Enclosure 3

Slides to Support NRC Meeting on the Classification of Co-60 Byproduct Material

(Non-Proprietary)

May 2021

Westinghouse Electric Company
1000 Westinghouse Drive
Cranberry Township, PA 16066

Classification of Cobalt-60 Byproduct Material

NRC Meeting

May 20, 2021

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Westinghouse **VISION & VALUES**

- Customer Focus & Innovation
- Speed & Passion to Win
- Teamwork & Accountability

Safety • Quality • Integrity • Trust

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Agenda

- Objective
- Background of Cobalt-60 Production
- Assessment of Regulations
- Westinghouse Position
- Precedent Applications
- Summary & Conclusions

Objective

- Dialogue with NRC Staff regarding classification and traceability of the Cobalt-60 capsules that will be transferred to the Nordion facility.
- After review of the regulations, it is Westinghouse position that the capsules containing Cobalt-60 produced at a licensee plant and transferred to Nordion's facility do not fall within the definition of sealed source.

Background of Cobalt-60 Program

- Westinghouse and Nordion (Canada) are developing an innovative isotope production technology, and with our partner utilities, plan to produce Cobalt-60 in Pressurized Water Reactors (PWRs).
- Nickel-plated slugs of Cobalt-59 target material will be provided to WEC by Nordion.
- Target material will be sealed in **[ ]**[a,c] capsules and the capsules loaded into **[ ]**[a,c] at the WEC Columbia Fuel Fabrication Facility.
- **[ ]**[a,c] are inserted into Westinghouse fuel assemblies, shipped to the plant site and loaded into the reactor core as fuel assembly components to be irradiated for multiple fuel cycles, producing Cobalt-60.
- After removal from the core, the activated capsules are harvested (removed from the **[ ]**[a,c]), loaded into a Nordion-supplied transportation cask, and transferred to Nordion's Canada facility.
- At Nordion, the Cobalt-60 slugs are removed from the capsules and packaged as sealed sources according to activity levels appropriate for supply to Nordion's customers for use in sterilization and medical use applications.

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Background - Cobalt-60 Production

a,c

[redacted]

Background – [ ]a,c

a,c

[ ]

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Assessment of Regulations

- Sealed sources used in the U.S. must be registered in the National Sealed Source and Device Registry.
  - Contains all the registration certificates that summarize the radiation safety information for the sealed sources.
  - Describes the licensing and use conditions approved for the product.
  - Each sealed source must be uniquely marked.
- The USNRC regulations that are relevant to sealed sources and this process are contained in 10 CFR Parts 30, 31, 32, 35, and 36.
- Much of the focus of the regulations is on the manufacture, distribution, use, and disposal of sealed sources.
- Thus, the definition of sealed source is particularly relevant to the interpretation and use of the regulations.

Assessment of Regulations

- Part 30 includes the following definitions: Rules of General Applicability To Domestic Licensing of Byproduct Material:
  - *Byproduct material* means— Any radioactive material (except special nuclear material) yielded in, or made radioactive by, exposure to the radiation incident to the process of producing or using special nuclear material.
  - *Sealed source* means any byproduct material that is encased in a capsule designed to prevent leakage or escape of the byproduct material.
- Part 35 “Medical Use of Byproduct Material,” also uses this same definition for sealed source.
- Part 36, “Licenses and Radiation Safety Requirements For Irradiators” also uses the Part 30 and Part 35 definition, but with an added phrase:
  - *Sealed source* means any byproduct material that is used as a source of radiation and is encased in a capsule designed to prevent leakage or escape of the byproduct material. [underline emphasis added]
- Part 30 (Section 30.41(b)) further states: “ …any licensee may transfer byproduct material: … To a person abroad pursuant to an export license…”

Assessment of Regulations

From the Final Rule for Parts 20 and 32, "National Source Tracking of Sealed Sources" (71 FR 65686):

- *C. Who Does This Action Affect?*
  The final rule applies to any person (entity or individual) in possession of a Category 1 or Category 2 source. It applies to all NRC licensees; including, for example: Manufacturers and distributors of Category 1 and Category 2 sources; Medical facilities, radiographers, irradiators, reactors, and any other licensees that are the end users of nationally tracked sources; and Disposal facilities and waste brokers. [underline emphasis added]
- *B. What is a Nationally Tracked Source?*
  For the purpose of this rulemaking, the term nationally tracked source does not include ….. nuclear material contained in any fuel assembly, subassembly, fuel rod, or fuel pellet.

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Westinghouse Position

- Per the provisions and definitions in the regulations, the capsules containing Cobalt-60 byproduct material at a licensee's plant do not qualify as sealed sources.
- It is planned that the target capsules will be marked using batch identification (e.g.,100 capsules or less per batch).
- The Cobalt-60 that is produced at a licensee's plant is byproduct material to be transferred to and used by Nordion.
- This process is quite similar to that used by Nordion with its Canadian Cobalt-60 suppliers.
- A license amendment will be requested for each licensee that will enable them to produce, possess and transfer Cobalt-60 byproduct material.
- Cobalt-60 byproduct material will be transferred to Nordion where the activated slugs will be removed from the capsules and packaged as sealed sources according to activity levels for supply to their customers for use in sterilization and medical use applications.

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Precedent Applications

- Clinton Power Station
  - Amendment No. 190 to Facility Operating License No. NPF-62
  - License Amendment Request to Modify Clinton Power Station Facility Operating License in Support of the Use of Isotope Test Assemblies
- Hope Creek Generating Station
  - Amendment No. 184 to Facility Operating License No. NPF-57
  - License Amendment Request Supporting the Use of Co-60 Isotope Test Assemblies (Isotope Generation Pilot Project)

Summary and Conclusions

- Westinghouse and Nordion plan to produce Cobalt-60 in Westinghouse PWR reactors.
- Capsules containing Cobalt-60 byproduct material produced at a licensee plant and transferred to Nordion's facility are not considered to be sealed sources and will not require registration with the National Sealed Source and Device Registry.
- Marking of the byproduct capsules will be on a batch basis.
- Individual capsules containing Cobalt-60 byproduct material will not be subject to tracking through the NSTS.
- A license amendment will be requested by each utility desiring to produce, possess, and transfer Cobalt-60 byproduct material.
- A similar process has been previously licensed at the Clinton Power Station and Hope Creek Generating Station.

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