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September 11, 2017

U.S. Nuclear Regulatory Commission
Division of Radiation Safety and Safeguards
Region I
2100 Renaissance Blvd.
King of Prussia, PA 19406

Ref: License #19-00296-17 03008478

Dear Sir or Madam:

Below is the response to your questions for a request for an exemption from 10 CFR 71.5 for an upcoming relocation of a Radioactive Material [REDACTED]. Since the time of the initial request on January 19, 2017, source decay results in a [REDACTED] quantity of radioactive material at the time of relocation.

NIH strongly believes that this irradiator is able to be moved without the use of a Type B container for the following reasons:

Experience - We have experience in overseeing movement of irradiators using forklifts. On our enclosed campus we oversaw the movement of [REDACTED] and [REDACTED] irradiators using a forklift from our Building [REDACTED] complex to a parking lot on the south end of campus which is 0.5 miles distance. This occurred in July 2014. Furthermore, in March 2014, Montgomery County Police Department (MCPD) assisted in a [REDACTED] irradiator relocation at a different off-site location, so they have experience as well.

Cost - There is an enormous cost savings. The estimate of using a Type B container is approximately \$166,000 and without the Type B container the estimate is approximately \$27,000. This a difference of \$139,000.

Safety - A safety assessment of the route has been conducted. The route of movement is on paved parking lots and across a paved road. The road that will be crossed is a [REDACTED]. Using only a forklift for movement decreases risk of dropping the irradiator since there will not be a need to lift the irradiator into a shipping container. MCPD will be present during the duration of the move and will be armed with weapons to ensure protection of the irradiator. Police officers will escort the forklift by driving a vehicle both in front and behind the forklift while moving the irradiator. Multiple health physicists will be present with radiation detection equipment and will continuously monitor the radiation levels and ensure the move is done safety.

Security - Since there is not a Type B container available that could hold this model of irradiator with the [REDACTED] in place, the [REDACTED] device would have to be removed before the irradiator could fit in an existing Type B container. Removing the [REDACTED] Additionally, there is an increased risk for potential radiation exposure since the sources have to be removed from the irradiator to package them in the Type B container.

Training - Health physicists from Radiation Safety have attended multiple sessions of the Y-12 training course on irradiator security emergency response, sponsored by the National Nuclear Security Agency. Individuals from MCPD have also completed this same training course. Additionally, Radiation Safety health physicists have conducted many joint training exercises with MCPD on radiological security using live Cs-137 sources. Through these multiple training opportunities, both Radiation Safety and MCPD staff are well-prepared to handle this irradiator relocation project.

Response to your questions:

1. *Although you provided the majority of the information requested in NUREG 1556, Vol. 5, Appendix Q, in your January 19, 2017, license amendment exemption request, please provide responses to each of the questions listed in NUREG 1556, Vol. 5, Appendix Q.*

The irradiator was built after 1966 so NUREG 1556, Vol. 5 Appendix Q does not apply.

NIH is requesting an exception from 10 CFR 71.5 for a [REDACTED] quantity of radioactive material relocation that is a very short distance through a private parking lot, across [REDACTED] which is a [REDACTED] public road, and through another private parking lot to reach its destination. NIH is requesting this exemption for a period of one day for this specific move.

The irradiator will be relocated as-is with its shielded housing intact. The manufacturer of the device will remove the tower and secure the source rods in place to prevent movement during relocation. A shipping cover will be placed over the irradiator [REDACTED]
[REDACTED]

An NRC licensed service provider will prepare and secure the irradiator on a forklift rated at [REDACTED] pounds using a heavy duty securing device such as ratchet straps or chains. A government employee experienced in driving forklifts will move the irradiator across the public road to the new facility that will house the irradiator.

Multiple armed officers from the MCPD will be providing security during the loading, movement, and unloading process and will maintain direct line of sight with the irradiator at all times. NIH Health Physicists will have direct line-of-sight with the irradiator at all times and will survey the irradiator for radiation levels before and after movement.

2. *Did the Department of Transportation (DOT) advise you that you qualify for an exemption in accordance with 49 CFR 171.1(d)(5)? If so, please state who was involved from DOT in that communication and describe the details of that communication and any related decisions.*

Jim Williams from DOT pointed out the regulation 49CFR171.1(d) and suggested NIH contact Tyler Patterson and Joe Solomey for interpretation of this regulation. A phone conversation took place with Tyler Patterson where NIH learned that this move could be done under 49CFR171.1(d)(5) as long as the move is done by a Federal, state, or local government employee solely for noncommercial Federal, state, or local government purposes.

3. *Please describe why you believe that use of a Type B transport cask is not a viable or reasonable option for your planned transfer. Include information associated with cost, schedule, actual distance on public roads, safety risks, security risks, etc.*

NIH reached out to the manufacturer of the irradiator and requested a preliminary quote. J.L. Shepherd estimated it would cost approximately \$166,000 to move the irradiator across the public

road. This quote includes the cost of the shipping container, transport equipment, rigger, forklift, 2-person crew to perform the work, labor for uninstalling the [REDACTED] before movement, and a [REDACTED] reinstall [REDACTED] after movement.

Because there is no Type B container available that could hold this model of irradiator with the [REDACTED] in place, the [REDACTED] device would have to be removed before the irradiator could fit in an existing Type B container. A new [REDACTED] would be installed after the move is completed. Removing the [REDACTED]

This is an excessive additional cost for a relocation that is just across a [REDACTED] public road that also results in [REDACTED] during the move.

The quote NIH received for movement of the irradiator without using a Type B container is approximately \$27,000.

4. Does this device qualify as a Type A package and is that one of your mitigating strategies?

The Sealed Source and Device Registry No. [REDACTED] for the [REDACTED] includes a label:

USA DOT 7A
TYPE A
RADIOACTIVE
MATERIAL
JLS

This irradiator was tested and found to meet Type A packaging requirements, which include water spray, free drop, stacking, and penetration tests listed in 49 CFR 173.465. The forklift driver will ensure the distance from the lowest point of the Type A container is less than 4 feet from the ground. This is the free drop test distance requirements this container endured.

5. Please address the following with respect to transport of the [REDACTED] Series irradiator with a forklift?

- You reported in your January 19, 2017, correspondence that the weight of the irradiator is [REDACTED] pounds and that you plan on using a forklift rated at [REDACTED]. Is that enough margin and what is your basis?

NIH contacted Sunbelt Rentals in Fairfax Virginia and this company recommends using a forklift rated at [REDACTED] pounds to move and lift [REDACTED] pounds. Therefore we intend to use a forklift rated at [REDACTED] pounds, not [REDACTED] pounds.

- How will the irradiator be secured on the forklift to prevent it from falling during transport?

An NRC licensed service provider will secure the irradiator on a forklift, rated at [REDACTED] pounds, using a heavy duty securing device such as ratchet straps or chains.

- Will the transport pathway encounter obstacles such as speed bumps, potholes, curbs, ramps, gravel, or mud? If so, please describe how the package and forklift will be able to transport the irradiator without incident.

A forklift will be used for movement of the irradiator. The route of movement is on a paved parking lot and road. There are paved curbs on both side of the road that have a slight incline and decline but nothing unusual. The path does not encounter speed humps, and potholes will be avoided, if there are any at time of movement.

- Do you plan to impose any environmental restrictions on transport (e.g., weather forecast, wind speed, storms, daylight, etc.)?

This relocation will occur during daylight. In the event of unusual inclement weather, the relocation will be rescheduled.

6. What are the maximum external dose rates on the [REDACTED] irradiator on contact with and at one meter? Where is the highest dose rate located on the irradiator?

The dose rate measurements were taken on 7/20/17 and the highest dose rate with the sources in the secured position is 0.026mR/hour at the rear base of the irradiator. The measurement at one meter is at background level.

7. Do you have current leak test results for the irradiator? What are the contamination levels on the irradiator?

The most recent leak test taken 7/20/2017 was non-detectable.

8. What is the actual distance that the irradiator will have to travel on public roads (e.g., perpendicular distance across [REDACTED])?

The distance from curb line to curb line is 58 feet.

9. Please describe how you will comply with the security requirements in [REDACTED] for transport of a [REDACTED] shipment?

This no longer applies. The irradiator will be a [REDACTED] quantity of radioactive material at time of relocation.

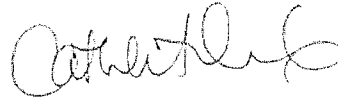
NIH Radiation Safety and the MCPD will maintain constant surveillance and have direct line-of-sight of the irradiator from the time the irradiator is moved out of the [REDACTED] building until the irradiator is in the [REDACTED] building. A security zone will be established in areas where the irradiator is loaded and offloaded from the forklift. During movement, the forklift will be the security zone and MCPD will escort the forklift during movement between the buildings. The security zone will be limited to authorized individuals only. MCPD will have the capability for immediate communication to summon appropriate response or assistance, if needed. Officers will use encrypted secure radio communication throughout the move and will directly communicate with all other individuals involved with the project. Furthermore, Officers will use cell phones as a backup communication devices.

10. Have you developed a detailed transport plan (e.g., loading plan, transport method, transport pathway, pre-transport pathway inspection, stop-work criteria, communications with NIH staff and Police, approvals and communications with individuals who own the private roads/parking lots, etc.? If so, please provide us with a copy.

NIH leases this property from a private company and the private company is aware that this equipment will be moved across their parking lot and into another leased facility owned by the same company.

A detailed relocation plan is included in this response.

If you have additional questions, please feel free to contact me at 301-594-1303 or via e-mail at cribaudo@nih.gov.



Catherine A. Ribaudo
Radiation Safety Officer, NIH

cc: Dr. Brad Wood, Chairman, NIH Radiation Safety Committee

Transport Route – Map Removed

Relocation Plan for NIH [REDACTED] Quantity of Radioactive Material

National Institutes of Health (NIH) will move a [REDACTED] quantity of radioactive material from one NIH facility to another NIH facility that is across a public road. Both NIH facilities are under the same NRC license. The irradiator will be moved a distance of 0.3 miles, from [REDACTED] MD to [REDACTED]. The irradiator will be moved through a private parking lot, across [REDACTED] which is a dead end public road, and through another private parking lot to reach its destination. The public road, [REDACTED] will be briefly closed to traffic by the Montgomery County Police Department (MCPD). The move will take place early in the day on a [REDACTED]

Radiation Safety will be required to perform the following actions:

Ensure only Trustworthy and Reliable staff have unescorted access to the irradiator for the duration of the relocation. Anyone not T&R will be escorted, with continuous direct line-of-sight.

Have present personal radiation detectors (PRDs) and ion chambers, including a Teletector radiation meter.

Maintain constant surveillance of the irradiator from the time the irradiator is moved out of the [REDACTED] building until the irradiator is in the [REDACTED] building.

Provide written procedures to the government employee fork lift driver, the contract service provider, and all onsite police officers responsible for providing protection during the irradiator move.

Communicate directly with MCPD during loading, relocation, and unloading of the irradiator.

Work with MCPD to establish a security zone while the irradiator is loaded and offloaded from the forklift. During movement, the forklift will be the security zone and MCPD will escort the forklift during movement between the buildings. The security zone will be limited to authorized T&R individuals only. Radiation Safety and MCPS will monitor, detect, assess, and respond to any unauthorized access.

Have lead blankets available in the event of an incident. Work with all personnel involved in the relocation to form action plans to recover from an incident.

Notify the NRC's Operation Center (301-816-5100) within 4 hours of determination that the [REDACTED] shipment of radioactive material is lost or missing. If after 24 hours the shipment is still lost or missing, the licensee shall immediately notify the NRC's Operation Center.

Notify the NRC's operations center (301-816-5100) as soon as possible upon discovery of any actual or attempted theft or diversion of the shipment, or any suspicious activity related to the movement of this [REDACTED] quantity of radioactive material.

JL Shepherd & Associates will be required to perform the following actions:

Prepare the irradiator for relocation by removing the tower, covering the irradiator [REDACTED] and then reinstalling tower after relocation.

MCPD will be required to perform the following actions:

Maintain constant surveillance of the irradiator from the time the irradiator is moved out of the [REDACTED] building until the irradiator is in the [REDACTED] building.

Ensure the area is closed off to traffic during movement and escort the forklift during movement.

Have the capability for immediate communication to summon appropriate response or assistance, if needed. Officers will use encrypted secure radio communication throughout the move and will directly communicate with all other individuals involved with the project. Additionally, Officers will use cell phones as a backup communication devices.

Carry PRDs throughout the move.

Government employee forklift driver will be required to perform the following actions:

Have a PRD present on the forklift.

Wait until Radiation Safety gives approval before driving the forklift slowly to its destination.

Drive the forklift at a slow safe speed and ensure the distance from the lowest point of the Type A container is less than 4 feet from the ground.

Contract Service Provider will be required to perform the following actions:

Perform a radiation survey and leak testing pre and post movement.

Move the irradiator to the outside of the [REDACTED] building and secure the irradiator on the forklift. The contractor will safely unload the irradiator at [REDACTED] and move it to its secured room.