

KAST METALS CORPORATION

KEOKUK STEEL CASTING DIV.

P.O. BOX 887/KEOKUK, IOWA 52632

TELEPHONE 319-524-2661



December 5, 1984

Radioisotopes License Branch
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

Applicant
Check No.	10698
Amount Fee Collected	\$230
Type of Fee	30 and
Date Check Rec'd	12/17/84
Received By	[Signature]

RECEIVED

84 DEC 17 AM 1:41

Re: Keokuk Steel Casting
License No. 14-07206-01
Applicant for Radiographer
and Radiographer's Assistants

Gentlemen:

We are herewith presenting our request for Larry Pullins to become a Radiographer on our License No. 14-07206-01.

Training and Experience

1. He attended the Hartford Steam Boiler Inspection and Insurance Company Radiography/Radiation Safety seminar. The course should meet NRC Requirements for training as defined in Title 10 CFR-Part 34-Appendix A.
2. He has been instructed in the use of equipment at the operation of the licensee under direct supervision of Radiographer, M. Anderson (Radiation Safety Officer) per our License No. 14-07206-01.
3. He has read and discussed our Emergency & Operating Procedure per our License No. 14-07206-01.
4. He has taken our in-the-plant test (written and oral) on the use of the equipment. Our equipment consists of the following:

A. Device and No.: T. O. 680-6 Projector
T. O. 416 Charger
Source: Cobalt 60, 100 Curies, #1871
Location: Permanent Location (1 Room)
at Keokuk Steel Casting,
Keokuk, Iowa

RECEIVED BY LFMB	
Date	12/17/84
Loc	Dec 11
By	[Signature]
Orig. To	[Signature]
Action Compl.	[Signature]

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REGION III

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CONTROL NO. 77926

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14-07206-01 PDR

KEOKUK STEEL CASTING

U. S. Nuclear Regulatory Commission
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- B. Film Badge
 - C. Pocket Dosimeter
 - D. Survey Meters
 - E. Gamma Alarm System
5. He has worked in the capacity of Radiographer's assistant for three months.

With the foregoing training and instruction, we are requesting that Mr. Larry Pullins be added to our present License as a Radiographer.

In addition, we are herewith presenting our request for Allan Nason, Dennis Taylor and Bill Via to be added as Radiographer's Assistants to our License No. 14-07206-01.

Training and Experience

1. They have been instructed in the use of equipment at the operation of the licensee under direct supervision of Radiographer, Mark Anderson (Radiation Safety Officer) per our License No. 14-07206-01.
2. They have read and discussed our Emergency & Operating Procedure per our License No. 14-07206-01.
3. They have taken our in-the-plant test (written and oral) on the use of the equipment. Our equipment consists of the following:

A. Device and No.: T. O. 680-6 Projector
T. O. 416 Changer
Source: Cobalt 60, 100 Curies, #1871
Location: Permanent Location (1 Room)
at Keokuk Steel Casting,
Keokuk, Iowa

KEOKUK STEEL CASTING

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- B. Film Badge
- C. Pocket Dosimeter
- D. Survey Meters
- E. Gamma Alarm System

With the foregoing training and instruction, we are requesting that Allas Nason, Dennis Taylor and Bill Via be added to our present license as Radiographer's Assistants. Please find enclosed our check for license ammendment in the amount of \$230.00.

Respectfully submitted,

KEOKUK STEEL CASTING
Division of Kast Metal Corp.

Mark Anderson

Mark Anderson
Radiation Safety Officer

MA:jy

Enclosure

CONTROL NO. 77926

FORM AEC-313R-S

Supplement to United States Atomic Energy Commission
Application for Byproduct Material License -
Use of Sealed Sources in Radiography

THIS FORM SHOULD BE USED ONLY BY PERSONS WHO WISH TO PERFORM RADIOGRAPHY UNDER A "LIMITED RADIOGRAPHY LICENSE" AS DESCRIBED IN SECTION I.D. OF THE AEC INDUSTRIAL RADIOGRAPHY LICENSING GUIDE. Use separate form for each individual. Additional pages may be attached. See reverse side for additional instructions.

It is hereby requested that Bill Via be listed on License No. 14-07206-01 as a ~~XXXXXX~~

(2) Radiographer's Assistant. (Circle (1) or (2)). The training and experience of this individual consists of:

(3) PERIOD OF TRAINING OR EXPERIENCE (From) (To)		(4) POSITION HELD (1) (2)		(5) TYPE OF EQUIPMENT USED (Make & Model Number)	(6) TYPE AND AMOUNT OF ACTIVITY	(7) NAME OF EMPLOYER AND USAEC OR AGREEMENT STATE LICENSE NO.
<u>(Mo.&Yr.)</u>	<u>(Mo.&Yr.)</u>	()	()			
(See attachment)		()	()	Tech-Ops Model A-424-14	Co ⁶⁰ 60 Curies	Keokuk Steel Casting
		()	()	Tech-Ops 680/693 Projector		License No. 14-07206-01
		()	()			
		()	()			
		()	()			

(8) Additional training and experience description or comment:

(9) Mark Anderson determined compliance with 10 CFR 34.31 for the person named above by:
(Briefly describe test, on-the-job evaluation, etc. Written test copy may be attached.)

(10) Signed: Mark Anderson

RADIOGRAPHERS ASSISTANTS QUIZ

98%

PART I

True or False

True False - 30%

Fill ins - 50%

Discussion - 20%

1. Area T access to a restricted area must be controlled by the license.
2. An overdose of radiation can be felt immediately. F
3. A film badge need only be worn by the chief radiographer. F
4. A casting is considered as being radioactive after having been exposed to Co⁶⁰. F
5. 1 millirem is equal to .001 rems. T
6. Maximum permissible radiation in an unrestricted area is 2 millirems per hour. T
7. It is necessary to carry a survey meter each time you enter the building. T
8. A gamma alarm is the only necessary meter for maintaining the source. F
- 2 9. A dosimeter is more sensitive to registering a dose than a film badge. F
10. The radiographic exposure device may be left unlocked while the radiographer is setting up a shot. F
11. Radiographers are required to have copies of the operating and emergency procedures. T
12. A radiographer's assistant may work unsupervised after he has completed his training. F
13. Film badge should be processed immediately if dosimeter reads off scale. T
14. It is necessary to mark radiation areas. T
15. In case of an emergency, notify the local police first. F

PART II
Discussion

1. Define the following: Radiographer -- Person licensed by N.R.C. to perform radiography
Radiographer's Assistant -- person in training under supervision of radiographer
2. List two methods of personnel monitoring and give advantages of each.
Film Badge - Permanent Record
Dosimeter - Instant reading
3. Describe permissible levels of radiation in an unrestricted area.
2 mR/hr
4. Under what conditions would you allow an untrained person to use the source? never
5. Describe in your own words the step by step procedure you would use before entering the radiography room.
 1. Source reeled in and locked
 2. Gamma alarm green light on.
 3. Survey room as entering
 4. Survey projector

PART III

This part of the exam is aimed at obtaining the general attitude of the man in respect to a radioactive source. We impress again the importance of the rules and regulations and inquire further by random questions his understanding of them. From a discussion of this time we feel that the sincerity of the man can be evaluated as part of his qualifications.

O.K.
M. Anderson 9-19-84

FORM AEC-313R-S

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Application for Byproduct Material License -
Use of Sealed Sources in Radiography

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It is hereby requested that Dennis Taylor be listed on License No. 14-07206-01 as a ~~X~~X ~~Radiographer~~
(name)

(2) Radiographer's Assistant. (Circle (1) or (2)). The training and experience of this individual consists of:

(3) PERIOD OF TRAINING OR EXPERIENCE (From) (To)		(4) POSITION HELD (1) (2)		(5) TYPE OF EQUIPMENT USED (Make & Model Number)	(6) TYPE AND AMOUNT OF ACTIVITY	(7) NAME OF EMPLOYER AND USAEC OR AGREEMENT STATE LICENSE NO.
<u>(Mo.&Yr.)</u>	<u>(Mo.&Yr.)</u>	()	()			
(See attachment)		()	()	Tech-Ops Model A-424-14	Co ⁶⁰ 60 Curies	Keokuk Steel Casting
		()	()	Tech-Ops 680/693 Projector		License No. 14-07206-01
		()	()			
		()	()			
		()	()			

(8) Additional training and experience description or comment:

(9) Mark Anderson determined compliance with 10 CFR 34.31 for the person named above by:
(Briefly describe test, on-the-job evaluation, etc. Written test copy may be attached.)

(10) Signed: Mark Anderson

Dennis Taylor

RADIOGRAPHERS ASSISTANTS QUIZ

PART I

True or False

True-False - 30%

Fill in - 50%

Discussion - 20%

83/10

1. Area access to a restricted area must be controlled by the license T.
2. An overdose of radiation can be felt immediately. F
3. A film badge need only be worn by the chief radiographer. F
4. A casting is considered as being radioactive after having been exposed to Co^{60} . F
5. 1 millirem is equal to .001 rems. T
6. Maximum permissible radiation in an unrestricted area is 2 millirems per hour. T
7. It is necessary to carry a survey meter each time you enter the X-Ray building. T
8. A gamma alarm is the only necessary meter for maintaining the source. F
9. A dosimeter is more sensitive to registering a dose than a film badge. T
10. The radiographic exposure device may be left unlocked while the radiographer is setting up a shot. F
11. Radiographers are required to have copies of the operating and emergency procedures. T
12. A radiographer's assistant may work unsupervised after he has completed his training. T only after licensed by A.R.C.
13. Film badge should be processed immediately if dosimeter reads off scale. F
14. It is necessary to mark radiation areas. T
15. In case of an emergency, notify the local police first. F

PART II

Discussion

person licensed by NRC
to perform radiography
unsupervised.
THE MAIN PERSON IN CHARGE
X-RAY

1. Define the following: Radiographer --

Radiographer's Assistant -- person who is in
TRAINING (by licensed Radiographer)

2. List two methods of personnel monitoring and give advantages of each.

Film badge - permanent record
dosimeter - instant reading
survive meter

3. Describe permissible levels of radiation in an unrestricted area.

2 millirems per hour

4. Under what conditions would you allow an untrained person to use the source?

you don't

5. Describe in your own words the step by step procedure you would use before entering the radiography room.

MAKE SURE SOURCE CRANKED IN & LOCKED
GREEN light ON
ALWAYS CARRY SURVIVE METER WHEN ENTERING

Survey room & source

PART III

This part of the exam is aimed at obtaining the general attitude of the man in respect to a radioactive source. We impress again the importance of the rules and regulations and inquire further by random questions his understanding of them. From a discussion of this time we feel that the sincerity of the man can be evaluated as part of his qualifications.

O.K.

M. Anderson 9-19-87

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It is hereby requested that Allan Nason be listed on License No. 14-07206-01 as a ~~XXXXXX~~ (name)

(2) Radiographer's Assistant. (Circle (1) or (2)). The training and experience of this individual consists of:

(3) PERIOD OF TRAINING OR EXPERIENCE (From) (To)		(4) POSITION HELD (1) (2)		(5) TYPE OF EQUIPMENT USED (Make & Model Number)	(6) TYPE AND AMOUNT OF ACTIVITY	(7) NAME OF EMPLOYER AND USAEC OR AGREEMENT STATE LICENSE NO.
(Mo.&Yr.)	(Mo.&Yr.)	()	()			
(See attachment)		()	()	Tech-Ops Model A-424-14	Co ⁶⁰ 60 Curies	Keokuk Steel Casting
		()	()	Tech-Ops 680/693 Projector		License No. 14-07206-01
		()	()			
		()	()			
		()	()			

(8) Additional training and experience description or comment:

(9) Mark Anderson determined compliance with 10 CFR 34.31 for the person named above by:
(Briefly describe test, on-the-job evaluation, etc. Written test copy may be attached.)

(10) Signed: Mark Anderson

RADIOGRAPHERS ASSISTANTS QUIZ

PART I

True or False

True-False-30%

Fill in - 50%

Discussion - 20%

9290

1. Area access to a restricted area must be controlled by the licensee T.
2. An overdose of radiation can be felt immediately. F
3. A film badge need only be worn by the chief radiographer. F
4. A casting is considered as being radioactive after having been exposed to Co^{60} . F
5. 1 millirem is equal to .001 rems. T
6. Maximum permissible radiation in an unrestricted area is 2 millirems per hour. T
7. It is necessary to carry a survey meter each time you enter the building. T
8. A gamma alarm is the only necessary meter for maintaining the source. F
9. A dosimeter is more sensitive to registering a dose than a film badge. F
10. The radiographic exposure device may be left unlocked while the radiographer is setting up a shot. F
11. Radiographers are required to have copies of the operating and emergency procedures. T
12. A radiographer's assistant may work unsupervised after he has completed his training. F
13. Film badge should be processed immediately if dosimeter reads off scale. T
14. It is necessary to mark radiation areas. T
15. In case of an emergency, notify the local police first. F

PART II

Discussion

1. Define the following: Radiographer -- An employee who has completed his training & able to work alone (licensed by N.R.C.)
Radiographer's Assistant -- An employee who has not completed his training & cannot work alone works under supervision of Radiographer
2. List two methods of personnel monitoring and give advantages of each.
dosimeter - instant readings
film badge - accurate readings - permanent record
3. Describe permissible levels of radiation in an unrestricted area.
2 m/hr
4. Under what conditions would you allow an untrained person to use the source? None
5. Describe in your own words the step by step procedure you would use before entering the radiography room.
① Make sure alarm is off
② Open door & survey room
③ Walk in & survey source box
Make sure source is in and locked

PART III

This part of the exam is aimed at obtaining the general attitude of the man in respect to a radioactive source. We impress again the importance of the rules and regulations and inquire further by random questions his understanding of them. From a discussion of this time we feel that the sincerity of the man can be evaluated as part of his qualifications.

OK.
M. Anderson 9-19-84

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It is hereby requested that Larry Pullins be listed on License No. 14-07206-01 as a (1) Radiographer
(name)

~~XXXXXXXXXXXXXXXXXXXXXXXXXXXX~~ (Circle (1) or (2)). The training and experience of this individual consists of:

(3) PERIOD OF TRAINING OR EXPERIENCE (From) (To)		(4) POSITION HELD (1) (2)		(5) TYPE OF EQUIPMENT USED (Make & Model Number)	(6) TYPE AND AMOUNT OF ACTIVITY	(7) NAME OF EMPLOYER AND USAEC OR AGREEMENT STATE LICENSE NO.
(Mo.&Yr.)	(Mo.&Yr.)	()	()			
(See attachment)		()	()	Tech-Ops Model A-424-14	Co ⁶⁰ 60 Curies	Keokuk Steel Casting
		()	()	Tech-Ops 680/693 Projector		License No. 14-07206-01
		()	()			
		()	()			
		()	()			

(8) Additional training and experience description or comment:

(9) Mark Anderson determined compliance with 10 CFR 34.31 for the person named above by:
(Briefly describe test, on-the-job evaluation, etc. Written test copy may be attached.)

(10) Signed: Mark Anderson

Larry Pullins

PREFACE SHEET FOR
EXAMINATIONS

A grade of at least 80% must be made in order to consider successful completion. The grades and records of the test shall be kept on file for inspection of the Commission.

Grading:

Part I - II - III	=	70	_____	64
Discussion	=	<u>30</u>	_____	<u>30</u>
100 Points				94%

PART I

True or False

1. Area access to a restricted area must be controlled by the licensee. T
2. Radiation means any or all of the following alpha rays, beta rays, gamma rays, X-rays, infrared rays, high speed electrons. T
3. The exposure rate seven feet from the source is twice as great as at a distance of fourteen feet. F
4. A gamma ray penetrates farther than an alpha or beta radiation. T
5. An overdose of radiation can be felt immediately. F
6. A "half value layer" concerns itself with shielding material. T
7. A film badge need only be worn by the Chief Radiographer. F
8. Iridium 192 requires heavier shielding than Cobalt 60. F
9. A casting is considered as radioactive after having been exposed to Co-60. F
10. A record must be kept showing that the source is secured at the end of the day. T
11. The term "half life" means the source deteriorates at a rate equal to one half of its original strength for every half life period. T ✓
12. 1 millirem is equal to .001 rems. T
13. A dose of 5 rems is permitted for each calendar quarter. F
14. Maximum permissible radiation in an unrestricted area is 2 millirems per hour. T
15. It is necessary to mark radiation areas. T
16. Records of individuals' exposure ~~are~~ kept and may be obtained at any time. T
17. A radioactive source of Co-60 may be purchased without an AEC license. F
18. It is necessary to carry a survey meter each time you enter the building. T

19. A gamma alarm is the only necessary meter for maintaining the source. F
20. A dosimeter is more/sensitive to registering dose than a film badge. T ✓
21. Radiographic exposure device may be left unlocked while the Radiographer is setting up a shot. F
22. Leak test shall be conducted every six months. T
23. Film badge should be processed immediately if pocket dosimeter reads off scale. T
24. A thorough survey around the building is required every day. F
25. Records of building surveys must be maintained for inspection by the Commission. T
26. Inventory of sources shall be completed quarterly. T
27. Radiographers are required to have copies of the Operating and Emergency procedures. T
28. Instrument radiation readings take precedence over calculated radiation. T
29. A Radiographer's Assistant may work unsupervised after he has completed his training. F
30. In case of any emergency, notify the local police first. F

PART II

DISCUSSION

- 1. Define the following: Radiographer - *PERSON QUALIFIED & LICENSED TO OPERATE RADIOGRAPHY EQUIP.*
Radiographer's Assistant - *PERSON USING RADIOGRAPHY EQUIP UNDER DIRECT SUPERVISION OF QUALIFIED RADIOGRAPHER*
- 2. List two methods of personnel monitoring and give advantages of each. *FILM BADGE - GIVES PERMANENT RECORD -*
POCKET DOSIMETER - GIVES IMMEDIATE READING
- 3. Describe permissible levels of radiation in unrestricted areas. *LESS THAN 2 MREM IN ANY 1 HOUR OR 100 MREM IN ANY 7 CONSECUTIVE DAYS*
4. Describe the steps you would take in order if it were discovered that the source had not been returned to the container but was loose somewhere in the cable. *1. BE SURE SHOOTING ROOM DOOR IS LOCKED AND SECURE 2. SECURE CONTROL BOX 3. NOTIFY RADIATION SAFETY OFFICER*
- 5. Under what conditions would you allow an untrained person to use the source. *NONE*
6. What radiation level would be calculated at a distance of 40 feet from a 10 Curie source of Co-60? *90.6 MREM*
7. Would shielding be required at this distance to reduce the radiation to less than 2 mrh? If so, what thickness of lead would be required? *YES 6 INCH 6.49" = 2.94" OF LEAD*
8. How many daily records are required to be kept? *DOSIMETER RECORD, SOURCE SECURE LOG*
9. A person had been working in a radiation area for 8 hours. During this time the radiation level had been 10 mrh for 3 hours, 5 mrh for 3 hours and 20 mrh for 2 hours. What would be the calculated total dosage for this man? *85 MREM (.085 REM)*
10. What precautions should be taken in regard to storage of the source? *1. SURVEY CAMERA, GUIDETUBE, TO INSURE SOURCE IS SECURE IN CAMERA 2. LOCK & SECURE SHOOTING ROOM 3. LOCK CONTROL BOX*
Disconnect control cable also
- 11. Describe in your own words the step by step procedure you would use before entering the Radiography Room. *(1) CHECK CONTROL CABLE TOWARD ALL THE WAY "IN" & BOX LOCKED (2) CHECK GAMMA ALARM SHOWING GREEN (3) CHECK SURVEY METER ZEROED (4) SURVEY IN ROOM BEFORE ENTERING (5) CONTINUE SURVEY AS YOU ENTER ROOM*
12. If the position lights were out on the remote control unit and the gamma alarm showed red, what steps would you take to determine whether or not the source was properly secured or not?
1. MAKE SURE CONTROL CABLE IS TOWARD ALL THE WAY "IN"
2. SURVEY IN ROOM BEFORE ENTERING
3. SURVEY AS DOOR IS OPENED, IF SURVEY METER READING IS LOW, CONTINUE FORWARD INTO ROOM, MAINTAINING SURVEY
4. IF SURVEY READING DOES NOT INCREASE, CONTINUE SURVEY TOWARD CAMERA & GUIDETUBE.
5. IF SURVEY READING DOES NOT INCREASE DURING SURVEY OF GUIDETUBE & CAMERA, SOURCE IS IN SECURE POSITION IN CAMERA

PART III

FILL INS

1. A microcurie is equal to .000001 curies.
2. One curie is equal to 37 Billion dps.
3. Maximum permissible dosage to a Radiographer in a restricted area is 3 REM ☒ 1/4 per quarter.
4. Survey meters shall be calibrated every 3 MONTHS.
5. Utilization logs shall be completed every DAY.
6. One rem is equal to 1000 mrem.
7. Film badges are to be processed every MONTH.
8. Radiation safety requirements for Radiographic operations are contained in Part 20 of the Federal regulations.
9. Licensing of by-product material is contained in part 30 of Federal regulations.
10. The leak test shall be capable of detecting the presence of .005 micro curies of removable contamination of the sealed source.

PART IV
ORAL DISCUSSION

This part of the exam is aimed at obtaining the general attitude of the man in respect to a radioactive source. We impress again the importance of the rules and regulations and inquire further by random questions his understanding of them. From a discussion of this type we feel that the sincerity of the man can be evaluated and that his is certainly a part of his qualifications.

Discussion O.K.

M. Anderson 6-25-84

CONTROL NO. 77926