DEC 1 9 1986

Docket 70-36

Combustion Engineering
Incorporated
ATTN: Mr. H. V. Lichtenberger
Vice President
Manufacturing
Nuclear Power Systems
Windsor, CT 06095

Gentlemen:

This refers to the special team inspection conducted by Mr. L. R. Greger and other members of the NRC on November 17-21, 1986, of activities at the Combustion Engineering Hematite facility authorized by NRC Special Nuclear Material License No. SNM-33, and to the discussion of our findings with Mr. J. A. Rode and others of your staff at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

No violations of NRC requirements were identified during this inspection. However, several weaknesses were identified concerning your activities. Please provide a written response to the weaknesses summarized in Section 17 of the enclosed inspection report, including appropriate corrective actions.

In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter, the enclosured inspection report, and your response to this letter will be placed in the NRC's Public Document Room.

SM-14

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

Jack A. Hind, Director
Division of Radiation Safety
and Safeguards

Enclosure: Inspection Report
No. 70-36/86004(DRSS)

cc w/enclosures:
DCS/RSB (RIDS)
OSHA, Region 7
EPA, Region VII

bcc w/enclosures:
W. Crow, NMSS
G. Sjoblom, IE

RIII	RIII	RIII	RIII	RIII	RIII	RIII	RIII
France/as	Januska	Peterson	Holmes	Sly	Greger	Shafer	Hind
12/19/86	12/19/86					yes	yes 12/19/86

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 70-36/86004(DRSS)

Docket No. 70-36 License No. SNM-33

Licensee: Combustion Engineering
Incorporated
Nuclear Power Systems
Windsor, CT 06095

Facility Name: Hematite Facility

Inspection At: Hematite Missouri

Inspection Conducted: November 17-21, 1986

Inspection Team Leader: L. R. Greger 12-19-86
Date

Inspection Team Members: G. M. France, III
A. G. Januska
J. Holmes
H. Peterson
D. Sly

Approved By: W. D. Shafer, Chief
Emergency Preparedness and
Radiological Protection Branch
12-19-86
Date

Inspection Summary:

Inspection conducted November 17-21, 1986 (Report No. 70-36/86004(DRSS))
Areas Inspected: Special announced team inspection of the licensee's facilities and operations as they affect the safety of onsite and offsite personnel, including management controls, training, procedures, fire protection, criticality safety, maintenance surveillance, chemical safety, radiation safety, and environmental monitoring.
Results: No violations or deviations were identified. Several weaknesses were identified (Section 17).

DETAILS

1. <u>Persons Contacted</u>

 G. Boyer, Health Physics Technician
 C. Christopher, Process Engineering Specialist
*L. Deul, Manufacturing Engineer
*H. Eskridge, Nuclear Licensing, Safety and Accountability Supervisor
*R. Fromm, Quality Assurance Manager
*R. Griscom, Plant Engineering Supervisor
 C. Hercher, Engineering Specialist
*R. Miller, Manager, Administration and Production Control
 R. Moore, Maintenance Supervisor
 N. Mortin, Production Operator
*A. Noack, Production Superintendent
 B. Pigg, Quality Control Laboratory Supervisor
*J. Rode, Plant Manager
 N. Steimel, Production Operator
 G. Uding, Quality Assurance Engineer
 N. Wilper, Health Physics Technician

The inspection team also contacted other licensee personnel.

*Denotes those present at the exit meeting.

2. <u>General</u>

This inspection, which began on November 17, 1986, was conducted principally to review the licensee's facilities, processes, and programs to identify licensee activities posing a threat to the safety of onsite and offsite personnel and to determine whether licensee procedures, training, and management controls are adequate to minimize the potential threats to personnel safety. The safety threats emphasized in the inspection were significant releases of radioactive material or hazardous chemicals (particularly those hazardous chemicals associated with radioactive material processes) or a nuclear criticality incident. In reviewing these threats, the potentials for fire and explosion and equipment, instrumentation, and process control malfunctions were evaluated. These inspection activities incorporated the important lessons learned from the UF_6 accident at the Sequoyah Fuels Corporation facility.

The inspection was conducted by a team of NRC inspection personnel with expertise in operator training, fuel facility operations, criticality safety, fire protection, and health physics. The inspection included observation of work activities, review of licensee procedures and records, interview of licensee employees, and tours of licensee facilities.

The Region 7 EPA and OSHA offices were unable to participate in the inspection due to other priorities. Copies of this inspection report will be furnished to those offices.

3. Facility Operations

The Combustion Engineering Hematite, Missouri facility produces uranium dioxide (UO_2) fuel for the commercial nuclear power industry. Low enriched uranium hexafluoride (UF_6) is received from government enrichment facilities in 2½-ton cylinders. The UF_6 cylinders are heated in atmospheric steam chests in order to feed the UF_6 to the dry fluid bed conversion equipment which produces UO_2 powder. The UO_2 powder is normally shipped to the Combustion Engineering Windsor, Connecticut facility for manufacture of UO_2 fuel pellets. Fuel pellet production can also be performed at the Hematite, Missouri facility and the fuel pellets then shipped to the Windsor, Connecticut facility for encapsulation in fuel rods. Additional operations involving radioactive material at the Hematite, Missouri facility include uranium recovery of process scrap, incineration of combustible waste, and effluent treatment. The licensee is also authorized to possess source material or natural UF_6 in 10-ton cylinders; however, no 10-ton UF_6 cylinders have been stored onsite to date and there are no current plans to do so. The following descriptions from the December 30, 1983 Safety Evaluation Report for the Hematite Missouri facility, prepared by the NRC Division of Fuel Cycle and Material Safety, were found to reflect current licensee operations.

- UO_2 Powder Production - The process of chemically converting uranium hexafluoride to uranium dioxide is carried out in process lines which use a proprietary, direct conversion, dry fluid bed process. The operation is conducted in closed, generally cylindrical vessels of limited size, designed to enhance nuclear criticality safety. UF_6 is received in standard 2½-ton cylinders inside protective overpacks. The cylinders and overpacks have been approved by the NRC and DOT for the shipment of UF_6. As needed, the cylinders are moved into one of two steam chambers located on the oxide building dock. Inside the oxide building, the vaporized UF_6 passes through metering valves and, along with a carrier gas, is transported directly to the conversion reactor where UF_6 and steam are mixed to produce uranyl fluoride (UO_2F_2). In the other two reactors, the UO_2F_2 is reduced to UO_2 by contact with cracked ammonia. The UO_2 is stored, blended, and either packaged for shipment or transferred to the pellet fabrication process area.

- UO_2 Pellet Production - Dry UO_2 powder is agglomerated, granulated, and fed to the pellet press. Pressed pellets are dewaxed, sintered, and processed through a grinder and packaged for shipment.

- Scrap Recovery - Clean scrap is treated to achieve the desired ceramic properties and recycled with the feed material. Wet recovery of other scrap-contaminated material, residues, combustibles, and UF_6 cylinder wash water includes oxidation, reduction, dissolution, filtration, precipitation, and drying of uranium tetraoxide (UO_4) product. This material is then processed as clean scrap.

- Waste Disposal - Laundry water and cooling water are treated and discharged to the industrial waste system via the storm drain which discharges into the site pond. Sanitary waste liquid effluent enters the site creek below the pond. Mop water is evaporated, and

chemically treated for subsequent uranium recovery. Process water from wet scrap recovery is evaporated; the evaporator bottoms are solidified for shipment to licensed burial. Contaminated combustible wastes are volume reduced in a gas-fueled incinerator or oxidized in the scrap recovery plant. The residues are treated for uranium recovery and/or shipped to a licensed burial facility. Bulky items are sized and/or placed in boxes for shipment to burial. Gaseous effluents from the UF_6 conversion process are passed through packed towers, containing limestone rock, to remove the hydrofluoric acid and trace quantities of uranium. The limestone rock is converted to calcium fluoride which is disposed of as onsite landfill material. Contaminated (radioactive) limestone is stored onsite. Nonradioactive solid waste is sent to a commercial waste firm.

The principal hazardous materials associated with the licensee operations are UF_6, KOH, H_2SO_4, HCl, HNO_3, H_2O_2, UO_2, NH_3, HF, H_2 and natural gas. Additionally, PCB contaminated oil is contained in several onsite electrical transformers. Of these, only UF_6 (HF & UO_2F_2 reaction products) and ammonia appear to pose potential offsite hazards, and then only from large UF_6 or ammonia releases. These hazards are discussed further in Sections 4 and 9.

4. <u>Licensee Action On Lessons Learned Recommendations (NUREG-1198)</u>

In July 1986, the licensee received a copy of NUREG-1198 (Release of UF_6 from a Ruptured Model 48-Y Cylinder at Sequoyah Fuel Corporation Facility: Lessons Learned Report) by cover letter from NRC(NMSS). The NRC recommended that the licensee consider the recommendations made by the Lessons Learned Committee for application at the Hematite facility. Although the licensee had not performed a formal documented evaluation of the applicability of the NUREG-1198 recommendations to their facility, the plant manager was conversant with the applicability of the recommendations, and at least one staff meeting had been held to address the NUREG-1198 recommendations. The licensee's status for the "Process and Facility Design" recommendations from NUREG-1198 are addressed below. Specific licensee weaknesses identified by the inspection team concerning those recommendations are also addressed below. Further action may be taken by NMSS concerning the recommendations from NUREG-1198.

The recommendations in NUREG-1198 emanated from the UF_6 cylinder rupture event at the Kerr McGee Gore, Oklahoma facility in January 1986. As such, they primarily address UF_6 conversion facilities, but also were intended for implementation, as applicable, at certain other NRC licensed facilities, including UO_2 fuel production/fabrication facilities. Uranium is present in several different chemical forms at the Hematite facility, but UF_6 is the only form which can be dispersed offsite without application of an external energy force to effect the dispersion. UF_6 will react with water to form hydrofluoric acid (HF) and uranyl fluoride (UO_2F_2). Since airborne moisture is a generally available water source, the reaction can be expected to occur if UF_6 is released to the atmosphere. The reaction is exothermic (heat-producing) for UF_6 existing in the gaseous state; therefore, heated UF_6 (>134°F at atmospheric pressure) represents a significant release hazard. Both the HF and the UO_2F_2 produced are hazardous chemicals. The HF is produced as a corrosive

acid vapor that can severely harm the lungs and exposed portions of the body. The UO_2F_2, formed as particulate material, produces both radioactive and chemical effects when taken into the body, with the chemical effect being the more important because much of the uranium is present in soluble form. According to NUREG-1140, a UF_6 release of sufficient magnitude to be lethal due to HF burns on lung tissue or uranium chemical toxicity would not result in radiation doses exceeding one rem effective dose equivalent.

Although the Combustion Engineering Hematite facility does not routinely fill UF_6 cylinders, UF_6 cylinders (2½-ton instead of the 10 or 14-ton cylinders used at UF_6 conversion facilities) are routinely heated to feed the UO_2 production process, and a small 255-pound operating capacity cold trap is filled and subsequently heated and emptied in its use as a process vessel. A very small amount of heated UF_6 (less than 25 pounds) is contained in process lines at any time. Release of the entire contents of the cold trap and of the process lines would not be expected to have any offsite effects; however, localized onsite hazardous conditions would exist. Release of the entire contents of a 2½ ton cylinder would be expected to create localized offsite hazardous conditions; as noted below, such a release is extremely unlikely due to engineering design and administrative control considerations. Although localized offsite hazardous conditions would exist, the accidental release of UF_6 from a 2½-ton cylinder, as evaluated in the September 1981 Environmental Impact Statement for the Combustion Engineering Hematite facility, would not pose a significant hazard to the nearest resident based on release of 22% of the cylinder contents. (Significantly more than 22% of the cylinder contents was released in the Sequoyah Fuels UF_6 cylinder rupture event.)

a. <u>Section 2.1 Recommendation #1</u>

Pressure-sensing instrumentation should be connected to UF_6 cylinders and cold traps any time heat is applied to them. Heat should not be applied to UF_6 cylinders or cold traps unless there is verification that a vent path is open to the associated pressure-sensing instrumentation. The pressure-sensing instrumentation should provide both alarm and visual display functions.

<u>Status</u>

Pressure-sensing instrumentation is not connected to the UF_6 cylinders at Combustion Engineering. The licensee currently has no plans to utilize such instrumentation because: 1) they do not want to operate valves on "cold" cylinders due to the potential for valve damage from the solidified UF_6, and 2) they prefer to slightly crack open the valve after the cylinder is heated thereby enabling the operator to visually detect leakage from the connectors immediately and thereby minimize any UF_6 release. The licensee does not fill UF_6 cylinders. The cylinders are filled and weighed at the government UF_6 enrichment facility. Weights, which are determined independently by the government enrichment facility and the licensee, are stringently controlled for financial and accountability as well as safety considerations.

Pressure-sensing instrumentation is connected to the UF_6 heel cold trap; however, the pressure instrument was inoperable at the time of the onsite inspection, and had been inoperable for several months. A replacement instrument was ordered in early September and is expected to be installed by the end of 1986. (Open Item 70-36/86004-01).

Two weaknesses were identified in that there is no alarm or control function associated with the pressure instrument and the pressure instrument is routinely isolated from the cold trap when the cold trap is being heated. The pressure instrument is intended to be used as a process indicator rather than a safety instrument. The licensee should evaluate the feasibility of heating the heel cold trap with the pressure instrument online and of adding an alarm function to the pressure sensor to correct the weaknesses identified. (Open Items 70-36/86004-02,03)

b. Section 2.1 Recommendation #2

Provisions should be made for overpressure relief or automatic heat termination upon overpressurization any time heat is applied to UF_6 cylinders or cold traps.

Status

As indicated in Section 2.1 Recommendation #1, no pressure instrumentation is currently utilized or planned for the UF_6 cylinders. No overpressure relief is available.

The pressure instrumentation on the UF_6 heel cold trap has no control function nor are there present plans to provide any control functions. There is a temperature controller which regulates steam flow to heat the ethylene glycol; this control function is described further in Section e below.

c. Section 2.1 Recommendation #3

The use of autoclaves for heating UF_6 cylinders should be evaluated in terms of providing an additional margin of safety.

Status

The licensee has no present plans for installation of autoclaves because they believe the monetary cost is not justified by the increased safety margin provided by autoclaves. However, the licensee did not appear to have thoroughly evaluated the actual safety margin provided by autoclaves.

d. Section 2.2 Recommendation #1

At least two separate means should be utilized for determining the quantity of UF_6 loaded into cylinders or cold traps before applying heat to them. "Real time" quantification methods are preferred, such as load cells, mechanical scales, or flow integration. Alarms should be associated with the quantification methods.

Status

The UF_6 cylinders, received from DOE enrichment facilities, are weighed by the DOE enrichment facilities subsequent to filling. This weight information accompanies each cylinder received by the licensee. The licensee subsequently also weighs the cylinders on their scales (load cell) and compares the two weights. Weight discrepancies are resolved before the cylinder is loaded into the vaporizers. This provides the recommended two separate quantifications of UF_6 in cylinders before applying heat to the cylinders. While there is no alarm associated with the licensee's scale, such alarm would be of limited value since UF_6 is not being added to the cylinder at the licensee's facility.

The UF_6 heel cold trap is equipped with a load cell scale which has local readout but no remote readout or alarm function. A second method.to prevent overfilling of the UF_6 heel cold trap was recently added by administratively restricting the number of cylinders that are allowed to be trapped out before emptying the cold trap to seven. This appears to be a satisfactory arrangement particularly in light of the relatively small volume of UF_6 in the heel cold trap available for release.

Two weakness were identified in that the licensee does not periodically use check weights and does not incorporate an alarm on the cold trap load cell. (Open Items 70-36/86004-04,05)

e. Section 2.2 Recommendation #2

Licensees should be required to establish maximum fill limits for cylinders and cold traps based on suitable standards.

Status

The licensee presently adheres to the limit specified in ORO-651 for the UF_6 cylinders. This limit, 5020 pounds for Model 30B cylinders and 4950 pounds for Model 30A cylinders, reportedly has not been exceeded although it was approximated on a couple of occasions according to licensee personnel. The licensee has not calculated separate administrative limits based on plant specific conditions. Should the licensee make such calculations, they would likely be able to increase their limit for these cylinders based on their inability to heat the UF_6 cylinders much above 212°F, due to their use of atmospheric steam chests.

The licensee presently adheres to a limit more conservative than that specified in ORO-651 for the UF_6 heels cold trap (Cylinder Model 8A). It is not clear, however, that this limit is appropriate since the ORO-651 limit is based on a maximum temperature of 250°F, and although a temperature controller is procedurally set to maintain a maximum ethylene glycol temperature of 208°F, failure of this temperature controller or a setting error could allow 40 psig steam to the ethylene glycol. The saturation temperature of 40 psig steam is 268°F. Also, failure of an upstream reducer could allow 90 psig

steam (saturation temperature 320°F) to the ethylene glycol; this reducer is not designed with a rupture disc to prevent introduction of the higher pressure steam downstream of the reducer.

One weakness was identified in that the licensee has not evaluated the appropriate operating weight limit for the heel cold trap nor the need for redundancy to prevent excessive heating of the cold trap. (Open Item 70-36/86004-06)

f. Section 2.3 Recommendation #1

Movement of filled, heated UF_6 cylinders should be minimized. The use of combination filling, weighing, heating, and sampling stations should be evaluated for the Sequoyah Facility.

Status

The licensee has two vaporizer positions (steam chests) where UF_6 cylinders are heated and the UF_6 fed to the fluid bed conversion unit. The cylinders are moved to one of the two positions by overhead crane where they are heated, fed into UO_2 reactor #1, evacuated to the UF_6 heel cold trap, and allowed to cool without further movement. Heated cylinders are not moved; such movement is restricted procedurally and by special written instruction from the plant manager. However, there is no similar prohibition to prevent movement of cold cylinders over a hot cylinder in a vaporizer, and this is occasionally done when loading and unloading the inboard (#2) vaporizer.

The UF_6 heel cold trap is permanently positioned; it is filled and evacuated inplace.

One weakness was identified in that the licensee does not prohibit movement of cold UF_6 cylinders over vaporizers containing heated cylinders. (Open Item 70-36/86004-07)

g. Section 2.3 Recommendation #2

A requirement, generally analogous to 10 CFR 50.59 should be established requiring that certain NMSS licensed facilities perform engineering evaluations of proposed design changes to ensure that overall safety margins would not be compromised by the proposed changes.

Status

This recommendation is not applicable to licensees. It calls for NRC action.

h. Section 2.4 Recommendation #1

Overfilled UF_6 cylinders or filled cylinders which are found to be defective should be evacuated without increasing cylinder internal pressure above atmospheric and preferably without application of heat.

Status

As noted in Section 2.2 Recommendation #1, no overfilled cylinders have been received from the DOE enrichment facilities. According to licensee personnel, no known defective cylinders (ORO-651 Section 2.2.1, Figure 1) have been received either. The licensee does not, however, routinely inspect incoming UF_6 cylinders for damage. The licensee apparently has no reasonable capability for evacuation of a UF_6 cylinder without application of heat. Nor does it appear reasonably possible to evacuate UF_6 cylinders without increasing cylinder internal pressure above atmospheric due to the necessity to feed the UF_6 to UO_2 reactor #1.

One weakness was identified in that the licensee has no procedure requiring inspection of incoming UF_6 cylinders for damage. (Open Item 70-36/86004-08)

i. Section 2.4 Recommendation #2

The frequency of hydrostatic testing of UF_6 cylinders specified in ANSI N14.1-1982 should be reevaluated to resolve the differences in treatment of empty and filled cylinders.

Status

This recommendation is not applicable to licensees. It calls for NRC action.

The licensee performs hydrostatic testing of their cylinders. Due to the reasonably short turnaround time, UF_6 cylinders rarely exceed the specified 5-year testing frequency because they are filled. The UF_6 heel cold trap is also tested at 5-year intervals.

j. Section 2.5 Recommendation #1

Instrumentation for detecting UF_6 releases should be utilized in areas of potential airborne UF_6 releases and in conjunction with steam heating to detect UF_6 released to the steam condensate.

Status

Conductivity monitors on the vaporizer drains are installed to detect UF_6 releases within the vaporizers. Automatic functions initiated by the monitors terminate steam flow to the vaporizer, initiate a blower system which provides suction on the steam chest and discharges thru a scrubber, and secures a roof event. This system is designed for relatively minor UF_6 releases (approximately 100 pounds scrubbing capacity) associated with pigtail or connector leaks and is not capable of handling larger leaks.

An airborne radioactivity monitor is installed in the UO_2 building. Although this monitor was not designed to warn of large UF_6 releases it should perform this function adequately. No airborne monitors are located in the vaporizer area, however. A ventilation intake for the UO_2 plant is located in close proximity to the vaporizer area and would provide a ready means of spreading HF throughout the UO_2 plant in case of a significant UF_6 release in the vaporizer area. Other building ventilation intakes could also be affected depending on release magnitude and weather conditions. There are no automatic functions which would shut off the ventilation systems in case of a significant UF_6 release. The licensee did enclose the vaporizer area recently in order to provide some holdup of HF and UO_2F_2 in case an accidental release of UF_6 occurs in the vaporizer area. This construction had not been completed at the time of this inspection.

One weakness was identified in that the licensee has no airborne detectors to warn of UF_6 releases in the vaporizer area. The use of automatic functions to minimize spread of HF and UO_2F_2 within the plant buildings should also be evaluated. (Open Items 70-36/86004-09,10)

k. <u>Section 2.5 Recommendation #2</u>

The instrumentation for detecting UF_6 releases should provide alarm and/or automatic protection functions (for example, containment, emergency ventilation, or effluent cleanup).

<u>Status</u>

As noted in Section 2.5 Recommendation #1, no airborne monitor automatic protection functions exist and the vaporizer waterborne monitor automatic protection functions are capable of handling only minor releases.

Eight weakness were identified.

5. <u>Personnel Training</u>

There are no license conditions which explicitly address training; however, the license application dated February 26, 1982, (Part I, Section 2.6) contains a brief description of the training program. That description references new employee safety training (industrial, radiation, and criticality), emergency response training, and on-the-job training; and annual retraining in criticality, radiation, and industrial safety. The description, however, is extremely general. No further written description of the licensee's overall training program was found during the inspection. The licensee's training activities, as found by the inspection team, are described below.

a. <u>Oxide Process Training</u>

Initial training consists of a four-week long training course with a well organized course outline which covers operations and safety of the processes. The licensee explained that the operator bidding for

the Oxide Process position is given the four-week course followed by on-the-job training. The operator is assigned to an experienced employee and is closely supervised by the foreman during the on-the-job training. The duration of on-the-job training is dependent on the individual and typically lasts 1 to 2 months. There did not appear to be a defined method for selecting the assigned experienced employee. The licensee stated that the major forum for retraining their operators is through ad hoc on-the-job training and safety meetings conducted by the foremen.

The only records identified showing any formal initial training were 11 graded final examinations, 10 of which were dated January 18, 1982, and 1 dated September 20, 1985. No retraining documentation was available except for safety meetings as discussed in Section 5.d below.

b. Pellet Process Training

The licensee stated that the training for the pellet process is entirely on-the-job training. No documentation was available documenting initial or subsequent periodic retraining for pellet process operators.

c. Recycle/Recovery Training

The licensee has documented the initial training of 17 individuals by attaching their names to the subject lesson plan. Subsequent retraining is reportedly thru on-the-job training, but again there is a lack of documentation of such training. Also there were no records of testing in this subject area.

d. Radiological Protection

This subject area satisfies the requirement of 10 CFR 19.12. The training is documented via an attendance form titled "Monthly Safety Meeting," although the meetings are not conducted monthly. The attendance form states the title of the topic presented and the signatures of the attendees. According to licensee records the training conducted in 1986 was as follows:

- UF_6 handling procedures and safeguards - last performed January 1986;
- Respiratory Protection - last performed March 1986
- Hazard Communication Program - performed April 1986 (OSHA Hazard Standard 29 CFR 1910.1200);
- General Plant Safety (Two films; "Anatomy of a Fall," "The Risk Takers") - last performed June but with no year;
- Radiation Safety - no document for 1986
- Principals of Nuclear Safety - no document for 1986; and
- First Aid - no document for 1986.

The only testing identified for this training was for the topic of "Radiation Safety." The tests had not yet been graded for the Radiation Safety training given in May 1985. There was no record

documenting the topic of "Radiation Safety" training for 1986. Licensee personnel stated that this topic is scheduled to be given in December of 1986.

No individual was identified who is responsible for coordinating and documenting overall plant training. Generally, each supervisor is responsible for their specific plant process or area responsibility. Only minimal records are maintained. There are no clear formalized policy/guidelines to preplan, schedule, and document training. Consequently various methods are utilized by the different supervisors. Although it appears that actual training of personnel is adequate based on observed operator performance and knowledge, the licensee should develop a written, formalized training/qualification program that specifically states each step of an individual's qualification and requalification process, including a formal documentation of the training/retraining activities to correct this identified weakness. (Open Item 70-36/86004-11)

One weakness was identified.

6. Procedures

There are no license conditions which explicitly address plant procedures; however, the license application dated February 26, 1982, (Part I, Section 2.7) contains a brief description of operating procedures. That description primarily address criticality and radiation safety concerns; general operating procedures are also referenced. The description is extremely general. No further written description of the licensee's overall procedural controls was found during the inspection.

The licensee's procedural program is fairly well established. However, the only procedures which are routinely reviewed for updating and which follow a formal approval process are those plant process procedures pertaining to Special Nuclear Material (SNM). Other procedures (e.g., Emergency Response Maintenance, Instrument Calibration, Sampling, Contamination Check, Trailer Survey, and Nuclear Alarm Testing procedures) are not required to be formalized, reviewed, and approved. These procedures are referred to by the licensee as guides or references. Notification of procedure revisions are made by use of a signature routing sheet. As a change is issued the routing sheet is attached to ensure that all pertinent management personnel acknowledge receipt of the change notice. Documentation was not available, however, to show that pertinent operating personnel have been informed of procedure changes.

Interviews with two Oxide Process operators revealed that the operators were well versed in the procedures for the operation of the Oxide Process, particularly the UF_6 cylinder operations. They were also very familiar with the specific precautions, limits, and requirements for the Oxide Process. Neither operator was aware, however, of the location of the UF_6 cylinder handling crane emergency disconnect switch box, which very recently had been relocated to a position allowing easier access. The relocation was performed during the week of November 10th, after the crane contractor reanalyzed the switch location. An emergency scenario concerning UF_6 release and loss of power was also posed to the two operators. Both operators were knowledgeable of the necessary procedural actions.

During review of selected licensee procedures, it was noted that the Emergency Response Procedure Manual was marked with an approval date of June 1975 (Rev. 2). Individual pages of the manual were marked as Revision 3 dated September 1986, Revision 8 dated March 1984 and Revision 10 dated March 1986. These revised pages did not contain review and approval signatures, nor did the manual contain an index listing the latest page revisions; this creates confusion concerning the correct (latest) page revision. Revisions 8 and 10 are two Emergency Call In Lists, one of which is presumably outdated.

It was also noted that data sheet parameters are routinely left blank in the procedures since parameters change periodically and if completed, frequent procedure revisions may be required. These parameter limits are handwritten in by the respective Systems Engineers prior to distribution to the operators. This system appears acceptable for some process parameters, but safety parameters (for example, temperature limit on heating the cold trap) should be incorporated in the procedure to reduce the likelihood of inadvertent errors in preparing the data sheets. The safety parameters are not as susceptible to change as are the other process parameters.

In order to correct weaknesses identified in this area the licensee should review their procedure review and approval program to ensure that all appropriate procedures and procedure revisions receive adequate review and approval, and reconsider their method of ensuring that operators are aware of procedure revisions and that safety parameters are not inadvertently changed when preparing data sheets for operator use. (Open Items 70-36/86004-12,13,14)

Three weaknesses were identified.

7. Quality Assurance - Audits and Inspections

Audits and inspections of safety related and environmental programs, including criticality control and radiation and industrial safety, are conducted by onsite personnel under the auspices of the Nuclear Licensing Safety and Accountability Supervisor. Corporate auditors review these inspection results in their oversite role to assess the effectiveness of the onsite audit program. Both onsite and corporate audit programs are primarily designed to determine if plant operations are conducted in accordance with applicable license conditions.

Other QA/QC inspections conducted under existing onsite audit programs are primarily directed at product QC to meet product specifications, (e.g. qualifying QA/QC technicians to perform chemical analyses, metallographic examination/adjustment, and calibration of the roller micrometer for physical measurements of pellets). The four technicians that perform QA/QC inspections qualify by passing written examinations, perform chemical analysis within established control limits, and provide support to the NLS&A supervisor in the accountability of SNM materials. Reevaluation of an individual technician's performance is required within a three-year operating period. The QA/QC inspections are also reviewed by corporate auditors.

The inspector noted that some components important to safety, such as crane operations, process vessel performance (R-1, R-2, R-3), UF_6 cylinder forklift, and ammonia and natural gas transfer lines, are not reviewed/inspected at the level of investigation that would be expected of a formal QA/QC program. As described in Section 11, Maintenance Surveillance, an independent service hired to inspect/service the crane used in UF_6 cylinder movements identified problems that the licensee program should have detected.

In order to resolve this weakness, the licensee should expand the QA/QC program to include those process components that may impact on onsite or offsite health and safety. (Open Item 70-36/86004-15). This was discussed with the Manager, QA/QC programs. During the discussion, the inspector noted that the licensee by expanding existing audit/inspection programs has the capability to develop plans and implement procedures to meet the objectives of a QA program which include the following:

- Provide a formal method for continually seeking out and identifying potentially significant problems before they have an adverse effect.
- Prevent recurrence of safety problems through adequate investigation, documentation, and follow-up.
- Require continual evaluation for effectiveness of these activities and report the findings to management.
- Maintain auditable evidence affecting safety that the QA program is attaining is objective.
- Maintain written records of all the above.

The inspector concluded that existing audit programs appear to measure licensee performance in accordance with license conditions. However, it does not appear that verification of signoffs attesting to overall component design, testing, and installation requirements expected in QA/QC programs is addressed during corporate audits.

One weakness was identified.

8. <u>Criticality Safety</u>

Neither the NRC inspection findings nor corporate plant criticality safety audits disclosed any infractions that involved more than one change in a process condition. The double contingency policy which requires at least two unlikely, independent, and concurrent changes in process conditions that may lead to a criticality accident was not violated. The inspector confirmed that management of the licensee's nuclear criticality safety program is commensurate with the administrative and technical requirements of the license as noted below.

a. <u>Nuclear Safety Analysis</u>

Operators were observed performing tasks in accordance with posted criticality limits. Process components of primary criticality

importance (most interactive) included the cooling table (slab) containing stacked trays of pellets and a five-gallon storage pail near the pellet presses containing rejected pellets. Operators followed posted criticality practices by stacking the pellet trays in the prescribed manner, and by storing the five-gallon pail of rejected pellets within the prescribed storage barrier.

A review of nuclear safety analysis (NSA) records disclosed that there were no facility modifications requiring NSA since the last IRAD inspection.

b. Audits

Corporate audits of the nuclear criticality safety program (conducted in December 1985 and June 1986) identified several minor infractions (new criticality sign limits; overweight vessels in storage arrays) in the licensee's criticality safety program. Appropriate management action was taken to assure that all of the infractions were corrected. Although there is documentation (March 1986) to confirm these corrective actions, improved clarity is desirable in the documentation format currently used by the licensee. The corrective actions should be indexed in order to correspond to the appropriate audit infractions. This matter will be reviewed further during a future inspection. (Open Item 70-36/86004-16)

c. Raschig Ring Analysis

Three vessels used in scrap recovery operations for processing uranium (fissile U^{235}) bearing filtrate and/or uranyl nitrate solutions in large volumes contain Raschig rings to retard neutron interaction in fissile material. A review of 1986 criticality records confirmed that Raschig ring analyses, described by a shop Traveler/Operating Sheet, were performed in accordance with the appropriate Reg Guide/ANSI standards for the three vessels. A visual inspection showed no evidence of chips or breakage in the borated (B_2O_3) glass rings. The Laboratory Supervisor confirmed by signature that the rings were cleaned, weighed, and analyzed for boron content. An engineering review of the data disclosed that boron loss in the rings sampled from the three uranium solution holding tanks varied from 0.009 to 0.017 percent. This is consistent with data accumulated since 1978. All work was performed under engineering and/or nuclear industrial safety surveillance.

d. Criticality Alarms

A review of records also disclosed that criticality detection instrumentation was periodically calibrated, alarms were exercised weekly, and criticality evacuation drills were conducted. A standby neutron detection instrument was observed to be operable.

9. Chemical Safety and Storage

All storage tanks and vessels holding liquid at the facility were inspected along with piping from stationary tanks (NH_3, N_2, fuel oil, and natural gas). Also inspected was the natural gas metering station and four electrical transformers containing PCBs and a separate building addition used for paint storage. The inspected tanks/vessels are listed below.

NH_3 tank	14,500 gallons - horizontal tank
#2 Fuel Oil	10,000 gallons (buried)
Gasoline	300 gallons - on elevated stand
Kerosene	two 55-gallon drums - on low stands
Nitrogen	74,360 pounds - upright tank
Lube oils	five 55-gallon drums
Trichlorethelene	three 55-gallon drums
Genesolv D	three 55-gallon drums

The nonradiological materials posing potential offsite hazards were found to be as described in the Environmental Impact Statement prepared by NRC(NMSS) in September 1981 in response to a proposed expansion of the Combustion Engineering Hematite facility, with the primary materials of concern being HF from routine process releases or an accidental release of UF_6 and ammonia from failure of its storage tank.

Routine HF releases are controlled by calcium carbonate scrubbers. In case of the unlikely failure of these scrubbers the UO_2 production process could be shut down terminating the HF release. Accidental releases of UF_6 are addressed in Section 4 of this report. An accidental ammonia release apparently could result in fatal offsite ammonia concentrations if the contents of the ammonia storage tank were released over a short time period. Hazardous onsite conditions could exist due to lesser ammonia releases. The ammonia tank and related piping were reviewed. Based on that review two weaknesses were identified. It is recommended that wooden pallets stored near the ammonia tank and under ammonia and other chemical piping be removed to minimize fire hazards. (Open Item 70-36/86004-17) According to licensee personnel, they were not aware of any requirements for hydrostatic testing of the ammonia tank and had not pressure tested the tank since it was installed approximately 25 years ago. It is recommended that the licensee determine if periodic test requirements apply to this equipment and if so, establish the required test program. (Open Item 70-36/86004-18).

In addition to the potential offsite hazards noted above, onsite hazards exist due to accidental nonradiological material releases. Due to the lack of necessary expertise on the inspection team, these nonradiological hazards were not comprehensively reviewed. However, several observations, included below, were made concerning these hazards and a copy of this report is being forwarded to the Region 7 OSHA Office with the expectation that they will provide a more comprehensive review of onsite nonradiological hazards as they deem appropriate.

Additional findings in this portion of the inspection are noted below. These items will be reviewed further during a future inspection.

- The shut-off valve for the 300-gallon gasoline tank was not operable. A malfunction of the dispenser valve could therefore result in the emptying of the tank and a resultant fire hazard. The gasoline tank should be provided with a new shut-off valve. (Open Item 70-36/86004-19)

- Lube oil drums and stands were very rusted and were not properly grounded. Proper grounding and perhaps a metal protective cover should be provided. (Open Item 70-36/86004-20)

- Combustibles such as paper and wood should be removed from the paint locker and housekeeping improved in the area. (Open Item 70-36/86004-21)

- Procedures for reacting to electrical transformer fires or leaks should be considered due to the presence of PCBs. (Open Item 70-36/86004-22)

- Base line air sampling of all hazardous chemicals used routinely in quantity at the facility should be considered. Base line air sampling concentrations of fluoride and cleaning solvents are examples of candidates for such a program. (Open Item 70-36/86004-23)

Two weaknesses were identified.

10. Fire Protection Organization Structure

The Plant Manager is responsible for the fire protection program at this facility. The responsibility for implementation of the fire protection program has been delegated to the Nuclear Licensing Safety and Accountability (NLS&A) Supervisor. The NLS&A duties include daily inspections and weekly written reports of identified fire hazards and review of monthly fire extinguisher and monthly emergency lighting checklists. During nonworking hours, security makes hourly rounds specifically to check for unusual conditions such as a fire or smoke. The NLS&A duties also include working with corporate and insurance fire inspectors. These inspections are evaluated for resolution with the Plant Manager. The Emergency Director (Production Superintendent) is responsible for fire fighting activities.

The plant fire brigade is composed of a minimum of five people during working shifts. The Emergency Director (Production Superintendent) or Assistant Emergency Director (Shift Supervisor) functions as fire brigade leader. The fire brigade is equipped for fighting incipient stage fires utilizing hand held dry chemical or carbon dioxide extinguishers and ISO dry compound chemical extinguishers. The fire brigade is trained yearly on the use of Scott Air Packs and proper use of fire extinguishers. The licensee appeared to have an adequate number of dry chemical and carbon dioxide extinguishers located throughout the premises. The extinguishers

are visually checked monthly. At the time of the inspection the licensee was unable to determine when the extinguishers were last hydrostatically tested. This matter will be reviewed further during a future inspection. (Open Item 70-36/86004-24)

The Hematite volunteer fire department is located approximately ½ mile away. Should additional manpower or equipment be necessary the Festus volunteer fire department which is located approximately five miles from the plant would respond. The licensee indicated that the fire departments have visited the site and agreements have has been established to work with the licensee should the need arise in fighting a fire at this facility. There is no fixed underground fire main at this facility. The licensee indicated that water for fire fighting purposes would be supplied by fire department water tankers. Tankers would obtain water from a pond located several hundred feet away from the plant and shuttle water to the fire department pumper trucks. There is a fire alarm system which is activated by manual push button stations located strategically throughout the plant. The fire alarm system is tested weekly by activating one of the manual stations. Although, the fire alarm system is tested weekly, the fire alarm is randomly chosen. It is recommended that this weakness be resolved by developing a systematic approach to testing the manual fire alarms to ensure that all manual push button stations are operable. (Open Item 70-36/86004-25)

In general, doors were observed blocked open throughout the plant. It is prudent practice to maintain the doors closed in the event of a fire. The closed door would prevent immediate propagation of the fire into the next room. Should a fire start in the scrap building, a closed door would prevent immediate propagation into the incinerator area. The licensee was requested to evaluate their policy on door positions as they relate to the spread of fire and to maintain this evaluation onsite for review during a future inspection. (Open Item 70-36/86004-26)

The licensee transfers ammonia and cracked ammonia to several areas of the plant by use of welded and threaded pipe. The adequacy of this piping to minimize fire potential should be reviewed by the Occupational Safety and Health Administration who will be provided with a copy of this report.

NFPA Standard 491 indicates that uranium dioxide spontaneously ignites in finely divided form. The licensee contends that an explosion hazard does not exist should finely divided uranium dioxide be suspended in air. This issue will be reviewed further druing a future inspection. (Open Item 70-36/86004-27)

During the inspection the inspector noted that welding was to be conducted on a metal structural member supported by a gasoline driven forklift truck in the oxide building dock area near several filled UF_6 cylinders. The inspector discussed the proposed work with the employee and the Maintenance Supervisor due to the potential hazard of cutting or welding in close proximity to the gasoline driven forklift truck. The licensee does not utilize a formal cutting and welding permit program. It is recommended that this weakness be resolved by developing such a program. (Open Item 70-36/86004-28)

Two weaknesses were identified.

11. Maintenance Surveillance

A review of the licensee's general maintenance operations, surveillance tests, and calibrations was conducted to determine specifically whether emergency utility services and systems pertinent to health and safety are being maintained properly.

a. Training

The licensee has no requirement for a formally structured training program for maintenance personnel. Maintenance workers either transfer from production operations or are hired from outside agencies when needed specialized skills are unavailable onsite. Training and qualification for a maintenance worker is based on a review of their basic skills prior to selection, on the job training, and trial performance. The licensee noted that production operators who transfer into a maintenance slot are familiar with plant systems and have previously performed some routine maintenance work.

b. Surveillance Tests

A review of maintenance records and health physics surveillance records disclosed that the following systems were being maintained in accordance with maintenance procedures:

- Forklift truck for movement of UF_6 cylinders.

- Emergency generators (two) are maintained on utility firm service so as to be available during emergency weather conditions.

- Ventilation blowers.

- Plant boiler is on utility interruptible service, therefore must be able to switch to oil during emergency conditions.

- UF_6 5-ton cylinder crane. In response to the inspector's concern (Inspection Report No. 70-36/86002) about increased maintenance for the 5-ton crane, the crane was inspected by an independent service on November 10, 1986. Based on the vendor's recommendation, the licensee modified the electrical utility service from 220 volts to a 480 volt system and relocated the disconnect switch to facilitate operator response. Other vendor recommendations include: replacement of load cable; replacement of pushbutton body; replacement of main line contactor; and replacement of bridge revising contactor. The licensee's progress on making crane repairs will be reviewed during a future inspection. (Open Item 70-36/86004-29)

- Cooling tower water and pellet sintering furnace water (chemical balance).

Based on the weakness identified with crane maintenance discussed above and the age of routine maintenance procedures, it appears that the routine maintenance procedures should be reviewed/modified to reflect current maintenance operations. (Open Item 70-36/86004-30).

One weakness was identified.

c. Pellet Process

During a tour of pellet plant operations and later discussions with the Maintenance Supervisor, the inspector determined that preoperational starts were conducted on the pellet presses, agglomerators, dewaxer and sintering furnaces, and the pellet grinder and grinder sludge centrifuge system in order to ensure operability when the process was initiated recently.

In response to inspector concerns the Maintenance Supervisor acknowledged that the Monthly Crane Inspection Report form should be modified to show maintenance for six rather than five cranes and should provide space to show an oil change as a checklist item. (Open Item 70-36/86004-31)

12. Ventilation System

Plant ventilation systems were reviewed. All systems were found to be adequate except for the recommendation for evaluation of ventilation intakes for susceptibility to disperse HF and UO_2F_2 in case of a large UF_6 release. (See Section 4). One weakness was noted that some hoods did not have sufficient air flow to permit operation without respiratory protection. An evaluation of the feasibility of increasing air flow to these hoods rather than relying upon respiratory protection is recommended. (Open Item 70-36/86004-32)

One weakness was identified.

13. Scrap Incinerator

The facility incinerator installation was inspected and the effects of a recent overheating event on the equipment was reviewed. While the licensee stated that the affected incinerator will be evaluated to ensure it is fully operable before being returned to service, it appears that a limited evaluation should be conducted of the other incinerator also due to common connections between the two incinerators and the possibility that the excessive temperatures may have affected the other incinerator. This matter will be reviewed further during a future inspection. (Open Item 70-36/86004-33)

The incinerator apparently overheated and destroyed the liner when cooling water was lost. The event was reported by telephone to the NRC Region III office, but a written report was not submitted according to licensee personnel because they did not believe that any of the 10 CFR 20.403 criteria requiring such notification were met. Subsequent licensee reevaluation of the monetary damage to the incinerator has resulted in a

determination that the $2000 damage reporting criteria (10CFR20.403(b)(4)) was met, and the written report specified in 10CFR20.405(a)(1)(iv) will be submitted. (Open Item 70-36/86004-34)

14. Environmental Protection

The licensee conducts a Radiological Environmental Monitoring Program (REMP) managed by the Nuclear Licensing, Safety and Accountability (NLS&A) Supervisor. Samples are collected by the licensee and analyzed by Teledyne Isotopes and Controls for Environmental Pollution. Results are reviewed by the NLS&A.

The inspector examined the contractors' data, the licensee's Environmental Log, and a summary of sample results from 1983 through October 1986, and found the sample locations and frequencies to be consistent with the REMP as described in the Environmental Impact Appraisal. No trends or anomalous results attributable to the plant operation were apparent. The inspector noted, however, that third quarter air samples had not been sent to the appropriate contractor and some of the more current analytical results had not been entered onto the summary sheets.

The inspector visited several environmental sampling stations, and split water samples with the licensee for comparative analyses. The licensee agreed to have these samples analyzed for gross alpha and gross beta and to report the results to Region III (Open Item 70-36/86004-35). The results will be compared to those of the NRC and reported to the licensee as an addendum to this report.

The defined REMP appears adequate to evaluate the radioactive effluents from the facility. However, environmental monitoring and inplant health physics programs appear to have been adversely affected by the manpower shortage created when the Nuclear Industrial Safety Coordinator terminated October 1, 1986. According to licensee personnel, the termination was unanticipated and efforts are being made to fill the position. The licensee noted that a health physics qualified individual is currently involved in pellet quality control work but could be available to assist the health physics group in the near future if such assistance becomes necessary. This matter will be reviewed during a future inspection. (Open Item 70-36/86004-36)

15. Quality Control of Laboratory Analyses

The licensee's program of quality control for effluent and environmental samples was examined. Only gaseous effluent samples are analyzed onsite. Weekly air planchette backgrounds and efficiencies and quarterly plateaus are run on the automatic low background alpha/beta sample counter. The inspector examined this data and found no problems.

The licensee has a procedure entitled "Quality Assurance Program For Environmental Monitoring" dated September 1980 signed by the Plant Manager and the NLS&A Supervisor. The inspector found it to be out of date, having been partially updated in pencil by Health Physics Technicians. This matter will be reviewed further during a future inspection. (Open Item 70-36/86004-37)

As a quality control check on environmental samples the licensee periodically sends splits of the same sample to both contractors. The inspector examined 1984 and 1985 split sample results. The variation of intralaboratory and interlaboratory comparisons appears to be acceptable.

Annual audits performed by Combustion Engineering Windsor office personnel on January 15-16, 1985, and November 20-21, 1985, were examined. Although one of the main items audited was the Radiation Safety Program, no specific mention was made of auditing the counting lab or the REMP. The NLS&A stated that the REMP was examined along with the effluent releases. Based on the NLS&A's statement, future audit documentation should be expanded to ensure that all areas audited are described in the audit documentation. This matter will be reviewed further during a future inspection. (Open Item 70-36/86004-38)

16. Instrumentation and Calibration

The inspector reviewed licensee radiological instrumentation and calibration practices for selected instruments (low background sample counter, fixed and lapel air sampling equipment, and portable monitoring equipment). Calibration records examined revealed that the low background sample counter and alpha and beta-gamma portable counters are calibrated quarterly and rotameter controlled fixed air sample flow rates are calibrated weekly. Alpha personnel contamination monitors are only verified as operable on the low range quarterly; orifice controlled fixed air sample flow rates are verified weekly. In addition to the quarterly calibration, the portable alpha counter calibration is verified prior to each use (normally daily). Lapel air sampler flow rate is only verified intermittently.

The inspector noted the following during this portion of the inspection.

- Fixed air sample systems whose flow rates are controlled by use of a fixed orifice tended to maintain more constant flow than rotameter controlled systems, which had to be adjusted to obtain relatively constant flows. The licensee should consider installing fixed orifices on the fixed air sample systems. This matter will be reviewed further during a future inspection. (Open Item 70-36/86004-39)

- Portable monitoring equipment is in poor repair. A number of monitors are out of service and have not been repaired, apparently because of manpower or priority problems. Only one portable alpha monitor, salvaged from two inoperable monitors by health physics technicians, is currently available. If this fails, a personnel contamination monitor (no back up unit available) will have to be calibrated and pressed into service. This would increase the possibility of the spread of contamination. It is recommended that the licensee increase the priority given to repair of radiation monitoring equipment or increase equipment inventories to resolve this weakness. (Open Item 70-36/86004-40)

One weakness was identified.

17. Exit Meeting

The inspection team met with licensee representatives (denoted in Section 1) at the conclusion of the onsite inspection. The inspectors summarized the scope and findings of the inspection, including the weaknesses summarized below. The licensee acknowledged the weaknesses and did not identify any material discussed as proprietary. The licensee was informed that copies of the report would be forwarded to the regional EPA and OSHA offices for their consideration.

Weaknesses

- Lack of an alarm on the cold trap pressure sensor. (Section 4.a)
- Heating of cold trap without pressure sensor online. (Section 4.a)
- No periodic verification of operability of the cold trap load cell. (Section 4.d)
- No alarm on the cold trap load cell. (Section 4.d)
- Need to evaluate operating limitation on cold trap loading. (Section 4.e)
- No prohibition on movement of heavy objects over heated UF_6 cylinders in the vaporizers. (Section 4.f)
- No inspection program for incoming UF_6 cylinder damage. (Section 4.h)
- No airborne detectors to warn of UF_6 releases in the vaporizer area and to prevent spread through facility ventilation systems. (Section 4.j)
- Need for improved training qualification program formal documentation. (Section 5)
- Need to review procedure review and approval process. (Section 6)
- Need to evaluate method for ensuring operators are aware of procedure revisions. (Section 6)
- Need to ensure that safety parameters are correct on data sheets. (Section 6)
- Need to expand the QA/QC program to include all safety related activities. (Section 7)
- Need to remove wooden pallets from proximity of ammonia tank and lines. (Section 9)
- Need to determine hydrostatic testing requirements applicable to the ammonia storage tank. (Section 9)

- Need to periodically test all fire alarms. (Section 10)
- Need to establish a formal cutting and welding procedure. (Section 10)
- Need to review maintenance procedures to ensure they are current. (Section 11.b)
- Need to evaluate continued use of hoods with inadequate ventilation flow. (Section 12)
- Need to improve supply of operable radiological monitoring equipment. (Section 16)