UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

FEB 24 1994

Docket 70-36
License SNM-33

Mr. Robert W. Sharkey, Manager
Regulatory Compliance
Hematite Nuclear Fuel Manufacturing
Combustion Engineering, Inc.
P.O. Box 107
Hematite, MO 63047

Dear Mr. Sharkey:

SUBJECT: CHEMICAL SAFETY PROGRAM FOR LICENSE RENEWAL (TAC NO. L21637)

As part of its review of Combustion Engineering's (CE) license renewal application for the Hematite uranium fuel fabrication facility, the Nuclear Regulatory Commission is assessing the adequacy of CE's chemical safety program (CSP). NRC has a regulatory responsibility to assure that the chemical hazards of licensed nuclear material and the chemical hazards that can significantly affect radiological safety are adequately addressed by its licensees. The source of this responsibility is the general requirement that NRC regulations protect the health and safety of workers and the public; the particular responsibility for chemical safety is addressed in the draft **Branch Technical Position on Chemical Safety For Fuel Cycle Facilities** (Federal Register, Vol. 54. No. 53, March 21, 1989, pp.11590-98).

In order to facilitate the assessment of your CSP, NRC and its contractor, Science Applications International Corporation (SAIC), visited the Hematite facility in October 1993 to gather information about CE's approach to chemical safety. A final contractor report, which was sent to CE's plant manager, was submitted to NRC on January 5, 1994. Based on the information gathered during the October 1993 visit and a review of the license application, additional information is needed to complete the evaluation of your CSP. The additional information, specified in the enclosure, should be provided within 45 days of the date of this letter. Please reference the above TAC NO. in future correspondence related to this request. Responses to this request will document the current status of CE's CSP and will help identify any deficiencies that may require attention.

The information requested is either directly addressed or implied in the language of the draft Branch Technical Positions on Chemical Safety, Requirements for Operations, and Management Controls. Furthermore, this information is also addressed by the Occupational Safety and Health

NFO5

Administration's Process Safety Management Standard (29 CFR 1910.119) and the Environmental Protection Agency's proposed Risk Management Program (40 CFR Part 68) which are applicable to the Hematite facility.

If you have any questions regarding this matter, please contact Dr. Richard Milstein (301) 504-1867 or me at (301) 504-2604.

Sincerely,

ORIGINAL SIGNED BY

Sean Soong
Licensing Section 2
Licensing Branch
Division of Fuel Cycle Safety
and Safeguards, NMSS

Enclosure: As stated

cc w/encl:
Mr. J. F. Conant, Manager
Nuclear Materials Licensing

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NAME	RMilstein		VLTharpe		SSoong		MTokar	
DATE	2/24/94		2/ /94		2/ /94		2/24/94	

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Request for Additional Information
Renewal Application
Combustion Engineering, Inc. (CE)
Docket 70-36

1.0 Chemical Hazard Identification

NRC's responsibility for chemical safety is focused on two areas:

- significant chemical hazards to workers and the public resulting from the storage, handling, or processing of NRC licensed nuclear material (e.g., UF_6); and

- chemical hazards of non-licensed material (including chemical release, chemical reactions, fire, and explosion) that could cause an accidental release of NRC licensed nuclear material.

1. **What are the onsite inventories of toxic and flammable chemicals that exceed the threshold amounts identified in OSHA's 29 CFR 1910.119 or EPA's 40 CFR 68?**

2. **Given the scope of NRC's responsibilities outlined above, which hazardous chemicals that are stored, handled, or processed have been included in your CSP?**

3. **Is UF_6, HF, NH_3, and H_2 included on the list of hazardous chemicals? If not, please explain.**

2.0 Chemical Hazard Assessment

There are a number of well-recognized and documented approaches that are currently considered appropriate for evaluating process hazards. For example, in 29 CFR 1910.119, OSHA has identified "What-If, What-If/Checklist, Hazard and Operability Study (HAZOP), Failure Mode and Effects Analysis (FMEA), and Fault Tree Analysis." OSHA also permits the use of "an appropriate equivalent methodology," but also requires that the analysis be "appropriate to the complexity of the process and shall identify, evaluate, and control the hazards involved in the process."

CE has established the Integrated Safety Assessment Program (ISAP) to examine all safety issues in an integrated manner. The renewal application does not provide sufficient information to judge the adequacy of this approach. Furthermore, the program appears to concentrate on criticality safety issues rather than chemical safety issues.

1. Describe how the ISAP methodology (methodologies) is used to conduct Chemical Hazard Assessments. Include a statement of its objectives and describe how the ISAP:

   a. systematically identifies and evaluates the chemical hazards involved in the process,
   b. takes into account information obtained from previous incidents,
   c. addresses engineering and administrative controls and the consequences of their failure, and
   d. addresses human factors.

2. Provide a rationale as to why the ISAP chemical hazard assessments are appropriate to the complexity of the processes analyzed.

3. Describe the composition of the ISAP team, used to address chemical hazards, and discuss why the team is appropriate, given the hazard assessment methodology selected and the complexity of the process. Do hourly employees participate in the hazard assessments?

4. Describe how the chemical safety portion of the ISAP assessments is documented including identification of the hazard assessment method, input information, and the HA team's findings and recommendations.

5. For issues affecting the chemical safety program, describe how the ISAP team recommendations are resolved and implemented.

6. Describe the process for reviewing the validity of the chemical hazard assessments and for scheduling updates of those assessments which are determined to be invalid.

7. Describe the hazards resulting from the release of hydrogen gas (from cracked ammonia). What controls are in place to prevent, detect, and mitigate the effects of such a release?

8. a. Describe the hazards associated with the storage of anhydrous ammonia.
   b. Identify the standards used to assure the integrity of the anhydrous ammonia tank and describe the procedure used to ensure that the standards are satisfied.
   c. What measures have been taken to detect a release of ammonia from the storage tank and/or underground piping?
   d. What measures have been taken to mitigate the effects of an ammonia release?
   e. If a release of ammonia were to occur, what is the potential for the gas to be sucked into the plant ventilation system and to affect process operators?

9. a. Why are there waste drums stored in the vicinity of the anhydrous ammonia tank?
   b. Describe the contents of these waste drums.
   c. What are the hazards posed by these wastes?
      - Are they flammable?
      - Could they explode?
      - Could they react with ammonia if an ammonia release were to occur?

10. a. What are the on-site and off-site concentrations of HF that result from normal operations?
    b. What would be the consequences if one or more of the HF scrubbers failed?
    c. What measures have been taken to detect failure of the HF scrubbers?
    d. Is there a capability to detect the concentration of HF released through the scrubbers?

3.0 Process Safety Information

In order to conduct meaningful chemical hazard assessments, the licensee must compile the necessary process safety information. This includes information pertaining to the highly hazardous chemicals used or produced by the process, the technology of the process, and the equipment in the process. As mentioned earlier, NRC's responsibility for chemical safety is limited (see Section 1.0).

Although the process safety information needed to satisfy NRC concerns is only a subset of the process safety information relevant to the overall safety of the plant, the facility will need to meet the broader requirements established by the OSHA Process Safety Management regulation (i.e., 29 CFR 1910.119).

1. Discuss the types of process safety information required to perform chemical hazard assessments including:

   a. Equipment, instrument, and pipeline lists
   b. Process flow diagrams
   c. Process chemistry
   d. Piping & instrumentation diagrams
   e. Site plans and topography
   f. Equipment, piping, and instrument specifications
   g. Interlock and logic diagrams
   h. Fire water system diagrams
   i. Electrical area classification
   j. Protective system design and specifications

2. Describe the system used to track and maintain the Process Safety Information needed to conduct chemical hazard assessments. How does CE assure that this information is complete, accurate, and available?

3. For the Process Safety Information relevant to chemical safety, describe whether or not a current version of the information exists, where it is maintained, and who is responsible for maintaining it. If a current version of the information does not exist, describe plans and schedules for developing such information.

4.0 Operating Procedures

Standard Operating Procedures (SOPs) should provide clear, written, step-by-step instructions for activities affecting processes of interest to NRC (see Section 1.0). The SOPs should be consistent with all current Process Safety Information.

1. Describe how the SOPs relevant to chemical safety are developed, reviewed, approved, distributed, and kept current.

   a. Does the review process provide independence between the reviewer and the preparer?
   b. Are the SOPs reviewed by safety personnel to assure that health and safety issues have been adequately addressed?
   c. Do the end-users (e.g., operators) participate in procedure development?
   d. What is the mechanism used to assure that SOPs are appropriately changed to reflect corresponding changes in process chemicals, technology, equipment, and facilities?
   e. How often are SOPs reviewed and certified for currency?
   f. How does CE assure that the SOPs are readily accessible to employees?
   g. How does CE assure that the management-approved recommendations of the Hazard Assessment team pertaining to operating procedures are incorporated into the SOPS.

2. Describe how the detailed procedures, log-sheets, and checklists address chemical safety concerns during all phases of operation as indicated below:

   a. Initial startup
   b. Normal operations
   c. Temporary operations
   d. Emergency shutdown
   e. Emergency operations
   f. Normal shutdown
   g. Startup following turnaround or emergency shutdown

3. Do the operating procedures for processes containing chemical hazards of importance to NRC (as defined in Section 1.0) address the following:

   a. Operational limits
   b. Consequences of deviations from safe operating limits
   c. Actions required to avoid deviations in the system or to return the system to normal mode of operation
   d. Preparation of equipment for maintenance
   e. Inspection of maintenance work prior to restart

4. Describe whether employees have ready access to the following sources of information:

   a. Properties and hazards of chemicals used in the process
   b. Precautions necessary to prevent exposure to hazardous chemicals, including personal protective equipment, engineering controls, and administrative controls
   c. Control measures to be taken if physical contact or airborne exposure occurs
   d. Control of hazardous chemical inventory levels

   e. safety systems, such as shutdown interlocks, detection and mitigation devices, etc., and their functions

5.0 Site-Wide Safety Procedures

The history of incidents and accidents at chemical facilities has demonstrated the importance of controlling the activities of non-routine workers and tasks. Site-wide safety procedures are intended to assure that such non-routine tasks, as well as tasks performed by non-routine workers (such as contractors or maintenance personnel), are carried out in a safe and effective manner. The procedures are used to communicate information on chemical (and other) hazards to all non-routine personnel.

1. In the following areas, describe the procedures used to protect maintenance and contract workers from the risks of handling, using, and storing the hazardous chemicals identified in response to Question 1.2:

   a. access control for maintenance, contract, and support personnel into and out of the facility
   b. hotwork permits which document measures taken for fire prevention and protection
   c. confined space entry permits which document measures taken for explosion and asphyxiation prevention

d. lockout/tagout procedures which define rules and methods for deactivating process equipment while maintenance work is being performed on or around it
e. safe opening of process equipment

2. Describe the contractor management program that is used to assure that the contractors perform their jobs in a safe manner. Include a discussion of the following areas to the extent that they provide assurance that contractors are properly prepared to deal with chemical hazards at the facility:

   a. contractor training and testing in relevant process hazards
   b. contractor safety performance reviews
   c. contractor safety logs

3. Describe how management-approved recommendations of the Hazards Assessment team are incorporated into site-wide safety procedures.

6.0 Detection and Monitoring

Monitors, detectors, and alarms are used for early detection of undesirable conditions and to facilitate prompt and appropriate responses.

1. Describe the facility's approach in determining its chemical hazard detection and monitoring needs. Include a discussion of:

   a. the rationale for determining whether or not detection and monitoring devices are required
   b. the rationale for determining the number and location of detection devices

2. Provide a listing of detection and monitoring systems for identified chemical hazards of NRC interest. Include a plot plan showing the location of such devices.

3. Describe the maintenance and inspection program for detection and monitoring devices.

4. Describe how management-approved recommendations of the Hazards Assessment team are incorporated into the detection and monitoring program.

7.0 Training

A training program provides information and hands-on experience to help employees understand the nature and causes of problems arising from process operations. An effective training program can significantly

reduce the number and severity of chemical incidents arising from process operations.

1. Describe the training program as it relates to chemical safety including:

   a. identification of training requirements
   b. selection of instructors
   c. measuring the effectiveness of the training program
   d. certification
   d. maintaining employee training records

2. Describe the typical material on chemical safety covered in the training program, including general orientation, initial training, and specialized training.

3. Describe the training material and frequency for refresher training on chemical safety.

4. Describe the process for incorporating management-approved chemical safety recommendations of the Hazards Assessment team into the training program.

8.0 Maintenance and Inspection

The maintenance and inspection program assures that equipment used to process, store, or handle hazardous chemicals is maintained to minimize the risk of releases of such materials.

1. Describe the maintenance and inspection program as it relates to equipment used to process, store, or handle hazardous chemicals. Include a discussion of:

   a. methods used for identifying which safety-related components need preventive maintenance (PM) and inspection
   b. methods used for identifying frequency of PM, inspection, and testing
   c. training program for maintenance personnel
   d. maintenance procedures
   e. documentation of maintenance and inspection
      - describe the system used for maintaining records on internal and external non-destructive testing of chemical-related equipment.

2. Identify a current list of components that are receiving regular preventive maintenance for chemical safety reasons.

3. Describe the process for incorporating management-approved chemical safety recommendations of the Hazards Assessment team into the maintenance and inspection program.

9.0 Management of Change

Management of change assures oversight of all modifications to equipment, procedures, raw materials, and processing conditions, other than replacement-in-kind, by identifying and evaluating the impact prior to implementation of the change.

1. Describe the management of change program, as it applies to chemical safety, including:

   a. definition of change
      - what constitutes a replacement-in-kind?
      - what constitutes a major change?
   b. technical basis for change
   c. safety impact analysis performed on change
   d. authorization required before implementation
   e. modification of documentation (SOPs, Process information, etc.)
   f. retraining of employees

2. Describe the process for incorporating management-approved chemical safety recommendations of the Incident/Audit team into the management of change program.

10. Emergency Planning

The emergency plan presents the licensee's overall approach for responding to plant emergencies.

1. Telecommunications at the site is based solely on in-plant telephone lines and a dedicated outside line that is also used as a FAX line. Currently, there is no independent backup system such as a mobile phone or radio. Are there plans to acquire and install an independent telecommunications backup system?

2. Would the ventilation system of the safe haven shelter used to direct emergency response operations be able to protect the shelter from the effects of a hazardous vapor plume?

3. Describe the process for incorporating management-approved chemical safety recommendations of the Hazards Assessment team into the emergency planning program.

11. Incident Investigation Program

Incident investigation identifies the underlying causes of incidents which resulted in, or could have resulted in, a catastrophic release; evaluates the response to the incident; and makes recommendations to reduce the likelihood or severity of the incident.

- **Describe the program for investigating chemical incidents including:**

  a. categorization of incidents and corresponding level of investigation (e.g., setting up investigation team)
  b. time frame for initiating an investigation (if required)
  c. composition of investigation team
  d. content of incident report
  e. mechanism for implementing investigation team's recommendations
  f. documentation
  g. review of relevant findings with affected personnel
  h. retention of incident investigation reports

12. Audits and Inspections

Self-auditing provides assurance that the Chemical Safety Program is functioning as intended. It provides verification that the procedures and practices developed under the program are being followed properly and are adequate.

- Describe the process used for auditing the elements of the Chemical Safety Program including:

  a. scope and frequency
  b. auditors (qualifications and independence)
  c. audit protocol (format, staffing, scheduling, verification methods)
  d. documentation (effective elements, corrective actions)
  e. resolution of findings (prompt followup on corrective actions)