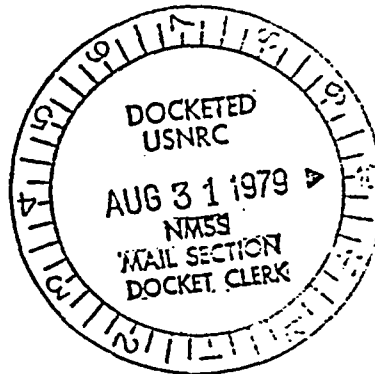


C-E Power Systems  
Combustion Engineering, Inc.  
Route 21-A  
Hematite, Missouri 63047

Tel. 314/937-4691  
314/296-5640

70-36  
release  
NIS/79/645

**CE POWER  
SYSTEMS**



R

August 24, 1979

W. T. Crow, Section Leader  
Uranium Fuel Fabrication Section  
Fuel Processing and Fabrication Branch  
Division of Fuel Cycle and Material Safety  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Docket No. 70-36

Dear Mr. Crow:

Enclosed are additional revised pages to the C-E Hematite Emergency Plan. Changes were made as discussed with Mr. Ketzlach of your staff, and are denoted by an asterisk in the right margin of the revised pages.

Very truly yours,

COMBUSTION ENGINEERING, INC.

*H. E. Eskridge*

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

/wg  
Enclosure

SEP 20 1979

**FEE EXEMPT**  
*add'l info*

SEP 11 1979

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#### 4.5 General Emergency

Accidents that have the potential for serious radiological consequences to the public health and safety have been analyzed previously and were found not to be credible for the C-E Hematite facility (NRC Environmental Impact Appraisal, March 1977).

#### 4.6 Spectrum of Postulated Accidents

\*

Offsite impact of the spectrum of accidents analyzed in the Environmental Impact Appraisal is shown in the following table:

<u>Accident</u>	<u>Classification</u>	<u>Offsite Impact</u>
Injured employee	personnel emergency	none
Contaminated employee	personnel emergency	none
Train derailment	emergency alert	none (from plant)
Process leak or spill	plant emergency	none
Fire	plant emergency	none
Substantial UF <sub>6</sub> release	site emergency	Site boundary concentration: 30% of 8-hr. TLV 4% of single exposure TLV *
Criticality	site emergency	Site boundary dose: whole body - 0.5 Rem * thyroid - 1.5 Rem
Substantial release of airborne particulate uranium	site emergency	Unrestricted Area MPC *

## 5. ORGANIZATIONAL CONTROL OF EMERGENCIES

The formal organization of C-E Hematite contains support groups which, in addition to normal functions during routine operations, can provide support to any or all facilities at Hematite during an emergency.

### 5.1 Normal Plant Operations

Each operation at C-E Hematite is staffed with experienced operating personnel. These personnel are well qualified to recognize conditions that may result in an accident and are capable of instituting remedial procedures. If these remedial actions would be insufficient to deal with a situation, the employees have been trained to make emergency notifications and to perform those emergency functions that provide the maximum immediate control over most situations. These staffs are also trained to evacuate the facility involved, if necessary.

The Production Superintendent has been delegated Emergency Director by the Plant Manager. The shift foremen act as alternates in his absence. A list is maintained of trained Fire Brigade Members and First Aid Team Members for the Emergency Director to call upon as necessary. A Health Physics Technician is present onsite for each production shift. A call-in list is used by the security guard to obtain emergency organization personnel when they are not present on site. A security guard is on duty at all times. This list also shows the line of succession for the major emergency functions.

The responsibility and authority of the Emergency Director and other members of the emergency organization are specified in the Emergency Procedures Manual. If management personnel are recalled to the site during an emergency, the highest ranking person assumes control of his emergency function.

## 5.2 Onsite Emergency Organization

At such time as the Hematite Emergency Plan is put into effect, all aspects of the emergency situation will be coordinated within the scope of the Hematite emergency organization (see Figure 5-1, which illustrates the emergency functions. An individual may perform more than one function, depending upon his training and the nature of the emergency).

Responsibilities of each position or function are shown below:

### 5.2.1 Emergency Director (Production Superintendent, Alternate: Shift Foreman).

- a. Activate Emergency Control Center in the tile barn emergency room, or establish an alternate control point from which activities can be directed.
- b. Determine status and necessity for shutdown of plant systems.
- c. Direct, coordinate, and evaluate actions to be taken by functioning emergency teams.
- d. Assure that off-site agencies are notified:

### 5.2.2 Fact Finding Committee

Members to serve on this committee will be selected by the Director depending on the nature of the emergency. The Chairman of the committee shall be an individual who is not a member of the immediate response teams.

- a. Communicate with the Emergency Director and others to obtain facts for determining the cause and effect of the emergency.
- b. Interview personnel who witnessed the incident or those who can contribute information leading to cause and effect.
- c. Review and examine all evidences (photographs, recoverable materials, etc.) that may be considered pertinent and informative for evaluation purposes.
- d. Keep records and prepare a written report for the Plant Manager.

## 5.2 Onsite Emergency Organization (continued)

### 5.2.3 Radiological and Safety Advisor (Supervisor; Nuclear Licensing, Safety and Accountability, Alternate: Quality Control Manager).

- a. Accumulate and evaluate known data to determine the extent of the emergency.
- b. Establish a liaison between the Director and a direct source of available information.
- c. Establish policies with Emergency Director regarding the emergency plan of action for controlling the incident.
- d. Shall be responsible for collecting and disseminating information pertaining to the emergency to outside agencies.
- e. Normally be the sole contact with news media.
- f. Maintain a close liaison with the Emergency Director and the Plant Manager regarding emergency activity progress.
- g. Inform and consult with the Fact Finding Committee.
- h. Review public releases and notices and obtain approval of Windsor Public Relations or their designate for such releases.

### 5.2.4 Supervisors

- a. Each supervisor is responsible for proper implementation of the Emergency Plan in his areas.
- b. Shall assure himself that personnel under his supervision are familiar with the location and use of emergency equipment.
- c. Shall assure personnel familiarization with the Emergency Plan and procedures.
- d. Shall account for their personnel during an emergency, including visitors and contractor personnel in their area.

## 5.2 Onsite Emergency Organization (continued)

### 5.2.5 Nuclear and Industrial Safety

- a. Shall assess and delineate an emergency radiation or toxic fume, vapor or mist condition, including radiological survey monitoring.
- b. Provide personnel monitoring, decontamination, recovery accident dosimetry for analysis and collect health physics or industrial hygiene samples for analysis.
- c. Conduct environmental monitoring.
- d. Assist with first aid and emergency rescue.
- e. Procure, store and issue protective clothing and equipment for recovery operations.
- f. Prepare necessary records and reports.

### 5.2.6 Site Security Officer (Production and Materials Control Supervisor, Alternate: Shift Security Guard). \*

- a. Direct and coordinate Security Guard activities.
- b. Restrict access to the site to authorized personnel and outside supporting services.
- c. Coordinate activities with state and local police.

### 5.2.7 Fire Marshal (NIS Technician, Alternates: Shift Foremen) \*

- a. Coordinate the fire-fighting activities of site fire brigades with local fire departments.
- b. Organize site fire brigades.
- c. Assure that personnel have been trained in fire-fighting techniques involving radioactive materials, including precautions to be taken in criticality control areas. \*

### 5.3 Augumentation of Qnsite Emergency Organization (continued)

#### 5.3.2.4 Hematite and Festus Fire Departments

The Hematite and Festus fire departments respond to emergency calls at C-E Hematite. If the response is for a fire involving radioactive material, Nuclear and Industrial Safety technicians provide monitoring as necessary to protect fire department personnel.

Protective equipment (e.g., protective clothing, respirators) is available for the protection of Fire Department personnel while fighting fires.

\*

#### 5.4 Coordination with Participating Government Agencies

As previously stated, analysis of the postulated C-E Hematite accident spectrum shows that there is no credible accident with significant offsite consequences.

A list of cognizant government agencies and current telephone numbers is maintained, however, and they will be contacted should an emergency arise involving a consideration within their jurisdiction. The contact would normally be in the form of notification although a request for emergency assistance would be made as needed. These agencies include:

U.S. Nuclear Regulatory Commission, Region III - Glen Ellyn, Illinois  
Missouri Department of Public Safety, Disaster Planning and Operations  
Office - Jefferson City

Missouri Division of Health, Bureau of Radiological Health -  
Jefferson City

Missouri Department of Natural Resources - Jefferson City,  
St. Louis

U.S. Environmental Protection Agency, Region 7 - Kansas City  
Missouri Highway Patrol - Creve Coeur

U.S. Federal Bureau of Investigation - St. Louis

U.S. Department of Energy Radiological Assistance Team - Chicago

\*

The above agencies are listed, with their area of interest, in the Emergency Procedures Manual. In the event of a plant emergency, only local agencies would be contacted (as discussed in Section 5.3). In the event of any site emergency, all the agencies would be contacted.

\*

The State of Missouri is currently preparing a Radiological Emergency Plan. The plan for off-site assistance will be coordinated with the State Plan.

\*



## 6. EMERGENCY MEASURES

### 6.1 Personnel Emergency

This class of emergency is declared by the affected individual or nearby personnel. (It does not involve sounding of an alarm). An assessment of the situation is made by a representative of the Nuclear and Industrial Safety group to determine whether medical treatment and/or personnel decontamination is necessary. When applicable corrective actions will be promptly taken to preclude further injury to the individual involved or nearby personnel. These correction actions may include:

Shutting off electrical power to faulty equipment.

Isolation and containment of minor process leaks.

Restricting personnel access to areas of possible high concentrations of airborne radioactive material.

Any other action necessary to correct or mitigate the situation at or near the source of the problem.

Normally protective action, other than the possible use of respiratory protection in the immediate area, is not required for a personnel emergency.

Use of respiratory protection is determined by a trained member of the Nuclear and Industrial Safety group. Personnel decontamination will be performed by or under the supervision of a trained NIS representative. Notification of and transportation to offsite medical facilities, if necessary, is also made by the Nuclear and Industrial Safety group. An NIS representative will accompany the victim to any offsite treatment facility.

A licensed medical doctor is retained to provide medical treatment locally (Crystal City) when hospitalization is not required.

## 6.4 Site Emergency

The Site Emergency can be implemented in several ways:

- Sounding of the nuclear alarm (intermittent horn).

- Sounding of the non-nuclear alarm (loud, continuously ringing bell).

- By any personnel cognizant of an actual or impending emergency which affects the C-E Hematite Site.

Examples of site emergencies are:

- Criticality accident

- Major UF<sub>6</sub> release

- Major fire or explosion

- Major anhydrous ammonia release

The non-nuclear alarm is usually sounded to designate a plant emergency. At the discretion of the Emergency Director, a site emergency may be declared in accordance with the criteria discussed in Section 4.4. At this time personnel are instructed to further evacuate to either the parking lot or the Emergency Assembly Area in the tile barn. The emergency actions are then directed and any necessary offsite notifications made from the Emergency Control Center.

In the case of the sounding of the nuclear alarm, all personnel evacuate immediately to the Emergency Assembly Area in the tile barn. Upon assembly at the barn, supervisors determine that all personnel under their cognizance have been evacuated and are accounted for, including their visitors and outside contractors.

Those present in the assembly area are questioned to determine if any unusual occurrences were observed and a survey team, consisting of at least two persons knowledgeable in the use of instruments, are instructed to prepare for re-entry. The emergency procedures contain appropriate instructions to minimize the possibility of a second criticality excursion.

#### 6.4 Site Emergency (continued)

First aid is provided for any individuals injured during the evacuation and all identification badges are checked for indium foil activation.

When the report of the re-entry team is received, the incident is considered confirmed if radiation levels in excess of 5 mr/hr are encountered.

At this point, a NIS representative is dispatched to the site boundary downwind of the plant to monitor the exposure rate. The maximum offsite thyroid dose is estimated from these readings as specified in the detailed procedures.

The Emergency Director assures that the following preplanned actions are initiated:

- Arrange for treatment of injured or exposed personnel.

- Arrange for decontamination of personnel.

- Determine radiation level in assembly area. Decide need to relocate.

- Collect film badges and record indium foil readings.

- Instruct health physics to initiate sampling of airborne contamination.

- Start action to obtain assistance:

  - Ambulance, Company Physician

  - Hillsboro Sheriff

  - Barnes Hospital (radiation exposure)

  - C-E Management list. Request first individual contacted to inform the NRC and other persons on management notification list.

- Direct survey team to establish 100 mr/hr boundary line.

\*

#### 6.4 Site Emergency (continued)

Based on information from survey team, initiate action to shut down the plant.

Obtain other assistance and make notifications of other offsite agencies as required.

Exposures during subsequent re-entry operations will be limited. Specific instructions, based on actual equipment or process involved will be issued to minimize the possibility of causing additional criticality excursions.

Allowed exposure during re-entry for any person shall not exceed 12.5 rems. Under unusual circumstances (e.g., lifesaving) exposures may be permitted to a maximum of 25 rems. \*

Time-of-stay during re-entry shall be limited. Such time-of-stay will commence upon penetrating beyond the 100 mr/hr boundary and terminate upon recrossing it while exiting.

No personnel are allowed to re-enter the affected plant areas unless authorized by the Emergency Director.

Prior to startup after a site emergency, the plant will be returned to a safe condition. Spills will be cleaned up and no excessive radiation or contamination levels will be present. Radiation levels will not be in excess of normal operating levels as specified in the SNM-33 license. \*

Radiological and non-radiological monitoring will be conducted as appropriate in case of a non-criticality site emergency.

## 7. EMERGENCY FACILITIES AND EQUIPMENT

This section identifies, describes briefly, and gives locations of items to be maintained for emergency use at C-E Hematite.

### 7.1 Emergency Control Center

The emergency control center is located within the tile barn west of the fenced manufacturing area. This direction is normally upwind from the manufacturing area. Although an alternate offsite location is not considered necessary, emergency equipment is portable and can easily be moved to an alternate location. Alternate emergency control locations are specified in the Emergency Procedures Manual.

### 7.2 Communications Systems

Communications during an emergency may be by the following methods:

- Normal plant telephone system

- Separate emergency telephone line in Emergency Control Center

- 2-way radios for plant re-entry (battery operated)

- Voice and hand signals (effective in many cases due to small size of plant)

All the above communication methods may be used at the Emergency Control Center.

### 7.3 Assessment Facilities

The following monitoring systems are used to initiate emergency measures as well as those used for continuing assessment:

#### 7.3.1 Onsite Systems and Equipment

Windspeed and direction - remote readout is in NIS office, but estimate may be obtained visually from emergency control center.

### 7.3.2 Facilities and Equipment for Offsite Monitoring

Portable battery-operated air samplers

Fixed air samplers outside of fenced manufacturing area

Portable radiation survey instruments

Containers, etc. for sampling soil, water and vegetation

Mobile proportional counter for alpha and beta analyses of  
samples - located in NIS Laboratory

Standard industrial hygiene equipment for measuring ammonia  
concentrations.

\*

## 8.1 Organizational Preparedness (continued)

The training and personnel safety program is continued with on the job training supplemented by regularly scheduled meetings conducted by line supervision and specialists in the subjects covered. Personnel protective equipment, industrial safety and accident prevention, emergency procedures and other safety topics are included. Foremen receive a formal course in radiation safety, criticality control emergency plans and procedures. Sufficient knowledge to enable them to carry out their training functions is determined by testing. All operating personnel receive a re-training course in criticality control, radiation safety and emergency procedures on an annual basis. Selected personnel are provided specialized training in Fire Fighting twice a year, and first aid every two years. All training is documented. The remainder of emergency team members receive training at least annually in connection with drills and exercises. The NLS&A Supervisor evaluates effectiveness of training, documentation, and revises the training program as appropriate.

### 8.1.2 Drills and Exercises

Semi-annual site emergency evacuation drills are conducted to provide training and test promptness of response, familiarity with duties, adequacy of procedures, emergency equipment and the overall effectiveness of the emergency plan. At least one of the drills will involve participation by offsite agencies to test as a minimum the communication links and notification procedures.

All drills are documented and critiqued by the NLS&A Supervisor to evaluate the effectiveness of the plan and to correct weak areas through feedback with emphasis on practical training. The NLS&A Supervisor revises drills and exercises, if necessary, to increase their effectiveness.

### 8.1.3 Emergency Planning Coordinator

The NLS&A Supervisor serves as the Emergency Planning Coordinator. His responsibility includes the coordination of offsite and onsite emergency planning efforts.

### 8.2 Review and Updating of the Plan and Procedures

An annual review of the emergency plan is performed by the Emergency Planning Coordinator for the purpose of updating and improving procedures. Results of training and drills as well as changes on site or in the environs are incorporated into this review. The annual review is documented.

All written agreements are reviewed and updated at least every two years.

\*



### 8.3 Emergency Equipment and Supplies

Both the nuclear and non-nuclear alarm systems are tested weekly to insure their proper operation. Testing is documented.

Nuclear and Industrial Safety is responsible for routine inspection and testing of all equipment and supplies at all emergency stations and other reserve equipment, and for maintenance and servicing, or obtaining servicing, for all emergency equipment. NIS also procures or initiates procurement, of all supplies of emergency equipment and other miscellaneous supplies necessary to cope with foreseeable emergency situations. Inspections and testing are documented.

The minimum frequency for inspections and testing of all equipment and supplies is quarterly.

\*

9. RECOVERY

The Emergency Director will assign such personnel as necessary to restore or have restored all equipment and/or services to a safe operating condition upon termination of the emergency. Any spills will be cleaned up and no excessive radiation levels will be present when operations are restarted. Radiation levels will not exceed normal operating levels as specified in the SNM-33 license. Deficiencies identified in the investigation of the incident shall be resolved prior to resumption of operations.

\*