

BRAUNSM
INTERTEC

71-0592
Braun Intertec Engineering, Inc.
6801 Washington Avenue South
P.O. Box 39108
Minneapolis, Minnesota 55439-0108
612-941-5600 Fax: 941-4151

*Engineers and Scientists Serving
the Built and Natural Environments*

April 16, 1991

Mr. Len Gordon
U.S. Nuclear Regulatory Commission
Transportation Branch
Division of Safeguards and Transportation
Washington, DC 20555

Dear Len Gordon,

In accordance with your request we are re-submitting our Quality Assurance program for your review.

The Quality Assurance program has been extensively incorporated into our material license. Rather than send fragmented parts I have included the entire License Agreement.

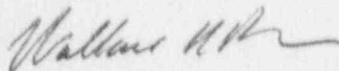
Since our last program was approved in 1985 the changes are as follows:

1. Corporate name change: see explanation on letter dated March 7, 1991
2. Change in Radiation Safety Officer: see letter dated March 7, 1991
3. Change in the License Agreement as noted: see attached license

It is my belief that there are no substantive changes in the previously approved Quality Assurance Manual.

If you have any question, comments, or concerns, please contact me at 1-800-279-2362 ext 4856

Sincerely



Wallace H. Rosier
Radiation Safety Officer

whr:jka

Attachments:

1. Letter to NRC dated April 16, 1991
2. Letter to NRC dated March 7, 1991
3. NRC License 22-16537-02

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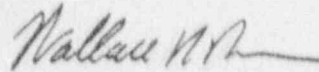
Dear Lynn Gordon,

RE: Quality Assurance Program 0592 for Radioactive Material, License No. 22-16537-02

In response to recent correspondence, we are submitting a \$180.00 fee and copies of the Quality Assurance Program for material License Number 22-16537-02.

If you have any questions comments or concerns, please contact me at telephone number 1-800-279-2362, ext. 4856.

Sincerely



Wallace H. Rosier
Radiation Safety Officer

whr:jka

Attachments:
Check for \$180.00
Quality Assurance Manual Part A (attachment #1)
Quality Assurance Manual Part B (attachment #2)

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~~9104220200~~

Attachment #1
Page 1 of 8

BRAUN INTERTEC ENGINEERING TESTING, INC.
Radiation Safety Quality Assurance Manual Part "A"
Radiation Safety Training

Revision#	Revised by	Description	RSO	NDT Dept. Manager
1	WHR	Name change, pronoun change, add ASNT IRRSP and Texas Bureau of Radiation		

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Attachment #1
Page 2 of 8

TRAINING PROGRAM

I. Radiographer

All individuals qualifying as a Radiographer with previous radiographer's certifications will meet the following criteria.

- 1) Show evidence of previous radiographers certification.
- 2) Will receive copies of the Operating Emergency manual and parts 19, 20, and 34 of the NRC Rules and Regulations Title 10, Chapter 1, United States Nuclear Regulatory Commission Rules and Regulations. They shall receive personal instructions and the specifics of the Operating and Emergency Manual.
- 3) Will receive equipment demonstrations and perform hands-on operation of exposure equipment, survey meters, and dosimetry use.
- 4) Will review transportation requirements for radioactive materials.
- 5) Will receive information regarding biological affects of radiation which may include text books, reference materials, video tapes, or personal instruction.
- 6) Will be required to pass a radiographers radiation safety test. A minimum score of 80% will be required.
- 7) Evidence of previous radiation safety training such as Hutchinson Vo-Tech Institute or other vocations, nuclear plant or company programs may be considered acceptable radiation safety training as described in item 5. If so, the individual must only pass the radiation safety test, review Operating and Emergency procedures, and show the proper use of exposure devices and other radio safety equipment.
- 8) If an individual has a valid American Society for Nondestructive Testing Industrial Radiographers Radiation Safety Program or The State of Texas, Bureau of Radiation Control card that individual will be required to:
 - A.) Receive instruction on the specifics of Braun's Operating and Emergency Manual
 - B.) Pass a Radiographers Safety exam with a minimum score of 80%.

Attachment #1
Page 3 of 8

- C.) Provide documentation of previous Radiographers Qualifications.
- D.) Receive equipment demonstrations and perform hands-on operation on Braun equipment. Equipment is to include cameras, controls, radiation survey and dosimetry.

If the individual fails the radiation safety test, they must fulfill all the requirements as stated above and retake the test.

- 9) If no previous evidence of radiation safety courses were provided for the individual, they shall complete the training course as outlined on the attached sheet. A minimum of 40 hours of radiation safety training must be documented. The specific amount of time will be dependent on the individuals knowledge and the opinion of the radiation safety officer.

II. Requirements for Radiographers Assistant to qualify as a Radiographer.

- 1) Will receive copies of the Operating Emergency Manual and parts 19, 20, and 34 of the NRC Rules and Regulations Title 10, Chapter 1 for review. They shall receive personal instructions on the specifics of the Operating and Emergency Manual.
- 2) Will receive equipment familiarization and performed demonstrations on correct procedures for the operation of exposure equipment, survey meters, and dosimetry.
- 3) Will review information regarding biological affects which may include text books, reference materials, video tapes, or personal instruction.
- 4) Will be required to pass a radiographer radiation safety test. A minimum score of 80% will be required.
- 5) Evidence of previous radiation safety training such as Hutchinson Vo-Tech Institute or other vocational, nuclear plant or company programs may meet the requirements of item 3 above. If so, the individual must only pass the radiation safety test, review Operating and Emergency Manual, and demonstrate the proper use of exposure devices and other equipment. If the individual fails the radiation safety test, they must fulfill all the requirements as stated in items 1 through 6 and then retake the test.

Attachment #1
Page 4 of 8

- 6) Documented safety training during the previous year and/or previous radiation safety training such as Hutchinson Vo-Tech or other vocational, nuclear plant or company radiation safety programs may be substituted for the time requirements for the radiation safety training program as outlined in the attachment. A minimum of 40 hours of radiation safety training must be documented.
- 7) After a minimum of 6 months on-the-job training, and passing a practical examination with a score of 70% or better, an individual may act as a radiographer.

III. Radiographers Assistant

All radiographers assistants will meet the following requirements.

- 1) Will receive copies of the Operating Emergency Manual and parts 19, 20, and 34 of the NRC Rules and Regulations Title 10, Chapter 1, United States Nuclear Regulatory Commission Rules and Regulations. They shall receive specific instructions regarding the Operating and Emergency Manuals.
- 2) Will receive demonstrations of exposure equipments, survey meters, and dosimetry. They will demonstrate correct procedures for equipment set-ups and proper use.
- 3) They will receive information regarding the biological effects of radiation, which may include text books, reference materials, video tapes or personal instruction.
- 4) Will be required to pass a radiographer assistant radiation safety test. A minimum score of 70% will be required.
- 5) Evidence of previous radiation safety training such as Hutchinson Vo-Tech Institute or other vocational, nuclear plant or company programs may meet the requirements of item 3. If so, the individual must only pass the radiographers assistants radiation safety test and comply with items 1, 2, 4, and 5. If the individual fails the radiation safety test, they must fulfill all the requirements as stated above plus they shall receive a minimum of 8 hours to a maximum of 20 hours radiation safety training as indicated in the attached outline. The specific amount of time will be dependent upon the individuals knowledge and the opinion of the radiation safety officer. A minimum of 40 hours of radiation safety training must be documented.

Attachment #1
Page 5 of 8

- 6) If an individual has a valid American Society for Nondestructive Testing Industrial Radiographers Radiation Safety Program card that individual will be required to:
 - A.) Receive instruction on the specifics of Braun's Operating and Emergency Manual
 - B.) Pass a Radiographers Safety exam with a minimum score of 80%.
 - C.) Provide documentation of previous Radiographers Qualifications.
 - D.) Receive equipment demonstrations and perform hands-on operation on Braun equipment. Equipment is to be cameras, controls, radiation survey and dosimetry.

PERIODIC REQUIREMENTS FOR RETRAINING
RADIOGRAPHERS AND RADIOGRAPHERS ASSISTANTS

1. Once each calendar year, all radiographic personnel shall show evidence of continued education of the following areas:
 - A) Review new and current regulations procedures policies concerning the use of radioactive materials.
 - B) Transportation requirements.
 - C) General review of radiographic operation and field problems
 - D) General discussions of field situations and set-ups.
 - E) Demonstrate proficiency in the handling of equipment per approved procedures and guidelines.
 - F) If an individual has a valid American Society for Nondestructive Testing Industrial Radiographers Radiation Safety Program or The State of Texas, Bureau of Radiation control card they will only have to satisfy the requirements stated above.

Attachment #1
Page 6 of 8

RADIATION SAFETY TRAINING OUTLINE

1. Introduction
 - 1.1 History of industrial radiography
 - 1.2 Principals of examination of materials with penetrating radiation
 - 1.3 Comparison with other types of NDT 2.0 hours
2. Physical Principles
 - 2.1 Nature of penetrating radiation
 - 2.2 Electrical theory of matter
 - 2.3 Electromagnetic waves
 - 2.4 Wave Properties 2.0 hours
 - 2.5 Sources of radiation and levels of radiation
 - a) X-ray equipment (briefly)
 - b) Isotopic (detailed)
 - c) Other (briefly)
3. Interaction between penetrating radiation and matter
 - 3.1 Absorption
 - 3.2 Scatter
 - 3.3 Secondary emission 2.0 hours
4. Isotopic Sources
 - 4.1 Method of producing
 - 4.2 Types
 - 4.3 Spectra
 - 4.4 Activity including self absorption
 - 4.5 Basic handling techniques 2.0 hours
 - 4.6 Beta, Alpha and Bhremstralung
5. Mathematics
 - 5.1 Inverse Square Law
 - 5.2 Application of the Inverse Square Law for determination of the extent of radiation areas and exposure techniques 2.0 hours
6. Radiometry
 - 6.1 Types and application of survey meters
 - 6.2 Ccnstruction and reliability of survey meters
 - 6.3 Use and care of survey meters
 - 6.4 Calibration of survey meters 2.0 hours

Attachment #1
Page 7 of 8

- 7. NRC Regulations
 - 7.1 Operating procedures 4.0 hours
- 8. NRC Regulations
 - 8.1 Emergency procedures 4.0 hours
- 9. Personnel safety and radiation protection
 - 9.1 Hazards of excessive radiation
 - 9.1.1 Biological effects of radiation
 - 9.2 Methods of controlling radiation dose 4.0 hours
 - 9.2.1 Time
 - 9.2.2 Distance
 - 9.2.3 Shielding
 - 9.2.4 Half value layer
 - 9.2.5 Reduction factors
 - 9.2.6 Exposure rates
- 10. Departmental equipment and its use
 - 10.1 Handling devices 8.0 hours
 - 10.1.1 Maintenance
 - 10.2 Ropes, signs
 - 10.3 Use of beam collimator
 - 10.4 Shields
 - 10.5 Survey meters
 - 10.6 Exposure device and sealed sources
 - 10.7 Storage containers
- 11. General review for clarification of critical areas pertaining to isotopes and their use. 1.0 hours
- 12. Survey techniques
 - 12.1 Method of surveying
 - 12.2 Method of determining radiation areas 1.0 hours
 - 12.3 Establishment of perimeters
 - 12.4 Occasions for conducting radiation surveys, security, and posting
- 13. Personnel monitoring
 - 13.1 Film badge 1.0 hours
 - 13.2 Dosimeters
 - 13.3 Pocket chambers

Attachment #1
Page 8 of 8

- | | | |
|-----|---|-----------|
| 14. | Quantity of radioactivity | .5 hours |
| | 14.1 Curie | |
| 15. | Units of radiation dose | |
| | 15.1 Rem and Mrem | .5 hours |
| | 15.2 Roentgen and mr dose rate | |
| 16. | Requirements of pertinent Federal Regulations | 1.0 hours |
| 17. | Documentation | |
| | 17.1 Quarterly inventories | 1.0 hours |
| | 17.2 Utilization logs | |
| | 17.3 Recordkeeping | |
| 18. | Review | 2.0 hours |
| | Case Histories/Accidents | |

Attachment #2
Page 1 of 3

BRAUN INTERTEC ENGINEERING TESTING, INC.
Radiation Safety Quality Assurance Manual "B"
Radiation Safety Audit Program

Revision#	Revised by	Description	RSO	NDT Dept. Manager
1	WHR	Name Change, change radiographic audit form to include Audible Alarming Ratemeter		

Attachment #2
Page 2 of 3

Internal Inspection System for Radiography

1.0 Scope

- 1.1 The document shall describe the requirements for auditing to verify compliance with license requirements for radiography.

2.0 Personnel

- 2.1 The Radiation Safety Officer (RSO) is responsible for the planning, execution, and resolution of audits.
- 2.2 The RSO may designate another qualified individual to perform specific audit functions in accordance with written procedures and checklist.
- 2.3 Personnel involved in audit functions shall be objectively removed from the production responsibility of that activity being audited.

3.0 Application

- 3.1 Periodic audits shall be performed as shown on the "Periodic Audit Schedule".
- 3.2 Random audits shall be performed as indicated by conditions.
- 3.3 Audits shall be performed to and documented on written checklists for each activity.
- 3.4 Non Compliances shall be noted on the checklist and also on a "Nonconformance Corrective Action" report.
- 3.5 Resolution of audits shall be performed by the RSO as indicated by findings.

4.0 Attachments

- 4.1 Attachments to this document may be revised as deemed necessary by the RSO without changing the revision level of this document, in so far as there is no lessening of the stringency of audit requirements.
- 4.2 Attachments to this document shall include:
 - a. Periodic Audit Schedule
 - b. Audit checklist

Attachment #2
Page 3 of 3

PERIODIC AUDIT SCHEDULE

I. Personnel

- a. Documentation of qualification - yearly
- b. Performance - quarterly
- c. Personnel dosimetry reports - quarterly

II. Equipment

- a. Documentation of inventories, logs, records, surveys
- quarterly
- b. Inventory of sources - quarterly