CHECKLIST FOR SELF-SHIELDED IRRADIATOR PERMITTEE APPLICATION

1. The enclosed Self-Shielded Irradiator Permittee Checklist should be completed without reference to any documentation submitted previously and should reflect current operating procedures. Retain a copy of your application package, which will become an integral part of your permit. Submit the application to Navy and Marine Corps Public Health Center (NMCPHC). The Naval Radiation Safety Committee (NRSC) will consider your application and issue your permit.

2. NRC NUREG-1556 Volume 5 contains details on the program requirements and provides model radiation safety procedures. Follow the guidance in NUREG-1556 Volume 5 in completing your application, except as modified for the following items of the application form:

Item 3 Locations of Use

Give complete address, **including building numbers** where radioactive material is used or stored.

_____

_____

_____

_____

Item 4 Person to be contacted.

Include name and title, telephone and fax numbers, and e-mail address.

_____

_____

_____

Items 5 and 6 Radioactive Material and Purpose

(a) Prepare your application in the format as described in NUREG-1556 Volume 5 Appendix S pages S-2 though S-3 (See pages 8-4 through 8-5 and 8-8 NUREG- 1556 Volume 5)

Items 7 through 11 of Naval Radioactive Materials Permit Application For Self-Shielded Irradiator

(Check all applicable rows and fill in details and attach a copy of the checklist to the application or provide information separately.)

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Item Number and Title	Suggested Response	Check box to indicate material included in application
Item 7: Individuals(s) Responsible for Radiation Safety Program and Their Training and Experience 7.1 Radiation Safety Officer (RSO) Name: _____	Before obtaining licensed materials, the proposed RSO will have successfully completed the training described in Appendix G in NuREG-1556, Volume 5. **AND** Before being named as the RSO, future RSOs will have successfully completed the training described in Appendix G in NUREG-1556, Volume 5. Within 30 days of naming a new RSO, we will submit the RSO's name to NEHC for inclusion in our permit. **Optional Response** Criteria for Acceptable Training for RSO and Self-shielded Irradiator Users Content: 1) Radiation Safety 2) Regulatory requirements 3) Practical explanation of theory and operation for each irradiator possessed by permittee Instructor's Qualifications: Instructor is qualified as RSO or AU before providing training. Training Assessment: Management ensures that RSOs, AUs are qualified to work independently with each type of permittee's irradiators.	
Item: Individual(s) Responsible for Radiation Safety Program and their Training Experience Item 7.2: Authorized User	Before using licensed material, authorized users will receive the training described in Appendix G in NUREG-1556, Volume 5. **Optional Response** Review optional response against criteria listed under RSO.	
Item 8: Training for Individuals Involved in or Frequenting Restricted Areas	The applicant's training program will be examined during inspection, but should not be submitted in the license application.	
Item 9. Facilities and Equipment	We will ensure that each area where a self-shielded irradiator is located corresponds to the "Conditions of Normal Use" and "Limitations and/or Other Considerations of Use" on the applicable irradiator's SSD Registration Certificate; the floor beneath a self-shielded irradiator is adequate to support the weight of the irradiator' each self-shielded irradiator is secured to prevent unauthorized access or removal; and each area where a self-shielded irradiator is located is equipped with an automatically operated fire detection and control system (sprinkler, chemical, gas) or the location of the area and other controls ensure a low-level radiation risk attributable to fires.	

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	Optional Response 1) Corresponds to Conditions/Considerations of Use on SSD Registration Certificate or justification for location and compensatory measures (e.g., increased surveillance, maintenance) to ensure that unit operated as designed and provides intended level of protection 2) Floor adequate to support weight 3) Secured to prevent unauthorized removal (e.g., locked room, bolted to floor) 4) Automatic fire detection and control or low radiation risk from fire (e.g.; ground floor, fire-resistant building, little combustible material, trained fire fighters)	
10. Radiation Safety Program 10.1 Audit Program	The applicant's program for reviewing the content and implementation of its radiation protection program will be examined during inspections, but should ***not*** be submitted in a permit application	
10. Radiation Safety Program 10.2 Radiation Monitoring Instruments	We will use instruments that meet the radiation monitoring instrument specifications published in Appendix K to NUREG-1556, Volume 5. Additionally, each survey meter will have been calibrated by the manufacturer or other person authorized by NRC or an Agreement Sate to perform survey meter calibrations no more than 12 months before the date the meter is used. **OR** We will use instruments that meet the radiation monitoring instruments specifications published in Appendix K to NUREG-1556, Volume 5. Additionally, we will implement the model survey meter calibration program published in Appendix K to NUREG-1556, Volume 5 and we will ensure that each survey meter will have been calibrated no more than 12 months before the date the meter is used. ***Note:*** License authorizing J.L. Shepard Mark Model 81-22 irradiator or I will contain a condition requiring calibrated survey meter or room monitor. **Optional Response** A description of alternative equipment and/or procedures for: 1) Ensuring that interlocks function, as required, to return moving self-shielded irradiator sources to the shielded position and/or 2) Determining source shielding integrity after an incident involving the self-shielded irradiator. Request to perform instrument calibration contains information described in Appendix K: 1) Personnel with adequate training and experience: -Principles and practices of radiation protection	

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	-Radiation measurements and instruments -Math, calculations basic to use and measurement -Biological effects of radiation -Observation and supervised hands-on participation in instrument calibration Facilities, equipment, and procedures ensure regulatory compliance and doses ALARA 1) Isolated area 2) Assigned dosimetry worn 3) Use of Calibrated, operable survey meter to detect unexpected changes in exposure rates **Optional Response** Model Procedure: 1) Source of radiation is used which: - Is a point source accurate to ± 5%, traceable to NIST - Uses same photon energy as the source in irradiator -Is strong enough to give 30 mR/hr at 100 cm 2) Inverse square law is used and decay corrections are made 3) Each calibration recorded and records maintained for 3 years (10 CFR 20.2103(a)) 4) Meter readings within ±20% of actual values 5) Number, location of calibrated points dependent on scales 6) Scales for measurements greater than 1 R/hr-no calibration is required but check for operation and approximately correct response 7) Calibration Report 8) Calibration tag or sticker placed on each meter indicates: -Type of radiation source used - Proper deflection for battery check -An indication that a scale was checked for function only but not calibrated -Calibration date -Due date -Rate from check source, if used	
10. Radiation Safety Program 10.3 Material Receipt and Accountability	Physical inventories will be conducted at intervals not to exceed 6 months, to account for all sealed sources and devices, received and posses under the permit. **Optional Response:** A description of the frequency and procedures for ensuring that no irradiators have been lost, stolen, or misplaced.	

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10. Radiation Safety Program 10.4 Occupational Dose	Either we will perform a prospective evaluation demonstrating that unmonitored individuals are not likely to receive, in one year, a radiation dose in excess of 10% of the allowable limits in 10 CFR Part 20 or we will provide dosimetry that meets the Criteria in the section entitled "Radiation Safety Program-Occupational Dose," in NUREG-1556, Volume5. **Optional Response:** Processed dosimetry (e.g., film, TLD): 1) Processed, evaluated by NVLAP-approved processor 2) Exchange frequency as recommended by processor Pocket chambers: 1) Assigned to single individual; dose is read, recorded, and chamber recharged, as appropriate, before chamber reassigned 2) Range of 0-200 mrem 3) Checked for correct response to radiation at intervals not to exceed 1 year 4) Reading within ±20% 5) Program prescribes action to evaluate dose	
10. Radiation Safety Program 10.5 Public Dose	No response is required from the applicant in a permit application, but documentation demonstrating compliance will be examined during inspection.	
10. Radiation Safety Program 10.6 Operating and Emergency Procedures	If we change our operating and emergency procedures without amending our license, we will ensure that: the changes are reviewed and approved by licensee management and the RSO; affected licensee staff are trained in the procedures before they are implemented; the changes are consistent with applicable license conditions and the procedures or commitments submitted in the licenses application; and the changes do not degrade the safety of the program. **AND EITHER** Operating and emergency procedures will be developed, implemented, maintained, and distributed and will meet the Criteria in the section entitled "Radiation Safety Program - Operating and Emergency Procedures" in NUREG-1556, Volume 5 dated October 1998. **OR** Alternative Procedures. **Optional Response** Develop, maintain, and implement model-specific operating and emergency procedures which contain: 1) Analysis of each material to be irradiated to ensure compatibility and determine if special procedures are needed 2) Procedure on how to operate and perform routine maintenance according to	

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Item Number and Title	Suggested Response	Check box to indicate material included in application
	manufacturer's (or distributor's) written instructions and recommendations 3) Security, access control (e.g., control key to irradiator room) 4) Steps to take to keep radiation doses received ALARA 5) Accountability (e.g., log book, leak tests, inventory) 6) Access control to damaged or malfunctioning irradiators 7) Steps to take and whom to contact when irradiator malfunctions or is damaged **AND** Provide copies of operating and emergency procedures to all users, and maintain current copy at irradiator control panel (or post notice describing where to find copy) **Licensing authorizing J. L. Shepard Mark I or Model 81-22 irradiator will contain the following conditions:** 1) Must have calibrated and operable survey meter or room monitor a) Room monitor: -Operable when irradiator is in use -Activates audible/visible alarm at 2 mrem/hr -Located to detect radiation from irradiator door -Visible to irradiator user b) Survey Meter: -Used to determine radiation levels when door is closed -Check for increased levels whenever door is opened; surveyor positioned to minimize radiation exposure 2) Before irradiator is used, check visual indicator to ensure source is in safe stored position 3) If abnormal radiation levels are detected or irradiator malfunctions a) Stop irradiator use b) Restrict access to irradiator c) Notify RSO d) Determine if NRC must be notified 4) Repairs only by those specifically authorized by NRC.	
10. Radiation Safety Program 10.7 Leak Tests	Leak tests will be performed at intervals approved by the NRC or an agreement Sate and specified in the SSD Registration Certificate. Leak tests will be performed by an organization authorized by NRC or an Agreement Sate to provide leak testing services for other licensees or using a leak test kit supplied by an organization authorized by NRC or an agreement State to provide leak test kits to other licensees and according to the self-shielded irradiator manufacturer's (or distributor's) and kit supplier's instructions. **OR**	

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	Leak tests will be performed at intervals approved by the NRC or an agreement Sate and specified in the SSD Registration Certificate. Leak tests will be performed by an organization authorized by NRC or an Agreement Sate to provide leak testing services for other licenses or using a leak testing services for other licenses or using a leak test kit supplied by an organization authorized by NRC or an agreement Sate to provided leak test kit to other licenses and according to the self-shielded irradiator manufacturer's (or distributor's) and kit supplier's instructions. As an alternative, we will implement the model leak test program published in Appendix P of NUREG-1556 Volume 5. **Optional Response** Evaluate alternative equipment/procedures for determining if there is leakage from sealed sources. -Identity who will make analysis and qualifications to make quantitative measurements -Leak test frequency as specified in the appropriate SSD Registration Certificate -How and where test samples will be taken -Materials to be used -Methods of handling samples to prevent or minimize exposure to personnel -Type of instrument(s) used, counting efficiency, and minimum levels of detection for each radionuclide ***Note:*** An instrument capable of making quantitative measurements should be used; hand-held survey meters will not normally be considered adequate for measurements. -Standard calibration sources, including the following information for each source; the radionuclide, quantity, accuracy, and traceability to primary radiation standards. ***Note:*** Accuracy of standards should be within $\pm$ 5 % of the stated value and traceable to a primary radiation standard such as those maintained by NIST. -Sample calculations to convert measurement data to Bq (or microcuries) -Instructions on actions to take and notifications to make regarding leaking sources.	
10. Radiation Safety Program 10.8 Maintenance	**ROUTINE CLEANING AND LUBRICATION** We will implement and maintain procedures for routine maintenance of our self-shielded irradiators according to each manufacturer's (or distributor's) written recommendations and instructions. **Optional Response-Routine Cleaning and Lubrication** -Considers ALARA -Ensures irradiator functions as designed	

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	-Ensures source integrity not compromised **NON-ROUTINE MAINTENANCE** We will have the self-shielded irradiator manufacturer (or distributor) or other person authorized by NRC or an Agreement Sate perform non-routine maintenance. **Optional Response-Non-routine Maintenance** Provide the information listed in Appendix I supporting a request to perform non-routine maintenance in-house. -Types of work to be performed -Who will perform maintenance, training, experience, why competent (e.g., previous experience and radiation safety training; vendor maintenance certification; pre-planned procedures with direct health physics supervision) -Handling procedures: doses to public, personnel ALARA and regulatory limits; security; posting; manufacturer's (or distributor's) written instructions and recommendations; evaluation of non-manufacturer-(or non-distributor-) supplied components, materials to ensure no degradation of safety; before return to routine use, test irradiator to verify it functions as designed, source integrity not comprised. -Use of whole body and extremity monitoring -Possess survey instrument (detects gamma; range to several hundred mR/hr; checked before use; calibrated annually, after repair; readings within $\pm$20 %; calibrated by manufacturer or NRC or Agreement State license-moving-source irradiator specifications in Appendix K) -10 CFR 20.1301 surveys (when and where instrument survey performed, records for 3 years)	
10. Radiation Safety Program 10.9 Transportation	No response needed. Transportation issues will be reviewed during inspection.	
10. Radiation Safety Program 10.10 Minimization of Contamination	The applicant is not required to submit a response to the minimization of contamination section if the applicant's responses meet the criteria for the following sections: "Radioactive Material - Sealed Sources and Devices," "Facilities and Equipment," Radiation Safety Program – Operating and Emergency Procedures," Radiation Safety Program – Leak Tests," and Waste Management – Self-Shielded Irradiator Transfer and Disposal."	
11. Waste Disposal 11.1 Self-Shielded Irradiator Disposal and Transfer	The permittee does not need to provide a response to this item during the permitteeing phase. However, the permittee should develop, implement, and maintain self-shielded irradiator transfer and waste disposal procedures in its radiation safety program.	N/A