11 ON 8-1/2 X 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL a. Element and mass number; b. chemical and/or physical form; and c. maximum amount which will be possessed at any one time	6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.
7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING EXPERIENCE.	8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.
9. FACILITIES AND EQUIPMENT.	10. RADIATION SAFETY PROGRAM.
11. WASTE MANAGEMENT.	12. LICENSEE FEES (See 10 CFR 170 and Section 170.31) FEE CATEGORY 3P AMOUNT ENCLOSED \$ 550.00
13. CERTIFICATION. (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, 36, 39 AND 40, AND THAT ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF. WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.	

CERTIFYING OFFICER - TYPED/PRINTED NAME AND TITLE

SIGNATURE

DATE

John A Nordin Manager Engineering

John A Nordin

9/23/96

FOR NRC USE ONLY

RECEIVED

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED	CHECK NUMBER	COMMENTS
			\$		
APPROVED BY				DATE	

SEP 26 1996

REGION III

301877

APPLICATION FOR MATERIAL LICENSE contd.

radprog.sam

NOTE: MLO = Michigan Limestone Operations Limited Partnership

**5.0 MATERIAL TO BE POSSESSED**

Manufacturer/ model	Element and Mass Number	Chemical and Physical Form	Maximum Activity Per Source
Unit 1: Texas Nuclear model 5204	Cesium-137	Sealed Source	500 MCI
Unit 2: Texas Nuclear model 5204	Cesium - 137	Sealed Source	500 MCI

**6.0 - PURPOSE FOR WHICH LICENSE MATERIAL WILL BE USED**

Item 5, Unit 1 and Unit 2: Both units are used to measure pipe slurry density. Possession of this license is necessary to allow removal, relocation, packaging, and to conduct leak testing and radiation surveys, and wipe tests on equipment listed in Item 5 for MLO.

**7.0 - INDIVIDUALS RESPONSIBLE FOR RADIATION SAFETY, THEIR TRAINING AND EXPERIENCE**

JOHN A NORDIN (RSO) resume attached

STEVE S TRURAN resume attached

**8.0 - TRAINING FOR INDIVIDUALS IN OR FREQUENTING RESTRICTED AREAS**

8.1

There will be no restricted areas, as the maximum levels of exposure will be less than .002 rems/hr for all accessible points on the gauges. See Appendix I for other training.

## **9.0 - FACILITIES AND EQUIPMENT**

9.1

MLO processes limestone. The limestone is quarried, crushed, screened, and washed. The wash water is collected and pumped to a tailings pond using 2 -20" pipelines. Each pipeline has a Nuclear Gauge located about 12' from the pump at the feed end of the pipeline. A door separates the gauge from the pumphouse, and serves as the entrance to the tunnel which contains both pipelines. The gauges monitor the density of the pipelines for control purposes. See Appendix V for plan view of the pumphouse and gauge area. The pipe tunnel is normally not occupied.

9.2

The environment will be cool and damp. Some vibration, noncorrosive.

9.3

No cooling will be necessary, ambient will be approximately 65 degrees all year.

9.4

No cooling will be necessary.

9.5

Gauges and area will be inspected quarterly for proper shutter operation, for labels that are visible and legible, and that gauges are protected from corrosive materials.

9.6 For emergency procedures, see 10.3.2.

## **10.0 - RADIATION SAFETY PROGRAM**

### **10.1 Personnel Monitoring Equipment**

Personnel monitoring is not required since all accessible points will be less than 5 mR/hr whether the shutter is opened or closed and therefore the likelihood of receiving 24% of the radiation dose specified in 10 CFR Part 20 is negligible.

### **10.2 Radiation Detection Instruments and Instrument Calibration**

TYPE	QUANTITY	RADIATION DETECTED	SENSITIVITY DETECTED	USE
TN Technologies Model 2652 Portable Survey Meter	1	Cesium 137	.005 micro Ci	Survey and wipe tests

This Instrument will be returned to the manufacturer for re-calibration every 12 months.



### **10.3 ALARA POLICY STATEMENT**

The objective of the Radiation Protection Program at MLO is to implement procedures and policies which will ensure that exposures from ionizing radiation devices to individuals are maintained **As Low As Reasonably Achievable**. It is the policy of this facility to:

1. Conduct its radiological operations in a manner that ensures the health and safety of all its employees and members of the public.
2. Establish and maintain a system of policies, procedures and guidelines commensurate with the scope and extent of licensed activities and ensure compliance with NRC 10 CFR 20.
3. Ensure the technical competence of personnel responsible for implementing and overseeing the radiation protection program.
4. Ensure personnel responsible for performing work activities on radiological devices are appropriately trained.

#### **10.4 INSTALLATION OF GAUGES**

Gauges will be installed in new facilities and in expansions of existing facilities only under the supervision of the manufacturer.

Existing gauges may be relocated or moved to storage under the supervision of anyone licensed to do so.

All radiation gauges installed at MLO shall be so constructed that the radiation field strength shall not exceed 2 mR/hr on accessible surfaces of the gauge.

All radiation devices containing radioactive isotopes shall be equipped with a lockable shutter to attenuate the primary beam to a level of less than 2 mR/hr for use during installation, use, servicing, transportation, or storing the device.

In every installation where it can be accomplished, entry into the primary radiation beam shall be prevented by physical constraints. If this is cannot be attained, administrative procedures appropriate to the specific installation shall apply.

Shutters shall be equipped with locks for the shutter-closed position. Keys are to be kept under the supervision of the RSO or designee.

A log book shall be maintained for each gauge by the RSO, recording the following:

- Date, time, and duration of shutter closures
- Maintenance of the gauge and inspection.
- Wipe tests and surveys.
- Gauge movements, storage, and disposals.
- Survey meter repairs and calibrations.

## **10.5 MAINTENANCE NEAR THE GAUGE**

No work shall be done anywhere on the 20" pipeline until the shutter has been closed and locked. Any supervisor or their designee may close the shutter. Only the RSO or designee may open it.

## **10.6 INSPECTION PROCEDURES**

Quarterly inspections will be performed by trained and qualified personnel. Quarterly inspections will include:

- Proper operation of the shutter.

- Shutter light system.

- Mechanical and physical integrity of gauge and mounting hardware.

- Date and time of inspection.

All gauges shall be wiped tested and surveyed at the time of installation and at 6 month intervals thereafter (see Appendix for wipe test procedures). Such wipe tests and surveys shall be performed by persons authorized to do so, or by other trained personnel under their supervision. Wipe test kits will be NRC approved. Survey will be performed with a certified survey meter.

At three (3) year intervals, gauges at this installation will be confirmed by wipe tests analyzed by an NRC approved facility.

## **10.7 EMERGENCY PROCEDURES**

In the event of suspected damage to the gauge, the RSO or his approved representative will be notified immediately. Rope access to the tunnel.

No MLO employee, unless specifically licensed or supervised by a person specifically licensed by the NRC will handle the gauge except to lock the shutter in the closed position.

Emergency procedures will be initiated after verification with a survey meter that the radiation levels are in excess of those at the original installation survey.

The RSO will immediately rope off the area including all accessible points where radiation levels exceeded 2 mR/hr.

An attempt shall be made to close off the primary beam either by closing the shutter or otherwise shielding the beam. This shall be done in such a manner that no employee shall be exposed to excessive radiation dosage, as defined in paragraph 20.403, part 20, 10 CFR of the Federal Register.

Reports shall be made to the NRC by the RSO as required.

## **10.8 TRAINING PROCEDURES**

Every employee working in a facility building which contains ionizing radiation devices shall receive training as stated in APPENDIX I.

Employee training will be kept on permanent file.

## **11.0 - WASTE MANAGEMENT**

Gauges removed for disposal shall be placed in storage.

A licensed contractor shall be used to dispose of gauges.

Amend NRC license if a specific model of the gauge is eliminated.

Sources will be returned to the manufacturer in accordance with the manufacturer's specific packaging and shipping instructions.



## APPENDIX I

### TRAINING

1. General (1/2 Hr annual ) for those who will be working in the area of the gauge.
  - A. Radioactive Materials and their application to MLO
  - B. Shielding
  - C. Plant location of gauges and safe operating practices.
  - D. Emergency Procedures
  - E. Safe Operating Procedures and Precautions
2. Specific ( 4 hours) For those crafts who will be working on the pipeline or with the gauge.
  - A. Radioactive Materials (Isotopes, Decay, half-life)
  - B. Radiation Interaction with Matter (Ionizing radiation, electromagnetic, Neutron)
  - C. Radiation Dosimetry ( Dose Determination, Quality Factor, Gamma Exposure Rate)
  - D. Shielding (Inverse Square Law, Time,Distance,Shielding, Half-value Layer)
  - E. Biological Effects.
  - F. Surveys and wipe tests. ( How to..hands on)

## APPENDIX II

### PROCEDURE FOR MOVING AND RELOCATING OR STORING A GAUGE CONTAINING AN ISOTOPE

1. The Radiation Protection Officer will continue to be ready to institute emergency procedures to prevent or minimize hazards to personnel. The shutter is to be locked in the closed position.
2. A package is to be constructed that will securely contain the source housing. That package must be able to protect the source housing under the normal rigors of commercial transportation.
3. A wipe test and a radiation survey are to be performed before the source is dismounted.
4. The Radiation Protection Officer shall supervise the dismounting and packaging of the source and monitor the operation with a survey meter.
5. The source housing is to be dismounted only so far as necessary to divorce it from the process equipment. Then it is to be placed in the package and the package properly closed. Under no circumstances is the source capsule to be removed from the shielded housing. If the package is to be handled by the commercial transport, it shall be labeled as per U.S. Department of Transportation hazardous Materials Regulations (49 CFR Parts 170-190).
6. If the source is to be stored or reused, normal MLO procedures for equipment transport will be implemented.
7. At the destination, the Radiation Protection Officer will monitor the radiation from the package and examine the package for shipping damage.
8. If the source is to be installed in an operating gauge position, normal installation procedures will proceed from this point using MLO personnel. MLO personnel are not to install new sources. The manufacturer will supervise new installations.
9. Sources to be stored are to be placed in locked storage. This storage shall be in an area occupied infrequently by personnel. Surface radiation of that storage with stored sources is not to exceed 2 mR/hr. Keys will be kept by the RSO.
10. The storage area is to be examined for tampering and monitored for radiation monthly.

### APPENDIX III

#### LEAK TEST PROCEDURE

The source unit is not to be dismantled from the pipe or disassembled in any way to test the source container. Testing of the external seams and end plate is adequate.

1. Actuate the shutter mechanisms to the closed position.
2. Obtain as many Q-Tips (cotton-tipped applicators) as indicated in the applicable drawing and slightly moisten with water.
3. Using a TN Technologies Model 2652 or equivalent with the appropriate calibration standard, calibrate the unit on the proper scale. The calibration standard is to be certified as being between 0.001 and 0.005 micro Ci.
4. With the shutter closed, wipe around the seams of the source housing assembly at the locations designated on the appropriate drawings (care should be taken not to touch the Q Tips with the fingers following wiping operation).
5. Carefully place the swab end of the Q-Tips as close to the window of the G.M. Tube on the Survey Meter as possible and read the result. The degree of removable contamination may be readily evaluated by the direct ratio methods.
6. A leak test certification is to be completed and filed as permanent record of the leak test.

#### CALCULATION FOR LEAK TEST PROCEDURE

The following procedure should be used for determining small amounts of radioactive material using a TN Technologies Model 2652 or equivalent Survey meter that has a demonstrated ability to detect 0.005 micro Ci of the radioactive source being leak tested.

1. Turn on the unit, check battery for operation.
2. Place selected certified standard source disk directly on end of the G.M. tube and turn range switch to proper position. Note and record the observed reading: M1 (in mR/hr.)
3. a. Take the cotton swab from leak test kit, make wipes at the locations indicated on the appropriate drawing.  
  
b. Place the cotton tip of the swab over the face of the G.M. tube in the same geometrical position as the standard source disk was in Step 2. Note and record the observed meter reading: M2 (in mR/hr.)

### APPENDIX III contd.

4. To determine the degree of contamination, in microcuries, the algebraic equation of proportionality, or direct ratio method is used:

$$A/M1 = C/M2$$

Where:

A = activity of certified standard test source in microcuries (micro Ci)

C = amount of removable contamination in microcuries (micro Ci)

M1= survey meter reading of standard source in milliroentgens per hour (mR/hr).

M2= survey meter reading of swab after wiping gauge in milliroentgens per hour (mR/hr)

NOTE: M1 and M2 must be in the same units. Only C is unknown in the above equation.



**APPENDIX IV**  
**( To be posted near Gauges)**

**RADIATION EMERGENCY**

Radiation Protection Officer	Name	<b>John Nordin</b>
	Phone	<b>ext 206</b>
Alternate	Name	<b>Steve Truran</b>
	Phone	<b>ext 235</b>

FIRE DEPT.                      9-911

HOSPITAL                        9-911

**EMERGENCY PROCEDURES:**

In the event of suspected damage to the gauge, the RSO or his approved representative will be notified immediately. Rope off access to the tunnel.

No MLO employee, unless specifically licensed or supervised by a person specifically licensed by the NRC will handle the gauge except to lock the shutter in the closed position.

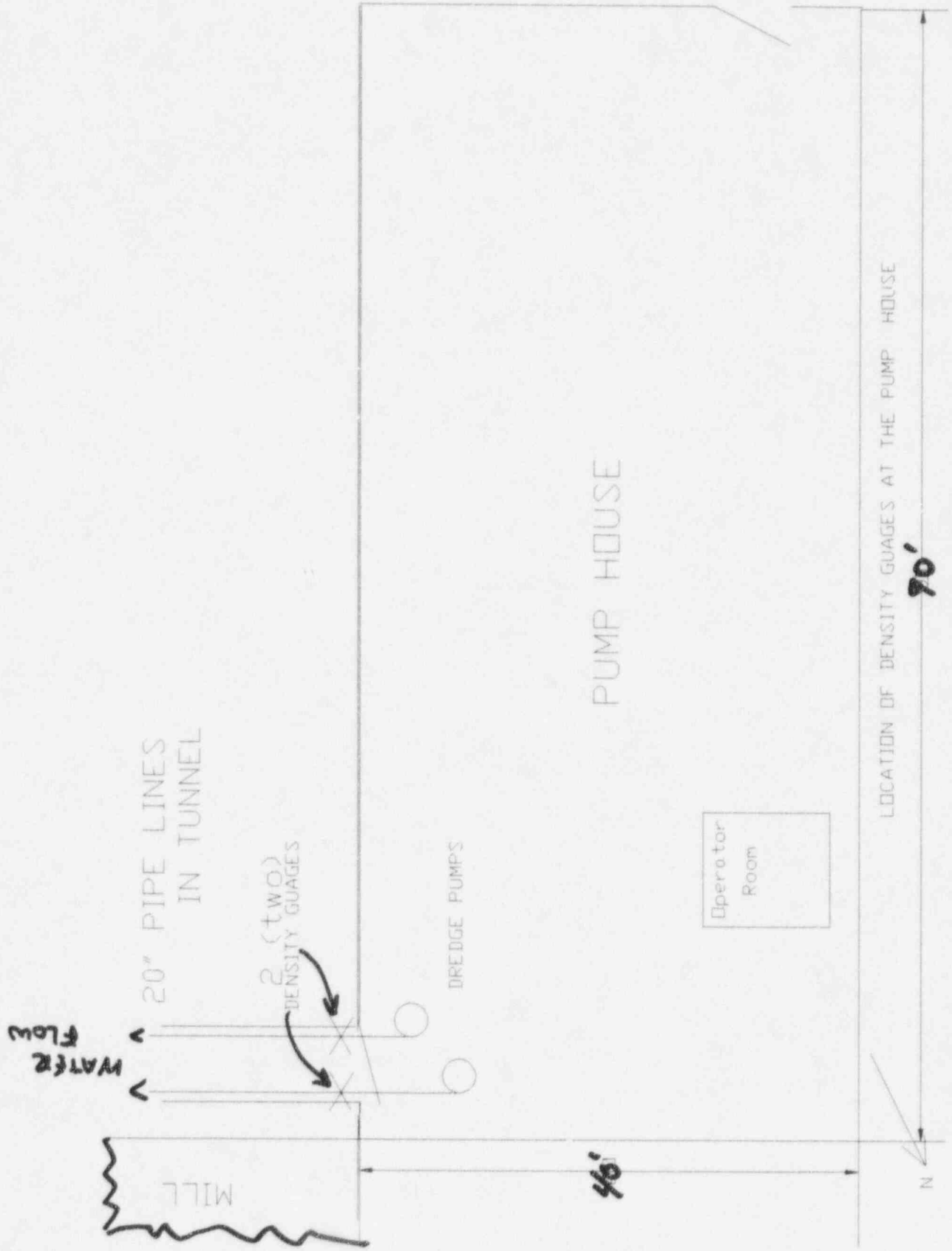
Emergency procedures will be initiated after verification with a survey meter that the radiation levels are in excess of those at the original installation survey.

The RSO will immediately rope off the area including all accessible points where radiation levels exceeded 2 mR/hr.

An attempt shall be made to close off the primary beam either by closing the shutter or otherwise shielding the beam. This shall be done in such a manner that no employee shall be exposed to excessive radiation dosage, as defined in paragraph 20.403, part 20, 10 CFR of the Federal Register.

Reports shall be made to the NRC by the RSO as required.

Appendix V  
Gauge Location  
Plan View



Resumes for proposed RSO and designate. See Appendix for complete course descriptions.

The application is a request for a specific license.

Michigan Limestone Operations Limited Partnership  
P.O. Box 1035  
Calcite Road  
Rogers City, Mi 49779

**John A. Nordin** (proposed RSO)

Training: 40 hours with TN Technologies, October 1976

40 hours with TN Technologies, Feb 1995

Radiation Protection Officer, U.S. Steel, Minntac Plant Mt. Iron Mn  
1977-1981

Present Job Title : Manager Engineering Services, Michigan Limestone Operations.

**Steve S. Truran** (proposed designate)

40 hours with TN Technologies, Feb 1995

Present Job : Manager Safety and Employee Services

# **TN Technologies**

A Thermo Instruments Company

February 21, 1995

Mr. John A. Nordin  
Manager - Engineering  
Michigan Limestone Operations  
1035 Calcite Road  
Rogers City, MI 49779

Dear Mr. John A. Nordin:

We are pleased to confirm your successful completion of the Radiation Safety Training Course conducted February 13-17, 1995 by TN Technologies Inc.

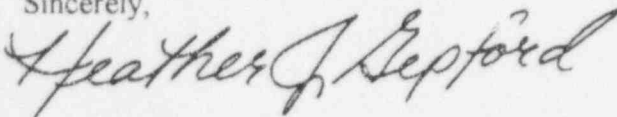
Enclosed are the following:

Record of Performance  
Certificate of Training  
Letter of Certification  
Course Outline  
American Board of Industrial Hygiene information  
Guide for Specific License Amendment

This form letter suggests what may be said to your regulatory agency to obtain the license amendments necessary to conduct installation, relocation, and leak testing on the listed TN Technologies industrial devices. Copies of procedures, survey and leak test forms from your course manual, with necessary changes to meet your specific requirements, should be sent with you license application as necessary.

Congratulations on completing the Radiation Safety Training Course. If we can be of further assistance, do not hesitate to let us know.

Sincerely,



Heather J. Gepford  
Senior Project Engineer  
Technical Services

Enclosures



RECORD OF PERFORMANCE

John A. Nordin  
Manager - Engineering  
Michigan Limestone Operations

HOMEWORK AVERAGE

98.75

TEST

100

FINAL GRADE

99.5

Class Average = 93.5

LETTER OF CERTIFICATION

This is to certify that

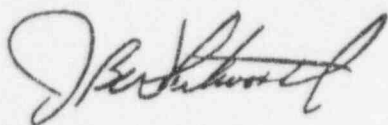
John A. Nordin  
Michigan Limestone Operations

has attended and successfully completed a course of instruction, conducted under the auspices of TN Technologies Inc. and described in the attached course agenda. The course covers fundamentals of radiation, units of dose and quality of radiation fields, hazards of radiation exposure, detection devices, regulatory controls, industrial devices and specific training on installation and leak testing of TN Technologies density, level, and weigh gauges.

The said course of instruction, together with prior experience, is structured to qualify persons who complete it to understand and safely perform various operations involving nuclear devices including the installation, relocation, and leak testing of such equipment. The operations are to be performed in accordance with the rules and regulations of the United State Nuclear Regulatory Commission and/or "Agreement States", and are in all respects subject to such rules and regulations.

This letter cannot be used in lieu of a specific license from or other sanction by an appropriate regulatory agency.

TN TECHNOLOGIES INC.



J. B. Whitworth, PhD.  
Director, Technical Services

**TN Technologies**  
A Thermo Instruments Company

OCT 1976  
class outline  
for John Nordin

December 12, 1994

Mr. John Nordin  
Michigan Limestone Operations  
1035 Calcite Road  
Roger City, MI 49779

Dear Mr. Nordin:

This is to certify that the records at TN Technologies, Inc. (formerly Texas Nuclear Corporation) indicate that you successfully completed the 40 Hour Industrial Radiation Safety Training course in October, 1976. Your recorded grades are as follows:

QUIZ I	QUIZ II	FINAL EXAM	FINAL GRADE
100	100	95	96

While a course outline for the particular class you attended in 1976 is not available, I am attaching a current course outline describing the material covered. The basic concepts required by regulation have not changed.

Sincerely,

TN TECHNOLOGIES, INC.



Lori Pelliccia  
Sr. Services Coordinator

/lp  
Attachment

OCT 1976

**AGENDA**  
**TN TECHNOLOGIES**  
**40-HOUR INDUSTRIAL RADIATION SAFETY TRAINING COURSE**

**Radioactive Materials**

- A. Isotopes
- B. Decay
- C. Half-life

**Types of Radiation****Radiation Interaction with Matter**

- A. Ionizing Radiation
  - 1. Electromagnetic
  - 2. Charged Particle
  - 3. Neutron
- B. Specific Ionization

**Radiation Dosimetry**

- A. Units & Dose Determination
- B. Quality Factor
- C. Gamma Exposure Rate
- D. Neutron Exposure Rate

**Shielding**

- A. Inverse Square Law
- B. Time, Distance, Shielding
- C. Half-Value Layer
- D. Calculating Shield Thicknesses

**Biological Effects**

- A. Radiosensitivity
- B. General Cell Structure
- C. Radiation Exposure
- D. Radiation Damage
- E. Long Term Effects

**Biological Effects (Con't)**

- F. Dose Limits
- G. Total Accumulated Dose
- H. Radiation Protection Guides
- I. Natural Background Radiation
- J. Estimated Loss of Life Expectancy

**Radiation Detection**

- A. Detection Instruments
  - 1. Basic Operations
  - 2. Survey Meters

**Personnel Monitoring**

- A. Requirements
- B. Devices

**Industrial**

- A. Posting
- B. Industrial Device Installation
  - 1. Requirements
  - 2. Surveying & Leak Testing Demonstration

**Factory "Hands-On" Training**

- A. Evaluation and overview on use of portable radiation survey meters
- B. Survey a fixed gauge
- C. Prepare survey forms
- D. Leak test devices using QT/1S procedure
- E. Count swabs
- F. Prepare leak test certificates

Industrial Radiation Safety Training Course  
Agenda  
Page Two

Oct 1976

**Regulatory Control**

- A. Title 10 Code of Federal Regulations
- B. Agreement States
- C. Licensing Procedures
- D. General vs Specific License
- E. User Responsibility
- F. Radiation Protection Program
  - 1. Recordkeeping
  - 2. Posting
  - 3. Training
  - 4. Incident Reporting
  - 5. Emergency Procedures

**Shipping Radioactive Material****Summary of Topics**

- A. Role of Radiation Safety Personnel
- B. Class Discussion

**Written Test on Lectures and Homework Assignments**

Note: Homework is assigned each night during the course.

# *Certificate of Training*

This is to certify that

JOHN A. NORDIN

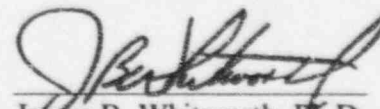
Has Successfully Completed the  
A Comprehensive [40 Hour] Radiation Safety Training Course  
Presented by TN Technologies

***TN Technologies***

A Thermo Instruments Company

P.O. Box 800, Round Rock, Texas 78680-0800  
Tel.: (512) 388-9100, Fax: (512) 388-9200

Issued February 17, 1995



James B. Whitworth, Ph.D.  
Director of Technical Services



# *Certificate of Training*

This is to certify that

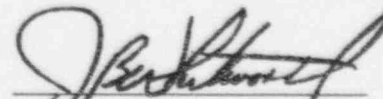
STEVEN S. TRURAN

Has Successfully Completed the  
A Comprehensive [40 Hour] Radiation Safety Training Course  
Presented by TN Technologies

***TN Technologies***  
A Thermo Instruments Company

P.O. Box 800, Round Rock, Texas 78680-0800  
Tel.: (512) 388-9100, Fax: (512) 388-9200

Issued February 17, 1995

  
James B. Whitworth, Ph.D.  
Director of Technical Services

Feb 1995  
Class outline for  
J Nordin & S. Truman

**OUTLINE**  
**TN TECHNOLOGIES**  
**40-HOUR INDUSTRIAL RADIATION SAFETY TRAINING COURSE**

**Atomic Structure**

- A. Bohr Model
- B. Nuclides and Notation
- C. Isotopes

**Types of Radiation**

- A. Alpha
- B. Beta
- C. Gamma and X
- D. Neutrons

**Radioactive Decay**

- A. Decay schemes
- B. Decay law
- C. Half-life

**Radiation Dose Units**

- A. Roentgen
- B. Rad
- C. Rem
- D. Quality factor

**Radiation Interaction with Matter**

- A. Ionizing vs. nonionizing
- B. Ionization and excitation
- C. Specific ionization
- D. Linear Energy Transfer
- E. Time, distance, and shielding
- F. Inverse square law

**Shielding**

- A. Alpha particle interactions
- B. Beta particle interactions

**Shielding(cont.)**

- C. Photon interactions
  - 1. Photoelectric, Compton scattering, pair production
  - 2. Photon exposure rate
  - 3. Shield calculations ( $I = I_0 e^{-\mu x}$ )
  - 4. Half-value layers
- D. Neutron interactions

**Biological Effects**

- A. Radiosensitivity
- B. General cell structure
- C. Exposure (acute, chronic)
- D. Damage (somatic, genetic)
- E. Long term effects
- F. Internal dosimetry
- G. Total accumulated dose
- H. Natural background radiation

**Radiation Detection**

- A. Fundamentals of detection
- B. Instrument characteristics, uses and limitations
- C. Survey meters

**Personnel Monitoring**

- A. Requirements
- B. Film badges, TLDs, etc.

**Industrial**

- A. Industrial device installation
  - 1. Requirements
  - 2. Surveying & leak testing demonstration
- B. Industrial applications

**Outline, 40-hour Industrial Radiation Safety Training Course**  
**Page Two**

**Factory "Hands-On" Training**

- A. Demonstration/discussion of different types of survey meters
- B. Use of portable radiation survey meters
- C. Survey a fixed gauge
- D. Prepare survey forms
- E. Leak test devices using QT/IS procedure
- F. Count swabs
- G. Prepare leak test certificates

**Regulatory Control**

- A. Title 10 Code of Federal Regulations
- B. Agreement states
- C. Licensing procedures
- D. General vs specific license
- E. User responsibility

**Radiation Protection Program/ALARA**

- A. ALARA statement
- B. Radiation Protection Program
- C. Operating, safety, and emergency procedures
- D. Compliance with dose limits
- E. Employee notification
- F. Recordkeeping
- G. Posting
- H. Training
- I. Incident reporting

**Shipping Radioactive Material**

**Written Test on Lectures and Homework Assignments**

Note: Homework is assigned each night during the course.

The Industrial Radiation Safety Training Course has been approved for CM points through the American Board of Industrial Hygiene. When updating your file, provide them with the following information:

Sponsor:	TN Technologies, Inc.
Name of activity:	Industrial Radiation Safety Training
Date:	February 13-17, 1995
CM points awarded:	4.5
CM approval number:	8162

For additional information, contact:

Ms. Barbara A. Saalfeld  
Administrative Assistant  
American Board of Industrial Hygiene  
4600 W. Saginaw  
Suite 101  
Lansing, MI 48917-2737  
(517) 321-2638

OCT 29 1996

John A. Nordin, P.E.  
Radiation Safety Officer  
Michigan Limestone Operations, Ltd.  
1035 Calcite Road  
Rogers City, MI 49779

Dear Mr. Nordin:

Enclosed is your NRC Material License Number 21-26757-01 in accordance with your request.

Please review the enclosed document carefully and be sure that you understand all conditions. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region III office at (630) 829-9887 so that we can provide appropriate corrections and answers.

Please be advised that your license expires at the end of the day, in the month, and year stated in the license. Unless your license has been terminated, you must conduct your program involving byproduct materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, note that you must:

1. Operate in accordance with NRC regulations 10 CFR Part 19, "Notices, Instructions and Reports to Workers; Inspections," 10 CFR Part 20, "Standards for Protection Against Radiation," and other applicable regulations.
2. Not possess and use materials authorized in Items 6, 7, and 8, on the license until:
  - a. You have constructed the facilities and obtained the equipment described in the license application and supporting documentation; and
  - b. You have notified the U. S. Nuclear Regulatory Commission, Region III, ATTN: Chief, Nuclear Materials Licensing Branch, in writing, that activities authorized by the license will be initiated.
3. Notify NRC, in writing, within 30 days:
  - a. When the Radiation Safety Officer permanently discontinues performance of duties under the license or has a name change; or

301877

- b. When the licensee's mailing address changes (no fee is required if the location of byproduct material remains the same).
- 4. In accordance with 10 CFR 30.36(b) and/or license condition, notify NRC, promptly, in writing, and request termination of the license:
  - a. When you decide to terminate all activities involving materials authorized under the license; or
  - b. If you decide not to complete the facility, acquire equipment, or possess and use authorized material.
- 5. Request and obtain a license amendment before you:
  - a. Change Radiation Safety Officers;
  - b. Order byproduct material in excess of the amount, or radionuclide, or form different than authorized on the license;
  - c. Add or change the areas of use or address or addresses of use identified in the license application or on the license; or
  - d. Change ownership of your organization.
- 6. Submit a complete renewal application with proper fee or termination request at least 30 days before the expiration date of your license. You will receive a reminder notice approximately 90 days before the expiration date. Possession of byproduct material after your license expires is a violation of NRC regulations. A license will not normally be renewed, except on a case-by-case basis, in instances where licensed material has never been possessed or used.

In addition, please note that NRC Form 313 requires the applicant, by his/her signature, to verify that the applicant understands that all statements contained in the application are true and correct to the best of the applicant's knowledge. The signatory for the application should be the licensee or certifying official rather than a consultant.

You will be periodically inspected by NRC. Failure to conduct your program in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will result in enforcement action against you. This could include issuance of a notice of violation, or imposition of a civil penalty, or an order suspending, modifying or revoking your license as specified in the General Policy and Procedures for NRC Enforcement Actions. Since serious consequences



J. Nordin

-3-

to employees and the public can result from failure to comply with NRC requirements, prompt and vigorous enforcement action will be taken when dealing with licensees who do not achieve the necessary meticulous attention to detail and the high standard of compliance which NRC expects of its licensees.

Sincerely,

Original Signed By  
Michael F. Weber  
Nuclear Materials Licensing Branch

License No.: 21-26757-01

Docket No.: 030-34252

Enclosures: 1. License No. 21-26757-01  
2. Form NRC-3

DOCUMENT NAME: M:\03034252.CL6

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	DNMS/RIII	<input checked="checked" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NAME	MWEBER:jaw								
DATE	10/29/96								

OFFICIAL RECORD COPY

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
801 WARRENVILLE ROAD  
LISLE, ILLINOIS 60532-4351  
630-829-9887 (phone), 630-515-1259 (fax)

CONVERSATION RECORD

TIME

7:35 am

DATE

10/22/96

NAME OF PERSON(S) CONTACTED

ORGANIZATION (OFFICE, DEPT, ETC.)

TELEPHONE NO.

John A. Nordin, P.E.

Michigan Limestone Operations

517-734-2131

SUBJECT

New license application - **CONTROL NUMBER 301877**

SUMMARY

Personnel Monitoring Equipment

1. Please commit to using whole body film badges as well as ring badges when servicing the gauges.
2. Please commit to using a supplier accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

We will continue our review of your application upon receipt of this information. Please reply in duplicate, within 30 days, and refer to **Control Number 301877**.

***P.S. Thanks for highlighting the changes in your application - it certainly makes it easy to find the changes!***

ACTION REQUIRED

Wait for response.

NAME OF PERSON DOCUMENTING CONVERSATION

SIGNATURE

DATE

Michael F. Weber

*Michael F. Weber*

10/22/96

## Michigan Limestone Operations

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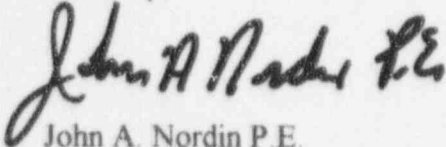
October 22, 1996

Michael F. Weber  
NRC, Control Number 301877  
Nuclear Regulatory Commission Region III  
801 Warrenville Road  
Lisle, Illinois 60532-4351

Dear Michael F. Weber:

Please find enclosed change to page 3 of my license application. Please call if there are any problems. Thankyou.

Sincerely,



John A. Nordin P.E.  
Manager Engineering

pm: 10-23-96

RECEIVED  
OCT 25 1996  
REGION III

301877  
OCT 25 1996

## **10.0 - RADIATION SAFETY PROGRAM**

### **10.1 Personnel Monitoring Equipment**

Personnel monitoring will not normally be required since all accessible points will be less than 2 mR/hr whether the shutter is opened or closed and therefore the likelihood of receiving 10% of the radiation dose specified in 10 CFR Part 20.1201 is negligible. However, when servicing the gauges film badges (ring type) and whole body film badges will be used. Since servicing the gauges will be so infrequent ( I would estimate an average of once per year), the film rings will be ordered a few days prior to the job, then submitted for analysis to the NRC approved facility. Suppliers for the film badges will be accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

### **10.2 Radiation Detection Instruments and Instrument Calibration**

The survey instrument used will be a Victoreen Thyac IV Model 290. Sensitivity ranges are: 0-0.1, 0-1, 0-10, 0-100, 0-1000 mR/h with a 10% full scale accuracy. This Instrument will be returned to the manufacturer (Victoreen, Inc. 6000 Cochran Road, Cleveland Ohio 44139-3395) for re-calibration every 12 months.

# Michigan Limestone Operations

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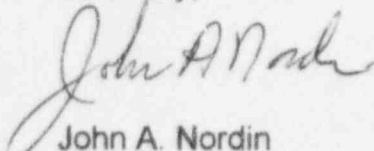
Friday, October 18, 1996

Michael F. Weber  
NRC, Control Number 301877  
Nuclear Regulatory Commission Region III  
801 Warrenville Road  
Lisle, Illinois 60532-4351

Dear Michael F. Webber,

Please find enclosed an updated application as requested. I highlighted the changes in green. Please call if there are further problems. Thankyou.

Sincerely,

  
John A. Nordin  
Manager Engineering

RECEIVED  
OCT 21 1996  
REGION III

Am: 10-18-96

OCT 21 1996

REV1.0

APPLICATION FOR MATERIAL LICENSE contd.

radprog.sam

NOTE: MLO = Michigan Limestone Operations Limited Partnership

**5.0 MATERIAL TO BE POSSESSED**

5.1 Radioactive material possessed is Cesium 137, contained in a double encapsulated cylinder.

The sources are Texas Nuclear Model 57157C, 500 MCI each.

5.2 Sources are housed in a Texas Nuclear model 5204 density guage.

**6.0 - PURPOSE FOR WHICH LICENSE MATERIAL WILL BE USED**

Both units are used to measure pipe slurry density. Possession of this license is necessary to allow removal, relocation, packaging, and to conduct leak testing and radiation surveys, and wipe tests on equipment listed in Item 5 for MLO.

**7.0 - INDIVIDUALS RESPONSIBLE FOR RADIATION SAFETY ..THEIR TRAINING AND EXPERIENCE**

JOHN A NORDIN (FSO) resume attached

STEVE S TRURAN resume attached

**8.0 - TRAINING FOR INDIVIDUALS IN OR FREQUENTING RESTRICTED AREAS**

8.1

There will be no restricted areas, as the maximum levels of exposure will be less than .002 rems/hr for all accessible points on the gauges. See Appendix I for other training.

## **9.0 - FACILITIES AND EQUIPMENT**

9.1

MLO processes limestone. The limestone is quarried, crushed, screened, and washed. The wash water is collected and pumped to a tailings pond using 2 -20" pipelines. Each pipeline has a Nuclear Gauge located about 12' from the pump at the feed end of the pipeline. A door separates the gauge from the pumphouse, and serves as the entrance to the tunnel which contains both pipelines. The gauges monitor the density of the pipelines for control purposes. See Appendix V for plan view of the pumphouse and gauge area. The pipe tunnel is normally not occupied.

9.2

The environment will be cool and damp. Some vibration, noncorrosive.

9.3

No cooling will be necessary, ambient will be approximately 65 degrees all year.

9.4

No cooling will be necessary.

9.5

Gauges and area will be inspected quarterly for proper shutter operation, for labels that are visible and legible, and that gauges are protected from corrosive materials.

9.6 For emergency procedures, see 10.3.2.



## **10.0 - RADIATION SAFETY PROGRAM**

### **10.1 Personnel Monitoring Equipment**

Personnel monitoring will not normally be required since all accessible points will be less than 2 mR/hr whether the shutter is opened or closed and therefore the likelihood of receiving 10% of the radiation dose specified in 10 CFR Part 20.1201 is negligible. However, when servicing the gauge, film badges (ring type) will be used. Since servicing the gauges will be so infrequent (I would estimate an average of once per year), the film rings will be ordered a few days prior to the job, then submitted for analysis to the NRC approved facility.

### **10.2 Radiation Detection Instruments and Instrument Calibration**

The survey instrument used will be a Victoreen Thyac IV Model 290. Sensitivity ranges are: 0-0.1, 0-1, 0-10, 0-100, 0-1000 mR/h with a 10% full scale accuracy.

This Instrument will be returned to the manufacturer (Victoreen, Inc. 6000 Cochran Road, Cleveland Ohio 44139-3395) for re-calibration every 12 months.

### **10.3 ALARA POLICY STATEMENT**

The objective of the Radiation Protection Program at MLO is to implement procedures and policies which will ensure that exposures from ionizing radiation devices to individuals are maintained **As Low As Reasonably Achievable**. It is the policy of this facility to:

1. Conduct its radiological operations in a manner that ensures the health and safety of all its employees and members of the public.
2. Establish and maintain a system of policies, procedures and guidelines commensurate with the scope and extent of licensed activities and ensure compliance with NRC 10 CFR 20.
3. Ensure the technical competence of personnel responsible for implementing and overseeing the radiation protection program.
4. Ensure personnel responsible for performing work activities on radiological devices are appropriately trained.

#### **10.4** **INSTALLATION OF GAUGES**

Gauges will be installed in new facilities and in expansions of existing facilities only under the supervision of the manufacturer.

Existing gauges may be relocated or moved to storage under the supervision of anyone licensed to do so.

All radiation gauges installed at MLO shall be so constructed that the radiation field strength shall not exceed 2 mR/hr on accessible surfaces of the gauge.

All radiation devices containing radioactive isotopes shall be equipped with a lockable shutter to attenuate the primary beam to a level of less than 2 mR/hr for use during installation, use, servicing, transportation, or storing the device.

In every installation where it can be accomplished, entry into the primary radiation beam shall be prevented by physical constraints. If this is cannot be attained, administrative procedures appropriate to the specific installation shall apply.

Shutters shall be equipped with locks for the shutter-closed position. Keys are to be kept under the supervision of the RSO or designee.

A log book shall be maintained for each gauge by the RSO, recording the following:

- Date, time, and duration of shutter closures

- Maintenance of the gauge and inspection.

- Wipe tests and surveys.

- Gauge movements, storage, and disposals.

- Survey meter repairs and calibrations.

## **10.5 MAINTENANCE NEAR THE GAUGE**

If repair is required on the pipeline which requires working on an open 20" pipe, no work within 12 feet of the gauges shall be done on the 20" pipeline until the shutter has been closed and locked. Any supervisor or their designee may close the shutter. Only the RSO or designee may open it.

## **10.6 INSPECTION PROCEDURES**

Quarterly inspections will be performed by trained and qualified personnel. Quarterly inspections will include:

- Proper operation of the shutter.

- Shutter light system.

- Mechanical and physical integrity of gauge and mounting hardware.

- Date and time of inspection.

All gauges shall be leak tested and surveyed at the time of installation. Leak tests shall be conducted at 3 year intervals thereafter (see Appendix III for leak test procedures). Such leak tests and surveys shall be performed by persons authorized to do so, or by other trained personnel under their supervision. Leak tests shall be analyzed by an NRC approved facility.

## **10.7 EMERGENCY PROCEDURES**

In the event of suspected damage to the gauge, the RSO or his approved representative will be notified immediately. Rope off access to the tunnel.

No MLO employee, unless specifically licensed or supervised by a person specifically licensed by the NRC will handle the gauge except to lock the shutter in the closed position.

Emergency procedures will be initiated after verification with a survey meter that the radiation levels are in excess of those at the original installation survey.

The RSO will immediately rope off the area including all accessible points where radiation levels exceeded 2 mR/hr.

An attempt shall be made to close off the primary beam either by closing the shutter or otherwise shielding the beam. This shall be done in such a manner that no employee shall be exposed to excessive radiation dosage, as defined in paragraph 20.403, part 20, 10 CFR of the Federal Register.

Reports shall be made to the NRC by the RSO as required.

Every employee working in a facility building which contains ionizing radiation devices shall receive training as stated in APPENDIX I .

Employee training will be kept on permanent file..

## **10.9 POSTING OF SIGNS**

The access areas to the radiation guages will be posted with signs stating:

RADIATION  
CAUTION  
<symbol>  
RADIOACTIVE  
MATERIAL

## **11.0 - WASTE MANAGEMENT**

Gauges removed for disposal shall be placed in storage.

A licensed contractor shall be used to dispose of gauges.

Amend NRC license if a specific model of the gauge is eliminated.

Sources will be returned to the manufacturer in accordance with the manufacturer's specific packaging and shipping instructions.

## APPENDIX I

### TRAINING

1. General (1/2 Hr annual ) for those who will be working in the area of the gauge.
  - A. Radioactive Materials and their application to MLO
  - B. Shielding
  - C. Plant location of gauges and safe operating practices.
  - D. Emergency Procedures
  - E. Safe Operating Procedures and Precautions
2. Specific ( 4 hours) For those crafts who will be working on the pipeline or with the gauge.
  - A. Radioactive Materials (Isotopes, Decay, half-life)
  - B. Radiation Interaction with Matter (Ionizing radiation, electromagnetic, Neutron)
  - C. Radiation Dosimetry ( Dose Determination, Quality Factor, Gamma Exposure Rate)
  - D. Shielding (Inverse Square Law, Time,Distance,Shielding, Half-value Layer)
  - E. Biological Effects.
  - F. Surveys and wipe tests. ( How to..hands on)

## **APPENDIX II**

### **PROCEDURE FOR MOVING AND RELOCATING OR STORING A GAUGE CONTAINING AN ISOTOPE**

1. The Radiation Protection Officer will continue to be ready to institute emergency procedures to prevent or minimize hazards to personnel. The shutter is to be locked in the closed position.
2. A package is to be constructed that will securely contain the source housing. That package must be able to protect the source housing under the normal rigors of commercial transportation.
3. A wipe test and a radiation survey are to be performed before the source is dismantled.
4. The Radiation Protection Officer shall supervise the dismantling and packaging of the source and monitor the operation with a survey meter.
5. The source housing is to be dismantled only so far as necessary to divorce it from the process equipment. Then it is to be placed in the package and the package properly closed. Under no circumstances is the source capsule to be removed from the shielded housing. If the package is to be handled by the commercial transport, it shall be labeled as per U.S. Department of Transportation hazardous Materials Regulations (49 CFR Parts 170-190).
6. If the source is to be stored or reused, normal MLO procedures for equipment transport will be implemented.
7. At the destination, the Radiation Protection Officer will monitor the radiation from the package and examine the package for shipping damage.
8. If the source is to be installed in an operating gauge position, normal installation procedures will proceed from this point using MLO personnel. MLO personnel are not to install new sources. The manufacturer will supervise new installations.
9. Sources to be stored are to be placed in locked storage. This storage shall be in an area occupied infrequently by personnel. Surface radiation of that storage with stored sources is not to exceed 2 mR/hr. Keys will be kept by the RSO.
10. The storage area is to be examined for tampering and monitored for radiation monthly.



### **APPENDIX III**

#### **LEAK TEST PROCEDURE**

Leak tests will be analyzed by an approved NRC facility once every 3 years. Leak test kits will be purchased, swabs taken by the RSO or designate and processed by the NRC facility. Leak test kits will include recommended areas to be sampled and proper procedures. In general:

1. Actuate the shutter mechanisms to the closed position.
2. Slightly moisten Q tips with water.
3. With the shutter closed, wipe around the seams of the housing assembly at the locations designated on the appropriate drawings ( care should be taken not to touch the Q Tips with the fingers following wiping operation).
4. Carefully package the swabs into the containers provided and mail to the approved NRC facility for analysis.
5. File completed leak test certificate as a permanent record.

**APPENDIX IV**  
**( To be posted near Gauges)**

**RADIATION EMERGENCY**

Radiation Protection Officer	Name	John Nordin
	Phone	ext 206
Alternate	Name	Steve Truran
	Phone	ext 235

FIRE DEPT.                      9-911

HOSPITAL                        9-911

**EMERGENCY PROCEDURES:**

In the event of suspected damage to the gauge, the RSO or his approved representative will be notified immediately. Rope off access to the tunnel.

No MLO employee, unless specifically licensed or supervised by a person specifically licensed by the NRC will handle the gauge except to lock the shutter in the closed position.

Emergency procedures will be initiated after verification with a survey meter that the radiation levels are in excess of those at the original installation survey.

The RSO will immediately rope off the area including all accessible points where radiation levels exceeded 2 mR/hr.

An attempt shall be made to close off the primary beam either by closing the shutter or otherwise shielding the beam. This shall be done in such a manner that no employee shall be exposed to excessive radiation dosage, as defined in paragraph 20.403, part 20, 10 CFR of the Federal Register.

Reports shall be made to the NRC by the RSO as required.

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
801 WARRENVILLE ROAD  
LISLE, ILLINOIS 60532-4351  
630-829-9887 (phone), 630-515-1259 (fax)

CONVERSATION RECORD

TIME

11:50 am

DATE

10/9/96

NAME OF PERSON(S) CONTACTED

ORGANIZATION (OFFICE, DEPT. ETC.)

TELEPHONE NO.

John A. Nordin, P.E.

Michigan Limestone Operations

517-734-2131

SUBJECT

New license application - **CONTROL NUMBER 301377**

SUMMARY

1. Please identify each sealed source by manufacturer and model number. (See FC 404-4 Item 5.)
2. Please be aware that the revised Part 20 (specifically 10 CFR 20.1502) requires, in part, each licensee to monitor occupational exposure to radiation by adults likely to receive a dose in excess of 10% of the annual limits in 10 CFR 20.1201 (not 24% as stated in your application).

Since you propose to service the gauges yourself (e.g., install the gauges and perform the initial radiation survey, relocate gauges, ship devices), you should provide personnel monitoring devices for your personnel who perform the operations. Either film badges or thermoluminescent dosimeters (TLDs) are acceptable. Therefore, please make a commitment that personnel monitoring devices will be worn by personnel when they are servicing the gauges. Please specify the type of personnel monitoring devices that will be used and the frequency of their exchange. The changes should be made at intervals not to exceed one month for film badges and three months for TLDs. It is not necessary to specify the name of the supplier of the personnel monitoring devices. (See FC 404-4 Item 10.2.)

3. Please state the range of your portable survey meter. (See FC 404-4 Item 10.3.)
4. 10 CFR 20.1902(e) requires, in part, each licensee to post each area or room in which there is used an amount of licensed material exceeding 10 times the quantity of such material specified in Appendix C to Part 20 with a conspicuous sign or signs bearing the radiation caution symbol and the words "CAUTION, RADIOACTIVE MATERIALS" or "DANGER, RADIOACTIVE MATERIALS." (For cesium-137, the Appendix C quantity is ten microcuries.) On the other hand, 10 CFR 20.1903(c) states that an area or room is *not* required to be posted with a caution sign because of the presence of a sealed source provided the radiation level at 30 centimeters from the surface of the source container or housing does not exceed 0.005 rem per hour. Therefore, please make a commitment to post the areas near the gauges, or justify why this is not necessary.
5. According to the NRC Sealed Source and Device Registry, the leak test frequency for the Texas Nuclear Model 5204 gauge is three years. In your application you indicated that the leak tests will be analyzed by your personnel every six months, but by an NRC approved facility every three years. Please clarify.

We will continue our review of your application upon receipt of this information. Please reply in duplicate, within 30 days, and refer to **Control Number 301877**.

ACTION REQUIRED


Wait for response.

NAME OF PERSON DOCUMENTING CONVERSATION

SIGNATURE

DATE

Michael F. Weber

|  |

10/9/96



# Patrick & Douglas, Inc.

450 E. 22nd Street  
Lombard, IL 60148

630-268-1900  
630-268-1923 Fax

## FAX MEMO

Date: 10/8/96 Time: 4:10 pm Page: 1 of 3

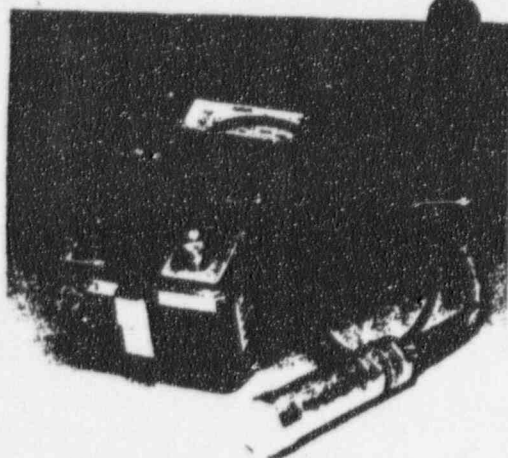
To: Michael Weber Company: Nuclear Regulatory Commission

Fax No: 630/515-1259 Phone No: 630/829-9825

From: Debbie Nelson @ Patrick & Douglas Inc.

Representing TN Technologies  
Subject: 200X Survey Meter

MESSAGE: The following is the information you  
requested from TN Technologies



- milliRoentgen/hour (mR/h) and counts/minute (CPM) Scales
- Four Linear Ranges
- GM Detector Saturation Indication, Circuitry Holds Meter Full Scale
- Calibration Check Source
- Clip-on Carry Strap
- Single or Dual 9 Volt Battery Operation
- Built-in Audio with Over-scale Alarm
- Rugged all Aluminum End-Window GM Tube Housing with Aluminum End Cap and Removable Cord

The Texas Nuclear 200X portable survey meter is designed for measuring X and gamma radiation in mR/h and is able to detect medium to high alpha and beta radiation in CPM. The 200X is specifically suited for industries using nuclear gauging devices. It is ideal for screening leak tests, contamination detection, monitoring of isotope shipments and packing material. Other uses include general survey work where varying types of radiation may be encountered.

The unique GM probe is capable of doing the normal contamination screening duties of an end-window GM probe, using the meter's CPM scale, yet is capable of doing area surveys like a side-window GM probe, using the meter's mR/h scale. The probe housing is ruggedly constructed to withstand the environment of the industrial world and exceeds the durability and reliability of most end-window GM probes available. The 200X has modern electronics that incorporate integrated circuitry and quality components all mounted in a lightweight all metal housing.

***TN Technologies***  
A Thermo Instruments Company

## Specifications

### Ranges:

#### Four linear ranges in mR/h

0-0.2 mR/h  
0-2.0 mR/h  
0-20 mR/h  
0-200 mR/h

### Detector:

End window GM tube in a ruggedized all aluminum housing with removable end cap and detachable cord. Long lived halogen quenched with thin mica window.

### Radiation Detected:

Calibrated to .662 MeV Cs-137 gamma radiation. Able to detect the presence of medium to high energy alpha, soft beta and x-ray radiation.

### Accuracy:

x.1, x1, x10 ranges are within 10% of full scale and x100 range is within 15% of full scale when calibrated to Cs-137 .662 MeV gamma radiation.

### Response Time:

Fast-slow selectable with 0-90% of final reading as follows:

Range	Fast	Slow
X0.1	12 sec	20
X1.0	1 sec	8 sec
X10	<1 sec	2 sec
X100	<1 sec	1 sec

### Temperature Range:

-20 to +50C.

### Humidity Range:

less than 5% change in reading from 10 to 95% RH

### Controls:

Seven position rotary switch with 'bat' check, HV check, X100, X10, X1.0, X0.1 positions. A two position switch for Fast and Slow response and audio ON-OFF. A meter reset pushbutton switch.

### Battery Life:

Typically 100 hours in normal background.

### High Voltage:

Electronically stabilized and factory set to 500 volts. Internally adjustable to 1600 volts for adaptation to other probe types.

### Geotropism:

±2% of full scale.

### Vibration:

5g in each of three orthogonal axes at one or more frequencies from 10-33Hz.

### Construction:

Two piece, all metal, splash proof, shock proof case.

### Audio:

Built-in speaker with audible click for each pulse detected. Over scale alarm when speaker is off.

### Weight:

3.1 pounds.

### Size:

4.25 x 8 x 6.8 inches including handle and probe clip.

### Connector:

MHV on meter and probe.

### Display:

Ruggedized recessed high torque 1 mA meter with 3.35 inch scale marked 0-2.0 mR/h, 0-3000 CPM and 0-2.0 kilovolts with 'bat ok'.

## ***TN Technologies***

A Thermo Instruments Company



TN Technologies Inc. • P.O. Box 800 • Round Rock, Texas 78680-0800 • 512/388-9100 • 800/736-0801 • Fax: 512/388-9333

85/7-95/2K





UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION III  
801 WARRENVILLE ROAD  
LISLE, ILLINOIS 60532-4351

September 30, 1996

John A. Nordin  
Radiation Safety Officer  
Michigan Limestone Operations, Ltd., Partnership  
1035 Calcite Road  
Rogers City, MI 49779

SUBJECT: ACKNOWLEDGEMENT OF CORRESPONDENCE  
(Application Dated 09/23/96)

Dear Licensee:

In response to your request, we have completed the initial processing, which is an administrative review of your application for a(n):

☒ New License                      ☐ Amendment                      ☐ Renewal  
☐ Termination                      ☐ Auth User (Amendment not required)  
☐ Other \_\_\_\_\_

No administrative deficiencies were identified during this initial review. However, it should be noted that a technical review may identify omissions in the submitted information.

It appears that your request is routine (see 1-3 below, as applicable).

1. New and amendment actions are normally processed within 90 days, unless we find major deficiencies, or policy issues requiring central program office assistance.
2. Renewal actions are normally processed within 180 days, however, under timely filing (before expiration), you may continue to operate under your existing license.
3. Termination actions are normally processed within 90 days, unless confirmatory surveys following decontamination/decommissioning activities are involved.

A copy of your correspondence has been forwarded to our Licensing Fee and Debt Collection Branch (301/415-6097) for approval of the fee category and amount, if required.

If you have a compelling safety or business-related reason for requesting expedited review, please contact the Materials Licensing Branch at (630) 829-9887. We will try to complete your request as soon as practicable. Any correspondence about this request should reference the control number.

Nuclear Materials Support Branch

Mail Control No. 301877  
License No. 21-26757-01