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SECY-78-202

April 10, 1978

COMMISSIONER ACTION

For: The Commissioners

From: Clifford V. Smith, Jr., Director
Office of Nuclear Material Safety
and Safeguards

Ernst Volgenau, Director
Office of Inspection and Enforcement

Thru: Executive Director for Operations

Subject: COMPREHENSIVE EVALUATION OF SAFEGUARDS AT THE NUCLEAR FUEL SERVICES (NFS) FACILITY, ERWIN, TENNESSEE

Purpose: To forward the comprehensive evaluation report on safeguards at the NFS, Erwin, facility and to obtain Commission approval of proposed letters for transmitting the report to Congress. This is a Commission Action Item.

Discussion:

Background

In May 1977, the Commission approved a comprehensive plan for evaluating safeguards at licensed fuel cycle facilities which contain significant quantities of strategic special nuclear materials. The first comprehensive evaluation report (on United Nuclear's Wood River Junction facility) was sent to the Congress in February 1978. In his covering letters, the Chairman promised to forward other evaluation reports to Congress, as they became available. The first report was sent to the following:

- The Honorable Gary Hart, Chairman
  Subcommittee on Nuclear Regulation
  Senate Committee on Environment and
  Public Works

- The Honorable Morris K. Udall, Chairman
  Subcommittee on Energy and the Environment
  House Committee on Interior and Insular Affairs

- The Honorable John D. Dingell, Chairman
  Subcommittee on Energy and Power
  House Committee on Interstate and Foreign
  Commerce

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Primary Evaluation Criteria

The staff evaluated safeguards at the NFS, Erwin, facility in terms of capability to protect against nuclear theft or sabotage involving the following:

1. An insider acting alone, or
2. A violent assault by several outsiders with assistance from an insider.

Results of Primary Evaluation at NFS, Erwin

Enclosure 1 is a comprehensive evaluation report on safeguards at NFS, Erwin consolidating the findings of four separate evaluation teams which visited the facility. Personnel from the Office of Inspection and Enforcment and from the Division of Safeguards participated in this evaluation effort.

On the basis of this report, the staff concluded that safeguards at NFS, Erwin protect with good assurance against theft or sabotage by a single insider acting alone, and good to fair assurance against a violent assault by several outsiders assisted by an insider.

Actions to Attain High Assurance Protection at NFS, Erwin

The comprehensive evaluation did not disclose any emergency safeguards deficiencies requiring immediate correction. However, on the basis of the report, the NRC staff is preparing to implement a number of short term actions and some of a less urgent nature to achieve high assurance protection at NFS, Erwin. They are as follows:

Protection Against an Insider

An action recommended to achieve high assurance protection against nuclear theft by a single insider is to improve promptly the conditions under which access controls are operated and searches conducted. In particular, personnel congestion presently complicates the work of security guards at an access control point.

Protection Against External Assault--With Inside Assistance

Following are short term actions recommended by the staff to improve NFS, Erwin protection against external assault:

Secondary Evaluation

During the evaluation of NFS, Erwin, secondary consideration was also given to the licensees' capability to satisfy more demanding safeguards requirements which were published for comment in the Federal Register on July 5, 1977 (42 FR 34310).

On the basis of the evaluation report, the staff concludes that existing safeguards at NFS, Erwin would require considerable modification to satisfy NRC's proposed new requirements. Following are the types of actions which would be required:

- o Increase surveillance of persons having access to material access areas
- o Establish dual manning of material access control points.

b(3) USC 10

- o Improve protected area lighting.

This is not an exhaustive list of actions which would be required at NFS, Erwin. Rather, it is indicative of the kinds of actions required to satisfy proposed new safeguards requirements currently being considered by the Commission. Furthermore, the list is generally consistent with that shown in the statement of considerations published with the proposed new rule in July, 1977 (42 FR 34310).

Summary

The comprehensive evaluation at NFS, Erwin did not disclose any problems warranting emergency remedial action. However, the staff is translating its recommendations into licensing actions to provide high assurance safeguards for strategic special nuclear materials at NFS, Erwin. An NRC team will visit NFS, Erwin soon to deliver the evaluation report and discuss licensing and inspection actions with licensee management.

Recommendation: That the Commission:

1. Note the contents of the enclosed evaluation report.
2. Approve identical letters transmitting the report to Congressional oversight Committees (enclosure 2 is draft letter).

Coordination: The Office of the Executive Legal Director has no legal objections. OCA concurs.

Sheldon Meyers

for Clifford V. Smith, Jr., Director
Office of Nuclear Material Safety
and Safeguards

Ernst Volgenau, Director
Office of Inspection and Enforcement

Enclosures:
1. Evaluation Report (Confidential-
Restricted Data)
2. Draft letter to Congress
fm Chairman Hendrie

issioners' comments should be provided directly to the Office of the Secretary
ose of business Friday, April 21, 1978.

ission staff office comments, if any, should be submitted to the
issioners NLT April 14, 1978, with an information copy to the Office
he Secretary. If the paper is of such a nature that it requires additional
for analytical review and comment, the Commissioners and the Secretariat
ld be apprised of when comments may be expected.

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ENCLOSURE 1

EVALUATION REPORT - ~~(Confidential-Restricted Data)~~

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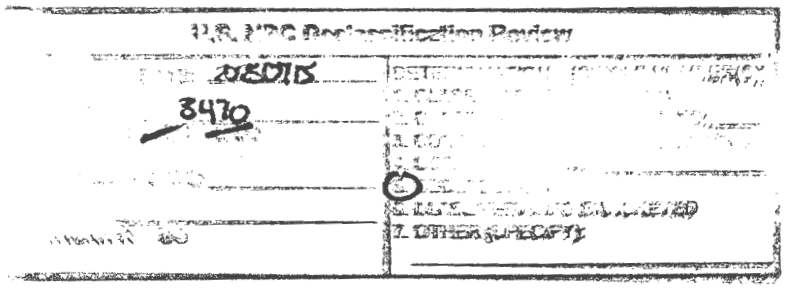
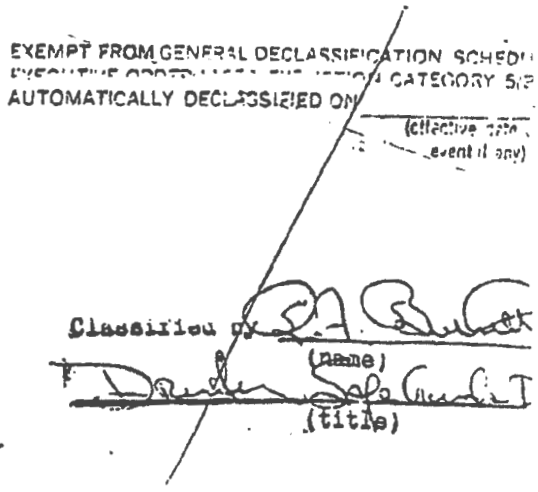
COMPREHENSIVE EVALUATION REPORT ON THE NUCLEAR SAFEGUARDS AT THE NUCLEAR FUEL SERVICES (NFS) FACILITY, ERWIN, TENNESSEE

APRIL 7, 1978





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COMPREHENSIVE EVALUATION REPORT ON THE
NUCLEAR SAFEGUARDS AT THE NUCLEAR
FUEL SERVICES (NFS) FACILITY, ERWIN, TENNESSEE

1.0 Introduction

This comprehensive evaluation report on safeguards is based upon data collected by NRC field evaluation teams which visited the NFS, Erwin facility during August and September 1977.

1.1 Facility Description

The NFS-Erwin plant is in a rural isolated area south of the town of Erwin, Tennessee (4-5000 population). The terrain is rugged, and the plant is immediately adjacent to the Nolichucky River, and the Clinchfield Railroad, which parallels the river. Highway ingress into the area is by US 23W, which also parallels the river valley.

This plant processes high enriched uranium into a form suitable for use in the naval reactor program. Employees have "L" or "Q" clearances from DOE. High quality standards and the complexity of this process generate significant amounts of scrap. This scrap is then recovered for reintroduction into the production process. Thus, there are two major productive operations at the plant.

In previous times, this plant also engaged in plutonium fabrication.

.2 Existing Security System

..2.1 Contract Guards and LLEA Response Forces

The present Contract guards and supervisors have now been on site for approximately 10 months.

Both the contract guards and the NFS shift supervisors have been sworn in as deputy sheriffs.

There is good interdepartment cooperation between the police agencies plus a very positive attitude in supporting NFS in their safeguards program. Police departments were familiarized with the facility layout.

1.2.2 Communications

1.2.3 Primary Central Alarm Station (PCAS)

1.2.4 Secondary Alarm Station (SAS)

1.2.5 Lighting

Perimeter lighting is supplied by several dozen mercury vapor lamps mounted on posts approximately 30 feet high.

1.2.6 Perimeter Barriers

The facility perimeter is protected by a chain link fence topped with barbed wire.

1.2.7 CCTV

1.2.8 Access Control and Search -- Material Access Areas (MAA's)

A member of the security force has direct control of all entrances into an MAA. The identity of individuals wishing to enter the MAA is checked against an authorized access log which is continually updated.

Packages are searched when entering the MAA for counterfeit SNM and or shielding material. A search for metal and SNM is performed by a member of the security force when materials and personnel exit the MAA.

A "two man rule" is observed when working in an MAA.

1.3 Evaluation Criteria

The primary purpose of the evaluation was to examine licensee capabilities and vulnerabilities against the threat of theft or sabotage by (1) a single insider acting alone, or (2) a violent assault of several well trained and dedicated persons with military training and skills assisted by a knowledgeable insider.

In reaching judgments about security, NRC evaluation teams used these criteria:

1. Poor	No evidence of capability Obsolete Not yet implemented Not yet operable Poor maintenance Easily compromised
2. Fair	Stated capability but not verified Fair maintenance Implemented but not completely operational Fair records and history Could be compromised
3. Good	Limited demonstration of capability Good maintenance Good records/history Not easily compromised
4. High	Several operational demonstrations High state of maintenance Records and history provide high support of performance Very difficult to compromise

The above categories provide a key to the relative adequacy of safeguards at different facilities.

2.0 The Evaluation Process

The comprehensive evaluation process involved four separate NRC teams. Each of them examined a different facet of the overall safeguards system. Their separate findings were then distilled into a single comprehensive evaluation report. The four teams performed the following in the field:

Diversion Path Survey
External Assault Survey
Physical Security Assessment
Material Control and Accounting Assessment

2.1 Diversion Path Survey

2.1.1 Purpose

The purpose of the Diversion Path Survey was to determine where in the production process the site might be vulnerable to internal diversion of strategic special nuclear materials.

2.1.2 Method

The facility strategic special nuclear material processing operations were examined to determine the process locations where nuclear material was accessible, its form at that point, and whether any diversion paths exist that would allow removal of SNM from the facility. All process locations where nuclear material was accessible were considered.

Primary consideration was given to those paths involving a single facility employee in any position or a single authorized visitor.

The Diversion Path Survey specifically excluded assessment of physical security procedures or equipment in either the material access area or the protected area since these were to be covered by the Physical Security Assessment Team.

2.2 External Assault Survey

2.2.1 Purpose

The purpose of the external assault survey was to obtain an external adversary-oriented view of the facility. The survey placed particular emphasis upon finding possible safeguards vulnerabilities which a potential adversary might exploit for purposes of theft or sabotage.

2.2.2 Method

The External Assault Team used remote observation, close surveillance, and communications monitoring of NFS and LLEA frequencies to identify vulnerabilities of the NFS Safeguards systems. Later in the assessment specific team members were escorted through the facility to get a first hand view of the safeguards system from an insider's perspective. Plans of attack were then developed by the team to exploit identified vulnerabilities and to evaluate their usefulness to a potential adversary.

2.3 Physical Security Assessment

2.3.1 Purpose

The assessment process was designed to answer the following basic questions:

1. Theft by a Lone Insider

   Are present material control procedures sufficient to prevent, with high assurance, the theft of more than five formula kilograms of strategic special nuclear material (SSNM) by an employee in any position in any single theft or in any continuing series of thefts over a period of up to one year?

2. Theft by External Assault

   Are present physical protection procedures sufficient to prevent, with high assurance, the theft of more than five formula kilograms of SSNM by means of a well-planned and coordinated assault by several outsiders assisted by an insider?

2.3.2 Method

In contrast to the adversary-oriented exterior assault team, which operated mostly outside the facility, the physical security assessment team did a detailed review of safeguard capabilities from within the facility. The following factors were considered:

Strategic special nuclear material is uranium-235 (contained in uranium enriched to 20 percent or more in the U-235 isotope), uranium-233, or plutonium.

[redacted] b(3) USC 10

Protection Against Lone Insider

Access Controls

- o Measures to prevent introduction of contraband
- o Measures to allow only authorized personnel access
- o Detection of unauthorized access

Containment Controls

- o Measures against unauthorized removal of SNM
- o Integrity of containment
- o Detection of unauthorized conditions

Protection Against External Assault (with inside assistance)

- o Detection and delay of adversaries
- o Deployment and communication of response forces
- o Motivation, training and reliability of response forces
- o Condition, equipment and numbers of response forces

2.4 Material Control and Accounting Assessment

2.4.1 Purpose

The purpose of the material control and accounting assessment was to determine whether the licensees' material control and accounting system would indicate significant theft or diversion, after the fact.

2.4.2 Method

In making its assessment of licensee material control and accounting capabilities, the NRC team measured time responsiveness of the system to verify after the fact, whether a theft had occurred.

This objective is expanded in the following question:

> Can the material control and accounting system substantiate if more than five kilograms of high enriched uranium were illicitly removed during previous inventory periods, and can it perform this verification during the current inventory period?

3.0 Specific Observations

3.1 Observations Concerning Material Accessibility

3.1.1 Fuel Production (MBA-6) -- Accessibility of SNM

SNM is accessible in several places in the fuel production process.

For this process step, the two-man rule seems to operate more effectively than it does for the end of the
At this stage of fuel production, the process controls and supervision become more stringent since the material is nearer to being a finished product.

On the other hand, process controls are even tighter at this stage of fabrication.

Supervisory and QC personnel also pay very close attention to all the production steps throughout this stage of the process.

3.1.2 HEU Laboratory (MBA-6) -- Accessibility of SNM

Access to SNM in the laboratory is limited to samples. Individual samples can be quite large (up to 500 gms) and the total lab inventory may be several kg.

] The laboratory is within the MAA, however, and all personnel are subject to MAA search procedures.

| This stream is sampled daily, by grab sample technique, from inside the protected area.

Sinks in the MBA-6 portion of the laboratory are tied into the plant contaminated waste stream. The waste stream is collected in large holding tanks where it is sampled and the sample analyzed for uranium content before disposal to the recovery facility or waste treatment facility.

The laboratory also contained a ladies restroom tied into the city sewer systems which could be used as a means of diverting easily accessible sample quantities of SNM from the labs.

3.1.3 MBA-6 Warehouse and Vault (Building) -- Accessibility of SNM

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accessibility is extremely limited because of the packaging and controls in effect.

3.1.4 Warehouses -- Accessibility of SNM

Building is used for stored scrap generated in MBA's 5 and 6. Containers are all sealed, and identified by quantity and type of material.

/ Waste containers scheduled for burial are also stored in this building and may be shipped from this building to burial.

ICA-13, Bldg. | -- Accessibility of SNM

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Quality control also has a vault type room within

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ICA-1, Bldg. -- Accessibility of SNM

is a general receiving area for all types of materials both radioactive and non-radioactive. b(1)

The nature of the material stored in the warehouses, its packaging and the procedures and controls in effect, limits the material accessibility for diversion.

3.1.5 Scrap Recovery (MBA 5, Bldg.) -- Accessibility of SNM

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3.2 Specific Observations--Diversion Path Survey

3.2.1 Emergency Safeguards Deficiencies Requiring Immediate Correction

The Diversion Path Survey did not disclose any emergency deficiencies requiring immediate correction.

3.2.2 Significant Safeguards Program Deficiencies Requiring Short Term Correction

The Diversion Path Survey did not disclose any significant safeguards program deficiencies requiring short term corrrection.

3.2.3 Minor Safeguards Program Deficiencies of a Less Urgent Nature

Drains Tied to Sanitary Sewer

A ladies restroom and some sink drains in the laboratory MAA were tied into the plant sanitary sewer system. They offered a possible path for diversion of accessible quantities of SNM contained in the laboratory.

Perhaps, more importantly, they also offered an opportunity for a disgruntled or careless employee to adversely affect the facility's material balance and possibly contaminate the city sewer system. (These conditions have since been corrected.)

Waste not Scanned for Metal

Non-combustible waste from the laboratory, particularly full plastic bags of empty contaminated sample vials, could conceivably house shielded quantities of SNM. This material was not scanned for metal prior to being placed into a 55-gallon drum. When this drum was full, it was tamper-safed and removed from the building for scanning. (This condition has since been corrected.)

Congested Access Control Point

The personnel access control point located is very congested. Three streams of traffic simultaneously converge upon this access control point. This could confuse the guard as to who is leaving the MAA. This condition should be called to management's attention.

3.2.4 Items of Noncompliance

The Diversion Path Survey did not disclose any items of noncompliance with existing regulatory requirements.

3.3 Specific Observations--External Assault Survey

3.3.1 Emergency Safeguards Deficiencies Requiring Immediate Correction

The External Assault Appraisal did not disclose any emergency deficiencies requiring immediate correction.

3.3.2 Significant Safeguards Program Deficiencies Requiring Short Term Correction

3.3.3 Minor Safeguards Program Deficiencies of A Less Urgent Nature

The External Assault Survey did not disclosure any minor safeguards program deficiencies of a less urgent nature.

3.3.4 Negative Factors in the Local Environment

The exterior assault appraisal team made some observations of a safeguard related nature involving matters generally outside the control of the licensee. These are noted below:

Adversary Escape Potential

Since there are only two roads accessing Erwin, Tennessee, they can easily be interdicted to prevent rapid response from police agencies outside of Unicoi County,

Interdiction of roads would also inhibit SNM recovery operations.

3.3.5 Positive Factors in the Local Environment

The exterior assault appraisal team noted a number of factors peculiar to NFS, Erwin, which support the safeguards system. These are enumerated below.

Adversary Movements Might be Hampered During Extended Reconnaissance

Free movement by potential adversaries is restricted to the outlying areas because of the sensitivity to strangers in the small towns and settlements. Even the heavy traffic which moves through the mountains in the summer is subject to this local interest. The sensitivity and awareness to strangers provides a unique and effective asset to NFS safeguards by endangering any lengthy reconnaissance effort by an adversary group.

Some daylight operations could be conducted on the western and northern boundaries, but at risk of possible detection by the local citizens and/or patrolling railroad detectives.

Road Escape Routes Can be Blocked

Two major roads lead into the town of Erwin. They are well maintained and easily travelled during normal weather, but are hazardous during periods of fog, rain, snow, or ice. These roads are not an effective route for adversary escape from the Erwin area since they can be easily controlled and blocked by the LLEA assets in the immediate area.

Illumination of Storage Areas is Good

Illumination of SNM storage area entrances is good.

Security Force Personnel are Deputy Sheriffs

The security force and plant security supervisors are deputy sheriffs. Security force members are deputy sheriffs. Auxiliary deputy sheriffs are also available for SNM recovery operations and/or adversary containment within NFS site boundaries. All security personnel on the contract guard force are local citizens and are familar with the surrounding terrain and indigenous population.

Local Police Provide Effective Support

Law enforcement response available to NFS

provide an effective backup to the site. The randomness of patrols, low communications profiles, and lack of established routines make law enforcement activities difficult for an adversary to evaluate. Officers' knowledge of the area plus an interdepartment mutual aid plan of the overlapping jurisdictions are an asset to NFS security. The LLEA have a cooperative attitude and an interest in supporting NFS in the Safeguards Program. Additional assets to LLEA are that can be utilized depending upon their availability.

Would Hamper Adversary Operations

An additional, not presently coordinated asset for NFS are the

(Note: Tennessee State Fish and Game officers, State Forestry personnel plus State and Federal Alcohol control agents are also active in this area and could pose difficulties for potential adversaries.)

Police Have Good Access to the NFS Facility

Law Enforcement Agencies have multiple avenues of approach to the NFS facility that would be difficult to interdict or block. The random patrols

make these routine patrols very difficult to fix and monitor.

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3.4 Specific Observations -- Physical Security Assessment

3.4.1 Emergency Safeguards Deficiencies Requiring Immediate Correction

The Physical Security Assessment did not disclose any emergency safeguard deficiencies requiring immediate correction.

3.4.2 Significant Safeguards Program Deficiencies Requiring Short-Term Correction

Alarm Condition Override Possibility

If the SAS operator was inattentive, distracted or not at his position, the occurrence could go unnoticed. (The licensee was made aware of this condition prior to the evaluation and it was subsequently corrected).

Secondary Alarm Station Manning/Operating Practices

From 7:00 p.m. to 7:00 a.m., the secondary station operator is required to reconcile all alarms with the primary station and to log the alarm reconciliations. However, during main shift operations (7:00 a.m. to 7:00 p.m.) the secondary station attendant is not required to reconcile all alarms with the primary station. (Recently he has been given the job of "silencing" alarms by pushing a button which stops the status light from blinking.)

Activities in this area should be closely monitored by management security personnel as well as NRC inspectors to ensure that secondary functions are being properly performed.

Protected Area Searches

Vehicles coming onsite are searched for people and explosives.

Alarm System Integrity

Maintenance or modification of intrusion alarm system components is accomplished by

No maintenance is performed on any part of the security system without the knowledge of the security officer. Furthermore, circuit(s) officially logged as modified or repaired are functionally tested by security personnel at the time of repair.

Dependence [ ] also jeopardizes the total system during any period of unplanned absence, although provisions are made for [ ] for anticipated absences.

Detection at the Protected Area Boundary

3.4.3 Minor Safeguards Program Deficiencies of a Less Urgent Nature

Narrow Clear Zones at the Site Perimeter

As an item of special attention, licensee management should expand the area external to the fence by cutting vegetation. Also, inside the perimeter of the fence, licensee management should conduct a general clean-up campaign to remove unnecessary items which would provide natural cover or concealment.

Manning of Primary Central Alarm Station

The number of people located within the station, the diversity of activities and the demands placed upon the station operator present a potential for the operator to be distracted from performing his duties. It is also conceivable that the station operator would be vulnerable to

were the inside adversary. This should be subject to close management evaluation to determine if there is any indication that the situation within the station actually degrades the level of operator performance.

Congestion at Access Control Points

During shift changes, activity is accelerated and waiting lines are formed. Under such conditions, search procedures have a potential for being hurried and less inclusive than those conducted under low volume periods. Management should closely examine the situation to see if alternative procedures could be worked out along with structural modifications. Management personnel should pursue the adequacy of searches conducted at this point. (This condition was also noted by the Diversion Path Survey Team.)

3.4.4 Notable Safeguards Strengths

The Physical Security Assessment Team also noted a number of safeguards system strengths peculiar to NFS, Erwin, as listed below:

Local Law Enforcement Support is Good

Supervisors and line personnel in [redacted] were interviewed. They informally discussed past operational experiences which were relevant to an assessment of their capability to support the NFS, Erwin facility. In particular, however, the interviews focused upon periodic "no notice" drills arranged by NFS Erwin managment in coordination with [redacted] Interviewees were asked about conduct of such tests. Regarding these tests, they were asked about initial disposition of response forces, personnel reactions, response times, functions performed and their personal attitudes toward such exercises. There appeared to be a good exchange of information and good coordination between LLEA elements and NFS, Erwin management. (For example, almost every sworn officer who was interviewed had been on a conducted tour of the NFS facility and was familar with the site layout and function.)

It was concluded that the attitude and relations between the LLEA and NFS Erwin managment was good. Furthermore, LLEA personnel recognize a special responsibility to protect against theft of the nuclear material at the NFS site.

Employees are Onsite 24 Hours a Day

The process areas operate continuously except for an annual two week shutdown for equipment repair. Because of this there is considerable movement in and around most of the buildings throughout a 24 hour period.

Guard Force Shift Supervisors are All Experienced

All supervisors [redacted] have police or military experience. The NFS shift supervisors are of particularly high quality and capability. They are also relatively young, dynamic and intelligent. Coupling the two sets of supervisors should provide good flexibility for command and control of emergency situations.

Alarm Systems are Effective

3.5 Specific Observations -- Material Control and Accounting Assessment

3.5.1 Emergency Safeguards Deficiencies Requiring Immediate Correction

The material control and accounting assessment did not disclose any emergency safeguards deficiencies requiring immediate correction.

3.5.2 Significant Safeguards Program Deficiencies Requiring Short Term Correction

The material control and accounting assessment did not disclose any safeguards program deficiencies requiring short term correction.

3.5.3 Minor Program Deficiencies of A Less Urgent Nature

Material Accounting Inventory Difference

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Measurement of Discard Stream

A discard stream was identified in MBA-6 in which process liquid discharged to the sewer was based on zero (0) uranium values if composite liquid samples were assayed to contain less than 0.0001 g U/l. Volume measurements for the discards were not made. Based on preliminary findings, the loss stream amounted to less than 30 g uranium per inventory period which complies with existing NRC license conditions. However, since volume measurements were not being performed accurately, corrective action ought to be taken to assure that total volume multiplied by liquid concentration does not exceed acceptable limits.

Reliability of Nondestructive Assay (NDA) Equipment

NFS's NDA system (segmented gamma scanner) for assaying incinerator ash had been independently tested and found to be unsatisfactory. NFS management acknowledged that the system had been experiencing drift problems and an outside consultant had been hired to correct the problem. Until the problem is resolved, NFS plans to run additional standards in order to correct for significant biases. At the closeout meeting, NFS personnel noted that the NDA system in question was shutdown due to operational problems similar to those found by the NRC team.

Scrap Recovery Plant

The scrap recovery plant (MBA-5) was designed and built in the 1950's when safeguards considerations were not emphasized as much as today. It lacks capability to measure in-process SNM and the physical ability to retrofit is questionable. A number of other concerns with the scrap plant include:

[redacted]

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4.0 Conclusions and Recommendations

4.1 Assurance Against a Single Insider

The NRC staff concluded that the safeguards system at NFS, Erwin provided good assurance of protection against nuclear theft by a single insider.

4.1.1 Recommended Actions to Achieve High Assurance Protection Against a Single Insider

The only actions necessary to achieve high assurance protection against nuclear theft by a single insider is to improve the conditions under which access controls are operated and increased management attention to searches. As noted elsewhere in this report, personnel congestion present complicates the work of security guards at an access control point.

4.2 Assurance Against External Assault

The NRC staff concluded that the safeguards system at NFS, Erwin provided good to fair assurance of protection against nuclear theft by several external armed assailants aided by an insider.

4.2.1 Recommended Actions to Achieve High Assurance Protection Against External Assault

The NRC staff identified a number of deficiencies requiring short term actions and some deficiencies of less urgent nature which also need correction to achieve a high level of assurance against external assault. Recommended actions are listed below:

Recommended Short-Term Actions -- External Assault Protection

Following are short term actions recommended by the NRC staff to improve nuclear safeguards against external assault at NFS, Erwin:

Recommended Actions of Less Urgent Nature -- External Assault Protection

Following are less urgent actions recommended by the NRC staff to improve nuclear safeguards against external assault at NFS, Erwin:

4.3 Capability of Accounting System to Substantiate Theft

The NRC staff concluded that the control and accounting procedures currently followed at NFS, Erwin provide to detect either a single theft or a series of small scale diversions as indicated below:

Criterion	Rating
o Capability to substantiate if more than five formula kilograms of SNM were illicitly removed from the facility during previous inventory periods.	
o Capability to substantiate if more than five formula kilograms of SNM were illicitly removed from the facility during current inventory period.	

4.3.1 Recommended Actions to Improve -- Material Accounting Capability

The NRC staff did not see the need for any emergency or short term actions to improve material accounting capability at NFS, Erwin. However, the following actions could improve SNM accountability:

4.4. Sabotage Considerations

4.4.1 Recommendations Concerning Potential Sabotage

Sabotage potential associated with Building should be the subject of a separate review by NRC and the licensee.

5.0 Secondary Evalution

During the site evaluation, secondary consideration was also given to the licensee's capability to meet more demanding safeguards requirements published for comment in the Federal Register on July 5, 1977 (42 FR 34310). These are also described in detail in Appendix B to this report. Based upon field observations the NRC staff concludes that safeguards at NFS, Erwin would require considerable modification to satisfy future requirements in the proposed new rule.

5.1 Specific Observations Related to NRC's Proposed Future Safeguards Requirements

5.1.1 Accessibility to SNM

Although SNM is accessible within the process area, the problem of accessibility especially in the early stages is not peculiar to NFS, Erwin. While more process control and/or surveillance within the process area should be encouraged, it must be understood that the process requires a high degree of material accessibility. Moreover, as long as the MAA control points are being operated correctly, access to the material does not imply that successful diversion may be carried out.

The proposed procedures and controls that work against one insider would also work to some extent against a conspiracy. However, additional safeguards measures related to process monitoring, surveillance and material control procedures, would be required to protect against a threat of diversion involving conspiracy.

5.1.2 Hardness of SNM Storage Areas

Based on surveillance, PDR information and insider information, the walls, doors, windows, ceiling and other openings of SNM storage buildings were assessed for vulnerability.

5.1.3 Secondary Alarm Survivability

it is anticipated that further hardening of the secondary alarm station would be required to meet proposed safeguards upgrading requirements now being considered by the NRC.

5.1.4 False Criticality Alarm Potential

The control panel for criticality alarm sensors is located in the Health and Safety lab area of bldg. 105. False alarms can be

5.1.5 Parts of Protected Area Are Not Illuminated

The lighting system of NFS effectively illuminates the fences and clear zones.

5.2 Satisfying Proposed Future Requirements of NRC's Upgrade Rule

The NRC staff concluded that safeguards at NFS, Erwin would require considerable modifications to satisfy proposed new requirements of NRC's upgrade rule. Following are the types of actions which would be required:

- o Provide increased surveillance of persons having access to material access areas.
- o Provide dual manning of material access control points.
- o Harden SNM storage vaults.
- o Improve protected area lighting.

This is not an exhaustive list of actions which would be required at NFS, Erwin. Rather, it is indicative of the kinds of actions required to satisfy proposed new safeguards requirements currently being considered by the Commission. Furthermore, this list is generally consistent with that shown in the statement of considerations published with the proposed new rule in July 1977 (42 FR 34310).

APPENDIX A

PHOTOGRAPHS OF NFS, ERWIN AND SURROUNDINGS

APPENDIX B

I. EVALUATION ADVERSARY DEFINITIONS

A. General

The purpose of this appendix is to discuss hypothetical adversary characteristics which will be used to assess safeguards during implementation of the 1977 Comprehensive Evaluation Plan for SSNM facilities.

B. The Baseline for Primary Evaluation

During 1977, primary evaluations will measure safeguards capabilities against the hypothetical threat given below. It should be noted that this requirement is similar to the requirement for physical protection of nuclear power reactors against industrial sabotage specified in 10 CFR 73.55 (a).

> The licensee shall establish and maintain an onsite physical protection system and security organization which will provide protection with high assurance against theft by both the following:
>
> (1) A determined violent external assault, attack by stealth, or deceptive actions, of several persons with the following attributes, assistance, and equipment: (i) well trained (including military training and skills) and dedicated individuals, (ii) inside assistance which may include a knowledgeable individual who attempts to participate in both a passive role (e.g., provide information) and an active role (e.g., facilitate entrance and

exit, disable alarms and communications, participate in violent attack), (iii) suitable weapons, up to and including hand-held automatic weapons, equipped with silencers and having effective long-range accuracy (iv) hand-carried equipment, including incapacitating agents and explosives for use as tools of entry or otherwise destroying features of the safeguards system,

(2) An internal threat of an insider, including an employee (in any position).

Each component type of evaluation, e.g., Exterior Assault Appraisal, Diversion Path Survey, Material Accounting Assessment, and Physical Security Assessment will use relevant portions of this adversary baseline as evaluation criteria and will measure safeguard capabilities and vulnerabilities against it.

C. The Baseline for Secondary Evaluations

During implementation of the 1977 Comprehensive Evaluation Plan secondary consideration will also be given to licensee capabilities to meet the more demanding performance requirements which will be the subject of safeguards upgrade rulemaking during the same time period. Evaluation results will provide input to the rulemaking process.

The hypothetical threat for the secondary evaluations is as follows:

(1) A determined violent external assault, attack by stealth, or deceptive actions, by a small group with the following attributes,

assistance, and equipment: (i) well trained (including military training and skills) and dedicated individuals, (ii) inside assistance which may include a knowledgeable individual who attempts to participate in both a passive role (e.g., provide information) and an active role (e.g., facilitate entrance and exit, disable alarms and communications, participate in violent attack), (iii) suitable weapons, up to and including hand-held automatic weapons, equipped with silencers and having effective long-range accuracy, (iv) hand-carried equipment, including incapacitating agents and explosives for use as tools for entry and otherwise destroying features of the safeguards systems, and (v) the ability to operate as two or more teams, and

2. The threat posed by a conspiracy of insiders or employees in any position.

ENCLOSURE 2

DRAFT LETTER TO CONGRESS FROM CHAIRMAN HENDRIE

The Honorable Morris K. Udall, Chairman
Subcommittee on Energy and the Environment
Committee on Interior and Insular Affairs
United States House of Representatives
Washington, D. C. 20515

Dear Mr. Chairman:

Enclosed is a comprehensive evaluation report on nuclear safeguards at the Nuclear Fuel Services (NFS) facility, Erwin, Tennessee. It is the second report in a series now in preparation reevaluating safeguards at fuel cycle facilities in accordance with a comprehensive evaluation plan which the Commission endorsed in May 1977. As stated in our letter of March 30, 1978, these reports disclose weaknesses for which we will require corrective actions.

On the basis of this report, the NRC staff concluded that safeguards at NFS, Erwin protect with good assurance against theft or sabotage by a single insider acting alone, and with good to fair assurance against a violent assault by several outsiders assisted by an insider.

The comprehensive evaluation did not disclose any emergency safeguards deficiencies requiring immediate correction. On the basis of the report, the NRC staff has recommended a number of actions to improve nuclear safeguards at NFS, Erwin. The staff is translating its recommendations into licensing actions to provide high assurance safeguards for strategic special nuclear materials at NFS, Erwin.

During the evaluation of NFS, secondary consideration was also given to the licensee's capability to satisfy more demanding safeguards requirements published for comment on July 5, 1977 in the Federal Register

(42 FR 34310). On the basis of the evaluation report, the staff concludes that safeguards at NFS, Erwin would require considerable modification to satisfy future requirements in the proposed new rule.

An NRC team will visit NFS, Erwin soon to deliver the evaluation report and discuss licensing and inspection actions with licensee management. Following corrective actions, the licensee will be reinspected by our staff to verify compliance. The reinspection report will be reviewed by the Commission which will take whatever corrective action is indicated, including, if necessary, license suspension.

This report is classified Confidential-Restricted Data-National Security Information because it contains information that could assist a potential adversary intent on theft or sabotage involving strategic nuclear materials.

Sincerely,

Joseph M. Hendrie
Chairman

Enclosure:
Evaluation Report (Confidential-
Restricted Data)

Similar letters to:

The Honorable Gary Hart, Chairman
Subcommittee on Nuclear Regulation
Committee on Environment and Public Works
United States Senate
Washington, D. C. 20510

(Additional addressees on next page)

The Honorable John D. Dingell, Chairman
Subcommittee on Energy and Power
Committee on Interstate and Foreign Commerce
United States House of Representatives
Washington, D. C. 20515

The Honorable John Glenn, Chairman
Subcommittee on Energy, Nuclear Proliferation
and Federal Services
Committee on Government Affairs
United States Senate
Washington, D. C. 20510