



W. David Drew, Administrator

April 5, 1985

The U.S. Nuclear Regulatory Commission
Regional Licensing Section
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Re: License #14-18903-01

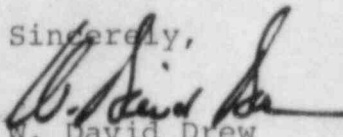
Gentlemen:

We recently received a letter informing us that our license should be renewed. After reviewing our existing license, the decision was made to renew the application in its entirety. The application enclosed is the renewal application for Shenandoah Memorial Hospital.

A check for \$580.00 is enclosed.

If you have any questions concerning the renewal application, please do not hesitate to call.

Sincerely,


W. David Drew
Administrator

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WDD/jb
Enclosures

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CONTROL NO. 78499

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Shenandoah, Iowa 51601

712-246-1230

LICENSE REQUIREMENTS SUMMARY
(NRC License)

I. Radiation Safety Committee: This committee should meet on a semi-annual or quarterly basis. If this is an NRC license, the requirement is quarterly, if it is a Kansas license, it should be on a semi-annual basis. The committee membership should be comprised of individuals from Radiology, Nuclear Medicine, Administration, Nursing, and Radiation Safety. Other members might include representatives from Clinical Lab, Internal Medicine, Radiation Therapy, or Hematology. The primary responsibilities of the Committee would be to review the exposure reports, physicist reports, analyze any accidents or misadministrations, and perform the annual ALARA review required by the licensing agent.

II. Dose calibrator checks

- A. A daily dose calibrator check must be performed with the Cs-137 source and Co-57 source. The results should be within $\pm 5\%$ of the true source activities. In addition to checking the calibration settings for Co-57 and Cs-137, the isotopes which are routinely used in this department must also be checked using the Cs-137 source. A sample dose calibrator sheet is attached.
- B. On a quarterly basis the dose calibrator linearity and accuracy must be checked. The data for performing the dose calibrator linearity test is collected by the technologist. The results are analyzed and reviewed by the radiation physicist. The accuracy test is performed by the radiation physicist at his quarterly visit.
- C. A dose calibrator geometrical variation check is performed by the radiation physicist at his initial visit and any time the dose calibrator has been sent in for repair.

III. Safety in Nuclear Medicine: The items listed below must be available and used routinely by personnel working in Nuclear Medicine and handling the radiation sources.

- A. Disposable gloves
- B. Syringe shields
- C. Lead vial shields
- D. Tongs and forceps
- E. Lead shielding
- F. Absorbent paper
- G. Survey meters

The Nuclear Medicine/Hot Lab area will be used for the receipt, storage, and preparation of radioactive materials. The radioactive material will be stored in shielded areas to reduce the radiation exposure to personnel and patients.

Whenever the Nuclear Medicine Department is closed, the room should be locked and keys made available to those personnel authorized by the Radiation Safety Committee.

During elution the eluate must be collected, assayed, and stored in the lead vial shield. After eluting the generator, a Mo-99 breakthrough test must be performed on the material. The elution vial will be placed in the Moly breakthrough shield and assayed. The results must be recorded in uCi of Mo. After measuring the amount of Moly breakthrough, the concentration of Mo-99 to Tc-99 must be determined. The maximum allowable concentration is 1 uCi of Mo/mCi of Tc. In addition, no more than 5 uCi of Mo may be administered to a patient.

Syringe shields must be used whenever possible. The shields will be used in drawing up the doses and administration to the patient.

Protective outer garments, such as laboratory coats and rubber gloves, must be worn while handling radioactive materials in uncontained form.

Whenever possible work will be performed over absorbent paper which can be easily cleaned up. All trays and other work areas will be covered.

Film badges should be worn whenever handling radioactive materials. During the elution/kit preparation/patient injection ring badges should be worn. Care should be taken not to contaminate the exposure devices. The badges should be left in the department when leaving at the end of the day.

IV. Personnel Training Program: Individuals who work around radioactive materials or patients who have been administered radioactive materials must be presented an annual inservice covering the following:

- A. Areas where radioactive material is used and stored
- B. Potential hazards associated with radioactive materials
- C. Radiation safety procedures appropriate to the respective duties
- D. Pertinent NRC/Kansas regulations
- E. The rules and regulations of the license
- F. Pertinent terms of the license
- G. Employee obligations to report unsafe conditions
- H. Appropriate responses to emergencies and unsafe conditions
- I. Employee right to be informed of their radiation exposure and bio-assay results

Lectures covering the various above will be given by a nuclear medicine technologist, a radiation safety officer, the Radiology Department Chairman, or the consulting physicist. A video tape covering the various Nuclear Medicine and Therapy procedures is available for review by the employees. On an annual basis the radiation physicist will present an inservice.

- V. Procedures for Ordering and Receiving Radioactive Materials: The nuclear medicine technologist, nuclear medicine physician, or the RSO designate will place all orders for radioactive materials. Prior to ordering the material you should insure that the requested material and quantities are authorized by the license.

During normal working hours, the material will be delivered to the Nuclear Medicine Department. During off-duty hours, Security or Nursing will accept delivery of the radioactive materials and have them delivered to the Nuclear Medicine Department.

If the package appears to be wet or damaged, the Radiation Safety Officer should be contacted immediately.

All radioactive packages must be checked and surveyed upon arrival. The following procedure must be used:

- A. Gloves should be worn to prevent contaminating the hands.
- B. Inspect the package for any signs of damage (wetness, crushed, etc.) If damage is noted, stop the procedure and notify the Radiation Safety Officer.
- C. Measure the radiation exposure rate at 3' from the package surface.
- D. Measure the radiation exposure rate at the surface of the package. The 3' and surface rate must be recorded.
- E. Open the package and verify that the isotope ¹²⁵I activity is correct. Check to insure that the final source container has not been damaged.
- F. Wipe the external surface of the final source container and assay it in the logic well counter. Readings which are twice background must be considered contaminated and further radiation studies performed on the package.
- G. Perform a radiation survey on the packing material to make sure that the material is not contaminated. If the packing material is not contaminated, it must be discarded. A sample package receipt form is attached.

- VI. Laboratory Rules for the safe use of radioactive materials and emergency procedures to be followed in the event of spills are posted in the Nuclear Medicine Department.

VII. Radiation Surveys

- A. A daily radiation survey must be performed in the generator solution, kit preparation, and patient injection areas. The low level survey meter must be used for this.
- B. Laboratory areas where only small quantities of radioactive materials are used must be surveyed monthly.
- C. Waste storage area of the laboratory will be surveyed weekly.
- D. Weekly and monthly surveys will consist of:
 - 1. Measurement of radiation levels with a survey meter sufficiently sensitive to detect 0.1 mR/hr.
 - 2. A series of wipe tests to measure contamination levels.
- E. A record must be kept of all survey results. The record will include:
 - 1. The location, date, and identification of equipment used.
 - 2. The name or initial of the person conducting the survey.
 - 3. A drawing of the area surveyed identifying the relevant features of the area.
 - 4. Measured exposure rates keyed to the location on the drawing.
 - 5. The results of decontamination if the initial survey found levels above background.

VIII. Waste Disposal Procedure

Liquid radioactive waste can be disposed of into the sanitary sewer system in accordance with section 20.303 of 10 CFR part 20. The concentration limits specified in this section must not be exceeded. In addition, no more than 1 curie per year can be disposed of into the sanitary sewer system.

The generators can be either returned to the manufacturer or held for decay until background levels are achieved.

Syringes, vials, and other waste generated during the operation of the Nuclear Medicine Department must be held for decay. The waste material must be held for a minimum of ten half lives. Prior to disposal of the waste materials, it must be surveyed with the low level survey meter. If radiation levels are found which exceed background levels, the material must be held for further decay. At the time of disposal, the container radiation level, the background radiation level, the type of waste being disposed of, and the name of the individual disposing of the material must be recorded. A sample disposal form is attached.

IX. Xenon 133 Procedures

The ventilation in Nuclear Medicine is checked on a semi-annual basis. The ventilation system must provide a negative pressure in the Nuclear Medicine Department so that if Xe-133 is lost in the trap or the patient, it will be exhausted into the atmosphere.

If an accidental loss of xenon should occur, whether from a patient or the trap breaking down, the low level survey meter should be secured. In addition, the area should be evacuated. Insure that all doors to the area are closed and controlled so that personnel cannot enter the area. You should wait 30 minutes to resurvey the Nuclear Medicine Department. If the radiation level has not returned to background, the room should not be used. Wait an additional 30 minutes and resurvey the area.

The charcoal trap must be monitored during the procedure to insure that it is efficiently trapping the Xe-133. The low level radiation survey meter must be used for this. The meter should be placed in the vicinity of the trap exhaust. During procedures the radiation meter should be monitored. If a sudden increase in radiation levels is achieved, procedures should be terminated and emergency procedures implemented.

PACKAGE RECEIPT FORM

CONTROL NO. 3499

PERSONNEL/CLOTHING SURVEY