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Box 355 Pittsburgh Pennsylvania 15230-0355

Westinghouse Electric Corporation Water Reactor Divisions

August 18, 1987

U. S. Nuclear Regulatory Commission ATTN: Mr. Leland C. Rouse Fuel Cycle Safety Branch Division of Fuel Cycle, Medical, Academic, and Commercial Use Safety Office of Nuclear Material Safety and Safeguards Washington, DC 20555

Gentlemen:

REF: NRC Letter Dated March 2, 1987 Westinghouse Letter Dated April 15, 1987 NRC Letter Dated June 29, 1987

In our above referenced letter, we submitted a proposed license demonstration and conditions in response to your March 2, 1987 letter. The purpose of this letter is to formalize this response with changed pages to the license.

If you have any questions, please write or telephone me at (803) 776-2610, Extension 3247.

Very truly yours,

A. J. Nardi, Manager NES License Administration

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### FOREIGN CONTAMINATES IN UF6 CYLINDERS AND PROCESS SYSTEMS

The presence of foreign contaminates in  ${\rm UF}_6$  cylinders and process systems is prevented through controls associated with  ${\rm UF}_6$  receipt, processing, cold trapping, maintenance, storage and transportation.

The first category,  ${\rm UF}_6$  receipt, describes those controls associated with receipt of  ${\rm UF}_6$  in Model 30 shipping packagings. This category also covers cylinder procurement.

The second category,  $UF_6$  processing, describes controls associated with processing cylinders (vaporization by both IDR or ADU systems). This category covers preoperational cylinder and process checks, processing and post operational cylinder checks.

The third category, UF<sub>6</sub> cold trapping, describes controls associated with cold trapping operations from Model 30 to Model 8 UF<sub>6</sub> cylinders. This category specifically addresses the controls that are maintained to prevent oil additions to UF<sub>6</sub> cylinders.

The fourth category,  $UF_6$  process and cylinder maintenance, describes the aspects of maintenance involving  $UF_6$  cylinder (valve replacement and recertification) and process systems (nil filled pressure gauges).

The fifth category, storage and transportation, describes the controls associated with on-site storage of cylinders and, in addition, transport of cylinders off-site to be refilled, washed or recertified.

#### 1.14.1 UF6 RECEIPT

UF<sub>6</sub> is received in Model 30 cylinders in NRC/DOT authorized packagings. These cylinders are inspected for damage upon receipt so as to ensure cylinder integrity. Cylinders (non-Westinghouse) are further inspected to determine that they are constructed and recertified in accordance with ANSI N14.1, "Packaging of Uranium Hexafluoride for Transport."

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Valve covers are removed for weight verification; at this time, the tamper safe seal is inspected. If the seal has been compromised, the cylinder will not be accepted for processing. Cylinders that are acceptable (meet defined requirements) are dispositioned for storage to await processing.

New cylinders (Westinghouse-owned) are designed, fabricated, tested, inspected and cleaned in accordance with ANSI N14.1 to assure that foreign contaminates are eliminated prior to initial use of each cylinder. Thereafter, cylinders are washed and recertified within the frequency as defined in ANSI N14.1.

#### 1.14.2 UF6 PROCESSING

Cylinders are transferred from storage to the  ${\rm UF}_6$  Bay where they are staged for process checks. Cylinders are cold vacuum checked to ensure cylinder integrity through the transportation and storage period. Cylinders that do not have acceptable vacuum are tagged for engineering disposition.

Cylinders are then placed in vaporization chests for processing. Pigtails are inspected for cleanliness and connected to the cylinder valve and process line to permit the flow of  $UF_6$  from the cylinder to the conversion process system. Connections are made while the cylinder valves are closed. Cylinder line  ${\rm UF}_6$  pressure is monitored via a diaphram pressure gauge. These pressure gauges are limited to halocarbon oils that are compatible with UF ..

Oil additions to line pressure gauges are identified in area operations procedures. These procedures specifically describe that halocarbon oils are to be used. In addition, halocarbon oils and grease are used elsewhere on process lines that may contain UF6. Actuator valves with interlocks on process line ensure that foreign contaminates will not backflow to the UF<sub>6</sub> cylinders.

Docket No. 70-1151 Initial Submittal Date: 4/15/87 Page No. 1.14-2 License No. SNM-1107 Revision Submittal Date: 8/18/87 Revision No. 15 After cylinder processing, an on-line eduction system is used to further reduce the uranium content of the cylinder. This eduction process uses only nitrogen. After eduction, the cylinder valve is closed and the pigtail removed.. After cooling, a vacuum check is performed. If the cylinder is not under acceptable weight or vacuum, the cylinder is dispositioned for cold trapping. Acceptable weight and vacuum cylinders then have tamper safe seals applied to valves and are dispositioned for storage.

### 1.14.3 UF6 COLD TRAPPING

The UF<sub>6</sub> cold trapping systems (IDR and ADU) are designed for further eduction of UF<sub>6</sub> (to "heel" quantities) from Model 30 UF<sub>6</sub> cylinders. The systems consist of the following: (1) refrigeration compressor, (2) Model 8 or 12 cold trap cylinder, (3) refrigeration chamber for Model 8 or 12 cylinder, (4) alumina packed columns, (5) oil trap and (6) vacuum pump. In addition, the IDR cold trapping system is equipped with a heat exchanger for heating model 12 cylinders on-line.

 $UF_6$  gas flows from Model 30 cylinder to Model 8 or 12 cylinders by vacuum transfer where it is cooled and condensed to solid  $UF_6$ . Heat (steam or hot water) is often applied to the Model 30 cylinder to enhance this transfer process. Uncondensed  $UF_6$  is collected in one of two alumina packed columns connected in series between the Model 8 and 12 cylinders and the oil trap. This process continues until the Model 8 and 12 cylinders are filled to an approved limit. Once filled, the Mcdel 8 and 12 cylinders are processed on a conversion line.

To prevent foreign contaminates (oils) from entering the Model 8, 12 and 30 cylinders, oil traps are installed between the cylinders and the vacuum pumps. This oil trap has a volume capacity of approximately 1.5 times the oil volume capacity of the vacuum pump. Oil traps are provided with drain valves to allow inspection and removal of materials prior to oil addition to the vacuum pump. To further safeguard cold trap operations, only oils and greases compatible with UF<sub>6</sub> (halocarbon) are used in the vacuum system.

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Cold trapping Model 8 and 12 cylinders are also designed, fabricated, inspected and tested in accordance with ANSI N14.1, Standard for packaging of UF\_6 for transport.

### 1.14.4 UF6 PROCESS AND CYLINDER MAINTENANCE

Foreign contaminates are eliminated from  $UF_6$  process systems and cylinders through an effective maintenance program. Maintenance on  $UF_6$  process systems encompasses process lines, valves and gauges. Process lines and valves are maintained to ensure their integrity from leakage and possible entry paths for foreign contaminates.

Maintenance of pressure gauges involves routine calibrations and additions of oils compatible with  $UF_6$  (i.e., when oil type gauges are used on  $UF_6$  process lines).

Foreign contaminates in  $UF_6$  cylinders are minimized or eliminated through detailed procedures describing  $UF_6$  cylinder valve replacement, in addition to washing and recertifying of cylinders in accordance with ANSI N14.1 guidelines.

When cylinder valves are shown to be defective, the cylinder is dispositioned for valve replacement. The procedure for valve replacement involves: 1) ice down of cylinder, 2) clean cylinder top after ice down, 3) position ventilation tent over vaporizer, 4) obtain, inspect and clean, if necessary, replacement valve, 5) remove valve under ventilation tent, 6) immediately install replacement valve, 7) establish cylinder vacuum prior to processing.

This procedure ensures that foreign contaminates will not enter UF<sub>6</sub> cylinders during valve replacement. Breached cylinders remain under continuous operations and/or maintenance surveillance until secured (i.e., valve replaced). The new valve is then equipped with a tamper safe seal, if disposition for storage.

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 $UF_6$  cylinders are also routinely washed, inspected and recertified in accordance with ANSI N14.1 guidelines. This will ensure removal of any foreign contamination that may have entered the cylinders.

### 1.14.5 UF6 STORAGE AND TRANSPORT

 $UF_6$  cylinders are stored in approved areas while awaiting processing or transport. Tamper safe seals are placed on all cylinder valves and plugs to detect tampering and possible entry of foreign contaminates, of cylinders that are dispositioned for storage outside the facility.

However, cylinders in the UF<sub>6</sub> Bay are excluded from tamper sealing, as well as cylinders dispositioned for decommissioning or washing. Cylinders in the UF<sub>6</sub> Bay are considered in process until released for storage. Cylinders dispositioned for transport (full, heel and recertified cylinders) are inspected for damage and the integrity of appropriate tamper safe seals established prior to release. Cylinders in good condition (i.e., valves and plugs) will not permit entry paths for foreign contaminates. Transportation of cylinders off-site (full, heel and recertified only) generally require sole use of the transport vehicle.

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### 2.2.17 FOREIGN CONTAMINATES IN UF6 CYLINDERS AND PROCESS SYSTEMS

The following shall be provided as part of the  $\text{UF}_6$  receipt, processing, cold trapping, maintenance, storage and transportation controls that preclude the introduction of foreign contaminates into  $\text{UF}_6$  cylinders and process systems.

- 2.2.17.1 Tamper safe seals on cylinder valves and plugs shall be inspected upon cylinder receipt.
- 2.2.17.2 New cylinder procurement shall be in accordance with the current revision of ANSI N14.1. Existing cylinders shall be cleaned, tested and inspected, so as to comply with the intent of ANSI N14.1.
- 2.2.17.3 Tamper safe seals shall be applied to UF<sub>6</sub> cylinder valves and plugs (heels, recertified and new cylinders) dispositioned for highway transportation. Full cylinders shall have tamper safe seals applied to the outer protective package.
- 2.2.17.4 Oil traps shall be provided for cold trapping systems with a volume fraction (oil trap-to-vacuum pump) of 1.5.
- 2.2.17.5 Oil traps shall be inspected prior to oil additions to vacuum pumps for detection of oil backflow.
- 2.2.17.6 Dil and grease usage in  $UF_6$  process and cold trap systems shall be limited to those compatible with  $UF_6$  (halocarbon).
- 2.2.17.7 Procedures shall be provided to prevent the introduction of contaminates to UF\_6 cylinders during valve replacements.

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REVISION RECORD

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13	7/23/87	New pages 1.11-6 through 1.11-8.	Added authorization for off-site drying of calcium fluoride.
14	8/14/87	Revised page 4.5-1.	Added drying of calcium fluoride to scope of operations.
		Revised pages 4.8-1 and 4.8-2.	Delete Western Zironium as an authorized recipient of HF.
		Revised page 4.1-1.	Update document date.
		Revised pages 1.11-2, 1.11-4, 1.11-5, and 1.11-6.	Added encapsulated materials to briquetting desciption.
15	8/18/87	New pages 1.14-1 thru 1.14-5 and 2.2-14.	Added criteria to preclude foreign contaminants from UF <sub>6</sub> cylinders.

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