Approved by OMB[1]
No. 3150-0183
Expires 11/30/2013

INTEGRATED MATERIALS PERFORMANCE EVALUATION PROGRAM
QUESTIONNAIRE

Iowa
Reporting Period: September 15, 2007 to August 10, 2012

Note: If there has been no change in the response to a specific question since the last IMPEP questionnaire, the State or Region may copy the previous answer, if appropriate.

A. GENERAL

1. Please prepare a summary of the status of the State's or Region's actions taken in response to each of the open recommendations from previous IMPEP reviews.

The 2007 State of Iowa IMPEP Review Team identified one recommendation that required State response. *"The review team recommends that the State evaluate their decommissioning financial assurance program to identify and secure original financial assurance documentation from current and future licensees who are required to comply with Iowa's financial assurance requirements."*

Bureau of Radiological Health staff have identified and secured original Statements of Intent for the University of Iowa (Iowa RAM license 0037-1-52-AAB) and Iowa State University (Iowa RAM license 0014-1-85-AAB). In addition, staff have identified and secured a Decommissioning Trust Agreement with Tjaden Biosciences, LLC (Iowa RAM license 0344-1-29-MD) and Fansteel/Wellman Dynamics Corporation (Iowa RAM license 0103-1-88-SM1). These original documents are stored in a fireproof safe in the office of the Bureau Chief. Bureau staff utilizes license conditions and restrictions on the amount of material that licensees may possess to eliminate financial assurance requirements for all remaining licensees. Bureau checklists for licensing actions specifically address financial assurance requirements.

B. COMMON PERFORMANCE INDICATORS

I. Technical Staffing and Training

2. Please provide the following organization charts, including names and positions:

(a) A chart showing positions from the Governor down to the Radiation Control Program Director;

[1] Estimated burden per response to comply with this voluntary collection request: 53 hours. Forward comments regarding burden estimate to the Records Management Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0183), Office of Management and Budget, Washington, DC 20503. If an information collection does not display a currently valid OMB control number, NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

See attached PDF organizational chart.

(b) A chart showing positions of the radiation control program, including management; and

See attached PDF organizational chart.

(c) Equivalent charts for sealed source and device evaluation, low-level radioactive waste and uranium recovery programs, if applicable.

Not applicable for the State of Iowa.

3. Please provide a staffing plan, or complete a listing using the suggested format below, of the professional (technical) full-time equivalents (FTE) applied to the radioactive materials program by individual. Include the name, position, and, for Agreement States, the fraction of time spent in the following areas: administration, materials licensing & compliance, emergency response, low-level radioactive waste, uranium recovery, other. If these regulatory responsibilities are divided between offices, the table should be consolidated to include all personnel contributing to the radioactive materials program. If consultants were used to carry out the program's radioactive materials responsibilities, include their efforts. The table heading should be:

NAME	POSITION	AREA OF EFFORT	FTE%	EXPERIENCE
Melanie Rasmusson	Chief	Administration	30%	5.5 years
Randal Dahlin	Health Physicist 3	Materials Licensing & Compliance	80%	10 years
Randal Dahlin	Health Physicist 3	Emergency Response	20%	10 years
Leo Wardrobe	Health Physicist 2	Materials Licensing, Compliance & Training	90%	5 months
Leo Wardrobe	Health Physicist 2	Emergency Response	10%	5 months
Angela Leek	Health Physicist 3	Emergency Response	5%	7 years
Kellee Kemp	Health Physicist 2	Emergency Response	5%	11 years
David Myers	Health Physicist 2	Emergency Response	5%	33 years
Tonya Osman	Clerk Specialist	Licensing Assistant	95%	8 months
Tonya Osman	Clerk Specialist	Emergency Response	5%	8 months
Renae Kleffman	Secretary 2	Emergency Response	5%	13 years

4. Please provide a listing of all new professional personnel hired into your radioactive materials program since the last review, indicate the date of hire; the degree(s) they received, if applicable; additional training; and years of experience in health physics or other disciplines, as appropriate.

Leonardo F. Wardrobe, Health Physicist 2, hire date March 2, 2012.
Graduated Magna Cum Laude from the University of Findlay with a Bachelor of

Science in Environmental Management.
Successfully passed the National Registry of Radiological Protection Technologists Exam. Four years experience as a Radiological Controls Supervisor and seven years experience as Senior Radiological Controls Technician covering various demolition jobs. Experience with numerous types of radiological detection and contamination survey equipment as a NDA Analyst/Engineer, as a Sr. RCT and a Field Service Engineer with Canberra Industries. Six years in the US Navy serving on board a nuclear submarine as an Electrical/Shutdown Reactor Operator.

5. Please list all professional staff who have not yet met the qualification requirements for a radioactive materials license reviewer or inspector. For each, list the courses or equivalent training/experience they need and a tentative schedule for completion of these requirements.

Leonardo F. Wardrobe, HP2

<u>Attended</u>:
NRC Materials Control & Security Systems & Principles (S-201) May 7 – 11, 2012
Transportation of Radioactive Material (H-308) June 25 – 29, 2012

<u>Submitted applications for the following:</u>
Diagnostic & Therapeutic Nuclear Medicine (H-304) August 6 – 10, 2012
Brachytherapy, Gamma Knife & Emerging Technologies (H-313) August 13 – 17, 2012
Safety Aspects of Industrial Radiography (H-305) October 15 – 19, 2012
Inspection Procedures (G-108) October 22 – 26, 2012
Licensing Procedures (G-109) November 5 – 9, 2012

Additional courses will be applied for in 2013 when the training schedule is published. It is expected that Mr. Wardrobe will be a fully qualified inspector and reviewer by the end of 2013.

6. Identify any changes to your qualification and training procedure that occurred during the review period.

Re-wrote the Inspector Qualification Journal to make it all inclusive for a Radioactive Materials Program Health Physicist. The new Health Physicist Qualification Journal is attached.

7. Please identify the technical staff that left your radioactive materials program during the review period and indicate the date they left.

Nancy A. Farrington, HP2, retired June 30, 2011
Jacob Crawford, HP1, resigned May 9, 2011

8. List any vacant positions in your radioactive materials program, the length of time each position has been vacant, and a brief summary of efforts to fill the vacancy.

Health Physicist 1, vacant since May 9, 2011 – It is the intent of the Bureau to request permission to post this position in the fall of 2012.

9. For Agreement States, does your program have an oversight board or committee which provides direction to the program and is composed of licensees and/or members of the public? If so, please describe the procedures used to avoid any potential conflict of interest.

No

II. Status of Materials Inspection Program

10. Please identify individual licensees or categories of licensees the State is inspecting less frequently than called for in NRC's Inspection Manual Chapter (IMC) 2800 and explain the reason for the difference. The list only needs to include the following information: license category or licensee name and license number, your inspection interval, and rationale for the difference.

The State is not inspecting any licensee less frequently than called for in NRC's Inspection Manual Chapter (IMC) 2800. It is the intent of the Bureau, after the Radioactive Materials Program is fully staffed, to have no inspection frequency greater than three years.

11. Please provide the number of routine inspections of Priority 1, 2, and 3 licensees, as defined in IMC 2800 and the number of initial inspections that were completed during each year of the review period.

Inspection Type	Number Completed
Priority 1	**29**
Priority 2	**62**
Priority 3	**56**
Initial	**16 (two additional inspections scheduled after IMPEP review)**

12. Please submit a table, or a computer printout, that identifies inspections of Priority 1, 2, and 3 licensees and initial inspections that were conducted overdue.

Not applicable. The State of Iowa does not have nor have we had any overdue inspections during this review period.

At a minimum, the list should include the following information for each inspection that was conducted overdue during the review period:

(1) Licensee Name
(2) License Number
(3) Priority (IMC 2800)
(4) Last inspection date or license issuance date, if initial inspection
(5) Date Due
(6) Date Performed
(7) Amount of Time Overdue
(8) Date inspection findings issued

13. Please submit a table or computer printout that identifies any Priority 1, 2, and 3 licensees

and initial inspections that are currently overdue, per IMC 2800. At a minimum, the list should include the same information for each overdue inspection provided for Question 12 plus your action plan for completing the inspection. Also include your plan for completing the overdue inspections.

Not applicable.

14. Please provide the number of reciprocity licensees that were candidates for inspection per year as described in IMC 1220 and indicate the number of reciprocity inspections of candidate licensees that were completed each year during the review period.

Year	Candidates for Inspection		Inspected	
September 15, 2007 to year end	Priority 1, 2 or 3: All others:	9 13	Priority 1, 2 or 3: All others:	2 2
2008	Priority 1, 2 or 3: All others:	11 23	Priority 1, 2 or 3: All others:	6 2
2009	Priority 1, 2 or 3: All others:	7 24	Priority 1, 2 or 3: All others:	4 5
2010	Priority 1, 2 or 3: All others:	12 26	Priority 1, 2 or 3: All others:	1 0
2011	Priority 1, 2 or 3: All others:	10 31	Priority 1, 2 or 3: All others:	3 0
2012 year to date	Priority 1, 2 or 3: All others:	3 11	Priority 1, 2 or 3: All others:	1 1

III. Technical Quality of Inspections

15. What, if any, changes were made to your written inspection procedures during the reporting period?

No changes were made during the reporting period.

16. Prepare a table showing the number and types of supervisory accompaniments made during the review period. Include:

Inspector	Supervisor	License Category	Date
Randal Dahlin	Melanie Rasmusson	High Dose Rate Afterloader	5/28/08
Nancy Farrington	Melanie Rasmusson	Research & Development	8/4/08
Randal Dahlin	Melanie Rasmusson	Portable Gauge	6/26/09
Nancy Farrington	Melanie Rasmusson	Nuclear Pharmacy	8/4/09
Randal Dahlin	Melanie Rasmusson	Medical - Diagnostic Only	6/15/10
Nancy Farrington	Melanie Rasmusson	Research & Development	12/1/10
Randal Dahlin	Melanie Rasmusson	Research & Development	11/16/11

It is Bureau policy that each inspector be accompanied by another qualified inspector twice each year. An attempt is made to have one of these accompaniments occur at a licensee under the increased controls for security.

17. Describe or provide an update on your instrumentation, methods of calibration, and laboratory capabilities. Are all instruments properly calibrated at the present time? Were there sufficient calibrated instruments available throughout the review period?

The Bureau maintains Ludlum, model 2241-3; Ludlum, model 2241-2; Canberra, Ultra Radiacs; and Canberra, model MCB2 radiation detection equipment that is calibrated at six month intervals by the Iowa Homeland Security/Emergency Management Division (Iowa RAM license number 0141-1-77-CD) calibration shop. BRH possesses a Ludlum, model 12-4 "REM Ball" that is returned to Ludlum when calibration is required. BRH also possesses a Thermo Electron isotope identifier and a Canberra, Inspector1000 identifier. All instruments are properly calibrated and the Bureau has had sufficient calibrated instruments throughout the review period.

IV. Technical Quality of Licensing Actions

18. How many specific radioactive material licenses does your program regulate at this time?

The Bureau currently regulates 168 specific radioactive material licenses.

19. Please identify any major, unusual, or complex licenses which were issued, received a major amendment, were terminated, decommissioned, submitted a bankruptcy notification or renewed in this period.

Not applicable.

20. Discuss any variances in licensing policies and procedures or exemptions from the regulations granted during the review period.

Not applicable.

21. What, if any, changes were made in your written licensing procedures (new procedures, updates, policy memoranda, etc.) during the reporting period?

The Bureau fully implemented the Pre-Licensing guidance checklist for all new licenses, renewals and licensees requesting to amend their license for quantities of material exceeding the category 2 thresholds. This has included several pre-licensing visits to applicants that are not known entities.

22. Identify by licensee name and license number any renewal applications that have been pending for one year or more. Please indicate why these reviews have been delayed and describe your action plan to reduce the backlog.

Not applicable.

V. Technical Quality of Incident and Allegation Activities

23. For Agreement States, please provide a list of any reportable incidents not previously submitted to NRC (See Procedure SA-300, *Reporting Material Events*, for additional guidance, OMB clearance number 3150-0178). The list should be in the following format:

All incidents during this reporting period were reported to the NRC via the NRC Operations Center when required or directly to NMED.

24. Identify any changes to your procedures for responding to incidents and allegations that occurred during the period of this review.

Not applicable, no changes have occurred.

C. NON-COMMON PERFORMANCE INDICATORS

I. Compatibility Requirements

25. Please list all currently effective legislation that affects the radiation control program. Denote any legislation that was enacted or amended during the review period.

Iowa Code (IC) Chapters 17A, 136B, 136C, and 136D.

IC Chapters 136C.3 subsection 5, 136C.8, 136C.14 subsection 2, 136D.2 subsections 4 and 5, 136D.8 and 136D.9 were amended per House File 2464 during the 2012 legislative session. The purpose of the amendments was to clean up existing language to reflect modern terms and current practice.

26. Are your regulations subject to a "Sunset" or equivalent law? If so, explain and include the next expiration date for your regulations.

No

27. Please review and verify that the information in the enclosed State Regulation Status (SRS) sheet is correct. For those regulations that have not been adopted by the State, explain why they were not adopted, and discuss actions being taken to adopt them. If legally binding requirements were used in lieu of regulations and they have not been reviewed by NRC for compatibility, please describe their use.

All required regulations through RATS ID 2009-1 have been adopted. RATS ID 2011-1 is due for state adoption 12-17-2015; 2011-2 is due 11-14-2014; and 2012-1 is due 1-25-2015.

28. If you have not adopted all amendments within three years from the date of NRC rule promulgation, briefly describe your State's procedures for amending regulations in order to maintain compatibility with the NRC, showing the normal length of time anticipated to complete each step.

Not applicable.

II. Sealed Source and Device (SS&D) Evaluation Program

This section is not applicable to the Iowa Agreement State Program.

29. Prepare a table listing new and amended (including transfers to inactive status) SS&D registrations of sources and devices issued during the review period. The table heading should be:

SS&D Registry Number	Manufacturer, Distributor or Custom User	Product Type or Use	Date Issued	Type of Action

30. Please include information on the following questions in Section A, as they apply to the SS&D Program:

Technical Staffing and Training - Questions 2-9
Technical Quality of Licensing Actions - Questions 18-22
Technical Quality of Incident and Allegation Activities - Questions 23-24

III. Low-level Radioactive Waste Disposal Program

This section is not applicable to the Iowa Agreement State Program.

31. Please include information on the following questions in Section A, as they apply to the Low-Level Radioactive Waste Disposal Program:

Technical Staffing and Training - Questions 2-9
Status of Materials Inspection Program - Questions 10-14
Technical Quality of Inspections - Questions 15-17
Technical Quality of Licensing Actions - Questions 18-22
Technical Quality of Incident and Allegation Activities - Questions 23-24

IV. Uranium Recovery Program

This section is not applicable to the Iowa Agreement State Program.

32. Please include information on the following questions in Section A, as they apply to the Uranium Recovery Program:

Technical Staffing and Training - Questions 2-9
Status of Materials Inspection Program - Questions 10-14
Technical Quality of Inspections - Questions 15-17
Technical Quality of Licensing Actions - Questions 18-22
Technical Quality of Incident and Allegation Activities - Questions 23-24

MATERIALS REQUESTED TO BE AVAILABLE FOR
THE ON-SITE PORTION OF AN IMPEP REVIEW

Please have the following information available for use by the IMPEP review team when they arrive at your office:

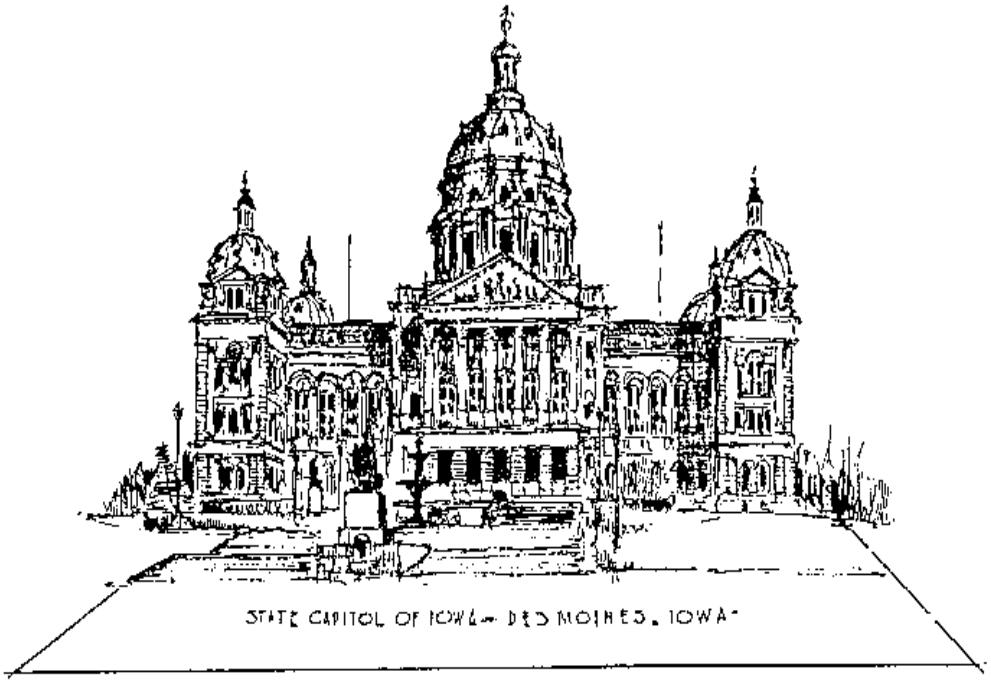
- List of open license cases, with date of original request, and dates of follow-up actions.
- List of licenses terminated during review period.
- Copy of current log or other document used to track licensing actions.
- List of all licensing actions completed during the review period (sorted by license reviewer, if possible).
- Copy of current log or other document used to track inspections.
- List of all inspections completed during the review period (sorted by inspector, if possible).
- List of inspection frequencies by license type.
- List of all allegations occurring during the review period. Show whether the allegation is open or closed and whether it was referred by NRC.
- List of all licenses that your agency has imposed additional security requirements upon.

ALSO, PLEASE HAVE THE FOLLOWING DOCUMENTS AVAILABLE:

- All State regulations
- Statutes affecting the regulatory authority of the State program
- Standard license conditions
- Technical procedures for licensing, model licenses, review guides
- SS&D review procedures, guides, and standards
- Instrument calibration records
- Inspection procedures and guides
- Inspection report forms
- Documented training plan, if applicable
- Records of results of supervisory accompaniments of inspectors
- Emergency plan and communications list
- Procedures for investigating allegations
- Procedures for investigating incidents
- Enforcement procedures, including procedures for escalated enforcement, severity levels, civil penalties (as applicable)
- Job descriptions

IOWA DEPARTMENT OF PUBLIC HEALTH
BUREAU OF RADIOLOGICAL HEALTH
RADIOACTIVE MATERIALS PROGRAM

HEALTH PHYSICIST QUALIFICATION JOURNAL



Iowa Department of Public Health
Bureau of Radiological Health
Radioactive Materials Program
Lucas State Office Building
Des Moines, Iowa 50319-0075

Table of Contents

Health Physicist
Qualification Journal

Employee:

Welcome. During your training, you will be participating in a structured program that will include both formal training courses at locations throughout the United States as well as on-the-job training at your office in Des Moines, IA and throughout the State of Iowa.

The scheduling of formal training courses is based on availability of resources and the number Agreement State personnel throughout the United States needing this training. As a result, the dates of an individual's participation in these courses cannot be determined very far in advance.

The remainder of the training program, which will lead to your qualification as a health physicist, involves activities, which are under your control. The rate at which you complete these tasks and have them documented in your qualification journal will determine how soon you will be certified as a qualified health physicist. Once you have been certified you will be able to conduct full inspections of licensees throughout the State of Iowa and conduct independent licensing actions.

Although completion of this program requires significant self-study and independent effort, be aware your supervisor and peers are available to answer questions and provide guidance. This applies particularly to matters involving policy or interpretation of regulatory requirements.

The staff is looking forward to working closely with you and encourages you to call upon us for help at any time. We are also looking forward to your becoming a fully qualified health physicist in the Iowa Department of Health, Bureau of Radiological Health.

_____ _____

Date

Melanie Rasmusson, Chief
Bureau of Radiological Health

I have received a copy of and reviewed the Inspection Manual, the Enforcement Manual, and the Health Physicist Qualification Journal. I understand the contents of these manuals and have had the opportunity to have any questions answered by qualified staff. I acknowledge that these are the property of the State of Iowa and will return them at the end of my employment. I agree not to copy or in any other way reproduce or disseminate the contents without the express permission of the Chief of the Bureau of Radiological Health.

Date	Signature

BUREAU OF RADIOLOGICAL HEALTH
IOWA DEPARTMENT OF PUBLIC HEALTH
LUCAS STATE OFFICE BUILDING
DES MOINES, IOWA 50319

POLICY: 93-0001 RAM

POLICY TITLE:

Use of Bureau of Radiological Health's Inspection Manual, Enforcement Manual and Health Physicist Qualification Journal

INTRODUCTION:

The combination of the Inspection Manual, Enforcement Manual and Qualification Journal form the nucleus of the Bureau's health physicist qualification program and provide the basic information necessary to perform licensing actions, conduct inspections and implement any enforcement action resulting from these inspections. Iowa Administrative Code Chapter 641-38(136C) contains the empowerment for both inspections and enforcement.

While the inspection and enforcement manuals present basic procedures for their respective functions and contain the appropriate forms, citations and letters for this Bureau to carry out its regulatory functions, the Qualification Journal is the tool by which management monitors each health physicist's qualification progress and documents for evaluation and review the steps taken to certify individuals as health physicist's in all but broadscope program categories. Broadscope certification is made on a case-by-case basis. Throughout this journal, the terms health physicist, inspector and license reviewer are considered as one in the same.

POLICY STATEMENT:

After each individual has signed a statement, which indicates receipt of these manuals and acknowledges the copyright protection, he/she will be issued a copy of each manual. The Inspection Manual will be used in training sessions and as a tool to prepare for and conduct inspections. The Enforcement Manual will be used in training as a guide to document and follow actions for completed inspections.

The Qualification Journal, because it forms part of an individual's personnel record, requires more specific instructions for its use. This journal contains an outline of the **minimum** activities expected by the Senior Health Physicist and the Bureau Chief. Additional activities may be assigned to a health physicist employee to augment his/her professional development. These activities are classified in four sections:

1. Formal training,
2. Self-study,
3. Accompanied inspections, and
4. Licensing actions.

With the concurrence of the Bureau Chief, the Senior Health Physicist will schedule attendance at US Nuclear Regulatory Commission (NRC) sponsored training courses when he/she is advised of the training schedule for the next fiscal year. No person will be expected to attend all eleven courses in a twelve-month period. But each health physicist employee will be required to attend all courses. Based on availability and program workload, the Bureau Chief reserves the right to waive the requirement for attendance at any course.

Two NRC documents govern the content of health physicist training. The current policy states: "although Agreement States need not follow NRC Inspection Manual Chapter 1248, they should have an equivalent program for training and qualification of personnel, and it should be present and adhered to in Agreement State programs.[1]" Formal training consists of the **"core courses"** indicated in Appendices A and B of the NRC Inspection Manual, Chapter 1248. These courses represent the minimum formal training requirements established for NRC personnel who license and inspect radioactive materials programs.

In addition to the core courses, there are several **"specialized training"** courses that can be scheduled to expand the staff's technical knowledge. Attendance, which is normally scheduled after employees have completed the core courses and performed independently as a health physicist, will be based on the availability of funds; the previous experience of the health physicist; and on the anticipated requirements of assigned work. The Bureau Chief will make the determination on an individual basis. For example, if a staff member is assigned activities in one of the areas for which a formal training course is available, that health physicist employee should attend the training or management should insure that the individual has had equivalent experience.

The **self-study** portion consists of online Emergency Management Institute Independent Study Programs and a quiz Chapters 38 through 45 of Iowa Department of Public Health rules pertaining to the use of licensed material. These questions examine not only the employee's knowledge of the rules, but also the thought process needed to effectively perform licensing actions, conduct inspections and enforce the rules. After the employee has completed a self-study quiz, he/she will present the entire journal to the Senior Health Physicist for grading. If the employee receives a less than passing grade (80%) the Senior Health Physicist and Bureau Chief will assign a remedial program. Once this program is completed the Senior Health Physicist will sign the appropriate block on page 22 of the journal with the original score and documentation of the remedial action. Once the signature is given, the original quiz and any documentation will become a part of the employee's personnel record.

Accompanied inspections have been divided into fourteen categories as indicated in a later portion of this journal. AT A MINIMUM the health physicist employee must complete two accompanied inspections. During the first accompaniment, the employee will observe a qualified inspector in all phases of the inspection. In the second, the employee will conduct all phases of the inspection under the supervision of a qualified inspector. These accompanied inspections must include security inspections of the "Increased Controls". At the discretion of

[1] *Integrated Materials Performance Evaluation Program (IMPEP) Directive 5.6, Common Performance Indicator 3 – Technical Staff and Training*

the Senior Health Physicist an employee may be required to perform more than one of either type of accompaniment for any area. Once an employee has received a signature of competency, he/she will be able to conduct that type of inspection independently.

After an employee has received all the signatures required in this journal, he/she will be certified to conduct inspections in all but broadscope program areas. The original of this page, along with a written certification, will become a part of an individual's personnel record.

The licensing actions have also been divided into fourteen categories. AT A MINIMUM the employee must complete a license renewal and an amendment request for each category under the supervision of a qualified health physicist prior to independently conducting licensing actions for that category. In addition, the employee must complete a pre-licensing checklist and accompany a qualified health physicist during a pre-licensing inspection.

_____ _____

Date

Melanie Rasmusson, Chief
Bureau of Radiological Health

Health Physicist
Qualification Journal

INTRODUCTION:

Webster's Collegiate Dictionary defines "journal" as, "A record of current transactions and an account of day-to-day events." Clearly, a journal should not be a massive reference manual. The Qualification Journal used by the State of Iowa for its health physicist employees defines areas in which an employee must demonstrate competence and provides a record to show how and when this competence was measured or demonstrated.

Although this Journal does not include reference material, it does, in some cases, describe various reference materials you should study to enable you, as a new health physicist, to satisfactorily complete the Journal.

One might ask, "What are the minimum training requirements for a health physicist in the State of Iowa and who decides these requirements?"

To answer this question, one needs to consider an agreement that was entered into between the State of Iowa and the U.S. Nuclear Regulatory Commission (commission) in accordance with the provisions of subsection 274b of the Atomic Energy Act of 1954, as amended.

Under the provisions of the Act, the Governor of Iowa certified the State has a program for the control of radiation hazards adequate to protect the public health and safety and the State desired to assume regulatory responsibility for those hazards.

The Act also provides that the State's program must be compatible with the Commission's program for the regulation of such material and the State's program must be adequate to protect the public health and safety with respect to the materials covered by the agreement.

To implement the requirements of the Act, the Commission routinely interacts with each Agreement State and verifies compatibility is being maintained and the State's program is adequate to protect the public health and safety.

An important criteria reviewed by the Commission is the level of technical competence of each State of Iowa health physicist. Since technology and the uses of radioactive material are not in a static state, it is necessary to continually evaluate the skills of State of Iowa health physicists based on current perceived hazards that exist throughout the radioactive material industry.

Therefore, the qualifications of State of Iowa health physicists are constantly being reviewed. Hazards exist now that did not exist 20 years ago. As a result, the minimum qualifications of a health physicist in the State of Iowa have also been constantly reviewed and upgraded as required.

The State of Iowa has concluded that if a health physicist satisfactorily completes this Qualification Journal, that individual will possess the qualifications to perform the entire spectrum of the duties of a health physicist in the Bureau of Radiological Health.

PURPOSE:

This Qualification Journal establishes your minimum training requirements to perform emergency response actions, radioactive material licensing actions and radiological health, safety and security inspections at radioactive material licensed facilities in the State of Iowa. It also is a record, which documents that you have satisfactorily completed these training requirements.

FORMAT:

The Journal documents that various administrative and technical tasks have been accomplished. It shows that:

1. The employee received an administrative orientation given by the Bureau Chief that explains administrative actions of the agency.

2. The employee received a copy of the Iowa Bureau of Radiological Health Inspection Manual and has reviewed and understands the content of the manual.

3. The employee received a copy of the Iowa Bureau of Radiological Health Enforcement Manual and has reviewed and understands the content of the manual.

4. The employee reviewed the Information Notices (IN's) issued by the Bureau of Radiological Health and has a basic understanding of the purpose of the IN's.

5. The employee completed the required formal training courses.

6. The employee demonstrated by a series of self-study quizzes an understanding of Chapters 38, 39, 40, 41, and 45 of Iowa Administrative Code Rules. Some of the questions pertain to the Enforcement policy that has been provided to you. In addition, answers to questions pertaining to transportation of radioactive material can be found in 49 CFR 172-184.

7. The employee accompanied a qualified health physicist during a specific series of inspections.

8. The employee independently performed a specific series of radioactive material inspections while being observed by a qualified health physicist.

9. The employee completed the required licensing actions under the supervision of a qualified health physicist.

10. The employee completed a specific series of online Emergency Management Institute Independent Study Programs.

11 The employee was interviewed, evaluated and approved by the Senior Health Physicist and the Chief, Bureau of Radiological Health as a qualified health physicist.

12. The individuals indicated in Item 11, above, certified in writing that the employee has met all requirements and is a health physicist qualified to conduct all required duties.

EXPECTATIONS FOR AN IOWA HEALTH PHYSICIST:

An effective health physicist possesses many skills that are difficult to quantify. In this training program, you will develop skills, which can be measured or objectively verified. The following list sets forth the more important basic skills that should be possessed by a competent and effective health physicist.

1. Academically Qualified
2. Competent Technical Writer
3. Effectively Communicates in Written and Verbal Form
4. Objective
5. Assertive
6. Persistent
7. Treats Others Fairly

ACADEMIC QUALIFICATIONS:

The usual criteria for evaluating technical personnel are academic qualifications. Many resumes and job interviewers focus almost entirely on academic qualifications. Little effort is made to evaluate the other areas listed above. This does not imply academic excellence is not important, it obviously is. However, academic excellence without collateral skills will never result in a competent and effective health physicist.

TECHNICAL WRITING SKILLS:

The ability to accurately document licensing actions and inspection findings in a license or report is essential. Each license or report provides the legal basis for enforcement sanctions that may result after an inspection. It also helps the health physicist review a licensee's past inspection and enforcement history before embarking on the next inspection.

It is expected that you discuss with your peers what type of documentation is required for each licensing action and inspection activity you perform.

As a health physicist, you will create four types of written documents. The one prepared most frequently is the handwritten Field Note Inspection Report. In this format, the health physicist fills in blanks and when problems are identified, expands comments to include justification for concluding a licensee has violated a particular regulatory requirement. In a Field Note Inspection Report, grammar, complete sentences, and precise format are important to ensure that the facts are correct. This is not a format that allows opinions or subjectivity.

The second kind of document is the formal Narrative Inspection Report. It is written less frequently and is prepared when a more complex inspection has been completed (i.e., a university broad license program) or where significant violations of regulatory requirements have been identified, possibly during an investigation, and it is likely that escalated enforcement action will be proposed by the agency.

The third kind of documentation is the Notice of Violation and transmittal letter, which are sent to a licensee following an inspection. It specifically describes the inspection findings as they relate to violations of agency requirements.

The fourth kind of documentation is a Radioactive Materials License (new license, renewal or amendment).

While you are completing this Qualification Journal, you will have many opportunities to prepare the first, third and fourth kinds of documentation and may have one or two opportunities to assist in the preparation of the second type of document, the formal Narrative Inspection Report.

It is important that you work closely with your peers to better understand what each of these documents looks like, why each is formatted in a particular way, and why various legal requirements dictate how the final document should look.

Perhaps one of the greatest difficulties new health physicists have is keeping an inspection report short but concise. Never under any circumstances should your opinion be included in a license or report.

COMMUNICATION SKILLS:

Three sources of information are available during an inspection; records, interviews with licensee personnel and observance of licensee personnel conducting licensed activities. The interviewees may be in a management position or workers directly engaged in licensed activities. Most of the information you will use to evaluate the adequacy of licensee management is obtained by direct interview. In some instances, licensee personnel are reluctant to give information to an inspector. This is especially true if it appears that the licensee management is not doing an adequate job.

It is essential that you ask questions that cannot be answered by a simple "yes" or "no." Remember, you are trying to find out how management is supporting the program to ensure that licensed radioactive materials are being handled in a safe manner. Let them explain how this is accomplished.

Licensee management personnel may try to intimidate you and ask you to justify why certain questions are being asked. Or, they might tell the truth but not the whole truth. If you perceive a question is not being answered truthfully or completely, ask the question again and wait for an answer. If you need more information, persist in a professional manner until you are satisfied.

A technique used by many licensees is asking an inspector questions about qualifications, experience on the job, and other things that might shake a person's confidence. If one is not aware of this ploy, an inspection can quickly deteriorate into an interview being conducted by the licensee.

Occasionally, an individual who is being interviewed will honestly not understand what is being asked and therefore might not respond in a meaningful way to your question. If this appears likely, rephrase the question and ask it again. Remember, your goal is to get information.

A principal source of information is the licensee's records. Some inspectors spend most of their inspection time reviewing page after page of records. Inspectors who conduct inspections in this manner may miss the fact that much valuable information that belongs in the licensee's records may not have been documented. In other instances, the inspector should be asking the licensee to explain how certain information was obtained and why it was documented in a particular way. Just because the licensee commits something to writing does not mean it is valid information. This does not imply the licensee is lying but it does suggest that if something is not correct it needs to be pursued further. It is your job, as an inspector, to evaluate each record as it is reviewed and ask yourself the question, "does this make sense?" If the answer is, "no," question licensee personnel and require that they explain what the records mean. If an individual is unable to explain why he recorded entries in a particular way, it may be a tip-off that something is seriously wrong and you may need to pursue it further before going on with the inspection.

A very important source of information is actually observing licensee personnel during performance of licensed activities. The way personnel handle radioactive material tells how the licensee’s radiation protection program impacts public health and safety.

OBJECTIVITY:

One often hears the statement, "If it ain't broken, don't fix it." A similar truism is, "If you don't have the facts, don't reach a conclusion". It should be understood that licensee's do not choose to interact with regulatory agencies and inspectors but are required to do so by the Code of Iowa and Iowa Administrative Code. Licensee personnel may try to intimidate you in the hopes of heading off an in-depth inspection. They may try to convince you that the scope of your inspection is going beyond your authority. This could cause you to back off and not ask probing questions. As a result, insufficient information may be gathered and any conclusions resulting from the inspection may be flawed.

If you don't have sufficient information to support a conclusion based on the facts, you must either obtain additional information or do not attempt to reach a conclusion. In some instances, the only conclusion one can reach is that a conclusion cannot be reached. It is important to discuss this situation with your peers and the Bureau Chief.

ASSERTIVENESS:

Assertiveness is sometimes mistaken for arrogance. You need to convey, in a professional way, that this is your inspection. Licensee management may try to intimidate you; especially if they are aware you are a new inspector.

If this happens, immediately head off this kind of licensee behavior by restating the purpose and scope of the inspection. Such a statement, when made in a confident, professional manner can do a great deal to get things back on course. Your job is to gather facts and reach conclusions and not to argue with licensee personnel.

PERSISTENCE:

Persistence means that you, as an inspector, are not finished until you have collected all the information and facts needed to make a valid conclusion.

Sometimes, a planned inspection schedule cannot be completed because an inspection is taking longer than was anticipated. This requires a decision. Is it more important to minimize the inspection backlog or put the planned schedule on hold and then expand the current inspection until all necessary information is obtained?

Of course, when such decisions are to be made you should contact your peers or the Bureau Chief. It is better to do fewer inspections and do them thoroughly than to do many superficial inspections. However, let your peers or Bureau Chief help with such decisions.

TREATING OTHERS FAIRLY:

As an Iowa health physicist, your behavior and attitude will reflect directly on how a licensee or others perceives your agency. In most cases, you are the only personal contact a licensee has with the agency.

An inspection is a tool for evaluating the adequacy of a licensee's radiation safety program. The agency needs to know whether the program involves competent management, trained radiation workers, and adequate faci1ities. During an inspection, you may find some deterioration in one or more areas.

In some instances, the person that you are interviewing is not the individual who actually caused the breakdown in the program or the incident. Licensee management is ultimately responsible for anything that happened.

Your job as an inspector, in addition to gathering information, is to communicate effectively with licensee management. If licensee management, acting in good faith doesn't agree that there is a problem, take another look at your conclusions.

It is essential that licensees understand all the areas of concern you identified and that these must be corrected or resolved quickly. If possible, and before leaving a licensee's facility, ask the licensee to explain what it plans to do to correct the identified deficiencies. Also, ask when this corrective action will be taken? In some cases, a licensee might need to think things over before committing to a specific corrective action timeframe. This is acceptable since regulations provide a licensee 30 days after the date a written Notice of Violation is issued before a response is required.

Rarely will a licensee mention the 30-day delay and you should encourage a licensee to take appropriate corrective action as soon as possible.

INFORMATION NOTICES

In order to keep licensees, as well as Agreement States, informed about various concerns involving radioactive material that were identified throughout the country, the NRC began issuing Information Notices. In 1993, Iowa began revising each NRC Information Notice to more closely reflect Iowa policy and rules. In addition, Iowa issues our own information notices based on issues unique to the State. Each notice describes a problem or concern that relates to equipment failure, design problems, loss of control over radioactive material, etc. More importantly, the information notices describe various solutions and corrective actions that were taken or can be taken to resolve identified problems.

During your training, you may need to refer to some of these information notices. You are not expected to review every notice. However, you should, as a minimum, review the titles of the notices and know where to look if a question or concern should arise. In addition to the binder that contains copies of the information notices, the notices can be accessed via the Internet at http://www.idph.state.ia.us/eh/radioactive_index.asp.

Health Physicist Qualification Journal

MASTER LOG SHEET

Employee:

The following log verifies you have received various documents and have completed required learning objectives in a satisfactory manner.

		Signature When Issued Or Completed	Date
1.	Administrative orientation and Agency Policy Explained	_____ (Bureau Chief)	_____
2.	Inspection Manual	_____ (Senior Health Physicist)	_____
3.	Enforcement Manual	_____ (Senior Health Physicist)	_____
4.	Information Notices	_____ (Senior Health Physicist)	_____
5.	Required Formal Training Courses	_____ (Senior Health Physicist)	_____
6.	Self-Study Quizzes	_____ (Senior Health Physicist)	_____
7.	Accompanied a Qualified Health Physicist	_____ (Senior Health Physicist)	_____
8.	Accompaniment by a Qualified Health Physicist	_____ (Senior Health Physicist)	_____
9.	Completion of Licensing Actions	_____ (Senior Health Physicist)	_____
10.	Completion of online study courses	_____ (Senior Health Physicist)	_____
11.	Inspector Has Been Interviewed, Evaluated and Approved	_____ (Senior Health Physicist) (Bureau Chief)	_____
12.	Written Certification Prepared	_____ (Senior Health Physicist) (Bureau Chief)	_____

Health Physicist Qualification Journal

CORE COURSE TRAINING LOG

This log verifies that you have satisfactorily completed the following "core courses."

		Signature When Complete	Date
1.	Inspection Procedures (G-108)		
	Date: _____	_____ (Senior Health Physicist)	_____
2.	Licensing Procedures (G-109)		
	Date: _____	_____ (Senior Health Physicist)	_____
3.	Fundamental Health Physics I & II (H-122)		
	Date: _____	_____ (Senior Health Physicist)	_____
4.	Root Cause Workshop (G-205)		
	Date: _____	_____ (Senior Health Physicist)	_____
5.	Security Systems & Principles (S-201)		
	Date: _____	_____ (Senior Health Physicist)	_____
6.	Diagnostic and Therapeutic Nuclear Medicine (H-304)		
	Date: _____	_____ (Senior Health Physicist)	_____
7.	Safety Aspects of Industrial Radiography (H-305)		
	Date: _____	_____ (Senior Health Physicist)	_____
8.	Transportation of Radioactive Material (H-308)		
	Date: _____	_____ (Senior Health Physicist)	_____
9.	Brachytherapy, Gamma Knife & Emerging Tech. (H-313)		
	Date: _____	_____ (Senior Health Physicist)	_____
10.	Radiological Emergency Response Operations (RERO)		
	Date: _____	_____ (Senior Health Physicist)	_____
11.	Health Physics in Radiation Accidents (REAC/TS)		
	Date: _____	_____ (Senior Health Physicist)	_____
12.	Fundamental Health Physics III (H-123)		
	Date: _____	_____ (Senior Health Physicist)	_____

Health Physicist Qualification Journal

SPECIALIZED TRAINING COURSES LOG

This log verifies that you have satisfactorily completed the following specialized training courses.

		Signature When Completed	Date
1.	Environmental Monitoring for Radioactivity (H-111)		
	Date: _____	_____ (Senior Health Physicist)	_____
2.	Air Sampling for Radioactive Material (H-119)		
	Date: _____	_____ (Senior Health Physicist)	_____
3.	Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) (H-121)		
	Date: _____	_____ (Senior Health Physicist)	_____
4.	Safety Aspects of Well Logging (H-314)		
	Date: _____	_____ (Senior Health Physicist)	_____
5.	Advanced Radiological Incident Operations (ARIO)		
	Date: _____	_____ (Senior Health Physicist)	_____
6.	Advanced Health Physics (H-201)		
	Date: _____	_____ (Senior Health Physicist)	_____

Health Physicist Qualification Journal

RADIOLOGICAL SAFETY & SECURITY INSPECTION ACCOMPANIMENTS

As part of your on-the-job training you will accompany other health physicists and observe how they conduct inspections. You will probably have an opportunity to accompany more than one health physicist. In this way you will be able to learn those techniques and methods, which best suit your personality and technical skills.

After you have participated in inspections, principally as an observer, you will have an opportunity to prepare for, perform, and document the results of actual inspections while being observed by a qualified health physicist. If it is determined that you are capable of performing a quality inspection for a particular type of licensed program, you will be granted approval for performing that type of inspection without accompaniment.

As you demonstrate the ability to perform additional types of inspections these will be added to the types of inspections you can perform without accompaniment. The following kinds of inspections are included in this qualification program:

1. Measuring Systems - Fixed Gauges
2. Measuring Systems - Portable Gauges
3. Medical Institution - Diagnostic Only
4. Medical Institution - Diagnostic & Therapy
5. Medical Institution – Diagnostic, Therapy & Emerging Technologies
6. High Dose Rate Afterloaders
7. Accelerator Produced RAM
8. Nuclear Pharmacy
9. Nuclear Medical Van
10. Research and Development
11. Broadscope
12. Industrial Radiography
13. Irradiators – Self Shielding
14. Manufacturing & Distribution

RADIOLOGICAL SAFETY & SECURITY INSPECTION ACCOMPANIMENTS WITH PARTICIPATION

This log verifies that you have accompanied a qualified health physicist on a series of inspections principally as an observer, with some participation. This accompaniment included at least one of each type of licensed program described on page 19 of this Qualification Journal.

Licensee **Type**	License No.	Inspection Date	Qualified Health Physicist
FG 1.			
PG 2.			
M2 3.			
M1 4.			
MET 5.			
HDR 6.			
PET 7.			
NP 8.			
NV1 9.			
R&D 10.			
AAB 11.			
IR1 12.			
I1 13.			
M&D 14.			

OBSERVED RADIOLOGICAL SAFETY & SECURITY INSPECTIONS

This log verifies that you have performed a series of inspections while being observed and evaluated by a qualified health physicist. Your effort included a review of the license files while preparing for the inspection, conducting the inspection (while being observed by a qualified health physicist), written documentation of the inspection findings, and any enforcement correspondence that resulted from your findings during the inspection. This accompaniment included at least one of each type of licensed program described on page 19 of this Qualification Journal.

Licensee **Type**	License No.	Inspection Date	Qualified Health Physicist
FG 1.			
PG 2.			
M2 3.			
M1 4.			
MET 5.			
HDR 6.			
PET 7.			
NP 8.			
NV1 9.			
R&D 10.			
AAB 11.			
IR1 12.			
I1 13.			
M&D 14.			

RENEWAL LICENSING ACTIONS

This log verifies that you have performed a series of license renewals under the supervision of a qualified health physicist. Your effort included a review of the license application, developing a pre-licensing checklist, use of the licensing checklist and review of the Sealed Source and Device Registry as appropriate. This licensing action included at least one of each type of licensed program described on page 19 of this Qualification Journal.

Licensee **Type**	License No.	Renewal Date	Qualified Health Physicist
FG 1.			
PG 2.			
M2 3.			
M1 4.			
MET 5.			
HDR 6.			
PET 7.			
NP 8.			
NV1 9.			
R&D 10.			
AAB 11.			
IR1 12.			
I1 13.			
M&D 14.			

AMENDMENT LICENSING ACTIONS

This log verifies that you have performed a series of license amendments under the supervision of a qualified health physicist. Your effort included a review of the license amendment request and review of the Sealed Source and Device Registry as appropriate. This licensing action included at least one of each type of licensed program described on page 19 of this Qualification Journal.

Licensee **Type**	License No.	Amendment Date	Qualified Health Physicist
FG 1.			
PG 2.			
M2 3.			
M1 4.			
MET 5.			
HDR 6.			
PET 7.			
NP 8.			
NV1 9.			
R&D 10.			
AAB 11.			
IR1 12.			
I1 13.			
M&D 14.			

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ONLINE COURSE TRAINING LOG

This log verifies that you have satisfactorily completed the following online courses. These courses and instructions may be found at http://training.fema.gov/IS/crslist.asp.

		Signature When Completed	Date
1.	Radiological Emergency Management (IS-3)		
	Date: _____	_____ (Senior Health Physicist)	_____
2.	Introduction to Incident Command System (IS-100.b)		
	Date: _____	_____ (Senior Health Physicist)	_____
3.	ICS for Single Resource & Initial Action Incidents (IS-200.b)		
	Date: _____	_____ (Senior Health Physicist)	_____
4.	Radiological Emergency Response (IS-301)		
	Date: _____	_____ (Senior Health Physicist)	_____
5.	Modular Emergency Radiological Response Transportation Training (IS-302)		
	Date: _____	_____ (Senior Health Physicist)	_____
6.	Introduction to Radiological Emergency Preparedness Exercise Evaluation (IS-331)		
	Date: _____	_____ (Senior Health Physicist)	_____
7.	National Incident Management System (NIMS), and Introduction (IS-700.a)		
	Date: _____	_____ (Senior Health Physicist)	_____
8.	National Response Framework, an Introduction (IS-800.b)		
	Date: _____	_____ (Senior Health Physicist)	_____
9.	Emergency Support Function (ESF) #8 – Public Health and Medical Services (IS-808)		
	Date: _____	_____ (Senior Health Physicist)	_____
10.	Introduction to NRF Support Annexes (IS-820)		
	Date: _____	_____ (Senior Health Physicist)	_____
11.	Nuclear/Radiological Incident Annex (IS-836)		
	Date: _____	_____ (Senior Health Physicist)	_____

Health Physicist Qualification Journal

SELF-STUDY QUIZZES – FINAL SCORES

This log verifies that you have satisfactorily completed the following self-study quizzes. A grade of 80% is required to pass each quiz. In some instances you are required to explain how you arrived at your answer. This requires that you analyze a situation that might be identified during an inspection before you are able to determine what, if any, regulatory requirement has been violated.

		Final Score	Date
1.	Regulatory Requirements, Chapter 38	_____	_____
2.	Regulatory Requirements, Chapter 39	_____	_____
3.	Regulatory Requirements, Chapter 40	_____	_____
4.	Regulatory Requirements, Chapter 41	_____	_____
5.	Regulatory Requirements, Chapter 45	_____	_____

SELF-STUDY QUIZ
CHAPTER 38
GENERAL PROVISIONS

Name:_____ **SCORE:**_____

Date Submitted:_____

38-1. If a person is subject to the regulations of the State of Iowa for a licensed byproduct material program, that person is also subject to the regulations of the U.S. Nuclear Regulatory Commission for the same program.

A. True
B. False

38-2. Most byproduct material is produced by:

A. A particle accelerator.
B. A nuclear reactor.
C. Chemical separation and processing of uranium ore.

38-3. To meet regulatory requirements, a restricted area must, as a minimum, be provided with and controlled by access doors that are locked when the area is not in use.

A. True
B. False

38-4. When comparing the dose equivalents of various kinds of radiation, one can assume that an absorbed dose of 1.0 rad of x or gamma radiation is equivalent to an absorbed dose of:

A. 1 rad due to neutrons or high-energy protons.
B. 0.1 rad due to neutrons or high-energy protons.
C. 10 rads due to neutrons or high-energy protons.

38-5. A restricted area can be created and can exist in a residential building.

A. True
B. False

38-6. Special form radioactive material is either a single solid piece or is contained in a sealed capsule that can be opened only by destroying the capsule.

A. True
B. False

38-7. A small single solid sphere of radioactive material has a diameter of 4.25 millimeters. This radioactive source meets the definition for a special form radioactive material.

A. True
B. False

38-8. All users of radioactive material in the State of Iowa are subject to the regulatory requirements set forth in Chapters 38, 39, 40, and in some cases Chapters 41 & 45. Explain your answer.

A. True
B. False

Explanation: _____

_____

_____

_____

_____

_____

_____

38.9 A person filed a request to institute a proceeding pursuant to 38.9(3) to suspend a licensee's authorization to conduct licensed activities in the State of Iowa. After making a thorough review of the request, the Chief, Bureau of Radiological Health, determined the request had no merit and dismissed the request. At this point the requester can:

A. Demand that the Chief, Bureau of Radiological Health review the matter again.

B. Do nothing because the matter is not subject to review.

C. Request the decision is overturned by the Director, Iowa Department of Public Health.

38-10. If a licensee refuses to submit to an unannounced inspection by a State of Iowa inspector the inspector can order an immediate suspension of all licensed activities. Explain your answer.

A. True
B. False

Explanation: _____

_____

_____

_____

_____

38-11. The agency is authorized to assess annual fees for licensed users of radioactive material in the State of Iowa. These fees are set forth in a schedule and each user in a particular category always pays exactly the same annual fee. No deviations from this schedule are permitted.

A. True
B. False

38-12. When violations of regulatory requirements are identified during an inspection, the licensee is notified in writing by the agency. The written notification is called:

A. Stipulation of violations.
B. Notice of violation.
C. Allegation of violations.

38-13. In extremely egregious cases or where it has been determined that violations of regulatory requirements were willful, a civil penalty may be assessed before a notice of violation is issued.

A. True
B. False

38-14. The Radiological Health Section of the Bureau of Radiological Health draws its enforcement jurisdiction from the:

A. Iowa Code chapter 17A.
B. Public Law 95-91.
C. Iowa Code chapter 136C.

38-15. If a licensee has been issued a Notice of Violation and informed that one or more significant violations exist and the licensee refuses to correct the violations, it is a basis for:

A. Amending the license.
B. Considering a Civil Penalty.
C. Revocation of the license.
D. Temporary suspension of all licensed activities.

38-16. In most instances the agency issues a Notice of Violation for Severity Level IV violations that are identified during an inspection. However, in certain situations a civil penalty may be issued for such violations if:

A. The violation(s) should have been identified by the licensee.
B. The violations is/are similar to previous Severity Level IV violations that occurred within the past two years.
C. The violations is/are willful.
D. All of the above.
E. B or C.

Note: This issue is also discussed in the Inspection Manual.

38-17. The maximum civil penalty for any one violation cannot exceed:

A. $5,000.
B. $5,000 per day.
C. $1,000 per day.
D. None of the above.
E. A and C.

38-18. During an inspection, an inspector learns a licensee employee falsified significant records that are required by agency regulations. Also this was done at the request of licensee management. As a result of these findings, the agency decided to initiate escalated enforcement action. Based on this scenario, enforcement action would most likely be taken against:

A. Licensee management.
B. The Employee.
C. A and B
D. None of the above.

38-19. If an employee had willfully caused numerous significant violations of agency regulations, but licensee management claimed it was not aware of the situation, the agency would not take escalated enforcement action against the licensee provided licensee management agreed to terminate the involved employee. Explain your answer.

A. True
B. False

Explanation: _____

_____

_____

_____

_____

38-20. Occasionally a licensee reaches an agreement with the agency to take certain actions to remove significant concerns about health and safety, safeguards, or the environment. In most instances, the agency will document this agreement in a letter to the licensee. This letter is called:

A. A Letter of Intent.
B. A Letter of Agreement.
C. A Confirmation of Action Letter.
D. A Confirmation of Concerns.

38-21. When a civil penalty or an order is issued to a licensee, the document, because of significant legal implications, must be signed by:

A. The Attorney General of the State of Iowa.
B. The Chief, Bureau of Radiological Health.
C. The Director, Iowa Department of Public Health.

38-22. Regulatory requirements have varying degrees of safety, safeguards, or environmental significance. Therefore, its Severity Level identifies the relative importance of each violation. The most significant violation is:

A. Severity Level V.
B. Severity Level I.
C. Depends on whether violation is willful.

Note: This issue is also discussed in the Inspection Manual.

38-23. A process machine at a licensee's facility contained a significant amount of radioactive material. One day the machine malfunctioned and released radioactive material into an unrestricted area. The agency concluded the licensee had done everything possible to maintain the equipment in accordance with the manufacturer's specifications, including periodic maintenance and testing. The licensees measurements showed radioactive material released to an unrestricted area was slightly greater than the limit specified in 641-40.4(3). Based on this information the agency would most likely: Explain your answer.

A. Issue an order immediately suspending all licensed activities.
B. Propose the issuance of a Severity Level I civil penalty.
C. Take no enforcement action.
D. Reduce the proposed civil penalty to Severity Level III because of the licensee's efforts to comply.
E. Issue a Confirmation of Action Letter.
F. C and E.

Explanation: _____

_____

_____

_____

_____

38-24. Which of the following are considered to be "major processors"?

A. Nuclear medicine programs.
B. Universities.
C. Industrial radiographers.
D. Small industrial programs.
E. None of the above.

38-25. A misadministration means that an individual who was not authorized used radioactive material in a nuclear medicine program.

A. True
B. False

38-26 The agency may grant exemptions or exceptions to regulatory requirements if it will not result in undue hazard to public health and safety and property.

A. True
B. False

38-27. If a licensee receives a Notice of Violation and does not wish to challenge any of the findings set forth in the Notice, the licensee is not required to respond to the Notice.

A. True
B. False

38-28. If a licensee makes a persuasive argument why alleged violations in a Notice of Violation are not valid, a proposed civil penalty may be withdrawn.

A. True
B. False

38-29. If a civil penalty is imposed after an inspection in which the agency alleges that significant safety related violations were identified, the licensee has one or more legal options to resolve the matter. Specifically:

A. The licensee can refuse to pay the civil penalty.
B. The licensee can pay the civil penalty.
C. The licensee can withhold payment of the civil penalty and ask for a hearing.
D. The licensee can request termination of its license.
E. A and/or D.
F. B or C.

38-30. If a licensee fails to report an event, as required by regulations, the agency must be able to show the licensee knew of the event that it failed to report.

A. True
B. False

SELF-STUDY QUIZ
CHAPTER 39
LICENSURE AND TRANSPORTATION OF RADIOACTIVE MATERIALS

Name:_____ **SCORE:**_____

Date Submitted:_____

39-1. An individual purchased 50,000 welding rods at a U.S. Government auction and, after having them analyzed by a metallurgist, found the welding rods contained 5.2 percent by weight of thorium. Since this is in excess of the 0.05 percent by weight exempt quantity of thorium, the individual is required to obtain a specific license to possess, use, or transfer the welding rods.

A. True
B. False

39-2. A scrap dealer calls the Agency and says he bought scrap material from a company in St. Louis. Among the items purchased were 500 heavy metal objects, which someone said were aircraft counterweights. He said there were no markings of any kind on the counterweights. He also said someone thought he might need a license to possess, use, or sell these items because they were made of depleted uranium. He is calling you to find out if he does, in fact, need a license. What would you tell him?
Explain your answer.

A. A license is needed.
B. A license is not needed.

Explanation: _____

_____

_____

_____

39-3 A manufacturer has a specific license to fabricate and distribute depleted uranium shields that are used in the manufacture of radiographic exposure devices. As part of the manufacturing process, about 50 pounds of uranium shavings are generated each year. A consultant from Chicago told the manufacturer it could save lots of money by not treating the shavings as radioactive waste but instead as material possessed under a general license. In that way the manufacturer could dispose of up to 15 pounds at one time, up to 150 pounds per year, and not even have to keep records of any of the transfers or disposals. Is this acceptable?
Explain your answer.

A. Yes
B. No

Explanation: _____

_____

_____

_____

_____

39-4. A small university wants to use radioactive material for teaching and research and to obtain a specific license of broad scope but can't afford to hire a radiation safety officer. Therefore, the only type license they can qualify for is a:

A. Type A specific license of broad scope.
B. Type B specific license of broad scope.
C. Type C specific license of broad scope.

39-5. What are the characteristics of a general license?

A. It must be renewed every three years.
B. A written application is not submitted.
C. There is a "one-time" licensing fee.
D. No license document is issued.
E. A and C.
F. B and D.

39-6. An Iowa materials inspector inspected an R& D facility and concluded the license possessed far more radioactive material than was really needed to run the program. During the inspection management personnel were mostly uncooperative, often made the inspector wait to talk to workers, and frequently challenged statements made by the inspector. By the time the exit meeting was held, the inspector was really irritated and told the licensee management that, although he did not find any violations of regulatory requirements, he was concerned about their poor attitude and was worried something could go wrong because the license possessed too much material. The inspector told licensee management he was going to modify the license and significantly reduce the possession limits specified in the license. The licensee requested that no changes be made. Can the inspector or the Agency modify the license under the circumstances described above? Explain your answer.

A. Yes
B. No

Explanation: _____

_____

_____

_____

_____

39-7. Six months after an industrial radiography license was issued, the licensee filed for bankruptcy then decided to go out of business and liquidate everything. In response to this decision the licensee should:

A. Request a rebate on the unused part of the license fee.
B. Immediately notify the agency in writing of its plans to terminate all licensed activities.
C. Try to sell the licensed material to another radiographer and save future costs.

39-8. A radiography company in a Dallas, Texas entered in to a contract with the Iowa Highway Commission to perform industrial radiography on a new series of bridges that were to be built in Iowa during 2011. This would require about 9-10 months of continuous work by the radiography company during 2011. In order to carry out this contract the company in Dallas would have to:

A. Pay a reciprocity fee of $1800.00 for the year 2011.
B. Open a permanent office in Iowa where appropriate records would be kept.
C. Employ only radiographers who are licensed in the State of Iowa.
D. Obtain an Iowa radioactive material license.
E. A and C.
F. B and D.

39-9. An individual purchased about 10,000 obsolete smoke detectors, containing americium-241, as salvage from the K-Mart Corporation and planned to repackage each one in a classy new package and then sell them to Ace hardware stores. The individual checked and found that K-Mart didn't have a specific license and assumed he didn't need one either. Was the individual's assumption correct? Explain your answer.

A. Yes
B. No

Explanation: _____

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39-10. A clockmaker repairs expensive grandfather clocks for individual clients and frequently needs to repaint the entire clock dials, hands, and numerals. He makes these repairs with tritium luminous paint. It is estimated the use of tritium luminous paint is about 450-500 millicuries per year. Is a license required to perform this activity? Explain your answer.

A. Yes
B. No

Explanation: _____

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39-11. All persons in the State of Iowa who possess radioactive material are subject to the requirements of 641 Chapters 38, 39, 40, and 41.

A. True
B. False

39-12. An individual purchased 1,000 pounds of a very expensive magnesium thorium alloy, which contained 0.08 percent of thorium by weight. The seller informed the individual that a license from the State of Iowa was needed to possess or use this material; however, if the buyer promised to apply for a license as soon as possible, the transfer would be made immediately. After the transfer was made someone suggested to the buyer that instead of applying for a license, the buyer could dilute the magnesium thorium alloy with another 1,000 pounds of magnesium and reduce the concentration of thorium to 0.04 percent by weight. This would then eliminate the need for a license. The buyer thought this was an excellent suggestion, reduced the concentration and did not apply for a license. Did the seller of the alloy violate any regulatory requirements? Explain your answer.

A. Yes
B. No

Explanation: _____

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39-13. Refer to Question 12 above. If one assumes the same scenario, did the buyer of the magnesium thorium alloy violate any regulatory requirements? Explain your answer.

A. Yes
B. No

Explanation: _____

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39-14. A high school student from Davenport, Iowa wanted to conduct a research project in which 8 microcuries of phosphorus-32 were injected into an animal. The student contacted the Bureau of Radiological Health in Des Moines and was told this quantity of phosphorus-32 was exempt from any requirement for a license. Did the Bureau of Radiological Health give the student the right answer?

A. Yes
B. No

39-15. The high school student in Question 39-14 visited the nuclear medicine lab of Davenport Hospital and asked the radiation safety officer (RSO) if he could purchase 8 microcuries of phosphorus-32 for his experiment. The RSO said it would involve too much paper work but he would give it to him without charge. The RSO offered the student 10 microcuries so there would be a little extra to allow for decay. A nuclear medicine technician removed 10 microcuries of phosphorus-32 from a 5-millicurie vial and gave it to the student. The student returned to his high school and completed the research project. Did the high school student violate any regulatory requirements? Explain your answer.

A. Yes
B. No

Explanation: _____

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39-16. A licensee decided not to renew its license that was due to expire in 60 days. It properly disposed of all remaining licensed material. It then made extensive radiation surveys of the area where the licensed radioactive was formerly used and stored. As a result of the survey, the licensee determined there was significant removable contamination in the area. What is the most likely thing that would happen when the license was due to expire?

A. The licensee would vacate the premises and release them for unrestricted use.
B. The agency would continue the license in effect with respect to residual radioactive material present as contamination.

39-17. If for any reason, the regulations of the U.S. Department of Transportation are not applicable to a shipment of licensed material, is the licensee required to conform to the standards and requirements of those regulations?

A. Yes
B. No

39-18. After successfully completing the research project described in the scenario in Question 39-14, the student decided to work with a larger animal but needed a larger amount of radioactive material. In fact, the student calculated that 50 microcuries of phosphorus-32 would be needed for the experiment. The high school science advisor suggested the student buy the radioactive material from Central Scientific in Cleveland, Ohio rather than bother the people at University Hospital. The student placed an order for five 10 microcurie Vials of phosphorus-32 with Central Scientific and received them about a week later. As soon as the phosphorus-32 arrived the student dumped the five vials into one beaker and then injected the entire 50 microcuries into the animal being used in the research project. Do Iowa regulations permit the student to purchase five exempt quantities of phosphorus-32 at one time?

A. Yes
B. No

39-19. Refer to the scenario is Question 39-18 above. Is it permissible for an individual to combine five exempt 10 microcurie quantities of phosphorus-32 into a single 50-microcurie quantity? Explain your answer.

A. Yes
B. No

Explanation: _____

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39-20. An industrial firm purchased a level gauge containing 500 millicuries of Cesium-137 as a sealed source under the provisions of a general license. Due to a change in plans, the gauge was not installed and has remained in storage in the original unopened shipping crate for more than 4 years. During this period, the firm did not perform any leak tests on the Cesium-137 sealed source. Are leak tests required under these circumstances?

A. Yes
B. No

39-21. An industrial firm purchased a thickness gauge containing 200 millicuries of krypton-85. In accordance with Iowa regulations:

A. Leak tests are required every 6 months.
B. Leak tests are not required.
C. Leak tests are required every 3 years.

39-22. An investment conglomerate owns a pool-type irradiator containing more than 500,000 curies of cobalt-60, but does not have a specific license. Is a specific license required to own this quantity of radioactive material?

A. Yes
B. No

39-23. In order for a physician or a clinical laboratory to use specified radioactive materials for in vitro or laboratory tests, the person must file an Agency Form "Certificate - In Vitro Testing with Radioactive Material Under General License."

A. True
B. False

39-24. Refer to Question 39-23 above. The person who intends to perform in vitro or laboratory tests can begin using the specified radioactive materials on the date the Form is sent to the agency.

A. True
B. False

39-25. Persons who use radioactive material under the provisions of a "Certificate - In Vitro Testing with Radioactive Material Under General License" can use this material only for:

A. Diagnostic administration to patients.
B. Therapy administration to patients.
C. Neither A nor B.
D. Both A and B.

39-26. The general licensee who uses radioactive material under a Certificate described in Question 39-25 shall not at any one time possess a total quantity of radioactive material in excess of:

A. 5 millicuries.
B. 200 microcuries.
C. 200 millicuries.
D. None of the above.

39-27. A general licensee who uses radioactive material under a Certificate described in Question 39-25 is permitted to use any radioactive material that has been approved for human use and has been manufactured in accordance with FDA requirements.

A. True
B. False

39-28. A licensee who applies for a specific license authorizing the use of up to 2 Curies of Iodine-131 for iodination studies is required, as part of the license application, to submit a decommissioning funding plan. Explain your answer.

A. True
B. False

Explanation: _____

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39-29. Each person licensed under Chapter 39 shall keep records of information important to the safe and effective decommissioning of the facility in an identified location until:

A. All radioactive material has been disposed or transferred to another specific licensee.
B. The license is terminated by the Agency.
C. A period of three years has elapsed.

39-30 A licensee submitted an application or renewal of its specific license 45 days before the license was due to expire. However, when the expiration date arrived the Agency had not yet renewed the license. Based on this scenario, the licensee:

A. Is required to put all licensed radioactive material in storage and discontinue all uses until the material can be transferred or disposed.
B. Can continue operating the program until the Agency renews its license provided the licensee has a "Deemed Timely Letter" from the Agency.
C. Can request a 90-day exemption from licensing until the Agency can issue a renewal.

39-31. One kind of information that is required on packages of radioactive material during transport is the Transport Index. The Transport Index is determined by referring to tables in Appendix B of Chapter 39.

A. True
B. False

39-32. Who is responsible for determining the Transport Index?

A. The shipper.
B. The carrier

39-33. What is the purpose of placing the Transport Index on the shipping label of a package containing radioactive material?

A. To warn dock workers to stay as far away as possible while the packages are on loading docks.
B. To help the carrier exercise adequate control during transportation.

39-34. If, during transportation, a package containing radioactive material is involved in an incident the carrier is required to notify:

A. The U.S. Nuclear Regulatory Commission.
B. The Agency.
C. OSHA.

39-35. Prior to each shipment of licensed material, the licensee shall determine that the level of removable radioactive contamination when measured over an area of 300 square centimeters does not exceed ..... disintegrations per minute per square centimeter.

Note: Refer to 49 CFR Parts 170 through 189.

A. 2200
B. 22
C. 2.2
D. B & C

SELF-STUDY QUIZ
CHAPTER 40
STANDARDS FOR PROTECTION AGAINST RADIATION

Name:_____ **SCORE:**_____

Date Submitted:_____

40-1. A licensee is not required to report to the Agency the theft or loss of a sealed radioactive source unless the strength of the source exceeds 1.0 millicurie.

A. True
B. False

40-2. Chapter 40, "Standards For Protection Against Radiation," applies to all individuals and/or corporate entities that possess radioactive material.

A. True
B. False

40-3. A United Parcel Service (UPS) driver is permitted by a licensee to routinely enter its production facility, a restricted area where radioactive materials are used. Since the UPS driver is present for a relatively short time, no personnel monitoring is provided to him. The licensee stated that this is not a problem because the driver enters its facility with its permission therefore the dose limit for the UPS driver is 5.0 rem per year. Is the licensee's conclusion correct? Explain your answer.

A. True
B. False

Explanation: _____

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40-4. During normal business hours, a licensee received a package that contained 25 millicuries of Iodine-131 in liquid form. To comply with procedures for receiving and opening packages, the licensee is required to monitor the external surface of the package for radioactive contamination within:

A. 1 hour
B. 3 hours
C. 24 hours
D. No survey is required.

40-5 A room in which 100 millicuries of Hydrogen-3 is used and stored is required to be posted with a sign that has:

A. A radiation caution symbol and the words "Caution (or Danger) Radioactive Material"
B. A radiation caution symbol and the words "Caution (or Danger) Radiation Area"
C. No posting is required

40-6. If an individual receives a whole body occupational dose in excess of the limits specified in 40.26(1)"a," the licensee has 10 days in which to satisfy the requirements of 40.26(3) and demonstrate that the exception applies.

A. True
B. False

40-7. Members of the public are not permitted by Agency regulations to receive a dose to the whole body in excess of 0.5 rem per year. Explain your answer.

A. True
B. False

Explanation: _____

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40-8. Individuals who are under 18 years of age and who work in or frequent a restricted area are not permitted to receive a dose to the whole body in excess of:

A. 1.25 rem
B. 300 millirems
C. 500 millirems
D. 125 millirems

40-9. A licensee calibrates survey instruments with a cobalt-60 sealed source during an 8-hour period each day. The sources are never exposed more than 12 minutes in any one-hour. While making a radiation survey, the radiation safety officer determined that, while the source was exposed, the receptionist who worked in an unrestricted area was in a radiation field of 7 mR/hr. The radiation safety officer concluded this exceeded the permissible radiation level for an unrestricted area. Is this a valid conclusion? Explain your answer.

A. Yes
B. No

Explanation: _____

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40-10. Refer to Question 40-9. After the radiation safety officer concluded the licensee had exceeded the radiation level limits for an unrestricted area, he wondered if he was required to report this matter to the Agency. Is reporting required in this situation?

A. Yes
B. No

40-11. Due to increased demand, the licensee in Question 40-9 purchased a new 2000-curie Cobalt-60 calibration source. The radiation safety officer again made a detailed survey of the licensee's facilities and determined that the unrestricted area where the desk of the receptionist was located was in a continuous radiation field of 0.8 mR/hr while the source was in a stored or shielded configuration. The radiation safety officer concluded this radiation level was well within the limits specified in the regulations and no further action was taken. Did the radiation safety officer make the correct conclusion? Explain your answer.

A. Yes
B. No

Explanation: _____

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40-12. If the radiation safety officer in Question 40-11 came to the wrong conclusion after surveying the new calibration source housing and all surrounding areas, is there any way he could resolve this matter without modifying the equipment or the facilities? Explain your answer.

A. Yes
B. No

Explanation: _____

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40-13. Because young persons are more susceptible to biological damage from exposure to radiation, every person under 18 years of age who works in or frequents any portion of a restricted area must be assigned personnel monitoring equipment.

A. True
B. False

40-14. If a licensee takes advantage of all exceptions allowed for doses received by individuals who work in or frequent any portion of a restricted area, which of the following is the maximum whole body dose an individual may receive in a year? Explain your answer.

A. 5 rem
B. 7.5 rem
C. 6.75 rem
D. 2 rem

Explanation: _____

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40-15. Agency regulations provide that every reasonable effort should be made to maintain radiation exposures and releases of radioactive material in effluents to unrestricted areas:

A. As low as is physically possible.
B. As low as is reasonably achievable.
C. As low as state of the art techniques allow.

40-16 When respiratory protective equipment is used to limit the inhalation of airborne radioactive material pursuant to 40.49, the licensee may make allowance for such use in estimating exposures to individuals provided that:

A. All equipment was purchased new.
B. The protective equipment has been tested and certified or had certification extended by NIOSH and MSHA.
C. The equipment is used as stipulated in U.S. Nuclear Regulatory Commission Reg. Guide 8.15.
D. The licensee or the manufacturer has tested and can demonstrate with test data that the protective equipment has the required efficiency.

40-17. All personnel dosimeters that require processing and are used to measure the dose to extremities must be processed and evaluated by a dosimetry processor currently accredited by:

A. Oak Ridge National Laboratory.
B. National Bureau of Standards.
C. American Association of Medical Physicists.
D. NVLAP.
E. None of the above.

40-18. Each licensee shall supply appropriate personnel monitoring equipment to and require its use by each individual who enters a restricted area under such circumstances that the individual receives, or is likely to receive, an annual dose in excess of ..... percent of the applicable value specified in 40.15(1).

A. 5 percent
B. 10 percent
C. 25 percent
D. None of the above

40-19. Radiation caution symbols which are used on caution signs, labels, and signals shall use the conventional radiation caution colors. These colors are:

A. Red on a white background.
B. Black on a yellow background.
C. Magenta or purple on a yellow background.
D. B and C.
E. None of the above.

40-20 The steel entrance door to a fixed radiography cell, a high radiation area, is provided with a conventional steel hasp and padlock so that the door can only be opened from the outside. This door is kept securely padlocked during overnight radiography exposures and also during the day when radiographic exposure are being conducted. This is an approved method of securing the entrance to a high radiation area. Explain your answer.

A. True
B. False

Explanation: _____

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40-21. A facility that is used for instrument calibration contains a one curie Cobalt-60 sealed source that is in the exposed position for 13 minutes out of each hour. While the source is exposed the radiation level in the room is 350 mR/hr. Based on this information, one can conclude the calibration facility is what type of area? Explain your answer.

A. Restricted area.
B. Radiation Area.
C. High Radiation Area.

Explanation: _____

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40-22. The licensee has a 1.0-curie Cesium-137 sealed source locked inside a storage container inside the calibration laboratory. The radiation level 30 centimeters from the surface of the source storage container was 21.5 mR/hr. Based on this information, one can conclude that:

A. The entrance shall be posted with the conventional radiation caution symbol and the words CAUTION (or DANGER) RADIOACTIVE MATERIAL.
B. The entrance shall be posted with the conventional radiation caution symbol and the words CAUTION (or DANGER) RADIATION AREA.
C. No posting of the room is required.
D. Both A. & B.

40-23 Before a licensee can dispose, to an unrestricted area, empty uncontaminated containers that previously held radioactive material the licensee shall:

A. Hold all containers 10 additional half-lives.
B. Delete all applicable entries from receipt records.
C. Remove or deface radioactive material labels or otherwise indicate that the container no longer contains radioactive material.

40-24. When calculating concentrations of radioactivity in effluents to unrestricted areas, the concentration limits are specified in:

A. Appendix B, Table II, Chapter 40.
B. Appendix B, Table I, Chapter 40.

40-25. A radiography camera which had its 100 curie Iridium-192 sealed source locked in a secure position was placed on the ground next to the security guard shack while the radiographer went into town for film. This constitutes adequate security for a source of radiation that is in an unrestricted area.

A. True
B. False

40-26. The licensee received a package of radioactive material, which contained a 100-curie Iridium-192 sealed source in a radiographic exposure device. However, the licensee did not perform a survey on the external surface of the package for radioactive contamination. This violates the regulation that relates to the procedure for receiving packages containing radioactive material.

A. True
B. False

40-27. The licensee received during normal working hours a package containing 25 millicuries of Iodine-131 in liquid form. In order to comply with the procedures for picking up, receiving, and opening packages, the licensee is required to monitor the external surface of the package for radiation within:

A. 1 hour
B. 3 hours
C. 18 hours
D. Survey not required

40-28. The licensee received a package containing ten 50-millicurie vials of Iodine-131 in liquid form and upon receipt monitored the package surface for radioactive contamination. This radiation survey showed removable contamination of 2325 dpm per 100 square centimeters of the package surface. Based on these measurements, the licensee is required to immediately notify:

A. The shipper
B. The Department of Transportation
C. The Nuclear Regulatory Commission
D. The final delivering carrier
E. The Agency
F. B and D
G. D and E

40-29. The licensee, a large university, routinely disposes of large amounts of Iodine-131 to the sanitary sewage system. At the end of the year, the licensee's waste disposal records showed that a total of 3.2 curies of Iodine-131 had been disposed to the sanitary sewage system. The radiation safety officer calculated that the concentration of the Iodine-131 in the water released by the licensee was well within the concentration limits specified in Appendix B, Table I, Column 2 of Chapter 40. Therefore, this disposal meets regulatory requirements. Explain your answer.

A. True
B. False

Explanation: _____

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40-30 The licensee routinely buries millicurie quantities of short half-life radioactive materials in a landfill at the edge of its property. The landfill area is surrounded by a barbed wire fence and a locked gate and the licensee makes a monthly analysis of water in a nearby river to demonstrate that none of the radioactive material is leaving the licensee's property. Since the licensee is controlling the radioactive material, this is an acceptable method of disposal.

A. True
B. False

40-31. When calculating the concentration of radioactivity in effluents to unrestricted areas, the concentrations may be averaged over a period not greater than:

A. 24 hours
B. 1 year
C. 13 weeks

40-32. All licensees who routinely release airborne radioactive material into restricted areas where employees are required to work are required to provide bioassay services to those employees.

A. True
B. False

40-33. A licensee monitors personnel for exposures. Annually, the supervisors personally tell the employees results of the measurements. Does this meet regulatory requirements?

A. Yes.
B. No.

Explanation: _____

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40-34. A room in which a sealed source container that measures 5.0 mR/hr at one foot is used and stored is required to be posted with the radiation caution symbol and the words:

A. Caution (or Danger) Radioactive Material.
B. Caution (or Danger) Radiation Area.
C. No posting is required.
D. A. & B.

40-35. Sources of radiation in an unrestricted area and not in storage shall be:

A. Secured in a locked container.
B. Maintained under constant surveillance and immediate control.

40-36. In a one-year period a licensee disposed 1.2 curies of mixed isotopes, 750 millicuries of Carbon-14, and 6.3 curies of Hydrogen-3 to the sanitary sewage system. This disposal is well within regulatory limits.

A. True
B. False

40-37. If your answer to question 40-37 was false, which isotope(s) were in excess of regulatory limits?

A. The mixed isotopes.
B. The mixed isotopes and Carbon-14.
C. The mixed isotopes and Hydrogen-3.
D. All disposals exceeded regulatory limits.

40-38 A licensee employee working in a restricted area receives a whole body radiation dose of 35 rem. As a result, the licensee is required to notify the Agency:

A. Within 24 hours.
B. Immediately.
C. Within 30 days.

40-39. When a licensee has facilities located in a restricted area in a building that is mostly unrestricted (e.g., an instrument calibration lab located in an office complex) the entrance to the licensed facility should be kept locked at all times; however, radiation caution signs should not be posted at the entrance to the licensed facility to prevent causing unnecessary alarm to other building residents.

A. True
B. False

40-40. A licensee that possesses a 30 curie Cesium-137 sealed source is required to implement 40.54(136C) "Security and control of licensed radioactive material in quantities of concern".

A. True
B. False

SELF-STUDY QUIZ
CHAPTER 41
STANDARDS FOR PROTECTION AGAINST RADIATION

Name:_____ SCORE:_____

Date Submitted:_____

41-1. Whenever an authorized user under a medical license permanently discontinues performance of duties under the license, the licensee must:

A. Replace the individual within 90 calendar days.
B. Notify the Agency in writing within 30 days.
C. Notify the Agency by telephone within 7 days.
D. Immediately discontinue scheduling patients.

41-2. One individual is responsible for keeping a copy of all records and reports required by the agency rules, a copy of these rules, a copy of each licensing request and license and amendments, and the written policy and procedures required by the rules. That individual is:

A. The corporate attorney.
B. The chief executive officer or president.
C. The radiation safety officer.
D. The personnel director.

41-3. A door is not required at the entrance to a high dose rate afterloader room provided the entrance is a maze entrance and the facility is provided with appropriate radiation alarms.

A. True
B. False

41-4 If the radiation monitor in a high dose rate afterloader treatment room becomes inoperable, the licensee is required to:

A. Notify the Agency within 15 days.
B. Promptly repair or replace the monitor.
C. Discontinue treatments with the high dose rate afterloader until the monitor has been repaired.
D. B and C.

41-5. A licensee authorized to use a high dose rate afterloader unit for medical use is required to perform full calibration measurements on the unit following replacement of the source.

A. True
B. False

41-6. An authorized medical user who supervises the use of licensed material by another individual who is not an authorized user is permitted to do so provided he:

A. Has written authorization from the Agency.
B. Stated in writing a willingness to take full responsibility in the event of a misadministration.
C. Is immediately available to communicate with the supervised individual.
D. Has submitted a written request to the radiation safety officer to have the license amended.

41-7. A visiting authorized user must work under the direct supervision of an individual who is named on a license as an authorized user.

A. True
B. False

41-8 Within 15 days of a therapy misadministration, the licensee must submit a written report to the agency. This report must include the name of the patient to ensure a full investigation by the agency.

A. True
B. False

41-9. A mobile nuclear medicine service shall not have radioactive material delivered directly from the manufacturer or the distributor to the client's address of use.

A. True
B. False

41-10. A licensee is required to determine the amount of activity administered to each patient. This is accomplished by:

A. Referring to the shipping papers.
B. Using a well counter.
C. Using a dose calibrator.

41-11. A dose calibrator shall be checked for constancy with a dedicated check source at the beginning of each day of use. If the licensee is using a Cesium-137 check source it must have an activity of at least:

A. 50 microcuries.
B. 10 microcuries.
C. The maximum dose that will be measured.

41-12. A licensee is required to assay radiopharmaceutical dosages. If a dosage contains 20 millicuries of technetium-99m, the assay is required to be performed:

A. Only by the pharmacy prior to shipment.
B. By the licensee within 1 hour before medical use.
C. By the licensee before medical use.
D. By the licensee within 30 minutes before medical use.

41-13. A licensee routinely uses a 50-millicurie krypton-85 source for various applications. This source is required to be leak tested at intervals not to exceed six months.

A. True
B. False

41-14. A licensee uses a molybdenum-99/technetium-99m generator to prepare technetium-99m radiopharmaceuticals. If the licensee elutes the generator three times each day, it is required to measure the molybdenum-99 concentration in the eluate:

A. Once each day - It must be the first elution.
B. Three times each day.
C. Once on the first day of use.

41-15. A dedicated check source is used:

A. To ensure constant operation of a survey meter.
B. Only with one specific survey meter.
C. To reduce the frequency of instrument calibration.

41-16 Although a licensee may apply for an amendment to its specific radioactive material license, the amendment is not effective until:

A. The agency verifies that any applicable amendment fee has been paid.
B. The amendment request is approved by the Agency.
C. The licensee has received the amendment.

41-17. If the licensee is a medical institution authorized for diagnostic and therapeutic use of radioactive material, its ALARA program is required to have an annual review by:

A. The radiation safety officer.
B. The radiation safety committee.
C. The Agency.

41-18. A medical institution's radiation safety committee is required to meet:

A. At least once each calendar quarter.
B. At least once each calendar year.
C. Within 24 hours after a major incident occurs.

41-19. The Agency must issue a written authorization to a mobile nuclear medicine service for each institution that is served by the mobile service and the authorization must be received before the first use of licensed radioactive material at each medical facility.

A. True
B. False

41-20 A licensee, after the discovery of a reportable medical event, is required to report the event via telephone to the Agency within what timeframe?

A. Immediately
B. 24 hours
C. 15 days

41-21. A mobile nuclear medicine service decided to reduce the possibility of having a transportation accident involving radioactive material in one of their vehicles. They accomplished this by having all radioactive materials delivered directly to the client hospitals. Is this practice acceptable?

A. Yes
B. No

41-22. Which record(s) is/are required to be signed by the radiation safety officer?

A. Instrument calibration records.
B. Sealed source leak test records.
C. Dose calibrator accuracy tests.
D. Assay of radiopharmaceutical dosages.
E. A and C.
F. B and C.
G. All of the above.

41-23 A licensee who uses a multidose container of a volatile radioactive material is required to store this material in:

A. A shielded container in the hot lab.
B. A locked shielded container in the hot lab.
C. A properly functioning fume hood.
D. Any location provided it is in a restricted area.

41-24. All radioactive material licenses issued to medical institutions grant authorization to use radioactive gases and aerosols.

A. True
B. False

41-25. A licensee authorized to use radioactive material for imaging studies is required to possess a minimum of operable and calibrated survey instruments.

A. True
B. False

41-26 A licensee elutes its molybdenum-99/technetium-99^m generator and after checking the eluate for molybdenum-99 concentration discovers it is 0.30 microcuries per millicurie of technetium-99^m. The licensee tries to resolve this problem and finally concludes that the best thing to do is: Explain your answer.

A. Hold the eluate for at least 36 hours until the molybdenum-99 concentration has decayed to below 0.15 microcuries per millicurie of technetium-99^m.
B. Dispose of the eluate and the generator as radioactive waste.
C. Order another generator and dilute the eluate from the problem generator with new eluate until the molybdenum-99 concentration is less than 0.15 microcuries per millicurie of technetium-99^m.

Explanation: _____

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41-27. If a licensee elutes a molybdenum-99/technetium-99^{m} generator and finds the eluate exceeds permissible concentration limits, the licensee is required to:

A. Immediately notify the Agency.
B. Immediately notify the generator manufacturer.
C. Notify the U.S. Food and Drug Administration within 30 days from the date of elution.
D. All of the above.

41-28. If a patient who has received radiopharmaceutical therapy dies, the licensee is required to immediately:

A. Notify the Agency.
B. Notify the Radiation Safety Officer.
C. Notify the authorized user.
D. B or C.
E. All of the above.

41-29 If a patient has received radiopharmaceutical therapy and is hospitalized because the activity in the patient is greater than 33 millicuries, the licensee:

A. Shall provide a private room for the patient.
B. May place two therapy patients in the same room.
C. Has no restrictions on patient room occupancy as long as the radiation level in unrestricted areas is within regulatory limits.
D. A. & B.

41-30. Immediately after removing temporary implant sources from a patient, the licensee carefully counted the removed sources and concluded all sources had been removed and returned to the storage facility. However, several days later, after the patient had returned home, it was found that one therapy source still remained in the patient. The licensee claimed it had done everything possible to prevent such an occurrence. Did the licensee do anything improperly? Explain your answer.

A. Yes
B. No

Explanation: _____

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41-31 Agency regulations provide, among other things, that only a person who is specifically licensed by the agency, the U.S. Nuclear Regulatory Commission, or an agreement state to perform high dose rate afterloader maintenance and repair shall install, relocate, or remove a high dose rate afterloader sealed source. You contracted with the Varian Company to replace the Iridium-192 sealed source in your Varian high dose rate afterloader unit. However, after the new source was installed, you learned that the Varian Company employee who performed the source installation was a new technician and was not qualified to perform a source installation. Based on this scenario, the hospital that owned the high dose rate afterloader unit violated regulatory requirements because it permitted an unqualified person to install the Iridium-192 sealed source. Explain your answer.

A. True
B. False

Explanation: _____

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41-32. A hospital constructed a new high dose rate afterloader room and because of the configuration of the walls, it was not able to provide a viewing window that could be observed by the technologist who was operating the high dose rate afterloader. As an alternative, the licensee installed a television camera and monitor system, which would make it possible for the patient to be observed from the operating console. Is this observation system acceptable?

A. Yes
B. No

41-33. A licensee authorized to use a high dose rate afterloader unit for medical use is required to perform full calibration measurements on each high dose rate afterloader unit:

A. Before the first medical use of the unit.
B. Following replacement of the source.
C. At intervals not exceeding three years.
D. A and B.
E. B and C.
F. All of the above.

41-34 The University of Iowa in Iowa City had its license for the use of radioactive material renewed in its entirety on April 30, 2008. The individual who acts as radiation safety officer for all uses of licensed material under this program is the same individual who fulfilled those duties since December 12, 1984. During an inspection of the program, the inspector noted the radiation safety officer did not comply with many of the requirements set forth in 641-41.2(65). Is it permissible for this individual to continue acting as the radiation safety officer? Explain your answer.

A. Yes
B. No

Explanation: _____

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41-35. As part of the full calibration measurements on its Iridium-192 high dose rate afterloader, a licensee is required to measure the output within plus or minus 5 percent. Also, a licensee is required to correct these outputs for physical decay intervals consistent with:

A. 1 percent physical decay
B. 5 percent physical decay
C. 10 percent physical decay

41-36 What personnel must be physically present during the initiation of all patient treatments involving a high dose rate afterloader?

A. Authorized User
B. Authorized Medical Physicist
C. Radiation Safety Officer
D. Radiation Therapist
E. A. & B.

41-37 A licensee of a mobile nuclear medicine service has a lead lined trash dispenser that the service uses for gloves, vial, etc. at each location of service and collects on a monthly basis. Is this an acceptable practice?

A. Yes
B. No

41-38 A licensee authorized to use radioactive material for imaging and localization studies has a survey instrument capable of measuring dose rates over the range of 1mr/hr (10uSv/hr) to 1000 mR/hr (10mSv/hr). Is this adequate for their authorized practice?

A. Yes
B. No

41-39 A licensee provided oral and written radiation safety instruction to all personnel caring for a patient receiving implant therapy. As long as there is no change in personnel, the licensee does not need to do any follow-up radiation safety instruction.

A. True
B. False

41.40 A licensee requests an amendment to add an authorized user to their license. The physician wants privileges specified in 41.2(31); (33); and (37). Where would the licensee look to verify if the physician's training is adequate?

A. 41.2(67) and (68).
B. 41.2(68) and (69).
C. 41.2 (67), (68), and (69).
D. 41.2(67), (68), (69), and (75).

SELF-STUDY QUIZ
CHAPTER 45
RADIATION SAFETY REQUIREMENTS FOR
INDUSTRIAL RADIOGRAPHIC OPERATIONS

Name:_____ SCORE:_____

Date Submitted:_____

45-1. A collimator is a small cone-shaped shield, usually of lead or tungsten, which significantly increases the intensity of the radiation beam and thereby reduces the duration of the radiographic exposure.

A. True
B. False

45-2. A source changer is a device that is used for removing an old sealed source from a radiographic exposure device and replacing it with a new source, which is contained inside the source changer.

A. True
B. False

45-3. Each licensee shall maintain records showing the receipt, transfer, and disposal of sources of radiation. The licensee is permitted to dispose of these records when:

A. The sources of radiation have been returned to the supplier or disposed as radioactive waste.
B. The sources have been held in storage for at least 10 half-lives.
C. Disposal of the records is authorized by the Agency.
D. The sources have been sold and transferred to another licensed radiographer.

45-4 A radiation survey instruments is considered to be operable if it has been calibrated by a qualified calibration facility within the past six months. Explain your answer.

A. True
B. False

Explanation: _____

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45-5. If an individual is a certified health physicist, that individual is automatically qualified and authorized to calibrate radiation survey instruments that are used by industrial radiographers.

A. True
B. False

45-6. Each radiation survey instrument shall be checked with a radiation source:

A. Immediately after it is returned from the calibration facility.
B. At the beginning of each day of use.
C. At the beginning of each work shift.
D. As part of a weekly inspection and maintenance program.
E. A and B
F. B and C

45-7. Each licensee is required to conduct a physical inventory at intervals not to exceed three months to account for sealed sources and radiography exposure devices received and possessed by the licensee.

A. True
B. False

45-8. A licensee is not required to include in the physical inventory any sources that have decayed to the point where they are not usable for industrial radiography and have been placed in permanent storage.

A. True
B. False

45-9. Areas in which radiography is being performed shall be conspicuously posted with the conventional radiation symbol and the words:

A. Caution (or Danger) Radioactive Material.
B. Caution (or Danger) Radiation Area.
C. Caution (or Danger) High Radiation Area.
D. A and C.
E. B and C.
F. A, B, and C.

45-10. The licensee purchased a new 100 curie Iridium-192 sealed radiography but the leak test certificate was apparently lost in shipment. Since the source was received directly from the manufacturer, the licensee put the source into use. This is permissible because the source was new.

A. True
B. False

45-11. Where will the licensee find information regarding the procedure for notifying proper personnel in the event of an accident?

A. License application.
B. Licensee's operating and emergency procedures.
C. Chapter 45 of the regulations.

45-12. Personal supervision of a radiographer trainee by a radiographer trainer means:

A. The radiographer trainer must be available by telephone in the event of an emergency.
B. The radiographer trainer must be available at the field site where radiography is being performed and must be available if needed within 10 minutes.
C. The radiographer trainee must be under the direct supervision of a radiographer trainer while the trainee is using sources of radiation.

45-13. While conducting an inspection and maintenance review of its radiography equipment, the radiation safety officer noted that one of the exposure devices that were currently being used at a field site had a defective lock and the sealed source could not be locked in the stored position. The radiation safety officer immediately notified all radiography personnel in writing of the problem and urged them to take special precautions whenever they used the defective exposure device. Is this an adequate handling of this matter? Explain your answer.

A. Yes
B. No

Explanation: _____

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45-14. After installing a new sealed source into a radiographic exposure device from a source changer, the licensee is required to:

A. Measure the clearance tolerance on the source pigtail to ensure that it meets specifications.
B. Replace the radiation caution labels to ensure that they are clearly visible.
C. Perform a radiation survey to ensure that the sealed source is in a shielded position.

45-15 A “lock-out survey is performed to ensure that:

A. A sealed source is in a shielded position.
B. The locking mechanism functions properly.
C. The sealed source remains fully exposed without any movement during the entire radiographic exposure.

45-16. The radiation safety officer for an industrial radiography program is required to have:

A. A degree from an accredited 4-year college.
B. At least 2000 hours of active participation in industrial radiographic operations.
C. A and B.

45-17. A transport container, which is used to provide radiation safety and security when industrial radiography sealed sources are transported, must meet all applicable requirements of:

A. OSHA.
B. The Nuclear Regulatory Commission.
C. The Iowa Department of Public Health.
D. The Department of Transportation.
E. B. & D.

Note: Refer to 10 CFR Part 71 or 49 CFR Parts 170 through 189.

45-18. A "temporary job site" is one in which:

A. The licensee performs industrial radiography less than 5 days out of each month.
B. The industrial radiography is performed at other than the location listed in a specific license.
C. The licensee rents a facility which is used only occasionally for industrial radiography.

45-19 A radiation survey instrument shall be ca1ibrated:

A. Prior to receiving a new radiography source.
B. At intervals not to exceed six months.
C. After each instrument servicing.
D. B and C.
E. A, B, and C.

45-20. Each radiography licensee shall maintain utilization logs showing the use of each source of radiation. According to Agency regulations, these records must be:

A. Stored inside the radiography camera shipping case.
B. Available inside the transport vehicle if work is being performed at a field site.
C. At the location specified by the license.
D. At the licensee's corporate headquarters.

45-21. A control device or alarm system of a permanent radiographic installation shall be tested:

A. At the beginning of each day, except Saturdays and Sundays.
B. At the beginning of each day of equipment use.
C. As part of the quarterly inspection and maintenance program.

45-22. If a control device or alarm system of a permanent radiographic installation is operating improperly, the licensee may use the radiography facility provided a qualified radiographer with an operable and calibrated survey meter is in constant attendance.

A. True
B. False

45-23 Radiography personnel require various kinds of experience in the use of radiographic exposure devices. These personnel include: (A) Radiographer Trainees, (B) Radiation Safety Officers, (C) Radiographer Trainers, and (D) Radiographers. List these personnel in order of increasing experience required in the use of radiographic exposure devices.

A. D, B, C, and A
B. B, C, D, and A
C. A, D, C, and B
D. A, D, B, and C

45-24. An individual who completes a written examination to become an industrial radiographer can request and be granted permission to have the name and test score withheld from public disclosure under the Privacy Act.

A. True
B. False

45-25. The main purpose of an internal audit is to ensure that all radiographic equipment is functioning properly.

A. True
B. False

45-26. An internal audit shall be performed at least:

A. Quarterly.
B. Every six months.
C. Annually.

45-27. A radiographer is permitted to conduct industrial radiography without wearing an alarm ratemeter under certain conditions. This is permissible when:

A. Radiography is performed by a radiographer trainer.
B. Two radiographers are working together at the same location.
C. Radiography is being conducted in a permanent radiography installation.7

45-28. A pocket dosimeter must be recharged:

A Whenever the reading exceeds 100 milliroentgens.
B. At the start of each work shift.
C. Whenever it is assigned to more than one person.

45-29. A radiographer trainee is permitted to work without supervision only when:

A. Radiography is performed in a permanent facility.
B. No other radiographer is available.
C. Neither of the above.

45-30. A radiography source shall be secured in its shielded position by locking the exposure device:

A. Each time the sealed source is returned to its shielded position.
B. Whenever radiography is being performed in an unrestricted area.

45-31. An Inspector, while inspecting a well-logging licensee, noted the licensee had the same sealed sources that were in use at the time of the previous inspection 3 years earlier. While reviewing records of the leak tests on these sealed well-logging sources, the inspector noted the leak test records only extended back 14 months. The inspector said this was a violation of regulations because the leak test records should at least go back to the date of the last inspection, 3 years ago. Is the inspector correct? Explain your answer.

A. Yes
B. No

Explanation: _____

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45-32. While inspecting a well-logging licensee in the field, the inspector asked one of the qualified well loggers at the site, "does the licensee have any written procedure for notifying proper personnel if there is an accident?" The well logger didn't know the answer to that question. Where should the well logger be able to look in order to find this information?

A. In the license conditions.
B. In the operating and emergency procedures.
C. In the license application.

45-33. A licensee wants to upgrade the training of its logging supervisors but doesn't know where to look for a list of appropriate subjects to be included in the course. What would be the best way to find this information?

A. Contact a manufacturer of well-logging sources.
B. Look in 641 - Chapter 45, Appendix E.
C. Contact another well-logging licensee.

Revisions

REVISION	SECTION	DESCRIPTION
10/01	ALL	Revised text and updated quizzes.
07/02/02	Policy Statement	Added discussion of core and specialized training. Updated training log for core courses and added log for supplemental training courses.
12/01/10	ALL	Revised core and specialized training.
06/14/11	ALL	Revised in its entirety to become a Health Physicist Qualification Journal. Updated self-study quizzes.