

VOID SHEET

TO: License Fee Management Branch

FROM: III - Glisset Watson

SUBJECT: VOIDED APPLICATION

MS 23
IP

Control Number: 303530

Applicant: WAPAACA Foundry Inc.

License Number: 48-15031-01

Docket Number: 030-08461

Date Voided: 4/3/98

Reason for Void: Licensee requested that the action be voided and will submit additional info. after proper training is received by individual at proposed new location of use.

Glisset Watson
Signature Date 4/3/98

Attachment:
Official Record Copy of
Voided Action

FOR LFMB USE ONLY

- Refund Authorized and processed
- No Refund Due
- Fee Exempt or Fee Not Required

Comments: _____

Log completed
Processed by: SAC 4/15/98

0/1
ML
30
BT

BETWEEN:

License Fee Management Branch, ARM
and
Regional Licensing Sections

(FOR LFMS USE)
INFORMATION FROM LTS

Program Code: 03120
Status Code: 0
Fee Category: 3P
Exp. Date: 20030630
Fee Comments:
Decom Fin Assur Req'd: N

LICENSE FEE TRANSMITTAL

A. REGION

1. APPLICATION ATTACHED

Applicant/Licensee: WAUPACA FOUNDRY INCORPORATED
Received Date: 980120
Docket No: 3008461
Control No.: 303530
License No.: 48-15031-01
Action Type: Amendment

2. FEE ATTACHED

Amount: 350
Check No.: 242724

3. COMMENTS

Signed
Date

D. Hersey
1-26-98

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

1. Fee Category and Amount: 3P \$350

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

Amendment
Renewal _____
License _____

3. OTHER

Signed
Date

SC
1/27/98

Log	<i>Jan 9 III</i>
Remitter	
Check No.	<i>242724</i>
Amount	<i>\$350</i>
Fee Category	<i>3P</i>
Type of Fee	<i>AMD</i>
Date Check Rec'd	<i>1/27/98</i>
Date Completed	<i>1/27/98</i>
By:	<i>SC</i>

1998 JAN 27 PM 2:46

NRC FORM 313
(6-93)
10 CFR 30, 32, 33
34, 35, 36, 39 and 40

U. S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3100-0120
EXPIRES 8-30-98

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 8 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 (MHB: 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

APPLICATION FOR MATERIAL LICENSE

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

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.

IF YOU ARE LOCATED IN:

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

MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137-5927

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
811 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 94596-5365

1 THIS IS AN APPLICATION FOR (Check appropriate item)

- A NEW LICENSE
- B AMENDMENT TO LICENSE NUMBER 48-15031-01
- C RENEWAL OF LICENSE NUMBER _____

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

Waupaca Foundry, Inc.
P.O. Box 249
Waupaca, WI 54981

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

Waupaca Foundry - Part 1 Waupaca Foundry - Part 2 Waupaca Foundry - Part 3
400 N. Division St. 311 Tower Rd. 7856 State Rd. 66
Waupaca, WI 54981 Waupaca, WI 54981 Tell City, IN 47586

4 NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Bryant Esch
TELEPHONE NUMBER
715-258-6611

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 <u>3A</u> AMOUNT ENCLOSED \$ <u>350</u>
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, 1949 (22 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: James R. Larson - U.S. Admin. Serv. Div. Dir. SIGNATURE: [Signature] DATE: 12/22/97

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED \$	CHECK NUMBER	COMMENTS
APPROVED BY			DATE	RECEIVED JAN 20 1998 303530	



January 12, 1998

United States Nuclear Regulatory Commission
Region III
Material Licensing Section
801 Warrenville Rd.
Lisle, IL 60532-4351

SUBJECT: AMENDMENT TO MATERIALS LICENSE NO. 48-15031-01

Dear Sir/Madam:

Enclosed please find an application for amendment to material license no. 48-15031-01. The amendment is being requested for the following two reasons:

- Waupaca Foundry has incorporated the use of ^{Sour} ~~two~~ additional Texas Nuclear Model #5200 level gauges at a new facility in Tell City, Indiana. The gauges contain 100 mCi each of Cs-137 in Texas Nuclear Model #696894 capsules. The gauges are currently under General License from Texas Nuclear, but Waupaca Foundry believes it would be appropriate to add them to its existing specific material license.
- Currently, Everett Morgan has been fulfilling the responsibilities of the Radiation Safety Officer. To provide improved RSO coverage for the facilities, Waupaca Foundry requests the addition of Bryant Esch as an additional Radiation Safety Officer. Bryant Esch has attended a radiation safety training course designed to meet the fixed gauge user training requirements prescribed by the NRC. Training course outline, examination, and certificate of completion are provided in Appendix I of the attached Radiation Protection Program.

Provided with, and also part of, the application for amendment is the newest revision of the Waupaca Foundry Radiation Protection Program. This revision has been updated to include the requests stated above.

The following are responses to items 5 - 11 on the NRC Form 313:

5. All elements, physical forms, and maximum amounts remain the same as described in existing material license No. 48-15031-01 with the addition of the two Cesium-137 (Nuclear Model 696894 capsules) not exceeding 100 mCi each.

RECEIVED

JAN 20 1998

REGION III

Waupaca Foundry, Inc. • 311 S. Tower Road • P.O. Box 249 • Waupaca, WI 54981-0249

SUBSIDIARY OF THE BUDD COMPANY

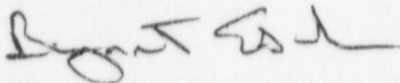
JAN 20 1998

Pm: 1-14-98

6. See attached Radiation Protection Program, Section 2.2 - General Gauge Usage.
7. See attached Radiation Protection Program, Section 7.1 - Radiation Safety Officer.
8. See attached Radiation Protection Program, Section 7.2 - Affected Personnel.
9. See attached Radiation Protection Program, Section 4.0 - Procedures For Controlling/Eliminating Exposures. Locations of devices can be found in Figures 1 - 5.
10. See attached Radiation Protection Program.
11. See attached Radiation Protection Program, Section 8.0 - Waste Materials.

The required amendment fee of \$350 is enclosed. If you have any questions regarding this amendment request, please feel free to contact me at 715-258-6611.

Sincerely,



Bryant Esch
Environmental Engineer

cc: E. Morgan

Radiation Protection Program

Waupaca Foundry, Inc.

Plant 1
406 N. Division Street
Waupaca, WI 54981

Plant 2
311 Tower Road
Waupaca, WI 54981

Plant 5
9856 State Road 66
Tell City, IN 47586

Revision 12/97

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APPENDICES

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FIGURES

FIGURE 1	Plant 1 Belt Weigh Scale Gauge Location
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FIGURE 5	Plant 5 Belt Weigh Scale Gauge Location

1.0 PURPOSE

This document is the Waupaca Foundry, Plants 1, 2, and 5 Radiation Protection Program. This plan was written to comply with the following applicable regulations:

10 CFR 20 Standards For Protection Against Radiation

29 CFR 1910.96 Ionizing Radiation

This plan has been developed to ensure all appropriate procedures are identified and documented in the implementation of a radiation protection program commensurate with the scope and extent of a licensed gauge activity. The program will outline sound radiation protection principles that protect the health and safety of employees and members of the public by achieving doses that are as low as is reasonably achievable (ALARA). The Radiation Safety Officer maintains the responsibility of reviewing the following procedures annually and as changes occur to assure the effectiveness of this document.

2.0 FACILITY OVERVIEW

2.1 General Facility Information

2.1.1 Location

Plant 1 - Waupaca Foundry, Inc. Plant 1 is located on the north central edge of the City of Waupaca, in Waupaca County, Wisconsin (NW 1/4 of the SW 1/4, Section 20, T22N, R12E). Waupaca County is located in the east central portion of the State of Wisconsin, with the City of Waupaca located in the southeast corner of the county.

Plant 2 - Waupaca Foundry, Inc. Plant 2 is located on the eastern edge of the City of Waupaca (NE 1/4 of the NW 1/4, Section 28, T22N, R12E). Plant 2 is approximately two miles southeast of Plant 1.

Plant 5 - Waupaca Foundry, Inc. Plant 5 is located on the northern edge of Tell City in Perry County, Indiana. Perry County is located in the southern portion of the State of Indiana, with the City of Tell City located in the southwestern portion of the county.

2.1.2 Site History/Profile

Plant 1 - The Plant 1 facility presently occupies approximately 19 acres within the City of Waupaca, Waupaca County, Wisconsin. The site now referred to as Plant 1 was acquired in late 1955. On September 30, 1968, the Budd Company of Troy, Michigan acquired the Waupaca Foundry as a wholly owned, independently operated subsidiary

within the Budd Company Automotive Division.

Plant 2 - The facility presently occupies approximately 91 acres within the City of Waupaca. In 1965, the Waupaca Foundry purchased 46 acres of land from the City of Waupaca for the construction of Plant 2. In 1969, approximately 10 acres of land was acquired along Tower Road extending to Highway 22/54. Property was purchased in 1977 along the east side of the existing property for an access road. In 1983, the foundry obtained the deed to the property at the intersection of Tower Road and Highway 22/54. Most recently, in 1983, 34 acres that was once the site of the Royal Oaks Charcoal plant was acquired to raise the total foundry acreage to the current 91 acres.

Plant 5 - The Plant 5 facility occupies approximately 162 acres on the outskirts of Tell City, Indiana. The phase I portion of the plant was completed and operational in 1997.

2.1.3 History of Operation

Plant 1 - Initial construction for Plant 1 was completed in 1955. The original plant was quickly outgrown and additions were made in 1957. The facility included a cupola melting facility, cope and drag molding lines, a core room, and a finishing department. Several expansions followed; in 1992, a new pattern building was added, a new crew facility was completed in 1994, a new chargeyard and coreroom in 1995, and an addition of Disa #6 in 1996, raising the floor space to 244,665 square feet.

Plant 2 - Construction for Plant 2 began in 1965 and was completed in 1966. The original structure was approximately 35,000 square feet in size. This included a cupola melting facility, two cope and drag lines, a finishing department, a locker room and lunch room. In 1982, Plant 2 was changed by adding a large Disamatic with the intention of phasing out the cope and drag molding system. In 1989, a second Disamatic line was installed, in 1995 a shipping area addition, and in 1996 an expanded office facility bringing Plant 2 to its present size of 165,127 square feet.

Plant 5 - The Phase I portion of the plant, which included a cupola and four Disamatic molding machines, was completed and operational in January 1997. Phase II which includes more Disamatics and an additional Cupola, is slated for completion in 1999.

2.2 General Gauge Usage

Plant 1 - Waupaca Foundry Plant 1 incorporates two Cesium-137 level gauges for level measurement within a cupola-type iron melting unit. The gauges are placed in such a manner to facilitate the measurement of high and low levels of scrap metal to be melted within the cupola. The low level gauge ensures there is an adequate quantity of scrap within the cupola to optimize the operation of the emission control system, while the high level gauge simply prevents cupola run over and associated hang-ups with the charge bucket scrap additions. Both gauges are wired into alarm indicators which are displayed to the cupola operator within the Melt Control Room.

The gauges function by emitting a narrow gamma beam from the source head which is projected through the cupola to the receiving head or detector. Scrap metal material within the path of the beam will act as shielding, diminishing the response to the detector side of the gauge and thus notifying the operator of the scrap metal level.

Plant 1 also uses a Cesium-137 belt weigh scale gauge. The gauge emits a wide gamma beam through a sand conveyor belt to a receiver which measures the depth of the sand on the belt. The depth measurements are converted to tons of sand/hour and displayed via computer to the sand lab technician. All three gauges are manufactured, installed, and serviced by Texas Nuclear Technologies, Inc. of Round Rock, Texas.

Plant 2 - Waupaca Foundry Plant 2 incorporates two Cesium-137 level gauges for level measurement within a cupola-type iron melting unit. The gauges are placed and operated similarly to that described above for the Plant 1 level gauges. Both gauges are manufactured, installed, and serviced by Texas Nuclear Technologies, Inc.

Plant 5 - Waupaca Foundry Plant 5 incorporates two Cesium-137 level gauges for level measurement within a cupola-type iron melting unit. The gauges are placed and operated similarly to that described above for the Plant 1 level gauges. Both gauges are manufactured, installed, and serviced by Texas Nuclear Technologies, Inc.

Additionally, a belt weigh scale gauge is on site which is under a general license agreement through the manufacturer, Ohmart, Inc. Though this unit is not licensed via the Nuclear Regulatory Commission's specific license, all safety practices described for the specifically licensed gauges will also apply to the Ohmart gauge.

All gauge activities described above, with the exception of the Ohmart device, are conducted under the auspices of Nuclear Regulatory Commission license #48-15031-01, valid until June 30, 2003.

3.0 AFFECTED PERSONNEL

Employees with responsibilities involving a gauge, or any other equipment in the vicinity of a gauge, would fall within the scope of the Radiation Protection Program. For each plant cupola area, affected personnel would consist of a six man cupola maintenance crew, melt maintenance electricians, and the Radiation Safety Officer. Personnel involved with the Plant 1 belt weigh scale gauge consist of the plant electricians and the Radiation Safety Officer.

Texas Nuclear Technologies, Inc. field service personnel would also have the potential for radiation exposure during normal servicing activities. Texas Nuclear personnel are the only individuals authorized to install, remove, or repair the source head side of the nuclear gauges.

Members of the public are restricted from all gauge areas. Employees who are minors or pregnant are also restricted access to the gauge areas. Ultimately, members of the public, minors, and pregnant women have no potential for radiation exposures.

4.0 PROCEDURES FOR CONTROLLING/ELIMINATING EXPOSURES

4.1 Gauge Placement

All gauges are placed in remote locations and are inaccessible to unauthorized individuals. The cupola gauges are mounted directly to the exterior shell of the cupola, on the uppermost mezzanines. The belt weigh scale gauges are mounted over remote sand conveyor belts which are isolated from any employee's daily workstation. Figures 1, 2, 3, 4, and 5 depict the specific locations for the Plant 1 belt weigh scale gauge, Plant 1 cupola level gauges, Plant 2 cupola level gauges, Plant 5 cupola level gauges, and Plant 5 belt weigh scale gauge respectively.

4.2 Security

Security of the gauge facilities are provided by a combination of methods. Unauthorized individuals are denied entry by melt and maintenance personnel during all hours of operation. Guards are on-site at the facility at all times and include the entirety of the plants in their daily/nightly rounds.

4.3 Shielding

All nuclear gauges used by Waupaca Foundry are manufactured by Texas Nuclear Technologies, Inc. and Ohmart, Inc., and are designed with adequate shielding to contain the source material in a variety of harsh environments. Each gauge also incorporates a lead shutter mechanism which, when lowered, restricts the projection of the gamma beam from the "lens" of the gauge.

Additionally, the Plant 1 and 2 cupola level gauges are housed within a heavy gauge steel box (which is tagged with gauge information) that protects the unit from physical impacts. The steel box also serves to reduce the immediate radiation levels around the cupola gauges, though no external shielding is required due to the low radiation levels emitted by all of the units incorporated by Waupaca Foundry.

4.4 Shutter Lockout Procedures

During normal production activities, no employees have duties in the vicinity of the gauges which require any handling or possible exposure to the gauges. Additionally, the remote placement of the gauges prevents the exposure of any employee from any other workstations. There are times, however, in which the individuals described in Section 3.0 may be required to perform a task adjacent to the mounted gauge.

For these specialized activities, such as but not limited to cupola entry, entry is not permitted unless the radiation from the gauge is isolated from the employees entering the cupola. This is accomplished by the department's Locking/ Lockout Procedure for the nuclear gauge. The procedure entails isolating the energy of the gauge from the work area by closing and locking the shutter mechanism, and confirmation of shutter position by checking control panel indicator signals. The lockout activity, when performed correctly, is designed to eliminate or reduce exposure to the source to a level that is as low as reasonably achievable (ALARA). The lockout activity is performed in a manner that is equal to or more effective than the OSHA 1910.147 Lockout/Tagout Standard.

Specific Locking/Lockout Procedures are provided in Appendices A thru E. Additional activities that may require the utilization of the lockout activity include service of the non-source detector side of the gauge by plant electricians and inspection/leak tests performed by the Radiation Safety Officer.

4.5 Warning Postings

Warning postings consist of three forms of labeling, area postings, device labeling, and 10CFR Part 19 postings. All areas incorporating the use of a nuclear gauge at Waupaca Foundry are far below the regulatory threshold of 5 mR/hr (at one foot) which requires the posting of an area as a "Radiation Area". Therefore, each manufacturing area which incorporates a nuclear gauge is posted with a "Caution - Radioactive Materials" posting in the customary yellow and magenta identification colors. The posted areas are identified clearly at the access points to the area.

Additionally, each gauge source head is outfitted with a riveted metal tag from the manufacturer which contains the radioactive symbol as well as the manufacturer's name, device serial number, model number, activity, and other crucial data. These tags are never removed and are inspected via the procedure described in Section 5.2.

Each Waupaca Foundry facility incorporating the use of fixed gauges has posted the "Notices, Instructions, and Report to Workers-Inspections" posting required by 10 CFR Part 19. The posting is plainly displayed at the main employee entrance to each affected plant.

4.6 Storage and Control of Licensed Material

All of the gauge sources in possession of Waupaca Foundry are permanently mounted at their point of use. With the exception of the Ohmart device, which is under general license and serviced by Ohmart, these units can only be removed or manipulated by Texas Nuclear technicians. Waupaca Foundry employees are prohibited from performing any installation, removal, or service on the devices. Waupaca Foundry's authorized personnel (Section 3 - Affected Personnel) are only permitted to work the shutters for the purpose of completing the Locking/Lockout procedure.

In addition to the gauges innate immobility, all of the units control processes which would essentially cease to function if the device were in any way removed or compromised. Anomalies of this type would be immediately identified by plant personnel. Outside parties are restricted access from gauge areas as described in Section 4.2 - Security. The facility Radiation Safety Officer maintains oversight of the gauges while performing the activities described in Section 5.0.

5.0 GAUGE SURVEY AND MONITORING PROGRAM

Gauge surveys are performed by the Radiation Safety Officer every six months to fulfill licensing requirements and collect information for occupational dose monitoring. The gauge survey and monitoring activities consist of leak tests, inventory inspections, shutter surveys, and gauge area surveys.

5.1 Leak Tests

Leak tests are performed every three years on each source device to ensure the integrity of the unit's housing. Leak testing entails the use of an approved Radioactive Sealed Source Leak Test Kit supplied by Texas Nuclear.

Leak testing is performed by wiping the device housing, lens, bolts, and other potential contaminated material collection points with the Q-tip provided within the kit. The Q-tip is then placed within the container and sent promptly to Texas Nuclear for analysis. Each provided kit is used to test a single source housing. Leak testing and sample handling is the responsibility of the Radiation Safety Officer. Certificates on the most recent leak tests for each gauge are provided in Appendix F.

5.2 Gauge Inventory Inspections

Gauge inventory inspections are conducted and documented every six months to ensure that gauges are secure and remain in operation as designed. Gauge inventory inspections are the responsibility of the Radiation Safety Officer. The inspections are performed by physically inspecting the mounting and placement of the gauge, and comparing the serial number on the source identification tag with the serial number for that device kept on file. Tags which are damaged, or are slowly becoming illegible, are replaced by tags provided by Texas Nuclear.

If an inspection ever reveals that a device is missing, or an unauthorized handling (other than by Texas Nuclear personnel) of the gauge has occurred, immediate notification shall be made to the Nuclear Regulatory Commission.

A gauge inventory inspection confirms the following information/locations:

<u>Serial #</u>	<u>(TN) Model #</u>	<u>Location</u>
B101	5038	Plant 1 Belt Scale
B329	5183	Plant 1 Low Cupola
B729	5203	Plant 1 High Cupola
B200	5183A	Plant 2 Low Cupola
B371	5183A	Plant 2 High Cupola
B2965	5200	Plant 5 Cupola
B2966	5200	Plant 5 Cupola
1939GK	(Ohmart, Inc.)	Plant 5 Belt Scale

5.3 Shutter Surveys

Shutter surveys are conducted every six months and documented by the Radiation Safety Officer. Shutter surveys are performed to confirm the proper operation of the shutter mechanism and associated process indicator. During the shutter survey, the Radiation Safety Officer works the shutter of each device to a fully closed and fully open position to evaluate the effectiveness of the shutter. Radiation levels are taken with a handheld survey instrument at each of the positions and recorded. If the shutter is functioning correctly, a gauge with a closed shutter will emit a significantly lower amount of radiation. Survey readings are taken at a distance of one foot at a ninety degree angle to the beam path.

During this activity, control room personnel monitor the process indicator light to confirm that the indicator responds accordingly during the shutter exercise. After the survey event, the Radiation Safety Officer receives verbal confirmation from the control room that the indicator responded to the shutter's status.

5.4 Gauge Area Surveys/Occupational Dose Monitoring

Gauge area surveys are performed by the Radiation Safety Officer to develop a profile of radiation levels around a gauge usage area. The survey consists of using a handheld surveying instrument at various points adjacent to and opposite from the gauge. The survey when completed, can then be used to conservatively determine worst case scenarios of employee exposure while working in gauge areas.

The completed surveys, provided in Appendix G, reveal that no Waupaca Foundry employees are exposed to radiation in excess of 100 mrem/yr visitor standard. Actual exposures through adjacent area activities represent just a fraction (approx. 5% max) of the 500 mrem/yr worker without a dosimeter badge standard. Due to the extremely low radiation levels within the gauge areas, and the type of gauge use, gauge area surveys are not performed on a rigid schedule. Follow-up gauge area surveys shall be performed if any changes take place that are expected to impact employees' exposure.

A gauge inventory inspection confirms the following information/locations:

<u>Serial #</u>	<u>(TN) Model #</u>	<u>Location</u>
B101	5038	Plant 1 Belt Scale
B329	5183	Plant 1 Low Cupola
B729	5203	Plant 1 High Cupola
B200	5183A	Plant 2 Low Cupola
B371	5183A	Plant 2 High Cupola
B2965	5200	Plant 5 Cupola
B2966	5200	Plant 5 Cupola
1939GK	(Ohmart, Inc.)	Plant 5 Belt Scale

5.3 Shutter Surveys

Shutter surveys are conducted every six months and documented by the Radiation Safety Officer. Shutter surveys are performed to confirm the proper operation of the shutter mechanism and associated process indicator. During the shutter survey, the Radiation Safety Officer works the shutter of each device to a fully closed and fully open position to evaluate the effectiveness of the shutter. Radiation levels are taken with a handhold survey instrument at each of the positions and recorded. If the shutter is functioning correctly, a gauge with a closed shutter will emit a significantly lower amount of radiation. Survey readings are taken at a distance of one foot at a ninety degree angle to the beam path.

During this activity, control room personnel monitor the process indicator light to confirm that the indicator responds accordingly during the shutter exercise. After the survey event, the Radiation Safety Officer receives verbal confirmation from the control room that the indicator responded to the shutter's status.

5.4 Gauge Area Surveys/Occupational Dose Monitoring

Gauge area surveys are performed by the Radiation Safety Officer to develop a profile of radiation levels around a gauge usage area. The survey consists of using a handhold surveying instrument at various points adjacent to and opposite from the gauge. The survey when completed, can then be used to conservatively determine worst case scenarios of employee exposure while working in gauge areas.

The completed surveys, provided in Appendix G, reveal that no Waupaca Foundry employees are exposed to radiation in excess of 100 mrem/yr visitor standard. Actual exposures through adjacent area activities represent just a fraction (approx. 5% max) of the 500 mrem/yr worker without a dosimeter badge standard. Due to the extremely low radiation levels within the gauge areas, and the type of gauge use, gauge area surveys are not performed on a rigid schedule. Follow-up gauge area surveys shall be performed if any changes take place that are expected to impact employees' exposure.

5.5 Instrumentation

Waupaca Foundry maintains eight handhold radiation survey instruments for the purpose of conducting gauge area surveys, shutter checks, and incoming scrap screening. The instruments consist of:

- Five Ludlum Model 19 Gamma Scintillation Detectors
- One Ludlum Model 3 Survey Meter with Geiger and gamma scintillation probes
- Two Ludlum Model 14C Survey Meters with Geiger and gamma scintillation probes

All instruments are capable of reading in the micro/R range. Calibration of the detectors is performed annually and by Ludlum Measurements, Inc. The Radiation Safety Officer is responsible for sending in the devices on a rotating schedule for the annual calibration. This ensures that calibrated survey meters will always be on site for gauge-related activities.

5.6 Annual Audit/Quality Assurance

An audit of the entire fixed gauge program is performed annually by the RSO. The audit is performed using the Suggested Fixed Gauge Audit Checklist (Appendix H) provided by the NRC. The audit includes all aspects of the Radiation Protection Program, as described within this document.

Problems/deficiencies identified during the audit will be immediately addressed by the RSO. Completed audits, as well as corrective action documentation, will be maintained by the RSO. The annual audit will provide the mechanism of insuring quality assurance within the Radiation Protection Plan. Information gathered during the annual audit will also be incorporated within the annual revision of the Radiation Protection Program.

6.0 EMERGENCY PROCEDURES

Waupaca Foundry maintains no on-site personnel with nuclear gauge-related emergency response duties. In the event of a catastrophic emergency which involves the devices described herein, the following actions will be taken:

1. The RSO will prevent any individuals from entering a large area around the gauge.
2. The RSO, with a handheld survey instrument, will cordon off areas which exceed 2 mr/hr, if applicable.

3. Texas Nuclear's Emergency Services Department will be contacted via their 24 hour number (800-736-0601 or 512-388-9310). Waupaca Foundry will describe the event to Texas Nuclear personnel and await further instructions.
4. The Nuclear Regulatory Commission will be notified at 800-522-3025 in events of human exposure to radiation, theft, and releases to the environment as required by 10 CFR PART 20.2202.
5. Any repair, relocation, or removal of the source holder will only be done by Texas Nuclear personnel.

7.0 TRAINING

Personnel training is necessary to reduce the potential for mistakes which might threaten human health by ensuring that facility personnel involved with gauge usage are familiar with their duties and responsibilities. The intent of the training is to provide employees with an understanding of what must be done in the areas of safety and why certain procedures are important. Personnel training will be scheduled by the Waupaca Foundry Training Coordinator.

7.1 Radiation Safety Officer

Each Radiation Safety Officer has received 24 - 40 hours of training in a radiation safety training course designed for personnel involved with industrial gauges. Each Radiation Safety Officer has been approved by the NRC as qualified and denoted on the material license. For training certificates and course outlines, see Appendix I.

7.2 Affected Personnel

Affected personnel, which includes plant cupola repair crews and department electricians, have received awareness training relating to the hazards of industrial gauges and the proper procedures to be instituted when working near them. Locking/lockout procedures and emergency notification requirements are key components to the awareness level training. Training documentation relating to affected personnel can be found in Appendix I.

Outside contractors with the potential of working within gauge usage areas will receive awareness level training which will include any content described above as is relevant to the work task and proximity to the gauge usage area. At a minimum, the training will include the hazards associated with industrial gauges, emergency notification requirements, and a warning that handling or manipulating of the gauge in any way is forbidden by Waupaca Foundry.

8.0 WASTE MATERIALS

Due to the nature of the on-site gauge usage, no radioactive waste materials are generated by Waupaca Foundry. If through some unforeseen circumstance a gauge failed, Texas Nuclear (or as applicable, Ohmart, Inc.) would be notified to remove and replace the unit.

9.0 DOCUMENTATION/RECORDS

Documentation relating to the implementation of the Radiation Protection Program is maintained by the Radiation Safety Officer at the Waupaca Foundry Plant 2/3 facility. Records are maintained indefinitely and include:

- leak test results
- gauge inventory inspections
- shutter inspections
- gauge area surveys
- instrument calibrations
- annual Fixed Gauge Audit Checklists
- NRC material license/fee invoicing/amendments
- NRC inspection reports
- copies of regulations
- records of device transfers or decommissioning

Personnel training records are retained by the Waupaca Foundry Training Coordinator.

APPENDIX A

EMPLOYEE PERFORMING WORK ON EQUIPMENT 11045-673, NUCLEAR SCALE LOCATED ON CONVEYOR BELT UNIT #718. (11045-661) SHALL LOCK OUT THE EQUIPMENT ACCORDING TO WAUPACA FOUNDRY'S LOCK OUT PROCEDURE AND BY FOLLOWING THE LOCK OUT DATA SHEET ATTACHED TO AN ENTRY POINT OR EASY TO FIND LOCATION ON THE EQUIPMENT.

BEFORE WORKING ON ANY EQUIPMENT, EACH EMPLOYEE MUST:

* "REFER TO COMPANY LOCKOUT PROCEDURE FOR LOCKOUT REQUIREMENTS AND SAFE PRACTICES"

* "ALWAYS PERFORM A CHECK TO VERIFY ENERGY IS CONTROLLED"
"ASSURE RELEASE OF ALL STORED ENERGY"

* "ONLY WORK UNDER YOUR OWN LOCK"

THERE ARE TWO ENERGY SOURCES THAT CREATE HAZARDOUS ZONES FOR THIS EQUIPMENT.

1. 480 VOLTS SUPPLIED TO THE CONVEYOR BELT MOTOR

2. RADIATION SOURCE ABOVE THE CONVEYOR BELT

PROCEDURE: LOCK OUT 480 VOLT FOR CONVEYOR #718, THEN LOCK OUT RADIATION SOURCE.

LOCK OUT METHOD

480 VOLT - TURN OFF AND LOCK OUT 480 VOLT DISCONNECT FOR CONVEYOR #718 - LOCATED IN DRY SAND MEZZANINE

NUCLEAR RADIATION SOURCE - REMOVE SAFETY PIN AND TURN SHUTTER HANDLE 90 DEGREES TO THE NORTH, PARALLEL TO BELT, AND LOCK OUT USING THE HOLES PROVIDED. ** NOTE ** DO NOT TURN HANDLE SOUTH - THIS IS THE CALIBRATE POSITION !! **

"CHECK"

WITH NO PERSONNEL IN HAZARD AREA, ALL ENERGY SOURCES WILL BE TESTED (I.E. PUSH MOTOR START BUTTONS, DEPRESS RUN BUTTONS, VISUAL CHECK OF VALVES, ETC.) TO VERIFY THAT THE POWER IS OFF AND NEUTRALIZED.

HOW TO TEST THIS SYSTEM

PUT CONVEYOR #718 AUTO/MAN SWITCH IN MAN POSITION - VERIFY CONVEYOR IS NOT RUNNING.

SCALE TONNAGE SHOULD READ ZERO - ALSO VISUAL CONFIRMATION THAT THE SHUTTER HANDLE IS IN THE OFF POSITION.



WAUPACA FOUNDRY, INC.

Lock Out System

Caution: Employees performing work on equipment shall refer to Waupaca Foundry, Inc. Lockout Procedures for complete lockout instructions. This sheet is limited and abbreviated: If must not be considered a substitute for the company's complete lockout procedure.

DWI Instructions

1. Check Company Lockout Procedure.
2. Turn Off & Lock Out 480 Volt for Conveyor #718.
3. Put Conveyor in Hand, Make Sure Conveyor Does Not Run, Turn Switch to Off.
4. Remove Safety Pin, Turn Shutter Handle to Off Position (North) and Lock Out.
5. Scale Read Out Should be Zero.

TEXAS NUCLEAR SCALE 11045-673		LOCATION: Waupaca Foundry, inc. PLANT: 1 DEPT: Drysand	
<p># 718 Belt Travel →</p> <p>Shutter Handle Safety Pin Shutter</p>			
<p>← You are HERE.</p>			
Energy Source	Location	Method	Check
Radiation	Radiation Source Above Belt.	Turn Shutter Handle to North and Lock Out.	Read Out Should be Zero.
480 Volt for Conveyor Belt # 718.	Dry Sand Mezzanine.	Turn Off & Lock Out Disconnect.	Push start button.

REMEMBER LOCKOUT

Always perform check to verify energy is controlled.

Assure release of all stored energy.

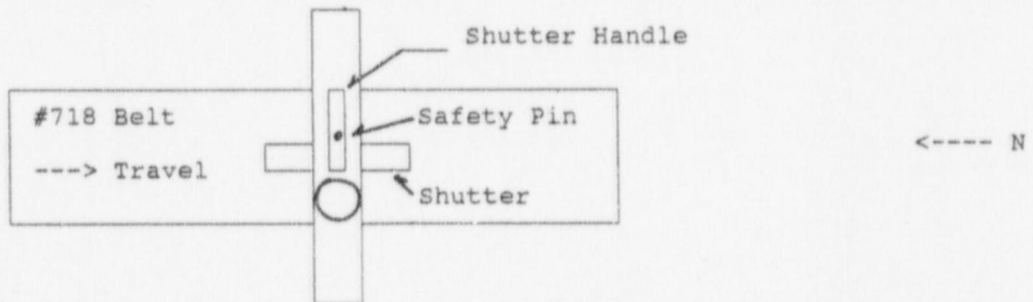
Only work under your OWN lock.

WAUPACA FOUNDRY LOCKOUT:TAGOUT SYSTEM

CAUTION: Servicing or maintenance is not permitted unless this equipment is isolated from all hazardous energy sources. *Refer to Company Lockout Requirements and Safe Practices. Always Perform Check to Verify Energy is Controlled. Assure Release of All Stored Energy.*
Always work under your OWN lock. This sheet is limited and abbreviated: *it must not be considered a substitute for the company's complete Procedure.*

LOCKOUT:TAGOUT DATA SHEET

TEXAS NUCLEAR SCALE 11045-673	LOCATION: WAUPACA FOUNDRY, INC. PLANT: 1 DEPT: Dry Sand System
----------------------------------	--



Energy Source	Location	Method	Check
Radiation source.	Above #718 conveyor belt.	Remove Safety pin & turn handle 90° & lock out.	Visual confirmation shutter is locked
			Tonnage should read zero.

APPENDIX 3

TITLE: Cupola Radiation Level Indicator Locking Instructions

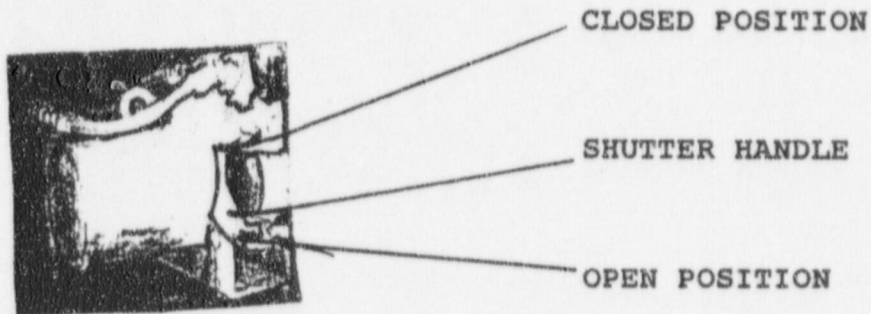
1.0 PURPOSE:

To provide cupola repair team members instructions on how to lock radiation sources used on the cupola to prevent exposure to the source.

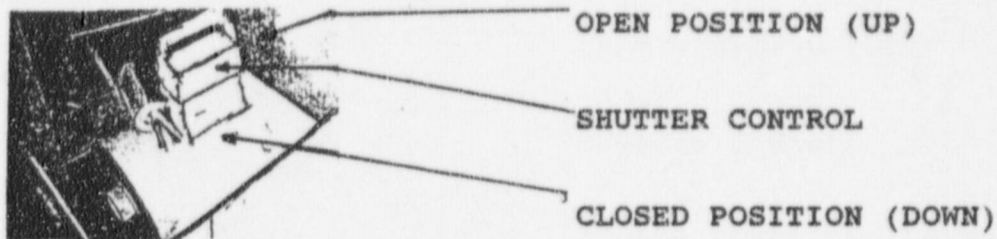
2.0 PROCEDURE:

- 2.1 No employee shall enter the cupola from the top down until the shutter in the radiation source is closed and locked by the employees who will be entering the cupola.
- 2.2 Remove the protective steel covers from both the upper and lower radiation sources.
- 2.3 On each radiation source, remove the pin that holds the shutter open.
- 2.4 Close the shutter on each radiation source.
- 2.5 Lock each radiation shutter closed.
 - 2.5.1 Check indicator light on Control Panel. Should show a full stack. (Light OFF)
- 2.6 Remove lock when all work has been completed.
- 2.7 Open each radiation source shutter and put holding pins back in place.
- 2.8 Put protective steel covers back on each radiation source.

CUPOLA
UPPER RADIATION SOURCE



CUPOLA
LOWER RADIATION SOURCE



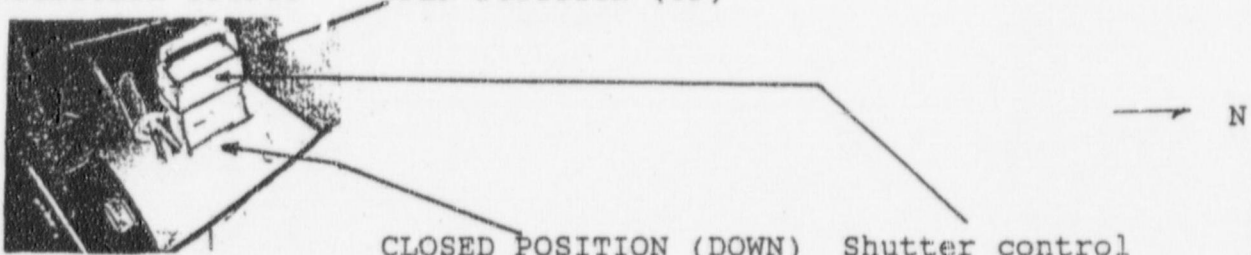
READ DWI 1215 BEFORE STARTING THIS PROCEDURE

1. REMOVE PROTECTIVE STEEL COVER FROM AROUND BOTH UPPER AND LOWER RADIATION SOURCES.
2. ON EACH RADIATION SOURCE, REMOVE THE PIN THAT HOLDS THE SHUTTER OPEN.
3. CLOSE THE SHUTTER ON EACH RADIATION SOURCE.
4. LOCK EACH SHUTTER CLOSED.
5. CHECK INDICATOR LIGHT ON CONTROL PANEL. LIGHT SHOULD INDICATE A FULL STACK. (LIGHT OFF)
6. REMOVE LOCK WHEN ALL WORK HAS BEEN COMPLETED.
7. REPLACE PROTECTIVE STEEL COVERS ON RADIATION SOURCES.

WAUPACA FOUNDRY LOCKOUT:TAGOUT SYSTEM

CAUTION: Servicing or maintenance is not permitted unless this equipment is isolated from all hazardous energy sources. This is the exclusive responsibility of designated "Authorized Employees" who must follow the complete "Lockout/Tagout Procedure" as published by the company. This sheet is limited and abbreviated: it must not be considered a substitute for the company's complete Procedure.


LOCKOUT:TAGOUT DATA SHEET

LOWER LEVEL INDICATOR 10110-102	Location WAUPACA FOUNDRY, INC. Plant 1 Dept Melt		
<div style="display: flex; justify-content: space-between;"> <div style="text-align: left;"> Lower Radiation Source </div> <div style="text-align: right;"> OPEN POSITION (UP) </div> </div>  <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="text-align: center;"> CLOSED POSITION (DOWN) </div> <div style="text-align: right;"> Shutter control </div> </div>			
Energy Source	Location	Method	Check
Lower Source	East side of cupola, below charge opening.	Close shutter and lock.	Visual confirmation shutter is locked
			Check indicator light on control panel.
			Should indicate a full stack.

WAUPACA FOUNDRY LOCKOUT:TAGOUT SYSTEM

CAUTION: Servicing or maintenance is not permitted unless this equipment is isolated from all hazardous energy sources. This is the exclusive responsibility of designated "Authorized Employees" who must follow the complete "Lockout/Tagout Procedure" as published by the company. This sheet is limited and abbreviated: it must not be considered a substitute for the company's complete Procedure.

LOCKOUT:TAGOUT DATA SHEET

UPPER LEVEL INDICATOR 10110-101	Location WAUPACA FOUNDRY, INC. Plant 1 Dept Melt																												
Upper Radiation Source 	CLOSED POSITION OPEN POSITION Shutter handle																												
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Energy Source</th> <th style="width: 25%;">Location</th> <th style="width: 25%;">Method</th> <th style="width: 25%;">Check</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Upper Source</td> <td style="padding: 5px;">East side of cupola, below charge opening.</td> <td style="padding: 5px;">Close shutter and lock.</td> <td style="padding: 5px;">Visual confirmation shutter is locked</td> </tr> <tr> <td style="padding: 5px;"> </td> <td style="padding: 5px;"> </td> <td style="padding: 5px;"> </td> <td style="padding: 5px;">Check indicator light on control panel.</td> </tr> <tr> <td style="padding: 5px;"> </td> <td style="padding: 5px;"> </td> <td style="padding: 5px;"> </td> <td style="padding: 5px;">Should indicate a full stack.</td> </tr> <tr> <td style="padding: 5px;"> </td> <td style="padding: 5px;"> </td> <td style="padding: 5px;"> </td> <td style="padding: 5px;"> </td> </tr> <tr> <td style="padding: 5px;"> </td> <td style="padding: 5px;"> </td> <td style="padding: 5px;"> </td> <td style="padding: 5px;"> </td> </tr> <tr> <td style="padding: 5px;"> </td> <td style="padding: 5px;"> </td> <td style="padding: 5px;"> </td> <td style="padding: 5px;"> </td> </tr> </tbody> </table>	Energy Source	Location	Method	Check	Upper Source	East side of cupola, below charge opening.	Close shutter and lock.	Visual confirmation shutter is locked				Check indicator light on control panel.				Should indicate a full stack.													N
Energy Source	Location	Method	Check																										
Upper Source	East side of cupola, below charge opening.	Close shutter and lock.	Visual confirmation shutter is locked																										
			Check indicator light on control panel.																										
			Should indicate a full stack.																										

APPENDIX C

WAUPACA FOUNDRY LOCK OUT/TAG OUT PROCEDURE
PLANT-2, MELT & WWT

NUCLEAR GAUGE

SHALL LOCK OUT/TAG OUT EQUIPMENT ACCORDING TO WAUPACA FOUNDRY'S LOCK OUT/TAG OUT PROCEDURE AND BY FOLLOWING THE INFORMATION ON THE LOCK OUT/TAG OUT DATA SHEET ATTACHED TO THE OPERATORS PANEL OF THE MACHINE.

ENERGY SOURCE, AND LOCATION:

- 1) TEXAS NUCLEAR SOURCE HEADS MODEL #5183A PLANT 2 CUPOLA, CHARGE MEZZANINE AND GASKET MEZZANINE.

THE METHOD USED: FOLLOW LOCK OUT/TAG OUT PROCEDURES.

- 1) ON EACH SOURCE (2), REMOVE THE PIN THAT HOLDS THE SHUTTER DOOR OPEN.
- 2) DO NOT PLACE ANY PORTION OF THE BODY BETWEEN THE GAUGE AND THE CUPOLA WALL.
- 3) CLOSE EACH SOURCE (2) SHUTTER BY PRESSING THE HANDLE DOWN. FASTEN A LOCK ON EACH RADIATION SOURCE TO SECURE THE CLOSED SHUTTER.
- 4) GO TO CONTROL ROOM AND CHECK IGNITION OR RUNNING LIGHT.

APPENDIX D

Waupaca Foundry Lock Out/ Tag Out Procedure

Plant 5, Tell City

Nuclear Gauge Melt Department

Employees shall Lock Out/Tag Out Equipment According to Waupaca Foundry's Lock Out/Tag Out Procedure and by following the information on the Lock Out/Tag Out data sheet attached to the operators panel of the machine.

Energy Source and Location:

- 1.) Texas Nuclear source heads Model# B2965 & B2966 Plant 5 Cupola, On Third level mezzanine.

The Method Used:

- 1.) On each Source (2), Remove the attached pin that holds the shutter switch door open
- 2.) Do Not place any portion of your body between the Gauge and the Cupola Shell
- 3.) Close Each Source (2) Shutter by pressing the handle down. Fasten a lock on each radiation source to secure the closed Shutter.
- 4.) Go to the control room to verify that the shutter switch is closed by checking the display screen on the control computer.

Check for Lockout:

- 1.) Check control room in melt department to make sure shutter switch is closed. Read computer display screen for information on shutter.

Before working on any equipment, each employee must:

- * Refer to the company lockout procedure for lockout requirements and safe practices
- * Always perform a check to verify energy is controlled
- * Only work under your own lock

APPENDIX E

Waupaca Foundry Lock Out/ Tag Out Procedure

Plant 5, Tell City

Nuclear Gauge Dry Sand System

Employees shall Lock Out/Tag Out Equipment According to Waupaca Foundry's Lock Out/Tag Out Procedure and by following the information on the Lock Out/Tag Out data sheet attached to the operators panel of the machine.

Energy Source and Location:

- 1.) Ohmart Nuclear source head Model# 1939GK Plant 5 Dry Sand System, On Second level conveyer belt located between the Disa and the Millroom. Instrument is Blue in color.
- 2.) 480 Volt electrical supply for conveyer belt system

The Method Used:

- 1.) Lock Out 480 volt energy supply to the conveyer belt system/motor
- 2.) On Source, Remove the attached pin that holds the shutter switch door open
- 3.) Do Not place any portion of your body between the Gauge and the Sand Weight Belt
- 4.) Close Source Shutter by pressing the handle down. Fasten a lock on each radiation source to secure the closed Shutter.
- 5.) Go to the control panel to verify that the shutter switch is closed by checking the display screen.

Check for Lockout:

- 1.) Push start button for conveyer belt system to check to make sure that belt will not run and is properly locked out.
- 2.) Check control panel located next to the instrument to make sure shutter switch is closed. Read display screen for information on shutter. Scale should read 0 pounds and a visual confirmation should be made that the shutter is in the off position.

Before working on any equipment, each employee must:

- * Refer to the company lockout procedure for lockout requirements and safe practices
- * Always perform a check to verify energy is controlled
- * Only work under your own lock

APPENDIX F

LEAK TEST CERTIFICATION

This is to certify that the product identified below was tested for removable contamination as shown:

Customer: WAUPACA FOUNDRY, INC.
Waupaca, WI 54981

Product: TN 5183A Serial No.: B371
Isotope: Cs-137 Activity: 1,000.00 mCi
Source Serial No.: MA-5061
Device Location: P2 HIGH CUPOLA
Test Type: Lab Counting

Result: Positive Negative: < 3.3E-5 uCi

Date: 09-95 Signature: Sharon Alexander
Leak Test Coordinator

This certificate should be maintained as a permanent record of the leak test of this product.

TN TECHNOLOGIES
Post Office Box 800
Round Rock, Texas 78680
512/388-9100

LEAK TEST CERTIFICATION

This is to certify that the product identified below was tested for removable contamination as shown:

Customer: WAUPACA FOUNDRY, INC.
Waupaca, WI 54981

Product: TN 5183A Serial No.: 200
Isotope: Cs-137 Activity: 1,000.00 mCi
Source Serial No.: SA-573
Device Location: P2 LOW CUPOLA
Test Type: Lab Counting

Result: Positive Negative: < 3.3E-5 uCi

Sharon Alexander

Date: 09-95 Signature: _____
Leak Test Coordinator

This certificate should be maintained as a permanent record of the leak test of this product.

TN TECHNOLOGIES
Post Office Box 800
Round Rock, Texas 78680
512/388-9100

LEAK TEST CERTIFICATION

This is to certify that the product identified below was tested for removable contamination as shown:

Customer: WAUPACA FOUNDRY, INC.
Waupaca, WI 54981

Product: TN 5203 Serial No.: 8729
Isotope: Cs-137 Activity: 500.00 mCi
Source Serial No.: 66-3693
Device Location: P1 HIGH CUPOLA
Test Type: Lab Counting

Result: Positive Negative: < 3.3E-5 uCi

Date: 07-95 Signature: Sharon Alexander
Leak Test Coordinator

This certificate should be maintained as a permanent record of the leak test of this product.

TN TECHNOLOGIES
Post Office Box 800
Round Rock, Texas 78680
512/388-9100

LEAK TEST CERTIFICATION

This is to certify that the product identified below was tested for removable contamination as shown:

Customer: WAUPACA FOUNDRY, INC.
Tell City, IN 47586

Product: TN 5200 Serial No.: 82966
Isotope: Cs-137 Activity: 100.00 mCi
Source Serial No.: GV-7420
Device Location:
Test Type: A

Result: Positive X Negative: < 1.00E-3 uCi

Date: 11-96 Signature:

Sharon Alexander

Leak Test Coordinator

This certificate should be maintained as a permanent record of the leak test of this product.

TN TECHNOLOGIES
Post Office Box 808
Round Rock, Texas 78680
512/388-9100

The Ohmart Corporation
4241 Allendorf Drive • Cincinnati, Ohio 45209
Phone (513) 272-0131 • FAX: (513) 272-0133



WAUPACA FOUNDRY
9856 ST RT 66
TELL CITY IN
47586

Kit No. _____ Date _____
Customer P.O. No. _____

Leak Test Kit

Caution: This kit is to be used only for the source holder described below. The information below appears on the metallic label on the actual OHMART source holder. Supply similar information if holder not OHMART.

Shop or Customer Order No. (S.O./C.O.)	isotope	Serial No.	mCi	Source Holder
1196-040-2705	CS 137	19396K	50 mCi	SHE1

Date Shipped	User Identification	Other
11-96	FELT SCALE	

Date of Test	Tested By (Tester's Signature)
3-19-97	<i>Don Walker</i>

This kit is to be used only by those whose license permit them to perform leak tests. (Per CFR-10 Part 20)

OHMART ANALYSIS

The following are analysis results:

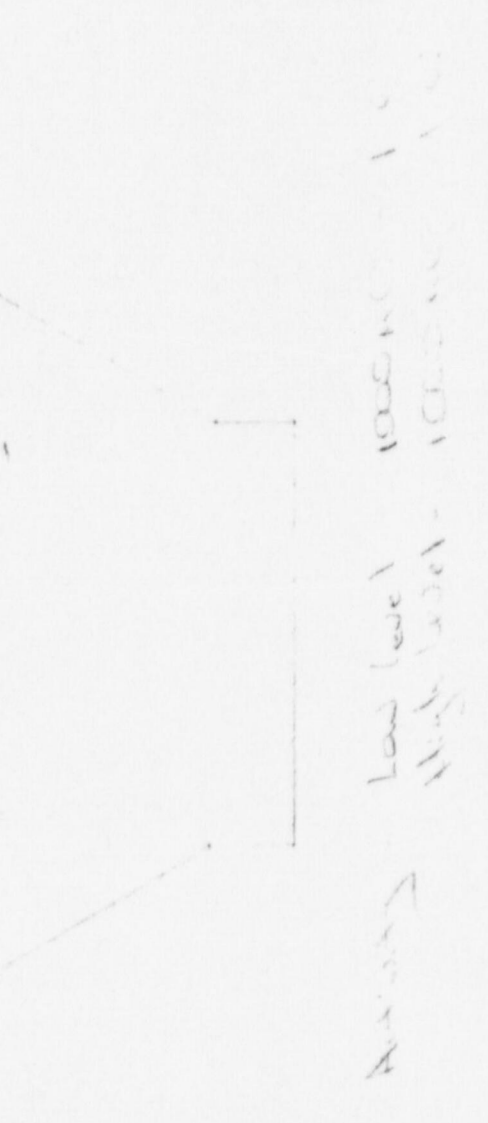
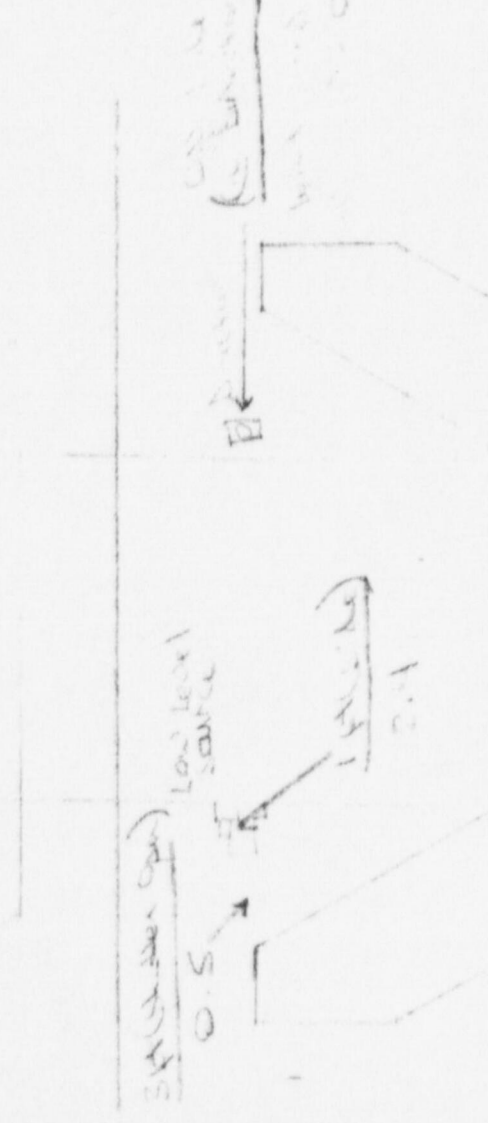
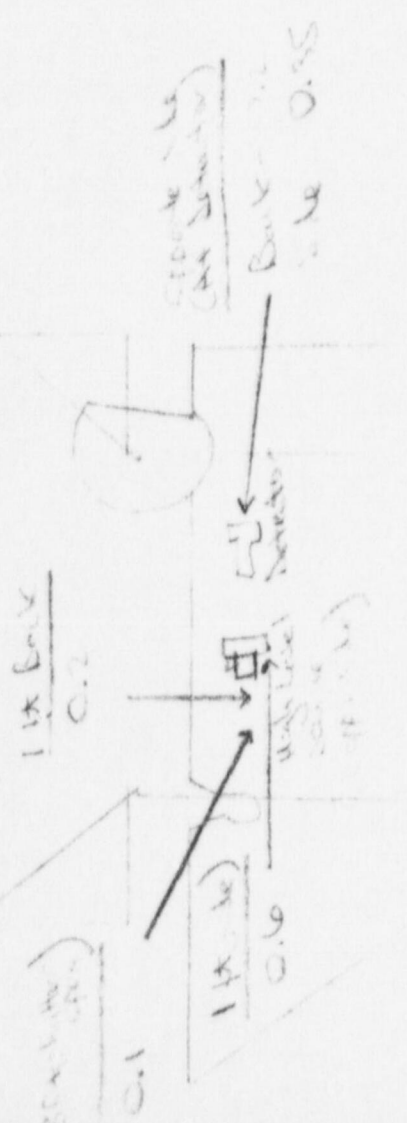
Source is O K (Activity less than 0.005µCi) Rewipe Required Defective

19cts *M. Williams* | 3-21-97
Tested By/Authorized Signature Date

APPENDIX G

Copied from [unclear] (Sheet 2)

411 31.75 MP/hr Background = 4.02 ml/hr



1.56 / 0.2 = 7.8

1.56 / 0.2 = 7.8
 7.8 ml/hr (0.78 l/h) = 41.5 ml/hr

150 ml/hr
 0.9 - 1.56 = 93.6 ml/hr

1.56 / 0.2 = 7.8
 7.8 ml/hr (0.78 l/h) = 41.5 ml/hr

1.56 / 0.2 = 7.8
 7.8 ml/hr (0.78 l/h) = 41.5 ml/hr

1.56 / 0.2 = 7.8
 7.8 ml/hr (0.78 l/h) = 41.5 ml/hr

10/16 Gang Survey (Sheet 1)

10-22-00

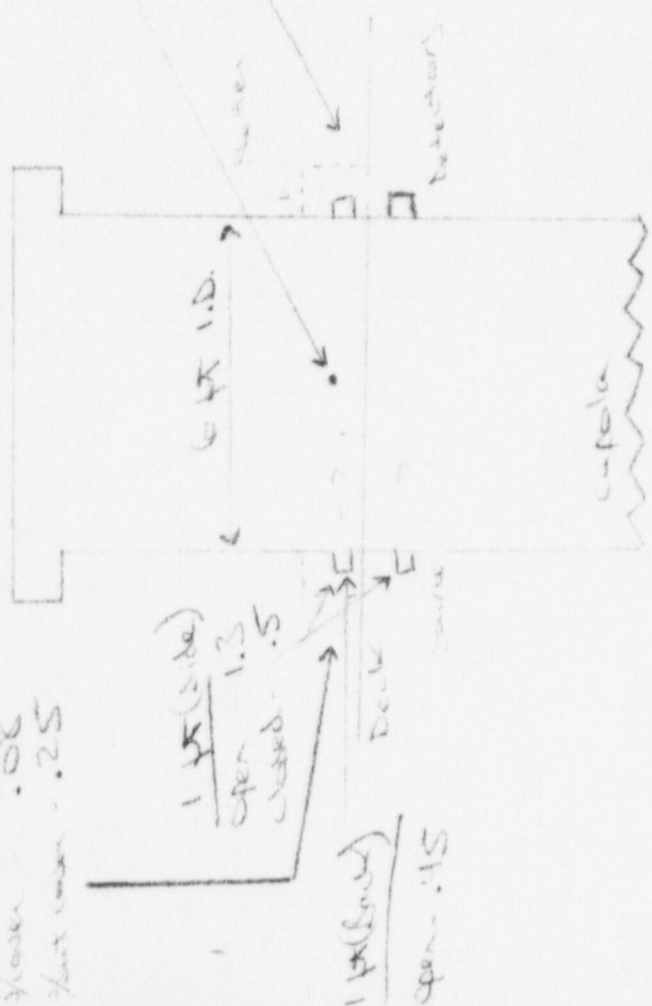
All units 2.4 hr
 Dose rate = 0.02 mR/hr

Net dose = 1000 mR = 1 Ci
 1000 mR = 1000 mR / 500 = 2 Ci

1.5K (Shutter open)

Time = .02

Net dose = .25



Employee Dose Calc.

Unplanned Crew - Planned Unplanned Unplanned
 Unplanned work 5.4 hr @ 1.3 mR/hr
 1.3 mR/hr (17.3h) = 22.5 mR/hr

150 - Gang Activities (1x/week for 20 min)
 Exposure = 0.17 mR/hr
 Annual work exposure @ 1.3 mR/hr
 1.3 mR/hr (.7 hr) = 0.9 mR/hr

open case

$$\bar{D} = \frac{6(1.5) \cdot 1000}{(4)^2}$$

$$\bar{D} = 0.37 R/hr$$

calculated level in Corridor
 open = .37 R/hr
 closed =

open 1.5K (2.4 hr)
 closed .02

17.3 mR/year

Exposure = 2.0 mR/hr
 Annual work 5.4 hr @ 1.3 mR/hr

1.3 mR/hr (2.0 hr) = 2.6 mR/hr

APPENDIX H

Suggested Fixed Gauge Audit Checklist

Note: All areas indicated in audit notes may not be applicable to every license and may not need to be addressed during each audit. For example, licensees do not need to address areas which do not apply to their activities and activities which have not occurred since the last audit need not be reviewed at the next audit.

Licensee's name _____ License No. _____

Date of This Audit _____ Date of Last Audit _____

(Auditor Signature) Date _____

(Management Signature) Date _____

1. AUDIT HISTORY

- a. Last audit of this location conducted on (date) _____
- b. Were previous audits conducted at intervals not to exceed 12 months? [10 CFR 20.1101]
- c. Were records of previous audits maintained? [10 CFR 20.2102]
- d. Were any deficiencies identified during last two audits or two years, whichever is longer?
- e. Were corrective actions taken? (Look for repeated deficiencies).

2. ORGANIZATION AND SCOPE OF PROGRAM

- a. If the mailing address or places of use changed, was the license amended?
- b. If ownership changed or bankruptcy filed, was NRC prior consent obtained or was NRC notified?
- c. Radiation Safety Officer
 - 1) If the RSO was changed, was license amended?
 - 2) Does new RSO meet NRC training requirements?
 - 3) Is RSO fulfilling his/her duties?
 - 4) To whom does RSO report?
- d. If the designated contact person for NRC changed, was NRC notified?

- e. Sealed Sources and Devices
- 1) Does the license authorize all of the NRC regulated radionuclides contained in gauges?
 - 2) Are the gauges as described in the Sealed Source and Device (SSD) Registration Certificate?
 - 3) Have copies of (or access to) SSD Certificates?
 - 4) Have manufacturers' manuals for operation and maintenance? [10 CFR 32.210]
 - 5) Are the actual uses of gauges consistent with the authorized uses listed on the license?
 - 6) Are the location of the gauges compatible with the "Conditions of Normal Use" and "Limitations and/or Other Considerations of Use" on the SSD Registration Certificates?

3. TRAINING AND INSTRUCTIONS TO WORKERS

- a. Were all workers who are likely to exceed 1 mSv (100 mrem) in a year instructed per [10 CFR 19.12]? Refresher training provided, as needed [10 CFR 19.12]? Records maintained?
- b. Did each authorized user receive training and instruction given at the time of gauge installation or equivalent training and instruction before using gauges?
- c. Are training records maintained for each authorized user?
- d. Did individuals who perform non-routine operations receive training before performing these operations?
- e. Did interviews with authorized users reveal that they know the emergency procedures?
- f. Did this audit include observations of authorized users using the gauge?
- g. Did this audit include observations of workers performing routine cleaning and lubrication on the gauge? Transporting gauge? Storing gauge?
- h. Did each authorized user demonstrate safe handling and security during transportation, use, and storage?
- i. HAZMAT training provided as required? [49 CFR 172.700, 49 CFR 701, 49 CFR 702, 49 CFR 703, 49 CFR 704]

4. RADIATION SURVEY INSTRUMENTS

- a. If the licensee is required to possess a survey meter, does it meet the NRC's criteria? [10 CFR 20.1501]
- b. Are calibration records maintained [10 CFR 20.2103(a)]?

5. GAUGE INVENTORY

- a. Is a record kept showing the receipt of each gauge? [10 CFR 30.51(a)(1)]
- b. Are all gauges physically inventoried every six months?
- c. Are records of inventory results with appropriate information maintained?

6. PERSONNEL RADIATION PROTECTION

- a. Are ALARA considerations incorporated into the radiation protection program? [10 CFR 20.1101(b)]
- b. Is documentation kept showing that unmonitored individuals receive $\leq 10\%$ of limit? [10 CFR 20.1502(a)]

- c. Did unmonitored individuals' activities change during the year which could put them over 10% of limit?
- d. If yes to c. above, was a new evaluation performed?
- e. Is external dosimetry required (individuals likely to receive >10% of limit,)? And is dosimetry provided to these individuals?
 - 1) Is the dosimetry supplier NVLAP approved? [10 CFR 20.1501(c)]
 - 2) Are the dosimeters exchanged monthly for film badges and quarterly for TLD's?
 - 3) Are dosimetry reports reviewed by the RSO when they are received?
 - 4) Are the records NRC Forms or equivalent? [10 CFR 20.2104(d), 10 CFR 20.2106(c)]
 - a) NRC-Form 4 "Cumulative Occupational Exposure History" completed?
 - b) NRC-Form 5 "Occupational Exposure Record for a Monitoring Period" completed?
 - 5) Declared pregnant worker/embryo/fetus
 - a) If a worker declared her pregnancy, did licensee comply with [10 CFR 20.1208]?
 - b) Were records kept of embryo/fetus dose per [10 CFR 20.2106(e)]?
- f. Are records of exposures, surveys, monitoring, and evaluations maintained [10 CFR 20.2102, 10 CFR 20.2103, 10 CFR 20.2106]

7. PUBLIC DOSE

- a. Is public access to gauges controlled in a manner to keep doses below 1 mSv (100 mrem) in a year? 10 CFR 20.1301(a)(1)]
- b. Has a survey or evaluation been performed per 10 CFR 20.1501(a)? Have there been any additions or changes to the storage, security, or use of surrounding areas that would necessitate a new survey or evaluation?
- c. Do unrestricted area radiation levels exceed 0.02 mSv (2 mrem) in any one hour? [10 CFR 20.1301(a)(2)]
- d. Is gauge access controlled in a manner that would prevent unauthorized use or removal? [10 CFR 20.1801]
- e. Records maintained? [10 CFR 20.2103, 10 CFR 20.2107]

8. OPERATING AND EMERGENCY PROCEDURES

- a. Have operating and emergency procedures been developed?
- b. Do they contain the required elements?
- c. Does each individual working with the gauges have a current copy of the operating and emergency procedures (including lock-out procedures and emergency telephone numbers)?
- d. Is a lock-out warning sign posted at each entryway to an area where it is possible to be exposed to the beam?
- e. Did any emergencies occur?
 - 1) If so, were they handled properly?
 - 2) Were appropriate corrective actions taken?
 - 3) Was NRC notification or reporting required? [10 CFR 20.2201, 2202, 2203]

9. LEAK TESTS

- a. Was each sealed source leak tested every 6 months or at other prescribed intervals?

- b. Was the leak test performed according to the license?
- c. Are records of results retained with the appropriate information included?
- d. Were any sources found leaking and if yes, was NRC notified?

10. MAINTENANCE OF GAUGES

- a. Are manufacturer's procedures followed for routine cleaning and lubrication of gauge?
- b. Was each on-off mechanism tested for proper operation every 6 months or at other prescribed intervals?
- c. Are repair and maintenance of components related to the radiological safety of the gauge performed by the manufacturer or person specifically authorized by the NRC or an Agreement State and according to license requirements (e.g., extent of work, procedures, dosimetry, survey instrument, compliance with 10 CFR 20.1301 limits)?
- d. Are labels, signs, and postings identifying gauges containing radioactive material, radiation areas, and lock-out procedures/warnings clean and legible?

11. TRANSPORTATION

(Note: This section will not apply if you have not transported gauges during the period covered by this audit.)

- a. DOT-7A or other authorized packages used? [49 CFR 173.415, 49 CFR 173.416(b)]
- b. Package performance test records on file?
- c. Special form sources documentation? [49 CFR 173.476(a)]
- d. Package has two labels (ex. Yellow-II) with TI, Nuclide, Activity, and Hazard Class? [49 CFR 172.403, 49 CFR 173.441]
- e. Package properly marked? [49 CFR 172.301, 49 CFR 172.304, 49 CFR 172.310, 49 CFR 172.324]
- f. Package closed and sealed during transport? [49 CFR 173.475(f)]
- g. Shipping papers prepared and used? [49 CFR 172.200(a)]
- h. Shipping papers contain proper entries? {Shipping name, Hazard Class, Identification Number (UN Number), Total Quantity, Package Type, Nuclide, RQ, Radioactive Material, Physical and Chemical Form, Activity, category of label, TI, Shipper's Name, Certification and Signature, Emergency Response Phone Number, Cargo Aircraft Only (if applicable)} [49 CFR 172.200, 49 CFR 172.201, 49 CFR 172.202, 49 CFR 172.203, 49 CFR 172.204, 49 CFR 172.604]
- i. Shipping papers within drivers reach and readily accessible during transport? [49 CFR 177.817(e)].
- j. Package secured against movement? [49 CFR 177.834]
- k. Placards on vehicle, if needed? [49 CFR 172.504]
- l. Proper overpacks, if used? [49 CFR 173.25]
- m. Any incidents reported to DOT? [49 CFR 171.15, 16]

12. AUDITOR'S INDEPENDENT SURVEY MEASUREMENTS (IF MADE)

- a. Describe the type, location, and results of measurements. Does any radiation level exceed regulatory limits [10 CFR 20.1501(a) & 1502(a)]?

13. NOTIFICATION AND REPORTS

- a. Was any radioactive material lost or stolen? Were reports made? [10 CFR 20.2201, 10 CFR 30.50]

- b. Did any reportable incidents occur? Were reports made? [10 CFR 20.2202, 10 CFR 30.50]
- c. Did any overexposures and high radiation levels occur? Reported? [10 CFR 20.2203, 10 CFR 30.50]
- d. If any events (as described in items a through c above) did occur, what was root cause? Were corrective actions appropriate?
- e. Is the management/RSO/shift foreman licensee aware of telephone number for NRC Emergency Operations Center? [(301) 816-5100]

14. POSTING AND LABELING

- a. NRC-Form 3 "Notice to Workers" posted? [10 CFR 19.11]
- b. NRC regulations, license documents posted or a notice posted? [10 CFR 19.11, 10 CFR 21.6]
- c. Other posting and labeling ? [10 CFR 20.1902, 10 CFR 20.1904]

15. RECORD KEEPING FOR DECOMMISSIONING

- a. Records kept of information important to decommissioning? [10 CFR 30.35(g)]
- b. Records include all information outlined in [10 CFR 30.35(g)]?

16. BULLETINS AND INFORMATION NOTICES

- a. NRC Bulletins, NRC Information Notices, NMSS Newsletters, received?
- b. Appropriate training and action taken in response?

17. SPECIAL LICENSE CONDITIONS OR ISSUES

- a. Did auditor review special license conditions or other issues (e.g., non-routine operations)?

18. DEFICIENCIES IDENTIFIED IN AUDIT; CORRECTIVE ACTIONS

- a. Summarize problems/deficiencies identified during audit.
- b. If problems/deficiencies identified in this audit, describe corrective actions planned or taken. Are corrective actions planned or taken at ALL licensed locations (not just location audited)? Include date(s) when corrective actions are implemented.
- c. Provide any other recommendations for improvement.

19. EVALUATION OF OTHER FACTORS

- a. Senior licensee management is appropriately involved with the radiation protection program and/or Radiation Safety Officer (RSO) oversight?
- b. RSO has sufficient time to perform his/her radiation safety duties?
- c. Licensee has sufficient staff to support the radiation protection program?

APPENDIX I

RADIATION SAFETY OFFICERS

Radiation Safety Seminar

September 9-11, 1996

New Orleans, Louisiana

Mon. 9/9/96	Description	Objectives	Trainer(s)
07:30 - 08:00 am	Continental Breakfast	Not Applicable (NA)	
08:00 - 08:10	Seminar Objectives/Overview	Understand seminar objectives. Meet trainers.	Bob Kaiser
08:10 - 08:30	How Radiation is Used <ul style="list-style-type: none"> Medical uses Industrial uses Academic uses 	Know common uses of radiation in industry, research & medicine.	Sue Engelhardt
08:30 - 08:50	Regulatory Agencies <ul style="list-style-type: none"> Who regulates what Where regulatory standards come from NRC vs. Agreement States Other agencies (e.g., OSHA, FDA, EPA, DOT) 	Understand how the regulations are developed. Know the difference between Agreement vs. Non-Agreement states. Know the relationship between the NRC and other agencies.	Sue
08:50 - 09:00	Break	NA	
09:00 - 10:30 (10 min break)	Radiation Physics <ul style="list-style-type: none"> Types of radiation Interactions with matter Half-life Radioactivity units 	Know the various types and characteristics of radiation (e.g., alpha, beta, gamma) and their interactions in matter. Understand half-life, Ci, & Bq.	Ralph Grunewald
10:30 - 11:30	Group Sessions	See handouts	All
11:30 - 12:30 pm	Lunch	NA	
12:30 - 01:20	Radiation Dosimetry <ul style="list-style-type: none"> Exposure and dose units Types of dosimeters; how they work NRC dose limits Dose Calculations 	Understand radiation exposure and dose units (e.g., rad, rem, R, RBE, LET, QF). Know NPC dose limits. Know how to calculate dose from a point source.	Sue
01:20 - 01:30	Break	NA	
01:30 - 02:20	Radiation Protection <ul style="list-style-type: none"> Time, distance, shielding Rules for protection from radiation Posting requirements ALARA 	Know methods used for radiation protection (e.g., time, distance, shielding, contamination control). Know how to apply inverse square law. Know what ALARA is and how to implement.	Dee Kaiser

Date	Description	Objectives	Trainer(s)
Mon. 9/9/96 (continued)	02:20 - 02:50 pm Types of Licenses/Regulatory Issues <ul style="list-style-type: none"> • General vs. Specific licenses • Device registrations • Gauge, medical, academic, biotechnology requirements 	Know common types of NRC licenses and scope of each.	Sue
02:50 - 03:00	Break	NA	
03:00 - 04:00	Group Sessions	See handouts	All
Tues. 9/10/96	Description	Objectives	Trainer(s)
07:30 - 08:00 am	Continental Breakfast	NA	
08:00 - 09:30 (10 min break)	Radiation Detection Equipment <ul style="list-style-type: none"> • Types of equipment • Appropriate uses • Demonstration of equipment • Self-reading dosimeters 	Understand how to select and operate equipment for the different types of radiation. Understand the basic design principles of various detectors.	Ralph
09:30 - 09:50	Sources of Radiation Exposure <ul style="list-style-type: none"> • Naturally occurring, medical, occupational, life style • Risk vs. benefit 	Understand typical levels of radiation exposure from common sources. Understand perceived vs. real risk	Sue
09:50 - 10:00	Break	NA	
10:00 - 10:30	Radiation Biology <ul style="list-style-type: none"> • Cellular effects, tissue effects, systematic effects • Delayed effects, early somatic effects • Acute radiation syndrome • Radiation hormesis, threshold vs. non-threshold 	Understand the biological effects of radiation and the dose levels where these effects occur.	Sue
10:30 - 11:30	Group Sessions	See handouts	All
11:30 - 12:30 pm	Lunch	NA	

Tues. 9/10/96 (continued)	Description	Objectives	Trainer(s)
12:30 - 01:15 pm	Radiation Safety Programs <ul style="list-style-type: none"> • Written programs • Key elements (e.g., RSO/RSC, facility design, PPE, procedures, records, audits) • Recordkeeping requirements • Annual reviews 	Know key elements of a radiation safety program. Know how to develop an effective program.	Dee
01:15 - 01:30	Responsibilities for Radiation Safety <ul style="list-style-type: none"> • Who is responsible • Legal issues 	Understand the various responsibilities for radiation safety.	Sue
01:30 - 01:40	Break	NA	
01:40 - 02:30	Emergencies <ul style="list-style-type: none"> • Types of emergencies (gauge, medical, academic) • Procedures • Source leakage, loss • Emergency personnel as responders • Performance based training • Interactions with the public, media, and employees 	Understand the RSO's role in planning for and preventing accidents. Know how to develop an emergency plan.	Judy Grunewald
02:30 - 02:50	Transportation <ul style="list-style-type: none"> • Regulatory requirements (NRC, DOT, IATA) • Shipper's responsibilities 	Know regulatory requirements for transporting radioactive materials. Know shipper's responsibilities.	Dee
02:50 - 03:00	Break	NA	
03:00 - 04:00	Group Sessions	See handouts	All

Wed. 9/11/96	Description	Objectives	Trainer(s)
07:30 - 08:00 am	Continental Breakfast	NA	
08:00 - 08:30	NRC Regulations <ul style="list-style-type: none"> • Parts 30 - 35 (types of licenses) • Special requirements (gauges and licenses) 	Understand general vs. specific license. Know which NRC regulations pertain to the different licenses (gauge, medical, etc.).	Sue
08:30 - 09:00	NRC Regulations (continued) <ul style="list-style-type: none"> • Parts 19 and 20 	Know critical provisions of these worker information and protection standards.	Sue
09:00 - 09:10	Break	NA	
09:10 - 09:40	Writing a License <ul style="list-style-type: none"> • New, renewal, & amendment applications • NRC Form 313 or equivalent for Agreement states • Content • Fees 	Understand the do's and don'ts when writing a license. Know what references are available for assistance (e.g., NRC Regulatory Guides).	Sue
09:40 - 10:30	Reportable Incidents <ul style="list-style-type: none"> • When to/not to report an incident • Interactions with the public and media 	Know NRC requirements for reporting incidents and misadministrations (medical). Understand the NRC's media notification criteria. Know key aspects of communicating with the public & media.	All
10:30 - 10:40	Break	NA	
10:40 - 11:30	NRC/State Inspections <ul style="list-style-type: none"> • How to prepare • How to deal with inspectors • What to do if your inspection is going badly • What to do if called for an enforcement conference 	Understand the inspection process. Know how to prepare for and respond to enforcement activities.	All
11:30 - 12:30	Examination	Complete exam and score 85% or better.	All
12:30 - 01:00	Wrap-up		

September 9-11, 1996 Radiation Safety Seminar Performance Objectives for the Gauge Group

These performance objectives are tailored to the participants' needs. Each session is 1 hour or longer.

Day One: Morning Session

- Understand physics and interactions of radiation with matter as it pertains to common radionuclides used in gauges.
- View slides on specific operation of many types of gauges (to understand common types of gauges and how they work).
- Know general characteristics of source capsule configuration and shutter designs.
- Calculate radioactive decay.

Day One: Afternoon Session

- Demonstration of gauge types/uses.
- Know what you can and cannot do with gauges with regards to maintenance and repair.
- Know ALARA strategies for mills/gauges.
- Demonstration of time, distance, and shielding principles.
- Get hands-on experience with opening and closing shutters (both cylinder and flat swing type).
- Understand badge requirements - who needs them, why, etc.
- Understand survey procedures - exposure rate monitoring, leak tests, and wipe tests.
- Discuss device registrations and general/specific licenses for gauges.
- Calculate dose from a point source.

Day Two: Morning Session

- Know the various types and uses of survey meters.
- Observe proper lockout/tagout demonstration and then lockout/tagout a gauge (hands-on).
- Determine what signs are needed in experimental settings.
- Know how to receive and ship a radioactive package.

Day Two: Afternoon Session

- Understand responsibilities of the RSO for the radiation safety program.
- Discussion of emergency preparedness and response.
- Do leak tests.
- Take hands-on radiation measurements with a Geiger counter and an ionization chamber around sources to observe how radiation is shielded, collimated, and scattered.
- Take radiation measurements of a source through various shielding materials to observe attenuation.
- Take radiation measurements of a source at various distances to understand the inverse square law.

Certificate of Completion

awarded to

Bryant Esch

for participation in a radiation safety training course

Given by Engelhardt & Associates, Inc.
September 9-11, 1996
New Orleans, LA

Susan J. Engelhardt
Susan J. Engelhardt, M.S.

Ralph Grunewald
Ralph Grunewald, Ph.D.

Dee Kaiser
Dee Ann Kaiser, M.S.

Judith Grunewald
Judith Grunewald, R.N., M.S.

97%

NAME Rigant Esch
DATE 9-11-96

NUCLEAR GAUGE RADIATION SAFETY EXAMINATION

True or False

1. T F Long-term (chronic) exposure to low levels of radiation is more hazardous to health than exposure to a large amount of radiation over a short period of time (acute exposure).
2. T F Time, distance and shielding are appropriate methods of minimizing exposure to radiation.
3. T F If a gauge is damaged, it must be assumed that a radiation hazard exists.
4. T F An unnecessary exposure to radiation is an excessive exposure.
5. T F Radiation safety training is recommended, but not required for individuals working with fixed gauges.

Match

- | | | | | |
|----|----|----------------|----------|-------------------------------------|
| 6. | a. | Geiger counter | <u>b</u> | Personnel dosimeter |
| | b. | Film badge | <u>c</u> | Contamination survey |
| | c. | Leak test | <u>A</u> | Exposure rate meter |
| | d. | Gauge detector | <u>D</u> | Transmission of gamma through steel |

Multiple Choice

7. Radiation survey meters must be calibrated at least every:
a. 3 months c. year
b. 6 months d. 3 years

8. Sealed sources in our gauges must be leak tested every:
- a. 6 months
 - b. Year
 - c. 2 years
 - d. 3 years
9. An area where radioactive material is stored must be posted with a sign bearing the warning:
- a. Keep Out
 - b. Caution - Radioactive Materials
 - c. Caution - Radiation Area
 - d. No posting required
10. If you suspect a gauge is damaged, you should:
- a. Affix a red tag to it, identifying it as in need of repair
 - b. Try to repair it
 - c. Notify the radiation safety officer at the earliest opportunity
 - d. Restrict access to the area and immediately notify the radiation safety officer
11. If an individual were to remain continuously present in a radiation area of 120 millirem per hour for 10 minutes, he would receive an exposure of approximately:
- a. 0.2 millirem
 - b. 2 millirem
 - c. 20 millirem
 - d. 200 millirem
12. How can a nuclear gauge be disposed of?
- a. Sell to highest bidder
 - b. Sell/transfer to licensed company
 - c. Return to manufacturer
 - d. b or c
13. Which of the following materials are appropriate forms of shielding for gamma radiation?
- a. Concrete
 - b. Lead
 - c. Steel
 - d. a, b, and c

14. If an incident occurred with a gauge which caused or threatened to cause an exposure to a worker in excess of regulatory limits, how soon would the appropriate regulatory agency have to be notified?

- a. Immediately
- b. Within 24 hours
- c. Within 30 days
- d. The regulations require different notification times depending on the circumstances

15. Which of the following environmental conditions may damage a gauge?

- A. Extreme temperatures
- B. Extreme vibration
- C. Exposure to caustic chemicals
- D. a., b., c.

Answer the following questions

16. Describe lock-out/tag out.

Lock-out of energy bearing sources to isolate the danger from workers entering an area.

17. What is the difference between being irradiated and being contaminated?

Contaminated has ^(radioactive) radioactive material on the item. Irradiated is being exposed to a "beam" of radiation that leaves no residual.

18. Would you be irradiated or contaminated if you stepped in front of the radiation beam coming from the radioactive source inside a gauge?

19. What is the difference between a millicurie and a millirem?

- Millicurie is a unit of activity
- Millirem is a measure of biological impact

20. Describe the process for doing a leak test?

~~Remove~~ use cotton swab to swab the potential leak points of a ~~gauge~~ gauge. This test would then be sent to a certified lab which would "count" the result.

Describe the actions to be taken if the source is found to be leaking.

- 1) Survey and develop an exclusion area
- 2) Call Vendor
- 3) Report to NRC if required

21. Why is it important to perform leak tests on gauges?

To ensure the ongoing integrity of the housing.

22. Describe ALARA.

"As Low As Reasonably Achievable", the process of instituting procedures to keep exposures as low as possible, below the regulatory and beyond.

23. When would a radiation badge be required for personnel working with radiation?

Required for individuals exposed to greater than 500 mrem/yr.

24. Name three duties of the radiation safety officer:

- 1) Implement and enforce aspects of radiation ^{Protection} ~~Program~~ Program
- 2) Contact for NRC
- 3) Maintain gauge inspections + records

25. Who is responsible for radiation safety at your facility?

RSO - Everett Morgan - Everybody

26. Describe the procedure to be followed if the gauge fell off its mounting:

Similar to Procedure described in
ques #20. This is a specific requirement
of Wapora Family License.

27. T F Anyone can install sources in a gauge.

28. T F You have one year to notify the NRC/Agreement State if you lose a source from a gauge.

29. T F Each gauge is designed for a specific purpose, so care must be taken before changing location of the gauge.

30. T F You must be licensed to move a gauge from one location to another in your plant/mill.

31. T F It's okay to post an area "Caution Radiation Area" even if the exposure rate is less than 5 mrem/hr.

32. a. "Caution: Radiation Area"	<u>E.</u> 100 mrem/yr
b. "Caution: High Radiation Area"	<u>D.</u> 5000 mrem/yr
<u>c.</u> "Caution: Radioactive Material"	<u>A.</u> 5 mR/Hr
d. Allowable limit for radiation worker	<u>B.</u> 100 mR/Hr
e. Allowable limit for member of the general public	<u>C.</u> Posted wherever radioactivity is used or stored

33. Describe procedure to be followed in the event of a fire in an area where a gauge is present:

For areas that are only "Caution Radiation
Material" areas, fight the fire. If the
source is damaged, Repeat ques. #20 + 26.

34. Describe the procedure to be followed if a gauge is missing (cannot be found):

Not: By NRC immediately continue
internal investigation. confirm identity
of missing unit - serial #, etc.

35. A person is exposed to a 1Ci source of ^{137}Cs from a gauge. Calculate the exposure to the person if the individual stood for 1 hour at 1 foot from the source. 2 feet from the source.

Helpful Hint: Equation = $\overset{\circ}{D} = \frac{6CE}{d^2}$

^{137}Cs has an energy, E, of .66 MeV
Source strength, C, is 1 Curie
distance, d, is 1 foot and 2 feet

Dose, $\overset{\circ}{D}$, is Roentgens/Hour (R/Hr)

$$1 \text{ hr} = \frac{6(1) \cdot 66}{(1)^2} = 3.96 \text{ R/Hr}$$

$$2 \text{ hr} = \frac{6(1) \cdot 66}{(2)^2} = .99 \text{ R/Hr}$$

AFFECTED PERSONNEL

NUCLEAR GAUGE TRAINING FOR MELT/ELECTRICAL PERSONNEL

- I. Introduction to Nuclear Gauges
 - A. Nuclear Gauges in Industry
 - B. Waupaca Foundry Gauge Locations
 - C. Gamma Radiation
 - 1. Properties
 - 2. Personal Protection
 - a. time
 - b. distance
 - c. shielding
- II. Waupaca Foundry Gauge Locking/Lockout Procedures
 - A. Performing the Locking/Lockout Procedure
 - 1. Beam Geometry
 - 2. Shutter Operation
 - B. Indicator Light Confirmation
- III. Emergency Notification - RSO
 - A. Damaged Gauge
 - B. Human Exposure
 - C. Missing Gauge
 - D. Unauthorized Gauge Maintenance

**WAUPACA FOUNDRY, INC.
TRAINING FORM**

Please complete this form when training has been completed. List people who have successfully completed the entire course.

Dates of Training Beginning Date: <u>1-7-98</u> Ending Date: <u>1-7-98</u>	Title/Subject of Training <u>Radiation Awareness + GMD System</u>
Total Number of Hours <u>.5 (30 minutes)</u>	Where Training is Being Held <u>Plant 5/Tell City</u>
Company/Institute Doing Training <u>WF @ Plant 5</u>	Individual Doing Training <u>Keith Tremblay</u>
Cost: Total or Per Individual (Circle one) \$ _____	Waupaca Foundry Person Who Set Up Training <u>Bryant Esch.</u>

EMPLOYEE NO.	Print	EMPLOYEE NAME (Signature)	Sign
5144	RANDY SCHERER	Randy Scherer	<i>Randy Scherer</i>
5447	John A. Hauser	John A. Hauser	<i>John A. Hauser</i>
5426	KEITH HOWELL	Keith Howell	<i>Keith Howell</i>
5451	David Seibert	David Seibert	<i>David Seibert</i>
5422	FROY A. BUCKENDAH	Froy A. Buckendahl	<i>Froy A. Buckendahl</i>
5257	RUSSELL RAINES	Russell Rains	<i>Russell Rains</i>
5143	RODNEY HOLBROOK	Rodney Holbrook	<i>Rodney Holbrook</i>
5141	TERRY FUCHS	Terry Fuchs	<i>Terry Fuchs</i>
4989	CHAD HENDREN	Chad Hendren	<i>Chad Hendren</i>
4949	JOCKEE WHEATLEY	Jockee Wheatley	<i>Jockee Wheatley</i>
5139	Glenn Kelly	Glenn Kelly	<i>Glenn Kelly</i>
5140	Brett Hagedorn	Brett Hagedorn	<i>Brett Hagedorn</i>

Please return completed form to the Personnel Department.

(C:\worddata\training\train.cht\js)

Send to Bryant

TN Technologies

TRAINING OUTLINE FOR GAUGE USERS

- A. Gauge Structure and Operation
 - 1. Beam Geometry
 - 2. Shutter Operation
 - 3. Gamma Radiation
- B. Device Location and Associated Hazards
- C. Required Routine Servicing and Precautions
- D. Regulatory Requirements
 - 1. Installation
 - 2. Leak Testing Instructions
 - 3. Maintenance and Relocation
 - 4. Transfers and Disposals
 - 5. Recordkeeping and Posting
 - 6. Licensing
- E. Emergency Procedures

Post-it® Fax Note	7671	Date	10/28	# of pages	1
To	BRYANT ESCH	From	K. HUNTER		
Co./Dept.	WAUPACA FOUNDRY	Co.			
Phone #		Phone #	512 388 9288		
Fax #	715 258 9268	Fax #	512 388 9333		

FIGURE 1

ELEVATION LOOKING EAST AT 11N11T 22710

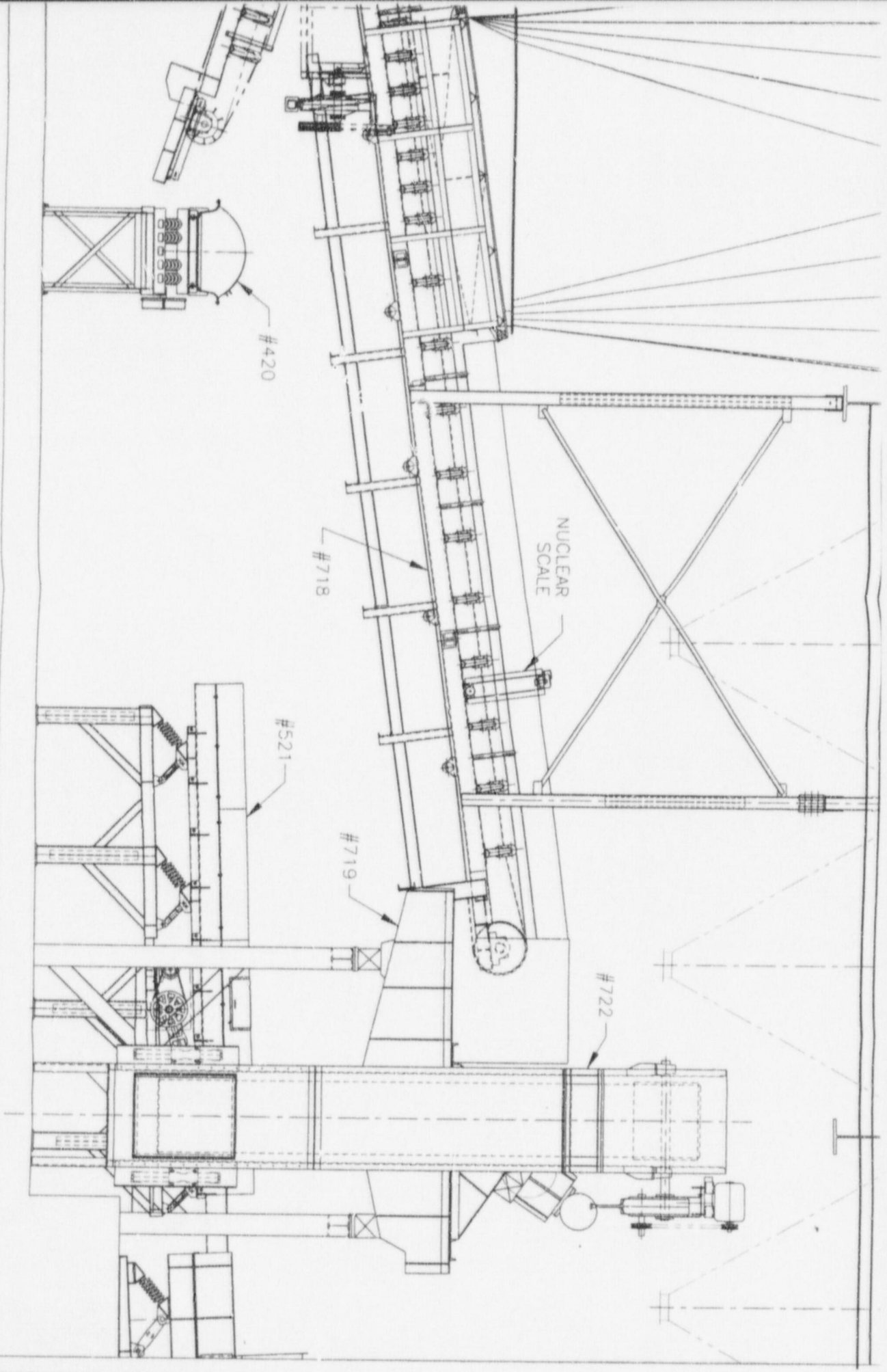
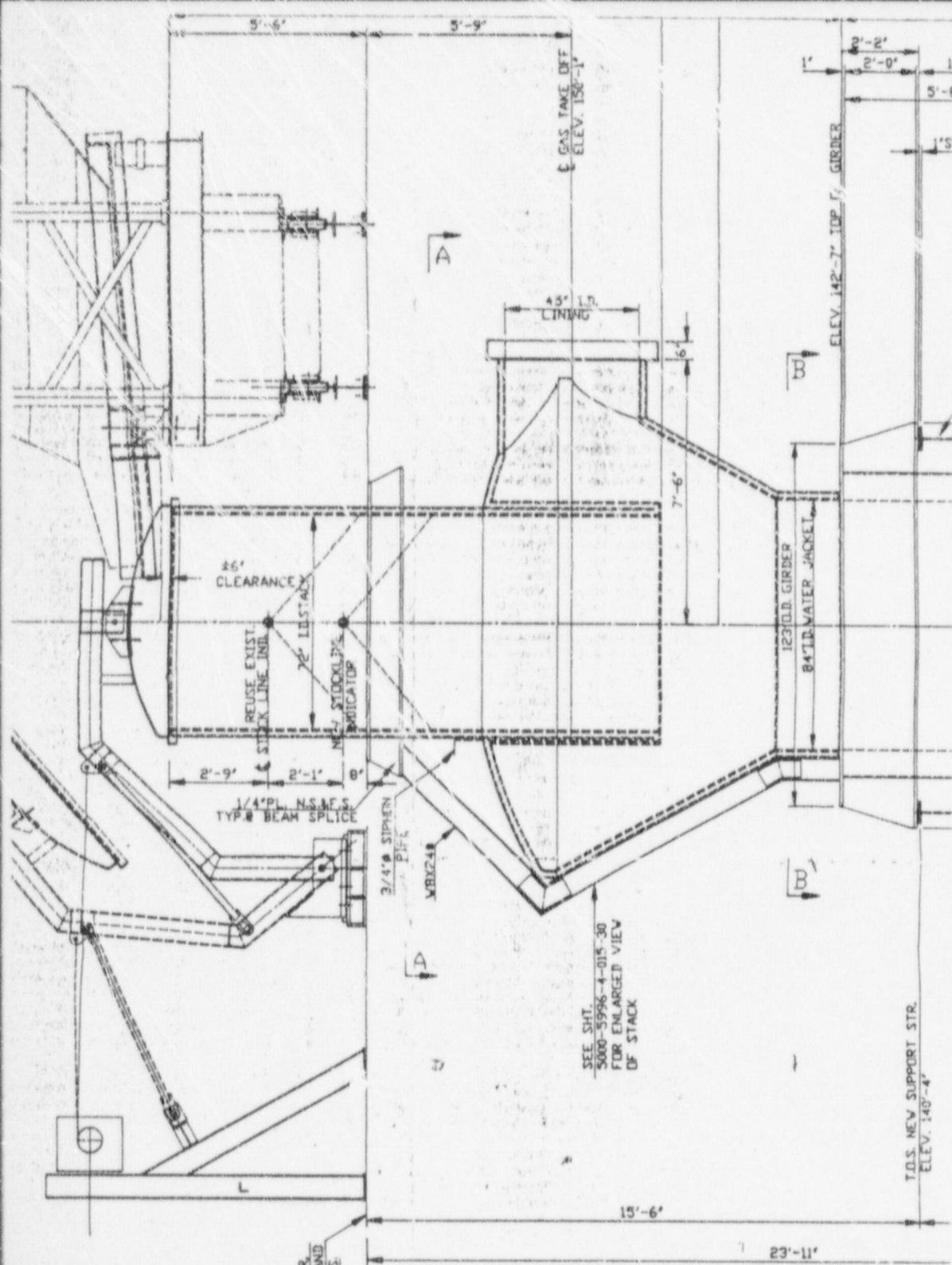


FIGURE 2



GAS TAKE OFF
ELEV. 150'-1"

ELEV. 142'-7" TOP F₁ GIRDER

T.O.S. NEW SUPPORT STR.
ELEV. 140'-4"

45" I.D. LINING

123" OLD GIRDER

84" I.D. WATER JACKET

±6' CLEARANCE

REUSE EXIST STOCK LINE IND.

NEW STOCK LINE INDICATOR

1/4" PL. N.S.A.F.S. TYP. BEAM SPLICE

3/4" Ø STEEL PIPE

W8X24

SEE SHIT. 5000-5996-4-015-30 FOR ENLARGED VIEW OF STACK

ELEV. 133'-10"
T.O.S. NEW CHARGE FLOOR, STOCK LINE INDICATOR AND INSPECTION PORT ACCESS.

102" I.D. SHELL

1/2" PL.

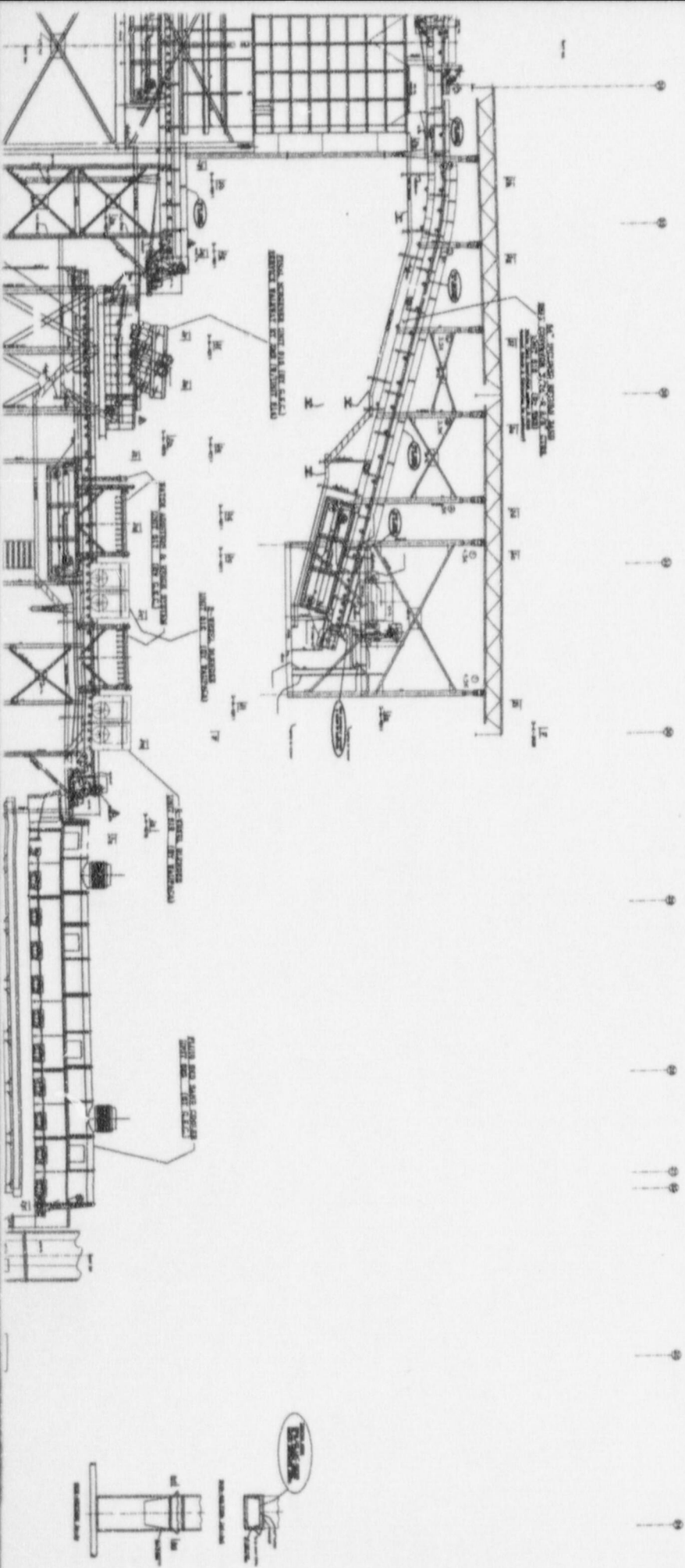
90° R.P.T. W/NER RINGS (TYPICAL AT TWO ELEV.)



FIGURE 3

FIGURE 4

FIGURE 5





UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

January 27, 1998

Everett Morgan
Radiation Safety Officer
Waupaca Foundry, Inc.
Tower Road
P.O. Box 249
Waupaca, WI 54981

SUBJECT: ACKNOWLEDGMENT OF CORRESPONDENCE
(Application Dated December 22, 1997)

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. 303530
License No. 48-15031-01