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DOCKET NO.: 70-36

LICENSEE: Combustion Engineering, Inc. (CE)

FACILITIES: Hematite Fuel Fabrication Facilities  
Hematite, Missouri

SUBJECT: REVIEW OF LICENSE AMENDMENT APPLICATION DATED AUGUST 22, 1979,  
AND SUPPLEMENT TRANSMITTED BY LETTER DATED OCTOBER 3, 1979,  
CONCERNING INCINERATOR OPERATION AND ADMINISTRATIVE CHANGE,  
PC NO. 78075A, SUBTASK 01

Background

(The license fee charges for this amendment are being assessed, as the licensee requested, against the fee for the UF<sub>6</sub> conversion expansion at the Hematite facility.) By application dated August 22, 1979, Combustion Engineering (CE) requested authorization to incinerate combustible scrap in a small (25 lb. per hour capacity) incinerator and provided a brief description of the equipment and mode of operation. The incinerator/scrubber system will be used to reduce the volume of low level uranium contaminated waste with a maximum enrichment of 4.1% U-235. The system consists of a gas-fired incinerator, an air-cooled heat exchange, an ejector-venturi scrubber and a packed tower scrubber. The incinerator is to be installed in the Building 240-3 area. We requested additional information on the operating controls in the letter to CE dated September 14, 1979, and this information was provided in CE's letter of October 3, 1979, and attachment, with revised license pages for the conditions section of the license dated October 1, 1979. The October 3, 1979, letter also requested that the Radiation Specialist-Windsor be allowed to substitute for the Windsor Nuclear Laboratory Radiological Safety Officer in the semi-annual inspections of the Hematite radiation safety program.

The proposed incinerator and questions on its operation were discussed with Mr. C. Peck, Region III principal inspector for the Hematite plant, in a telecon on September 12, 1979. Mr. Peck saw no objection to issuance of an authorizing amendment after CE had provided satisfactory answers to our questions, which were transmitted to CE in the NRC letter dated September 14, 1979.

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## Discussion

### Administrative Change

The degree and 2-year radiation safety experience requirement for the Radiation Specialist-Windsor should be sufficient to ensure adequate capability to perform the 6-month inspections. The resume provided for the current incumbent in the position indicates that he meets the requirements of the position and is capable of performing the required 6-month inspections.

The balance of the discussion concerns the proposed incinerator operation.

### Radiation Safety

The same controls will be used to ensure radiation safety and adherence to ALARA principles in the operation of the new incinerator that are used in the existing licensed operations. The licensee has experience in the operation of related type equipment used to oxidize uranium oxide for recovery. The incinerator is designed for operation at negative pressure relative to atmosphere. There will be routine air sampling conducted with both fixed and lapel samplers to assure adequate radioactivity containment in the incinerator operation.

### Nuclear Criticality Safety

The nuclear criticality safety of the incinerator and auxiliary equipment is based on:

1. Limiting the total uranium charged to a safe mass for the maximum (4.1%) enrichment allowed under the license.
2. Limiting the ash accumulation to a safe slab depth for the maximum allowed enrichment.
3. Cleanout of the incinerator and inspection of the secondary chamber each time ash is removed from the primary chamber.
4. Frequent inspection of the auxiliary equipment and weekly analyses of the scrubber liquor.
5. Limiting the off-gas cooler and the ejector-venturi scrubber to favorable geometry.
6. Replacing the liquid in both scrubbers after the processing of charges containing a safe mass.

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This system of redundant controls is in compliance with the double contingency policy endorsed in Regulatory Guide 3.4, "Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors."

#### Environmental Impact

The scrubbed gases from the incinerator pass through a packed tower scrubber to remove any residual particulates before discharge into the 240-2 wet recovery ventilation stack. This stack is continuously sampled with samples changed daily and analyzed for gross alpha each week. Existing License Condition 15 requires the licensee to investigate and take corrective action if effluent concentrations averaged over two weeks exceed the concentrations in Part 20, Table II, Column 1 of Appendix B.

There will be no liquid discharged to the environs from the system. The used scrubber solution will be evaporated to recover the solids content. Solids from the incinerator operation will be sent to wet recovery or to a licensed burial site.

The overall environmental impact of the incinerator operation is expected to be minimal and the solid waste volume will be reduced without other significant impact.

#### Process Safety

The gas burners are provided with the usual thermocouple controlled valves. The incinerator is a commercially available design and the licensee has experience with related equipment.

#### Conclusion and Recommendation

Based on the safety and environmental reviews of the amendment application as supplemented, it is concluded that the incinerator can be operated without undue risk to the health and safety of the operating staff or the public, and without significant adverse environmental impact. Authorization of the incinerator operation and authorization to use the Radiation Specialist-Windsor in the 6-month inspections is recommended.

Original Signed By:  
R. L. Stevenson

R. L. Stevenson  
Uranium Process Licensing Section  
Uranium Fuel Licensing Branch  
Division of Fuel Cycle and  
Material Safety

Original Signed By:

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