

R3/D2#32

Enclosure III to
ML-91-033

COMBUSTION ENGINEERING, INC.
HEMATITE NUCLEAR FUEL MANUFACTURING FACILITY
REVISION TO REQUEST FOR LICENSE AMENDMENT
PROPOSED LICENSE APPLICATION PAGES

Information in this record was deleted
in accordance with the Freedom of Information
Act, exemptions 6
FOIA-2004-0234

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AUGUST 12, 1991

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2.0 ORGANIZATION AND ADMINISTRATION

2.1 Organizational Responsibilities and Authority

The President, Nuclear Power Businesses has the ultimate responsibility for ensuring that corporate operations related to the Nuclear Power Businesses Division are conducted safely and in compliance with applicable regulations. The President has delegated the responsibility for nuclear fuel manufacturing and product development activities to the Vice President, Nuclear Fuel.

2.1.1 Plant Manager, Hematite

The Plant Manager, Hematite reports to the Vice President, Nuclear Fuel. He directs and has the overall responsibility for the safe operation of the Hematite facility including production, accountability, security, criticality safety, radiological and industrial safety, environmental protection, transportation, training, materials handling and storage, licensing, process and equipment engineering and maintenance. He fulfills these functions by delegation to a staff at Hematite that reports to the Plant Manager. He may also request support from the Windsor, CT staff to provide functions that may include criticality analysis, production methods, nuclear licensing and others as needed.

2.1.2 Manager, Nuclear Licensing, Safety and Accountability (NLS&A)

The Manager, Nuclear Licensing, Safety and Accountability reports to the Plant Manager. He manages radiological protection and industrial safety, SNM accountability, criticality safety, licensing, emergency planning, and environmental protection. His activities include review and approval of procedures for control, sampling, measurement and physical inventory of SNM, auditing of

2.1.2 Manager, Nuclear Licensing, Safety and Accountability (Continued)

plant operations. He reviews results from personnel and environmental monitoring and facility activities to ensure compliance with the requirements of License No. SNM-33. To enforce compliance, he has authority to halt any operation at the Hematite facility, and the operation shall not restart until approved by the Plant Manager or a duly authorized alternate.

2.1.3 Superintendent, Production

The Superintendent of Production reports to the Plant Manager. The Superintendent directs production operations in accordance with the content of Operation Sheets and Traveler documents. The Superintendent's activities include scheduling of production Shift Supervisors and of the activities of the Maintenance Supervisor, recommending improvements to equipment, processes and procedures, training and qualification of production operators through their Shift Supervisors and periodically directing the cleanout of the production equipment in conjunction with the physical SNM inventory.

2.1.4 Manager, Engineering

The Manager, Engineering reports to the Plant Manager. He manages the engineering of new equipment and of modifications to existing equipment. With support from his staff, his activities include recommendation, development and qualification of manufacturing processes, specification of process control methods and design, procurement and installation of processing equipment.

2.1.5 Nuclear Criticality Specialist

The Nuclear Criticality Specialist is located at Windsor, Connecticut. He reports functionally for criticality evaluations to the Plant Manager at Hematite. The Nuclear Criticality Specialist verifies that equipment, processes and procedures satisfy the criticality criteria in Section 4 of Part I by performing the review described in Section 2.6 of Part I. Alternatively, for criticality analyses that require elaborate computational techniques, he may supervise the analysis and review at Windsor. He may also perform the annual audit at Hematite required by Section 2.7.

2.1.6 Supervisor, Health Physics

The Supervisor of Health Physics reports to the Manager of Nuclear Licensing, Safety and Accountability. He supervises the health physics technicians in the radiological surveillance of activities that involve radioactive materials, in personnel radiation monitoring and in the collection and measurements of environmental samples. He has the authority to suspend unsafe operations.

2.1.7 Health Physics Specialist

The Health Physics Specialist reports to the Manager of Nuclear Licensing, Safety and Accountability. His activities include observation of plant operations and evaluation of results from personnel and environmental monitoring. He compares quantitative measurements and other observations of Facility activities with the requirements of License No. SNM-33.

2.1.8 Health Physics Technicians

The Health Physics Technicians report to the Supervisor, Health Physics. The Technicians are responsible for the day-to-day monitoring of operations. Monitoring is accomplished through the collection of data which allows the effectiveness of radiological, criticality and industrial safety, environmental protection and emergency planning programs to be assessed. Technicians also monitor the proper implementation of radiation work permits (called Special Evaluation Travelers).

2.2 Personnel Education and Experience Requirements

Table I.2-1 lists the minimum education and experience requirements for the positions described in Section I.2.1.

2.3 Hematite Plant Safety Committee

The Hematite Plant Safety Committee meets at least once each calendar quarter to review plant operations, to compare them with selected safety requirements of Part I and the License Conditions and to consider other aspects of safety the Committee believes appropriate. The Plant Safety Committee shall perform an annual review of each of the following:

- o Environmental protection trends
- o Radiation safety trends
- o Criticality safety practices
- o Industrial safety trends
- o Adequacy of emergency planning and drills
- o Effectiveness of ALARA program
- o Internal inspection and audit reports
- o Abnormal occurrences and accidents including recommendations to prevent reoccurrence
- o Review of significant physical facility changes in the pellet ship and significant changes to operations involving radiation and/or nuclear criticality safety

2.3 Hematite Plant Safety Committee (Continued)

The review of findings and recommendations of corrective action shall be reported to the Plant Manager for action.

The Committee Chairman or Plant Manager determines which committee members, as a minimum, shall attend each quarterly meeting, according to the topics to be considered. The Committee submits a quarterly meeting report to the Hematite manager level personnel and the Plant Manager at Hematite. The Plant Manager appoints the committee members to represent, as a minimum, engineering, production, health physics, and criticality safety. He may also approve alternate(s) for the members.

Minimum education and experience requirements for the Chairman are in Table I.2-1. The Committee is composed of senior personnel from the technical staff of Combustion Engineering's Nuclear Power organization who have at least five (5) years experience in the nuclear industry. The Committee Chairman or Plant Manager may invite participation by others from within Hematite or from the staff at Windsor.

2.4 Approval Authority for Personnel Selection

Two higher levels of management shall approve personnel for safety-related staff positions.

2.5 Training

Hematite staff conduct or supervise the indoctrination of new employees in the safety aspects of the facility. The indoctrination topics shall include nuclear criticality, safety, fundamentals of

2.5 Training (Continued)

radiation and radioactivity, contamination control, ALARA practices and emergency procedures. After test results demonstrate that a new employee has sufficient knowledge in the above topics, the new employee begins on-the-job training under direct line supervision and/or experienced personnel. The Supervisor monitors performance until it is adequate to permit work without close supervision.

The training and personnel safety program continues with on-the-job training supplemented by regularly scheduled meetings conducted by line supervision and specialists in the subjects covered. Topics include personnel protective equipment, industrial safety and accident prevention, and other safety topics. Production Supervisors receive formal training in radiation and criticality control. Testing determines when they have sufficient knowledge to enable them to carry out their training functions. Operating personnel receive a re-training course in criticality control and radiation safety on a biennial basis. The effectiveness of retraining is determined by testing. Formal training shall be documented. The health physics staff will receive professional related training at least biennially.

2.6 Operating Procedures

Operations which involve licensed material shall be conducted in accordance with approved written procedures. Operating Procedures, called Operation Sheets, are issued and controlled by Quality Control. They provide the detailed instructions for equipment operation and material handling and the limits and controls required by the License. Operation Sheets are the basic control document; before issuance or revision they require signed approval by the Managers of Engineering, Production, Quality Control, and Nuclear Licensing, Safety, and Accountability. In the Manager's absence, another individual meeting

the Manager's minimum education and experience requirements, or the Plant Manager, may provide approval. Health Physics activities will be conducted in accordance with approved written procedures; these procedures must be approved by the Manager, NLS&A.

2.6 Operating Procedures (Continued)

Supervision is required to assure that handling, processing, storing and shipping of nuclear materials is given prior review and approval by the NLS&A Manager, that suitable control measures are prescribed, and that pertinent control procedures relative to nuclear criticality safety and radiological safety are followed.

Primary responsibility and authority to suspend unsafe operations is placed with line supervision. Within their respective responsibilities, members of NLS&A also have authority to suspend operations not being performed in accordance with approved procedure.

Supervision is further required to assure that, prior to the start of a new activity involving nuclear materials, approved procedures are available. A review procedure has been established for changes in processes, equipment and/or facilities prior to implementation. NLS&A authorization must be obtained for each change involving nuclear safety, radiological safety or industrial safety. NLS&A reviews shall be documented, except for minor changes within existing safety parameters.

The NLS&A Manager shall grant approval only when:

- a. A nuclear criticality safety evaluation has been performed based on the criteria and standards of Chapters 3.0 and 4.0 by a person who meets the education and experience requirements for a Nuclear Criticality Specialist (and who may be the NLS&A Manager). This evaluation shall be in sufficient detail to permit subsequent review.

2.6 Operating Procedures (Continued)

- b. The criticality safety evaluation has been reviewed by a person who has fulfilled the education and experience requirements for a Nuclear Criticality Specialist for at least two years (and who may be the NLS&A Manager). This individual will be different from the person who performed the evaluation. This review is based on the criteria and standards of Chapter 4.0 and includes verification of each of the following:
- 1) assumptions
 - 2) correct application of criteria of Section 4.0
 - 3) completeness and accuracy of the evaluation
 - 4) compliance with the double contingency criteria
- c. The NLS&A Manager has concluded that the operation can be conducted in accordance with applicable health physics and industrial safety criteria.

Review and verification shall include written approval by the reviewer.

The minimum frequency for review, for the purpose of updating, of operating procedures involving Special Nuclear Materials and health physics procedures shall be every two (2) years. Updating of operating procedures is the responsibility of the cognizant manager.

2.7 Audits and Inspections

Audits and inspections shall be performed to determine if plant operations are conducted in accordance with applicable license conditions, C-E policies, and written procedures. Audits shall apply to safety-related and environmental programs. Qualified

2.7 Audits and Inspections (Continued)

personnel having no direct responsibility for the plant operation being audited shall be used to ensure unbiased and competent audits.

Daily checks for safety related problems are made by NLS&A technicians, who observe, note and make general observations in addition to their other duties. Problems are normally corrected on the spot by the Shift Supervisor. More significant problems are listed on the daily exception report distributed to the Plant Manager and manager level staff. The Superintendent, Production, is responsible for corrective action.

Planned and documented quarterly inspections, performed by an individual who meets the education and experience requirements of the NLS&A Manager, cover criticality control, radiation safety and industrial safety. The inspection of criticality control shall be performed by an individual meeting at least the education and experience requirements of a Nuclear Criticality Specialist and at least one of the quarterly inspections regarding criticality control will be by an individual who is not the NLS&A Manager. Items requiring corrective action are documented in a report distributed to the Plant Manager and manager level staff. The Superintendent, Production, is responsible for corrective action, except where another manager is specifically designated. Follow-up actions taken by the Superintendent, Production, or responsible manager, shall be documented. Documentation shall be maintained for at least the period stated in Section 2.9.

2.7 Audits and Inspections (Continued)

Annual audits are conducted in which the results of previous inspections or audits are reviewed, as an evaluation of the effectiveness of the program. These audits may also involve a detailed review of non-safety documents such as operation procedures, shop travelers, etc., and are documented by a formal report to the Vice President, Nuclear Fuel. Annual audits are performed by a team appointed by the Vice President, Nuclear Fuel. Personnel on the team will not have direct responsibility for the function and areas being audited. The team shall include, as a minimum, a Nuclear Criticality Specialist and a radiation specialist who shall audit criticality and radiation safety, respectively. The radiation specialist who conducts the annual audit shall have as a minimum a Bachelor's degree in Science or Engineering with two years experience in operating health physics for uranium bioassay techniques, internal exposure controls and radiation measurement technique. The annual audit will review ALARA requirements in conformance with Regulatory Guide 8.10, as applicable. The NLS&A Manager shall be responsible for follow-up of recommendations made by the audit team.

2.8 Investigations and Reporting

Events specified by applicable regulations or license conditions shall be investigated and reported to NRC. The NLS&A Manager shall be responsible for conducting the investigation and documentation of reportable events.

Non-reportable occurrences shall be investigated and documented as appropriate. Such reports shall be available for NRC inspection.

2.9 Records

Retention of records required to be maintained by the regulations, and by the conditions of this license, shall be the responsibility of the cognizant manager. Records of tests, measurements, and surveys

2.9 Records (Continued)

identified as requiring preservation until the NRC authorizes disposition shall be retained indefinitely. Records of NLS&A evaluations and approvals shall be retained for a period of at least six months after use of the operation has been terminated, or for two years, whichever is longer. Other safety significant records shall be retained for at least two years.

TABLE I.2-1

MINIMUM EDUCATION AND EXPERIENCE REQUIREMENTS FOR KEY PERSONNEL

<u>POSITION</u>	<u>Title</u>	<u>Education</u>	<u>Experience (Years/Field)</u>
Described In Section No.			
I.2.1.1	Plant Manager	Bachelors, Science or Engineering	5/Nuclear manufacturing
I.2.1.2	Manager, NLS&A	Bachelors, Science or Engineering	5/Health Physics with 2/Operational health physics with uranium bioassay techniques, internal exposure control, and radiation measurement techniques
I.2.1.3	Superintendent, Production	Bachelors, Science, Engineering or Manufacturing	2/Nuclear manufacturing industry
I.2.1.4	Manager, Engineering	Bachelors, Science or Engineering	5/Engineering design or process, systems or facilities
I.2.1.5	Nuclear Criticality Specialist	Bachelors, Science or Engineering	2/Nuclear criticality evaluations.
I.2.1.6	Supervisor, Health Physics	High School Diploma	5 Total/Nuclear industry, with 3/Senior Health Physics Technician
I.2.1.7	Health Physics Specialist	Bachelors, Science or Engineering	2/Operational Health Physics applicable to fuel manufacturing
I.2.1.8	Health Physics Technician	High School Diploma or GED Equivalent	6 mos/Training and experience in radiation protection activities
I.2.3	Chairman, Plant Safety Committee	Bachelors, Science or Engineering	5/Nuclear manufacturing industry

3.0 RADIATION PROTECTION

3.1 Administrative Requirements

3.1.1 Radiation Work Permit Procedures

Operations not covered by an effective operating procedure shall be conducted under a Special Evaluation Traveler (S.E.T.). Prepared by the responsible function, it shall contain detailed instructions for the procedure and shall include all safety requirements to assure that the proposed operation is conducted in a safe manner. The same approvals as required for Operating Sheets shall be required on all S.E.T.'s. Completion of the operation shall be appropriately documented as indicated on the traveler.

3.1.2 ALARA Commitment

It is the policy of Combustion Engineering to maintain a safe workplace and healthful work environment for each employee. It is also C-E's policy to keep radiation exposures to both employees and the general public As Low As Reasonably Achievable (ALARA). The annual audit team, described in Section 2.7 considers ALARA requirements in conformance with the intent of Regulatory Guide 8.10.

3.2 Technical Requirements

3.2.1 Access Control

The facility shall be zoned to define contamination areas and clear areas. Protective clothing shall be worn in the contamination areas. A sink and alpha survey meter or alpha monitor shall be provided at the exit from the contamination area. All personnel are required to wash and monitor their hands, and to monitor other body surfaces and personal clothing as appropriate, when exiting a contaminated area. Except for hand contamination which is easily removed on the first rewashing, health physics assistance and approval for release above background levels shall be required.

3.2.4 Internal and External Exposure

3.2.4.1 Special Surveys

All non-routine operations not covered by operating procedures shall be reviewed by NLS&A and a determination made by NLS&A if radiation safety monitoring is required.

With the exception of incidents requiring immediate evacuation, spills or other accidental releases shall be cleaned up immediately. Criticality restrictions on the use of containers and water shall be followed at all times. The Shift Supervisor and NLS&A must be notified immediately of such incidents. Appropriate precautions such as use of respirators shall be observed.

3.2.4.2 Routine Surveillance

Surveys shall be conducted on a regularly scheduled basis consistent with plant operation and survey results. The frequency of survey depends upon the contamination levels common to the area, the extent to which the area is occupied, and the probability of personnel exposures. The frequency for contamination surveys in plant operating areas shall be specified in Table 1 of Regulatory Guide 8.24, where applicable. Clear areas with high potential for tracking of contamination may be surveyed more frequently. Areas with a low use factor may be surveyed less frequently.

Cleanup action for restricted areas shall be initiated when surface contamination exceeds the action limits specified in Table 2 of Regulatory Guide 8.24.

3.2.4.3 Air Sampling Criteria

Air sampling shall be performed using fixed location samplers, personal (lapel) samplers, and air monitors.

The type of air sample collected at a specific operation or location shall depend on the type, frequency, and duration of operations being performed. One or more of these sample methods shall be employed at intervals prescribed by the NLS&A Manager. General criteria for sampling are:

- a. Fixed location samplers shall be used where uranium handling operations are pursued for extended periods of time, or where short term operations occur frequently. These samplers shall be located in or as near as practical to the breathing zone of the person performing the operations. Fixed sampling may also be used for investigative purposes. In this case, the samples may be collected near the point of suspected release of material.
- b. Lapel samplers may be used where work stations are not defined or for supportive measurements and special studies. Continuous air monitors may be used for early warning of unexpected releases.
- c. Emphasis shall be placed on sampling new operations or processes until adequate, effective, control of airborne contamination is assured.

4.0 NUCLEAR CRITICALITY SAFETY

4.1 Administrative Requirements

4.1.1 Double Contingency Policy

Process Designs shall, in general, incorporate sufficient factors of safety to require at least two unlikely, independent, and concurrent changes in process conditions before a criticality accident is possible.

4.1.2 Criticality Safety Review

Final design, initial installation, modification, or relocation of special nuclear material processing, handling or storage equipment, or related operations, shall be reviewed and approved by the NLS&A Manager. Such changes as could effect nuclear criticality safety shall be reviewed prior to implementation according to the review and approval procedure described in Section 2.6 of this part.

4.1.3 Posting of Limits

Signs listing approved nuclear criticality safety limits shall be posted such that information thereon is readily discernible to employees. This posting may be for individual pieces of equipment or groups of equipment, depending on the nature of the operations covered.

3.0 ORGANIZATION AND PERSONNEL

Section I.2.1 describes the key positions important to safety and the line of authority to top management. Section I.2.2 lists the education and training requirements for those positions. The following Section II.3.1 similarly describes additional positions of the organization. Section II.3.2 gives the resumes for personnel currently holding the key positions described in Part I.

3.1 Organizational Responsibilities

Figure II.3-1 is the Hematite plant organization chart. The following sections describe some of the supervisory and higher level positions shown in Figure II.3-1 that are not included in Section I.2.1.

3.1.1 Manager, Administration and Production Control

The Manager, Administration and Production Control reports to the Plant Manager. He manages the control of SNM from receipt at the Hematite facility, through the production process until it is shipped as product or waste. His activities include scheduling of production, selection of SNM for use in the production process, specification of the product lot makeup, scheduling of SNM shipments from the supplier to Hematite and from Hematite to the customer, coordination of the packaging and shipment of SNM waste and residues to a commercial, licensed disposal facility and development of procedures for packaging, shipping and receiving. He also performs facility administration duties including the supervision of the guards, site purchasing and personnel services.

3.1.2 Manager, Quality Control

The Manager, Quality Control reports to the Plant Manager. He manages the measurement activities which verify that the product conforms to specification. These activities may include development of the Operation Sheets that are the procedures for acquisition of product data, approval of laboratory measurement methods, approval of statistical methodology for data evaluation and establishment of the system for control and distribution of data documentation. The manager maintains separation between his measurement activities and the production activities that he monitors. He has authority to halt production and it shall not restart until approved by the Plant Manager or a duly authorized alternate.

3.1.3 Coordinator of Nuclear Materials Accountability

The Coordinator of Nuclear Materials Accountability reports to the Manager of Nuclear Licensing, Safety and Accountability. He maintains the SNM accounting records, prepares NRC required reports on material balance, transfer and inventory, periodically verifies current knowledge of the presence of SNM and computes Inventory Differences.

3.1.4 Supervisor, Material Control

The Supervisor, Material Control reports to the Manager, Administration and Production Control. He implements the production schedules provided by the Manager through supervision of the production clerk, the material control operators and the material handlers. He monitors the sequence of steps in the processing and handling of each material unit including the proper use of the Traveler that documents each process step.

3.1.5 Supervisor, Quality Control Engineering

The Supervisor, Quality Control Engineering reports to the Manager, Quality Control. He supervises the quality control technicians who obtain the measurement samples and he supports the activities of the Manager. His support may include recommendations on sampling plans, development of statistical methods, evaluation of data trends, recommendations on measurement standards, participation in writing procedures, review and approval of Travelers and Operation Sheets and administration of the document control system.

3.1.6 Supervisor, Laboratory

The Laboratory Supervisor reports to the Manager, Quality Control. He supervises and trains the laboratory technicians, recommends sampling procedures, establishes laboratory methods and reviews and approves all chemical measurements on SNM. He also selects subcontractors and qualifies and coordinates their measurement services.

3.1.7 Supervisor, Maintenance

The Supervisor, Maintenance reports to the Superintendent, Production. He supervises technicians in the maintenance activities related to the facility and the production equipment within the constraints of applicable radiation and industrial safety practice.

3.2 Resumés of Personnel

Resumés of key personnel important to safety are provided in this section for the following personnel:

J. A. Rode - Plant Manager

3.2 Resumés of Personnel (Continued)

R. J. Klotz - Nuclear Criticality Specialist
(located in Windsor)

H. E. Eskridge - Manager, Nuclear Licensing, Safety, and
Accountability

A. J. Noack - Superintendent, Production

R. W. Griscom - Manager, Engineering

E. W. Criddle - Supervisor, Health Physics

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JAMES A. RODE - PLANT MANAGER, HEMATITE

EDUCATION:

B.S., Chemical Engineering, University of Texas, 

EXPERIENCE:

COMBUSTION ENGINEERING, INC. 1974 to Present
Plant Manager, Nuclear Fuel Manufacturing, Hematite

Responsible for all Nuclear Fuel Manufacturing activities at the Hematite Plant. Manages Engineering, Production and Materials Control, Manufacturing, Nuclear and Industrial Safety, Nuclear Material Management, and Quality Control.

GULF UNITED NUCLEAR FUELS CORPORATION 1968 to 1974
Technical Consultant

Responsible for establishing process flow sheets and capacities for production of UO_2 , UO_2 pellets, and uranium recovery; and coordinating development activities. Also responsible for preparation of stable density pellets and development of process modifications. Technical Assistant to the Manager of Chemicals Operations on major operational problems.

JAMES A. RODE (continued)

UNITED NUCLEAR CORPORATION

Manager of Facilities Development and Technical Director 1964 to 1968

Responsible for design, construction and startup of the first large scale fluidized-bed process for the production of UO₂ from UF₆ and of companion facilities for converting oxide to pellets.

Responsible as Technical Director for Chemicals Operations for process engineering supervision and development activities including design, construction, and operations of a pilot plant for preparation of UO₂ via the reaction of UF₆ and steam and for development, design, construction and startup of a fluid-bed vapor phase coating system.

Assistant Technical Director 1962 to 1964

Responsible for process and equipment design in the Rhode Island Scrap Recovery Facility, development work on process for producing pyrolytic carbon coated UO₂, and for continuing development work in Naval Fuel Program.

Project Leader 1961 to 1962

Assumed total responsibility for salvaging a non-operative Naval Fuels Plant including production, quality control, development and customer contacts. The facility was converted into the primary source of profits for the Chemical Operations.

JAMES A. RODE (continued)

MALLINCKRODT CHEMICAL WORKS

Group Leader and Production Superintendent

1958 to 1961

Responsible for the startup of high enrichment metal production and development and startup of the Hematite Pellet Plant.

Responsible as Production Superintendent for detailed supervision of production in both high and low enrichment conversion operations.

Process Engineer and Research Chemist

1953 to 1958

Participated in preparation of proposals for production of yttrium metal and conversion of 5000 tons per year of UF₆. Responsible for operation of the first ADU pilot plant and startup of the Hematite Oxide Plant.

ROBERT J. KLOTZ - NUCLEAR CRITICALITY SPECIALIST

Ex 6

EDUCATION

Graduate, Oak Ridge School of Reactor Technology, [REDACTED]
M.S. Physics, Kansas State College, 1954
A.B. Physics and Mathematics, Kansas State Teachers College of Emporia [REDACTED]
Graduate Studies, Texas Christian University

EXPERIENCE

COMBUSTION ENGINEERING, INC. 1965 to Present
Windsor, Connecticut

Senior Consulting Physicist 1977 to Present

Responsible for the physics design of new and spent fuel racks, fuel transfer machines, and other equipment involved in moving, testing or storing fuel. Nuclear Criticality Specialist provide technical support and criticality audit function at both the Windsor Manufacturing and Hematite Fuel Manufacturing facilities. Involved in solving special physics problems.

Section Manager, Radiation and 1965 to 1977
Criticality Physics

Responsible for radiation shielding, the ex-core criticality, and determination of source terms for Nuclear Steam Supply Systems. Also for providing nuclear heat generation rates for structures in the NSSS, and radiation dose rates for assessing physical changes in NSSS materials and equipment in the radiation environment.

ROBERT J. KLOTZ (continued)

GENERAL NUCLEAR ENGINEERING CORPORATION

Physicist

1959 to 1965

Responsible for the shield design of the heavy water research reactor at the Georgia Institute of Technology and the thermal and biological shield design analysis for the Boiling Nuclear Superheat Reactor (BONUS) located in Rincon, Puerto Rico. Reviewed all the literature on radiation shielding for the publication Power Reactor Technology.

CONVAIR DIVISION OF GENERAL DYNAMICS

Physicist

1954 to 1959

Responsible for the design of a shield for a mobile reactor of the Army Compact Core Design and for a Nuclear Ramjet Missile. Performed analysis of aircraft nuclear shielding experiments, developed shielding programs for computers, and contributed to the Aircraft Shield Design Manual.

HAROLD E. ESKRIDGE - MANAGER, NUCLEAR LICENSING, SAFETY AND ACCOUNTABILITY.

EDUCATION:

B.S., Physics, North Carolina State University, [REDACTED]
M.S., Physics, North Carolina State University, 1963

Ex 6

EXPERIENCE:

COMBUSTION ENGINEERING, INC.

Manager, Nuclear Licensing, Safety 1989 to Present
and Accountability - Hematite

Supervisor, Nuclear Licensing, Safety and 1974 to 1989
Accountability - Hematite

Responsible for licensing, safety, and safeguards at Nuclear Fuel Manufacturing - Hematite. Develops and implements the health physics, criticality and industrial safety, and accountability programs for the Hematite facility. Audits manufacturing operations and supervises safety and safeguards personnel in day-to-day operations.

GENERAL ELECTRIC COMPANY 1972 to 1974
Nuclear Safety Engineer

Analyzed changes and specified requirements for Wilmington nuclear fuel manufacturing to assure compliance. Audited manufacturing operations and radiation protection programs. Planned and conducted development programs in dosimetry, radiation monitoring and environmental sampling.

HAROLD E. ESKRIDGE (continued)

SALISBURY METAL PRODUCTS COMPANY

1971 TO 1972

Co-Manager

Managed operations for manufacturer of precision components; including sales, finance, production control and quality assurance. Consultant to Institute for Resources Management on decontamination and radioactive waste disposal projects and a member of Rowan Technical Institute Advisory Committee.

EVIRONONICS, INC.

1970 to 1971

Vice President - Nuclear Applications

Performed variety of functions, including market research, proposal preparation and technical analyses relating to remote sensing, environmental surveys, and health physics services. Contacted potential customers, including government agencies and utility companies with power reactors.

EG&G, INC.

1967 to 1970

Senior Scientist and Scientific Executive

Head, Radiological Sciences Section and Senior Health Physicist, responsible for radiation and nuclear safety and regulatory compliance for Las Vegas Operations. Provided technical direction for Nuclear Counting Laboratory, Nevada Aerial Tracking System, and Aerial Radiation Measuring Surveys Programs. Acting Manager, Environmental Measurements Department, which included High Energy Neutron Reactions Experiment and Metrology Sections.

NORTH CAROLINA STATE BOARD OF HEALTH

1962 to 1967

Public Health Physicist

Technical, policy, and procedural consultation in all aspects of health physics, environmental surveillance and radiological health. Functioned as administrator of Radioactive Materials Licensing and Regulation. Served as Team Chief of State

HAROLD E. ESKRIDGE (continued)

Radiological Emergency Team and established and equipped a laboratory for radiological and chemical analysis of environmental samples.

U.S. AIR FORCE
Nuclear Specialist

1954 to 1957

Responsible for criticality and radiological safety for nuclear weapon systems and components. Also was an instructor in nuclear safety and weapons systems.

ARLON J. NOACK - PRODUCTION SUPERINTENDENT, HEMATITE

EDUCATION:

Hillsboro High School,  Graduate

EX 6

EXPERIENCE:

COMBUSTION ENGINEERING, INC.

Production Superintendent - Hematite 1981 to Present

Responsible for production and maintenance operations, operator and maintenance training, manpower scheduling, interviewing and hiring operating personnel, handling Union grievances, and training new production and maintenance supervisors.

Maintenance Supervisor - Hematite 1980 to 1981

Responsible for the maintenance of production equipment, building and grounds maintenance, ordering repair parts, and porter service.

Production Supervisor - Hematite 1974 to 1980

Shift Supervisor in charge of production operations, dealing with Union problems, operator training, and scheduling production to assure fulfillment of customer schedule requirements.

ARLON J. NOACK (continued)

GULF UNITED NUCLEAR FUELS CORPORATION

Production Supervisor - Hematite

1970 to 1974

Production Supervisor in charge of production operations, dealing with Union problems, operator training, and scheduling production to fulfill customer schedule requirements.

Engineering Technician - Hematite

1969 to 1970

Responsible for production engineering functions as assigned by the Process Engineer, some drafting responsibilities, and Engineering technical assistance.

UNITED NUCLEAR CORPORATION

1966 to 1969

Process Development Technician - Hematite

Participated in development of Uranium Oxide Conversion Plant, such as operating and repairing development equipment, and assisting in the development of new operating techniques.

LUDLOW SAYLOR WIRE CLOTH COMPANY

1963 to 1966

Production Operator - St. Louis

Operated wire screen loom, wire stretcher, and punch press.

HOWARD INDUSTRIES COMPANY

1962 to 1963

Junior Draftsman - Festus

Responsible for drawing changes, drawing minor equipment, and document control of production drawings.

ROBERT W. GRISCOM - MANAGER, ENGINEERING, HEMATITE

EDUCATION:

B.S., Chemical Engineering, Georgia Institute of Technology, [REDACTED] Co-op
M.S.C.E.-Sanitary, University of Missouri-Rolla, 1974.

Ex. 6

EXPERIENCE:

COMBUSTION ENGINEERING, INC.	1981 to Present
<u>Manager, Engineering - Hematite</u>	1989 to Present
<u>Engineering Supervisor - Hematite</u>	1981 to 1989

Responsible for managing Engineering Department. Activities including process engineering, plant expansion design and management, drafting, instrument maintenance, and staff assistance to other plant departments.

NATIONAL STEEL ENGINEERS & ASSOCIATES	1977 to 1981
<u>Project Manager - St. Louis</u>	

Project Manager in corporate environmental consulting group. Directly responsible for engineering, fabrication, and installation of multi-million dollar air pollution control and wastewater treatment systems for major steel companies.

ROBERT W. GRISCOM (continued)

ROCKWELL INTERNATIONAL

1974 to 1977

Senior Test Engineer - St. Louis

Responsible for establishing and gathering an hourly emission inventory for EPS sponsored St. Louis Regional Air Pollution Study (RAPS). Also supervised and performed stack sampling in St. Louis and New Mexico.

MONSANTO COMPANY

1969 to 1974

Process Engineer - St. Louis

Responsible for process and cost improvements in various chemical production departments. Designed and installed a wastewater treatment system for removing phenolics.

ENOS W. CRIDDLE - SUPERVISOR, HEALTH PHYSICS

Cape Girardeau Central High School, Graduated [REDACTED]
Naval Nuclear Power School, 1982 X
Naval Nuclear Power Prototype Training, 1983 X
Naval Nuclear Engineering Laboratory Technician, 1983 X
Naval Damage Control School, 1984 X
Naval Fire Fighting Training, 1985 X

Ex 6

PROFESSIONAL EXPERIENCE:

ABB Combustion Engineering Nuclear Power, 1988 to Present

Health Physics Supervisor, 1990 to Present

Responsible for the daily operations management of the health physics department and staff at Nuclear Fuel Manufacturing - Hematite. Implements health physics and industrial safety program through training, supervision, and daily audit. Develops and revises departmental operations procedures and emergency plan implementing procedures.

Health Physics Technician, 1988 to 1990

Responsible for radiological and industrial safety at Nuclear Fuel manufacturing - Hematite. Duties include instrument calibration, environmental sampling, documenting employee exposures, maintaining health physics documents, and performing routine radiological and industrial safety monitoring.

U.S. Navy Engineering Laboratory Technician, 1981 to 1987

Stationed on board USS Lafayette SSBN 616 (G) responsible for radiological safety throughout the ship. Qualified supervisor for administration and control of radiological materials and records. Responsible for instrument and gauge calibration program, chemical inventory and storage, and water chemistry controls for reactor plant and steam plant.

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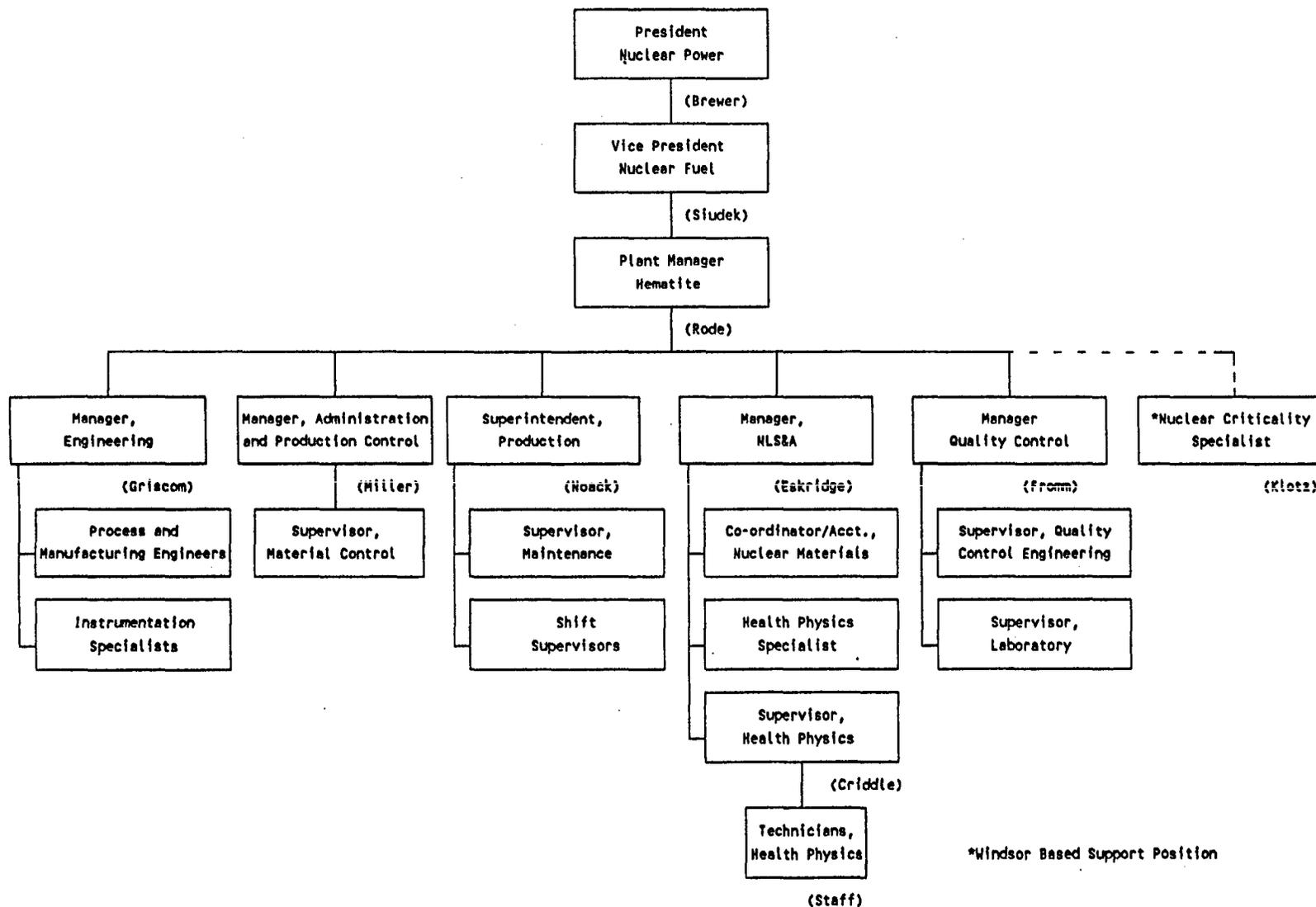


FIGURE II.3-1
HEMATITE PLANT ORGANIZATION CHART