C-E Power Systems
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NIS/79/652

POWER SYSTEMS

October 3, 1979

Mr. Robert L. Stevenson
Uranium Process Licensing Section
Uranium Fuel Licensing Branch
Division of Fuel Cycle and Material Safety
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Docket 70-36

Dear Mr. Stevenson:

Enclosed is additional information, as requested by your letter dated September 14, 1979, concerning safety of the operation of a new waste incinerator in area 240-3 of the Hematite plant.

Also enclosed is a revised page 2-10 and a new page 2-25 to the SNM-33 License application, indicating that the Radiation Specialist - Windsor may substitute for the Windsor Nuclear Laboratory Radiological Safety Officer on semi-annual inspections.

Very truly yours,

COMBUSTION ENGINEERING, INC.

H. E. Eskridge

H. E. Eskridge
Supervisor, Nuclear Licensing,
Safety and Accountability

/wg
Enclosure

Response to Questions on Application Dated
August 22, 1979, Combustion Engineering, Inc.,

Docket 70-36

Question 1. *The mass limit for the incinerator allows for possible double batching of a homogeneous system of moderated oxide, but does not explain how the uncertainty of the charge measurements will be considered. Please explain how the charge uncertainty is allowed for in the operating controls, including the uncertainty in the uranium enrichment.*

Response: All charges will be gamma counted for U-235 content prior to introduction into the incinerator. The passive gamma counting system measures the U-235 directly, and has an upper detection limit of 100 grams U-235. Thus, a single incinerator charge will not exceed 100 grams U-235. The gamma counter is included in the Measurements Control Program, involving frequent calibration measurements of standards which must count within control limits set at the 0.05 level of significance.

The typical incinerator charge will contain about 10 kilograms of combustible waste and only a few grams of U-235. The small size of the incinerator will make it necessary to vacuum out the ash long before the safe mass limit is reached. Operating procedures will require removal of the ash when it reaches a depth of 3 to 4 inches (less than a safe slab configuration). No significant ash accumulation was observed in the secondary combustion chamber after test runs with non-contaminated charges. Operating procedures, however, will require inspection of the secondary chamber each time the ash is removed from the primary chamber. The probability of moderation by water flooding is essentially zero.

The above considerations, including basing the mass limit on the highest licensed enrichment, negate the effect of any charge measurement or enrichment uncertainty.

Question 2: *Please justify the annual inspection frequency of the auxiliary equipment in terms of possible hazardous fissile material accumulations in the equipment during that interval.*

Response: Heat Exchanger - Flue gas passes through 12 two-inch diameter tubes having a combined cross-sectional area which is about 50% of a safe-diameter cross-sectional area. Significant plugging would cause an increase in pressure in the incinerator exhaust stack. The gas distribution plenum will be inspected each time a safe mass input is reached.

Question 2. *(Continued)*

Response: Ejector-venturi scrubber - This scrubber and its recycle tank are less than or equal to a safe diameter for 4.1% enrichment (9-3/4 inches). The separator box will be inspected each time a safe mass input is reached. An inspection port is available for this inspection.

Packed tower scrubber - This scrubber is very similar to the scrubber used with the furnaces in area 240-2. Thus, the same control procedures will be used. The scrubber liquor will be sampled weekly and analyzed for uranium concentration. The scrubber will be drained and flushed if the uranium concentration exceeds 1 gram per liter.

Question 3. *Please describe the main radiation safety controls that will be used to ensure the safety of the incinerator operation, e.g., differential pressure instruments or alarms.*

Response: Pressure indicators are located before and after each stage of the system (see PI 1-7 on engineering flow diagram). Operating procedures will require frequent checks of these indicators to assure that the entire system remains under negative pressure. Routine air sampling will be conducted with both fixed and lapel samplers.

Question 4. *Please confirm that the gas firing system will be provided with the standard fire safety controls (e.g., automatic cut-off in the event the flame goes out).*

Response: Both burners are provided with thermocouple controlled valves which close in the event the flame goes out. The valves will not open if the pilot light is out. Gas supply is cut off by HCV-2 if there is an electric power failure.

2.6.3 Other Inspections

Inspections are performed twice per year by the NLS Supervisor - Windsor and the Windsor Nuclear Laboratory Radiological Safety Officer or the Radiation Specialist - Windsor. These inspections include a performance review of the radiation safety programs, as well as a plant inspection to observe for items requiring corrective action. *

An inspection will be conducted by the Nuclear Criticality Specialist - Hematite on a monthly basis covering all phases of nuclear criticality safety and control, including results of previous inspections and follow-up action taken.

Both the semi-annual and the monthly inspections are documented and reports distributed to the General Manager, Plant Manager, NLS&A Supervisor and other Supervisors. The Production Superintendent and the NLS&A Supervisor are responsible for any corrective actions required.

2.6.4 Annual Audits

Annual audits are more thorough inspections in which the results of previous inspections or audits are also reviewed, as an evaluation on the effectiveness of the program. All aspects of the activities involved, including the equipment, facilities and operator's knowledge are covered. A review of the follow-up action taken on previous audits and inspections, the recommended corrective action, and a schedule date which such action will be accomplished are also covered. These audits may also involve a detailed review of non-safety documents such as operating procedures, shop travelers, etc., and are documented by a formal report to the Vice President-Nuclear Fuel. Records of audits are maintained for at least one year. Annual audits are performed by a team appointed by the Vice President, Nuclear Fuel. The team shall include a Nuclear Criticality Specialist from Windsor who shall audit all phases of Nuclear Criticality Safety. The annual audit will consider ALARA requirements in conformance with the intent of Regulatory Guide 8.10.

GREGG A. JOHNSTONE

EDUCATION

B.S. - Physics, Muhlenberg College, [redacted] Ex.6

M.S. - Radiation Science, Rutgers University, 1978

PROFESSIONAL EXPERIENCE

March 1979 to Present, Radiation Specialist, Combustion Engineering, Inc., Windsor, CT.

Mr. Johnstone is responsible for the radiation monitoring program and associated record-keeping to assure compliance with all regulations. He implements programs for indoctrination and training of all personnel in the safe practices of nuclear fuel handling and audits manufacturing operations to assure compliance with all applicable federal, state, and local regulations relating to radiation safety. Provides technical support services in the areas of health physics, emergency planning, and evaluations of proposed modifications to processes or equipment.

1977-1978, Radiation Safety Specialist, Radiation & Environmental Health & Safety Department, Rutgers University, New Brunswick, NJ.

Assisted in maintaining personnel dosimetry program for several hundred radioisotope workers, comprehensive radiological surveillance of radioisotope laboratories pursuant to federal and state requirements; packaging and transportation of all radioactive waste at the University; acting liaison between campus radioisotope researchers and commercial radioactive waste disposal company. Performed x-ray unit surveys at Raritan Valley Hospital; packaging and transportation of miscellaneous laboratory chemicals and measurements of thermal effects on workers.

1974-1977, Radiation Technician, Radiac Research Corporation, Brooklyn, NY.

Assisted in the establishment of a radioactive waste disposal service program for customer including instruction and procedures on the proper packaging pursuant to appropriate Department of Transportation Regulations; maintained personnel dosimetry and exposure records of personnel; maintenance and calibration of radiological instrumentation services at customers facilities; performed all required radiological surveys of radioactive waste storage facility and environs as per license requirements; assisted in proper packaging and disposal of miscellaneous hazardous chemicals, including segregation according to type and compatibility.

ACHIEVEMENTS AND PROFESSIONAL AFFILIATIONS

National and local Health Physics Society

Completed health physics training program at Brookhaven National Laboratories - 1978. This program included Environmental Monitoring and Analysis, Film Badge and TLD Exposure Analysis, HEPA Filter Testing, Survey Instrument Calibration, Reactor Survey, Sample Activation and Hazard Analysis, Decontamination of equipment, Respirator Training, Industrial Hygiene, Hospital Health Physics, Van de Graaf Accelerator, Radiation Surveys, Emergency Exercise: Radioactive Material Transportation Accident.

Special Project: Health Physics at high flux beam reactor, including complete gaseous effluent survey.