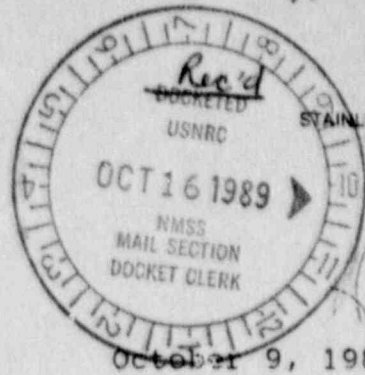
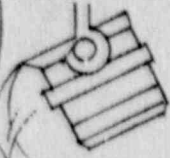


EMPIRE STEEL CASTINGS, INC.

P. O. Box 139 • Reading, Pa. 19603-0139
Telephone 215 921-8101



STAINLESS • ALLOY • CARBON
STEEL CASTINGS



Charles E. Mac Donald, Chief
Transportation Branch
Division of Safeguards and Transportation, NMSS
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Renewal Quality Assurance Program for Radioactive
Material Packages. No. 0172

Dear, Mr. Mac Donald,

Inclosed 3 copies for your review of Empire Steel
Castings Inc. Quality Assurance Program for Radioactive
Material Packages. Renewal fee of \$150.00 inclosed.

Sincerely,

Gene R. Gaumer

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Log	Oct-3-90
Remitter	
Check No.	54108
Amount	\$150
Fee Category	10B
Type of Fee	Ren
Date Check Rec'd.	10/17/89
Date Completed	10/18/89
By	Mission

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EMPIRE STEEL CASTINGS, INC.
Post Office Box 139
Reading, PA 19603

QUALITY ASSURANCE REQUIREMENTS
FOR RADIOACTIVE SHIPPING PACKAGES (10CFR PART 71)

1. Organization

The final responsibility for the Quality Assurance Program for Part 71 Requirements rests with Empire Steel Castings, Inc., Frush Valley Road, Laureldale, PA 19603. Design and fabrication of radioactive material shipping packages shall not be conducted under this Quality Assurance Program. The following organization:

2. Organizational Chart

President - Edward J. Crowley
Quality Assurance Manager - Gene R. Gaumer
Quality Assurance Operations - Forrest Schmeck
Applications Manager - Forrest Schmeck

3. The Radiation Safety Officer is responsible for overall administration of the program, training and certification, document control and auditing. (Gene R. Gaumer Forrest Schmeck)
4. The Radiographers are responsible for handling, storing, shipping, inspection, test operating status and record keeping. (Gene Gaumer, Forrest Schmeck, Clarence Schoffstall, Jr., and Ben Randazzo.)
5. Quality Assurance Program

The management of Empire Steel Castings, Inc., Frush Valley Road, Laureldale, Pa 19603, establishes and implements this Quality Assurance Program. Training for all Q.A. functions, prior to engagement in these functions, is required according to written procedures. Q.A. Program revisions will be made according to written procedures with management approval. The Q.A. Program will ensure that all defined Q.A. procedures, engineering procedures, and specific provisions of the package design approval are satisfied. The Q.A. Program will emphasize control of the characteristics of the package which are critical to safety.

6. Procedure for handling of Radioactive Packages

- A. All Radioactive Packages will be surveyed and checked for damage upon receipt.
- B. All Radioactive Packages will be brought to the X-Ray Department upon receipt of package.
- C. The Radioactive Package will be stored in exposure areas #1 or #2. See Layout Drawing Form I.
- D. Source will be changed immediately by Radiographers.
- E. Package will be checked for damage and sealed.
- F. The proper tags and labels will be placed on package and type source, curie strength, and survey reading.
- G. Transportation Instructions (Form II) will be used for shipment of Radioactive Packages.
- H. The Radioactive Package will be held in X-Ray Department until notified of transportation of shipment.
- I. The following check list will be used for receiving, storage and shipping of Radioactive Packages (Form III)
- J. All personnel will have instruction in Radiation Safety before handling Radioactive Packages.
- K. All documents on Radioactive Packages will be kept on file for a period of two (2) years.

7. The Radiation Safety Officer shall assure that all radioactive material shipping packages are designed and manufactured under a Quality Assurance Program approved by the Nuclear Regulatory Commission for all packages designed or fabricated after 1 July 1978. This requirement can be satisfied by receiving a certification to this effect from the manufacturer.

8. Document Control

All documents related to a specific shipping package will be controlled through the use of written procedures. All document changes will be performed according to written procedures approved by management.

9. The Radiation Safety Officer shall insure that all QA functions are conducted in accordance with the latest applicable changes to these documents.

10. Handling Storage and Shipping

Written safety procedures concerning the handling, storage and shipping of packages for certain special form radioactive material will be followed. Shipments will not be made unless all tests, certifications, acceptances, and final inspections have been completed. Work instructions will be provided for handling, storage and shipping operations. Refer to Transportation Instructions.

11. Radiography personnel shall perform the critical handling, storage and shipping operations. Refer to #6.

12. Inspection, Test and Operating Status

Inspection, test and operating status of packages for certain special form radioactive material will be indicated and controlled by written procedures. Status will be indicated by tag, label, marking or log entry. Status of nonconforming parts or packages will be positively maintained by written procedures. Refer to #6.

13. Radiography personnel shall perform the regulatory required inspections and tests in accordance with written procedures. The Radiation Safety Officer shall ensure that these functions are performed. (Refer to #6, Form II.

14. Quality Assurance Records

Records of package approvals (including references and drawings), inspections, tests, operating logs, audit results, personnel training and qualifications and records of shipment will be maintained. Descriptions of equipment and written procedures will also be maintained. Refer to #6.

15. These records will be maintained in accordance with written procedures. The records will be identifiable and retrievable. A list of these records, with their storage locations, will be maintained by the Radiation Safety Officer. Refer to #6.

16. Audits

Established schedules of audits of the Quality Assurance Program will be performed using written checklists. Results of audits will be maintained and reported to management. Audit reports will be evaluated and deficient areas corrected. The audits will be dependent on the safety significance of the activity being audited, but each activity will be audited at least once per year. Audit reports will be maintained as part of the quality assurance records. Members of the audit team shall have no responsibility in the activity being audited. Form **IV**

EMPIRE STEEL CASTINGS, INC.
Post Office Box 139
Reading, PA 19603

Transportation Instruction

PART I

RECEIVING RADIOACTIVE MATERIAL




NOTES:

1. A package of radioactive material must be accepted from the carrier at the time it is delivered. (10CFR20.205(a)(1))
 2. If a package of radioactive material is to be held at the carrier's terminal, it must be picked up expeditiously upon receipt of notification from the carrier of its arrival. (10CFR20.205(a)(2))
-
1. Upon receipt of a package of radioactive material, survey the exterior surfaces of the package to insure that the radiation levels do not exceed 200 milliroentgens per hour. (10CFR20.205(c))
 2. Survey three feet from the exterior surfaces of the package to insure that radiation levels do not exceed 10 milliroentgens per hour. (10CFR20.205(c))
 3. For packages containing radioactive material in normal form (i.e. not in special form), make contamination wipe tests of the exterior surfaces of the package. Count these wipes to insure that contamination levels do not exceed 0.01 microcuries per 100 square centimeters. (10CFR20.205(b)).
 4. Record the results of these surveys on the Receiving Report. If any of the above limits are exceeded, notify the Radiation Safety Officer. (10CFR20.401(b))
 5. Record on the Receiving Report the source, model number, serial number, isotope, activity, shipping container model number and serial number.
 6. Inspect the package for any evidence of physical damage. Record the result of this inspection on the Receiving Report.
 7. Forward a copy of the Receiving Report to the Radiation Safety Officer.

PART II SHIPPING RADIOACTIVE MATERIAL

SUBPART A SHIPMENT OF RADIOGRAPHIC SOURCES

1. Insure that the source is secured in the proper shielded storage position in the shipping container.
2. Attach a security seal with an identification mark to the package closure. (49CFR173.393(b))
3. If the shipping container is to be packaged inside a crate or other outer packaging, the outer packaging must be strong enough to withstand the normal conditions of transport. Place the shipping container in the outer package with sufficient blocking to prevent shifting during transportation. (49CFR173.25)
4. Survey the package at the surface and at three feet from the surface to determine the proper radioactive shipping labels to be applied to the package. Use the criteria of Table II.1. (49CFR172.403)

	Surface	3 Feet
RADIOACTIVE-WHITE I 	0.5mR/hr	None
RADIOACTIVE-YELLOW II 	50mR/hr	1.0mR/hr
RADIOACTIVE-YELLOW III 	200mR/hr	10mR/hr

PART II (continued)

SUBPART A

5. Properly complete two shipping labels indicating the contents ($^{192}\text{Iridium}$, $^{60}\text{Cobalt}$, etc.), the number of curies and the Transport Index (maximum radiation level measured at three feet from the surface of the package; used on Yellow II and Yellow III labels only). (49CFR172.403(g))
6. Insure that any old shipping labels have been removed from the package. Apply the two properly completed radioactive shipping labels to two opposite sides of the package. (49CFR172.403(f))
7. Mark the outside of the package with the proper shipping name (Radioactive Material, Special Form, n.o.s.) if not already marked. (49CFR172.300)
8. If a shipping container is packaged inside a crate or other packaging mark the outside package "Inside Container in Accordance with _____". (Fill in the blank space with the appropriate DOT Specification Number of Type B Certificate Number) and the words "TYPE B" or "TYPE A" if applicable. (49CFR172.310; 49CFR173.393a)
9. Perform a radioactive contamination wipe test of the shipping package and insure that the wipe test does not exceed 0.001 microcuries per 100 square centimeters. (49CFR173.397; 49CFR173.393(n)(9))
10. Properly complete the shipping papers indicating:
 - a. Proper shipping name (i.e. Radioactive Material, Special Form, n.o.s.)
 - b. Name of Radionuclide (i.e. $^{192}\text{Iridium}$, $^{60}\text{Cobalt}$)
 - c. Physical or chemical form (or Special Form)
 - d. Activity of Source (expressed in curies or millicuries)
 - e. Category of Label applied (i.e. Radioactive Yellow III)
 - f. Transport Index
 - g. USNRC Identification Number or DOT Specification Number
i.e. USNRC: USA/9032/B or DOT-7A)
 - h. For export shipments, IAEA Identification Number
(i.e. IAEA: USA/9032/B) (49CFR172.203(d))

PART II (continued)

SUBPART A

i. Shipper's Certification:

"This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transport according to the applicable regulations of the Department of Transportation." (49CFR172.204(a))

Notes: 1. For air shipments, the following shipper's certification may be used:

"I hereby certify that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled and are in proper condition for carriage by air according to applicable national governmental regulations". (49CFR172.204(c))

2. For air shipments, the package must be labeled with a "CARGO AIRCRAFT ONLY" label and the shipping papers must state: (49CFR172.402(b))

"THIS SHIPMENT IS WITHIN THE LIMITATIONS
PRESCRIBED FOR CARGO-ONLY AIRCRAFT"
(49CFR172.204(c))

PART II SHIPMENT OF RADIOACTIVE MATERIAL

SUBPART B SHIPMENT OF EMPTY DEPLETED URANIUM SHIELDED
CONTAINERS AND COLLIMATORS

1. If the container is to be packaged inside a crate or other outer packaging, the outer packaging must be strong enough to withstand the normal conditions of transportation. Place the container in the outer package with sufficient blocking to prevent shifting during transportation.
2. Mark the outside of the outer shipping package:
"RADIOACTIVE - MATERIAL - LSA, n.o.s."
(49CFR173.392(c)(8); 49CFR172.300)
3. Perform a radioactive contamination wipe test of the shipping package and insure that the wipe test does not exceed 0.001 microcuries per 100 square centimeters.
(49CFR173.397; 49CFR173.393 (n)(9))
4. Survey the package at the surface and at three feet from the surface to determine the proper radioactive shipping labels to be applied to the package.
 - a. If the surfaceradiation level is less than 0.5 milliroentgens per hour and there is no measurable radiation level at three feet from the surface, no label is required. Mark the outside of the package with the statement: "Exempt from specification packaging, marking and labeling, and exempt from the provisions of 49CFR173.393 per 49CFR173.391(c). Exempt from the requirements of 49CFR Part 175 per 49CFR175.10(a)(6)."
(49CFR173.391(c) & 49CFR175.10(a)(6))

Properly complete the shipping papers indicating:

- (1) Proper shipping name (Radioactive Material LSA, n.o.s.)
- (2) Name of Radionuclide (Depleted Uranium)
- (3) Physical or Chemical Form (Solid Metal)
- (4) Activity (in curies or millicuries)

PART II (continued)

SUBPART B

(5) The Statement "Exempt from specification packaging marking and labeling and exempt from the provisions of 49CFR173.393 f 49CFR173.391(c). Exempt from the requirements of 49CFR Part 175 per 49CFR175.10(a)(6)." (49CFR172.203(d))

(6) Shipper's Certification:

"This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transport according to the applicable regulations of the Department of Transportation." (49CFR172.204(a))

NOTES: 1. For Air Shipments, the following shipper's certification may be used:

"I hereby certify that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled and are in proper condition for carriage by air according to applicable national governmental regulations." (49CFR172.204(c))

2. For Air Shipments, the following statement must appear:

"This shipment is within the limitations prescribed for passenger aircraft in accordance with 49CFR175.10(a)(6). (49CFR172.204(c))

b. If the surface radiation level exceeds 0.5 milliroentgens per hour, or if there is a measurable radiation level at three feet from the surface, use the criteria of Table II.1 to determine the proper radioactive shipping labels to be applied to the package.

Properly complete the shipping papers indicating:

- (1) Proper shipping name (radioactive material, LSA, n.o.s.)
- (2) Name of Radionuclide (Depleted Uranium)
- (3) Physical or Chemical Form (Solid Metal)

PART II (continued)

SUBPART B

- (4) Activity (in curies or millicuries)
- (5) Category of Label Applied (i.e. Radioactive Yellow II)
- (6) Transport Index
- (7) USNRC Identification Number or DOT Specification Number (i.e. USNRC USA/9032/B or DOT-7A)
- (8) For Export Shipments, IAEA Identification Number (i.e. IAEA USA/9032/E) (49CFR172.203(d))
- (9) Shipper's Certification

"This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transport according to the applicable regulations of the Department of Transportation." (49CFR173.204(a))

- NOTES: 1. For Air Shipments, the following shipper's certification may be used:

"I hereby certify that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled and are in proper condition for carriage by air according to applicable national governmental regulations." (49CFR172.204(c))

2. For Air Shipments, the package must be labeled with a "CARGO AIRCRAFT ONLY" label and the shipping papers must state: (49CFR172.402(b))

"This shipment is within the limitations prescribed for cargo-only aircraft." (49CFR173.204(c))

PART II

SUBPART C SHIPMENT OF EMPTY LEAD SHIELDED CONTAINERS

1. Insure that the container does not contain a radioactive source.
2. Insure that the container interals are securely closed or contains no radioactive contaminations. (49CFR173.29(c))
3. Perform a radioactive contamination wipe test of the outside of the container and insure that the wipe test does not exceed 0.001 microcuries per 100 square centimeters. (49CFR173.397)
4. Survey the external surface of the container to insure that the radiation levels do not exceed 0.5 milliroentgens per hour. (49CFR173.29(e))
5. Insure that any old shipping labels have been removed from the package. Attach an "EMPTY" label to the package. (49CFR173.29(e))

PART III

CARRYING RADIOACTIVE MATERIAL

1. Insure that the vehicle used is in good condition and carries the normal complement of safety equipment including radiation area signs, a length of rope, spare tire, fire extinguisher, a set of vehicle tools and a set of flares. The glove compartment shall contain the registration certificate and an operating flashlight. Additionally, the operator must have a calibrated and operable survey meter and be wearing a film badge and dosimeter.
 2. Insure that the container is properly packaged, marked and labeled and the proper shipping papers are completed in accordance with the instructions of Part II.
 3. Place the radioactive material container in the vehicle. Secure the container against movement in the vehicle.
(49CFR177.834)
 4. Survey the driver's compartment to insure that the radiation level does not exceed 2 milliroentgens per hour.
(49CFR173.393(j)(4))
 5. If the vehicle is transporting a package bearing a "RADIOACTIVE YELLOW III" label, the vehicle must be placarded on all four sides with a "RADIOACTIVE" placard. (49CFR172.504)
- Note: Operation of a vehicle which is required to be placarded requires compliance with the Federal Motor Carrier Safety Regulations (49CFR390-397)
6. Complete the radioactive material transport checklist. Forward a completed copy to the Radiation Safety Officer upon completion of the carriage.
 7. If the vehicle becomes disabled on the road, do not leave the vehicle unguarded when going for help. A message for help may be sent by a passing motorist or the police be enlisted to guard the vehicle.
 8. Should any kind of accident occur, make an immediate radiation survey to see where, if at all, the radiation levels are higher than normal. If any abnormal radiation areas exist, keep all persons out of them and get police assistance, if possible. If radioactive sources have escaped from their containers, notify the Radiation Safety Officer. Do not leave the scene without assuring that someone responsible (such as police) will keep people away from radiation areas.

PART III (continued)

9. Collect information pertinent to the accident, such as names of witnesses, names of people involved, names of police, license numbers, circumstances of the accident. Call the Radiation Safety Officer promptly giving him as much information as possible about the condition of the radioactive sources.
10. If a source should escape from its container, the vehicle operator should make no attempt to restore the source by himself, but he should wait for assistance from the Radiation Safety Officer.

FORMS

- I GENERAL LAYOUT & STORAGE
- II RADIATION SHIPMENT COGO, IR192
- III RADIOACTIVE PACKAGE CHECKLIST
- IV AUDIT CHECKLIST

GENERAL LAYOUT

FORM I

EXPOSUR AREAS 1 - 2

SOURCES'S A, B, C, D

EXPOSURE AREA #1

C. CO60 300 ci
Model 520

D. IR 192 100 ci
Model 660

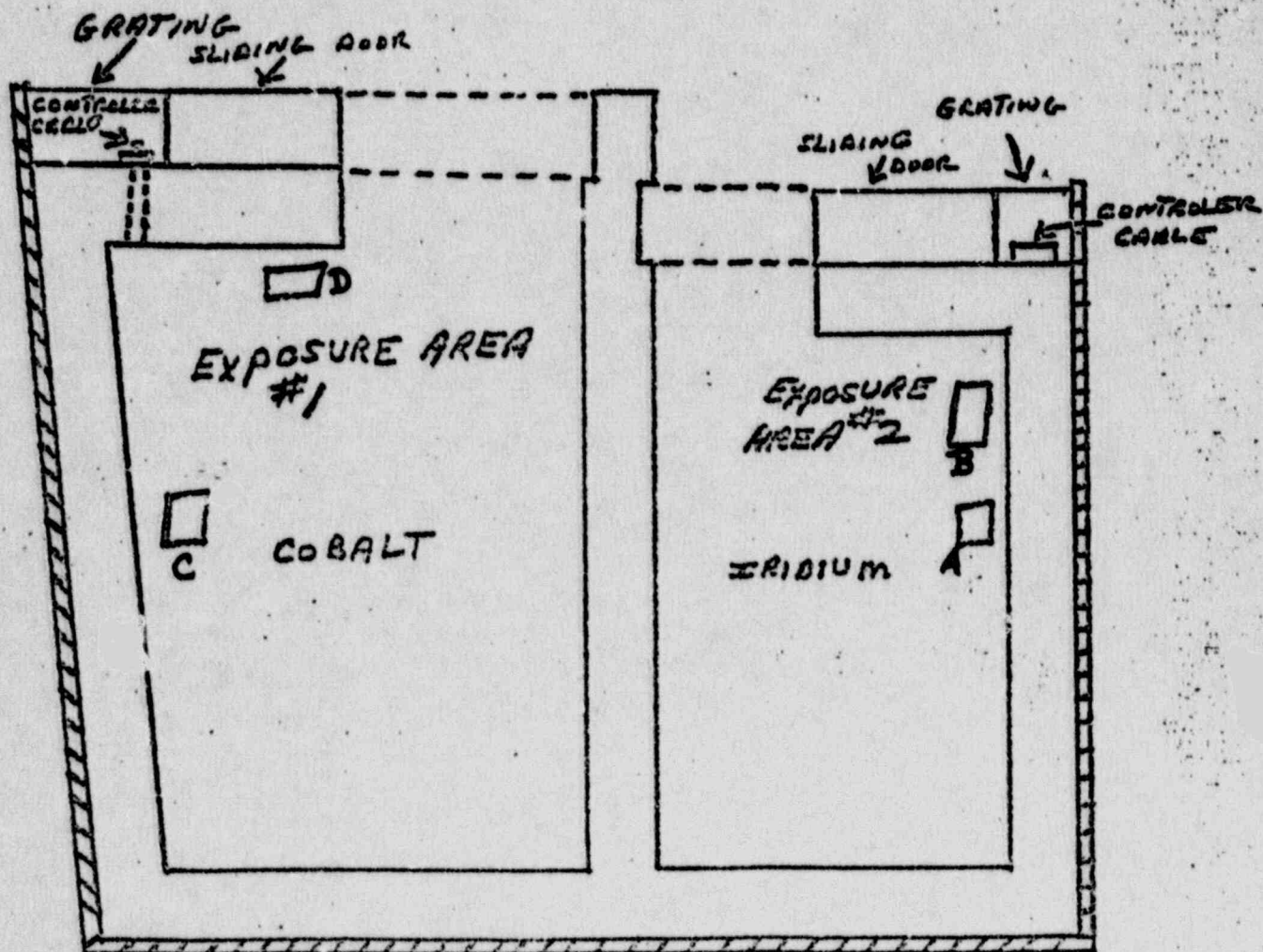
Also for storage of
Radioactive shipping
packages

EXPOSURE AREA #2

A. IR 192 100 ci
Model 660

B. CO60 50ci
Model 446

Also for storage of
Radioactive shipping
packages



EMPIPE STEEL CASTINGS, INC.
P.O. Box 139
Reading PA 19603

Danger: Radiation Shipment

Shippers Certification

IR¹⁹² _____ ci

Survey Readings

Surface

1 Meter

"This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled, and are in proper condition for transport according to the applicable regulations of the Department of Transportation." (49CFR 172.204(a))

Date _____ RSO _____

EMPIRE STEEL CASTINGS, INC.
P. O. Box 139
Reading PA 19603

Danger: Radiation Shipment

Shippers Certification

CO⁶⁰ _____ ci

Survey Readings
Surface

_____ 1 Meter _____

"This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled, and are in proper condition for transport according to the applicable regulations of the Department of Transportation." (49CFR 172.204(a))

Date _____ RSO _____

FORM IV AUDIT CHECK LIST

_____ Date

- _____ 1. Radioactive Packages being received and stored in proper area upon arrival.
- _____ 2. Package check for damage.
- _____ 3. Surveys taken.
- _____ 4. Source changed.
- _____ 5. Package check for damage and proper tags and label attached before shipment.
- _____ 6. Package shipped by proper transportation.
- _____ 7. Reports and documents on Radioactive Packages being maintained.

_____ Auditor