ATTACHMENT 6

Calculation 51-2400552-01,
"Assessment of Other External Event Hazards at NEF for ISA and Design Basis"

FRAMATOME ANP

ENGINEERING INFORMATION RECORD

Document Identifier 51 - 2400552 - 01

Title Assessment of Other External Event Hazards at NEF for ISA and Design Basis

PREPARED BY:	REVIEWED BY:
Name G.A. Harper	Name D.M. Pepe
Signature [signature] Date 12/12/03	Signature [signature] Date 12/15/03

Technical Manager Statement: Initials DZM 12/16/03

Reviewer is Independent.

Remarks:

As part of the Integrated Safety Analysis (ISA), the structures comprising the National Enrichment Facility (NEF) have been evaluated for other (transportation, nearby facility accidents, and on-site natural gas use) external event hazards. Through the ISA process, the appropriate design basis loads can be specified, if required, as outlined in this Engineering Information Record.

The assessment demonstrates that no design basis events for transportation and nearby facilities were identified that require an explicit design basis for the NEF.

The ISA Accident Sequence and Risk Index for other (transportation and nearby facility accidents) external event hazards is provided in Table 1. The ISA Accident Description for external event other (transportation and nearby facility accidents) is provided in Table 2.

Document Pagination:

Revision Summary Page

Affected Section and/or Page(s)	Description (Include changes to calculation attachments, microfiche, and electronic media)
General	Revision 1 updates one reference and incorporates a Design Verification Checklist. The revision does not affect the inputs or the results in the original document.
Pg 2	Added revision summary page as required by procedure.
Pg 12	Updated Reference 5 to note revision.
Attachment F	Added Design Verification Checklist as required by revision to FANP Procedure 0402-01, Revision 35.

Table of Contents

Executive Summary

As part of the Integrated Safety Analysis (ISA), the structures comprising the National Enrichment Facility (NEF) have been evaluated for other (transportation and nearby facility accidents) external event hazards.

The assessment demonstrates that no design basis events for transportation and nearby facilities were identified that require an explicit design basis for the NEF.

The ISA Accident Sequence and Risk Index for other (transportation and nearby facility accidents) external event hazards is provided in Table 1. The ISA Accident Description for external event other (transportation, nearby facility accidents, and on-site natural gas use) is provided in Table 2.

1.0 Introduction

As part of the Integrated Safety Analysis (ISA) for other (transportation and nearby facility accidents) external event hazards for the National Enrichment Facility (NEF) were evaluated. Through the ISA process, the appropriate design basis, if required, can be specified as outlined in this Engineering Information Record.

During the ISA team meetings on October 29, 2002 and September 24, 2003, each area in each of the main plant buildings was discussed as to whether or not adverse impacts from transportation and nearby facility accidents were acceptable from a safety standpoint. The following areas were selected by the team as requiring a "Highly Unlikely" likelihood category:

- Separations Building Module (UF_6 Handling Area, associated Cascade Halls and Process Services Area)
- Cylinder Receipt and Dispatch Building (CRDB)
- Blending and Liquid Sampling Area
- Centrifuge Test Facility (CTF) in the Centrifuge Assembly Building (CAB)
- Technical Services Building (TSB)
- Uranium Byproduct Cylinders (UBC) Storage Pad

Note: Only specific areas of the TSB containing UF_6 and/or Uranium were explicitly identified as requiring protection from this other (transportation and nearby facility accidents) external event hazards. However, for design purposes the entire TSB may be designed for these hazards.

The external event portion of the baseline ISA was performed on October 29, 2002. In addition to the full ISA Team, G. Harper (document preparer) presented the external events during the team meeting. The external event portion of the ISA was re-assessed on September 24, 2003 to identify any changes due to the NEF design and location. No changes

were identified other than the new design basis values associated with the NEF site. D. Pepe was the ISA Team scribe at both meetings and is the verifier of record for ISA-related information in this document. J. Snooks is the verifier for all information except that which is ISA-related.

2.0 Discussion

The following list of other (transportation and nearby facility accidents) external event hazards were identified for consideration in the assessment. The selection of these hazards was based on engineering judgment and experience of the preparer in this area. The selection was verified by the non-ISA reviewer who is also experienced in these types of assessments.

Other (transportation and nearby facility accidents) external event hazards identified for consideration included:

1. Aircraft (nearby airports and jet ways)
2. Gas Pipelines
3. Highway Traffic
4. Other Nearby Facilities
5. Railroads
6. On-site Use of Natural Gas at Central Utility Building (CUB)

On-site usage of gas was included because the proposed design for the NEF boiler plant located in the Central Utility Building will be gas fired.

3.0 Assessment

3.1 Aircraft

As an external event, an aircraft accident is considered not credible if the probability of the event initiation is less than 10^{-6} per year in accordance with NUREG-1520 (Reference 4). If the probability is greater than 10^{-6} per year, the event is considered credible. For a credible aircraft accident, the accident is conservatively assumed to be a High Consequence event. The associated risk will be acceptable if the probability is less than 10^{-5}. Thus, the maximum probability of an aircraft accident at the proposed site is limited to 10^{-5}, for the event risk to be acceptable.

The purpose of this assessment section is to summarize the detailed analysis presented in Reference 1 of the hazard to the NEF due to potential aircraft transits past the site. The analysis followed the methodology as described in Standard Review Plan (SRP) Section 3.5.1.6 for aircraft hazards evaluation (Reference 2), which is accepted by the USNRC to assess the probability of hazards due to aircraft transits at nuclear facilities.

There are six (6) airports within 20 to 25 nautical miles of the proposed NEF site. The largest international airport nearest to the site is the Midland International Airport in Texas, which is

about 50 nautical miles east-southeast of the site and is judged sufficiently far from the site to have any significant impact.

The six airports were evaluated following the SRP 3.5.1.6 methodology. The methodology provides a screening based on distance between the site and the airports and the number of annual operations (takeoffs and landings) for airports more than 10 miles from the site of interest. Per SRP 3.5.1.6, Item II.1(a), the probability of aircraft accidents is less than about 10^{-7} per year if the annual number of operations satisfies the screening criteria. All six airports satisfied this screening criterion. Therefore, Reference 1 concluded that the presence of these airports is not significant to plant safety and no further analysis is required with regard to the impact of nearby airports.

There are no military facilities within 20 miles of the proposed site. There is military operation out of the Lea County Regional Airport only, but the number of operations is far below the SRP allowable limit. There are three military routes, IR-128 (maximum altitude of 13000 feet), IR-178 (maximum altitude of 15000 feet) and IR-180 (maximum altitude of 17000 feet) within a 30 nautical mile radius of the proposed site. The closest approach (by IR-128 and IR-180) is about 14 nautical miles southwest from the site geographical center. This is not expected to pose any hazard to the proposed facility, since the routes are more than 5 statute miles from the site, per SRP 3.6.1.5II.1(b). Lastly, since military operations in nearby airports were included in the evaluation given in general airport evaluation, no further analysis was required with regard to the impact of military training route.

A low-level federal airway (V-68) passes within 5 nautical miles, northeast of the proposed NEF site. The probability, P, of an aircraft flying along either airway crashing onto the proposed site was conservatively estimated from the following expression, as given in SRP 3.5.1.6:

$$P = C \times N \times A / w$$

where:

C = in flight crash rate per mile for aircraft using the airway,
N = number of flights per year along the airway,
A = effective target area (square miles), and
w = width of airway (miles) [plus twice the distance from the airway edge to the site when the site is outside the airway]

Using daily flight information supplied by the FAA Office in Atlanta, recent published values for aircraft crash rate from the National Transportation Safety Board, and conservative target area and airway width parameters, the estimated the probability of an aircraft flying along either airway crashing onto the proposed site was calculated to be 3.4×10^{-7}.

Based on the detailed risk assessment of the aircraft hazards in Reference 1, which followed the methodology of SRP 3.5.1.6 (Reference 2), the following conclusions were made. Airports and

airways in the vicinity of the proposed NEF site have been identified. Using published number of operations and distance to the proposed site, the presence of these airports does not pose any risk to site with regard to aircraft hazard. For the identified airways, the probability of aircraft along these airways crashing onto the proposed site has been conservatively calculated to be 3.4×10^{-7} per year. This yields an initiating event index of (-6), which meets the definition of "not credible."

3.2 Gas Pipelines

As an external event, a gas pipeline accident is considered not credible if the probability of the event initiation is less than 10^{-6} per year in accordance with NUREG-1520 (Reference 4). If the probability is greater than 10^{-6} per year, the event is considered credible. For a credible gas pipeline accident, the accident is conservatively assumed to be a High Consequence event. The associated risk will be acceptable if the probability is less than 10^{-5}. Thus, the maximum probability of a gas pipeline accident at the proposed site is limited to 10^{-5}, for the event risk to be acceptable.

The purpose of this assessment section is to summarize the information gathered to evaluate the hazard to the NEF due to potential hazards from nearby gas pipelines and the detailed analysis performed in Reference 5.

There are two pipelines within or near the NEF site boundaries. The first is a 10-inch diameter carbon dioxide pipeline that extends along an easement running diagonally through the site from southeast to northwest. This pipeline was excluded as a risk to NEF plant operations because a release of carbon dioxide is a health and safety hazard rather than a hazard to plant operations.

The second pipeline is a 16-inch natural gas line that runs along the southern boundary of the site. Information gathered from Sid Richardson Energy Services Co. (SRESCo), the pipeline operator, via telephone revealed that the pipeline is a low-pressure line (<50 psi) that carries "wet sour gas," which is unprocessed, field gas from the well being sent for processing (Attachment A).

Following a postulated rupture of a segment of the gas pipeline, natural gas will be discharged into the atmosphere. The released gas mixes with the atmosphere and forms a vapor cloud. Depending on the environmental conditions, this vapor cloud will rise (due to buoyancy effects) and travel away from the rupture location. The vapor cloud may explode (or detonate). When this occurs, the shock wave associated with such explosion will create an overpressure on plant structures. Also, the dynamic impulse from such an explosion may propel objects, or missiles, in the vicinity of the explosion towards facility structures and may produce structural damage to critical equipment. Alternatively, the vapor cloud may ignite and form a fireball. The radiation heat from the burning cloud will be incident upon the facility building structures, resulting in potential structural damage.

Based on the above discussion, Reference 5 assessed the risk posed by an accidental rupture of the SRESCo gas pipeline for the following hazards:

a. Overpressure on plant structures due to shock waves generated by detonation or explosion of the gas cloud from mixing of the released gas and the atmosphere.

b. Radiant heat flux on plant structures due to combustion of the gas/air mixture in the gas cloud.

c. Impact by missiles propelled by air bursts from detonation or explosion of the gas cloud.

Reference 5 concluded that the yearly probability of hazards due to thermal radiation is zero. For the hazard due to overpressure of a detonation, the yearly probability is 4.04×10^{-6}. Lacking information on the type of likely missile that could be generated and the acceptable impact velocity, the probability of a hazard due to missile generation was conservatively assumed to be given by the detonation probability. This implies that every detonation will result in a missile generation hazard (i.e., one that will create an unacceptable impact velocity on the proposed facility). The total yearly probability of hazards posed by accidental rupture of the natural gas pipeline is therefore 8.08×10^{-6}. This conservative assessment yields an initiating event index of (-5), which meets the definition of "highly unlikely."

3.3 Highways

As an external event, a highway traffic accident is considered not credible if the probability of the event initiation is less than 10^{-6} per year in accordance with NUREG-1520 (Reference 4). If the probability is greater than 10^{-6} per year, the event is considered credible. For a credible highway traffic accident, the accident is conservatively assumed to be a High Consequence event. The associated risk will be acceptable if the probability is less than 10^{-5}. Thus, the maximum probability of a highway traffic accident at the proposed site is limited to 10^{-5}, for the event risk to be acceptable.

The purpose of this assessment section is to summarize the information gathered related to evaluate highway traffic near the NEF and the detailed analysis performed in Reference 6.

The Standard Review Plan (SRP), Section 2.2.1-2.2.2 (Reference 2), when identifying potential hazards to a facility, uses site location and separation distance with respect to transportation routes. In particular, hazards identified within 5 miles should be reviewed. Hazards at greater distances, however, should be reviewed only "if they otherwise have the potential for affecting plant safety-related features."

New Mexico Highway 234, a 2-lane road, runs along the southern edge of the site and connects to a 4-lane, divided and controlled-access highway (U. S. Highway 18), approximately 3.5 miles west of the site (Figures 1 and 2). Telephone information gathered (see Attachment A) indicates that bulk transport (10,000 gallons) of propane passes the site on the highway at a relatively high frequency, i.e., 2-3 times per day, or approximately 900 times per year. Estimates of an in-place

propane explosion on the highway adjacent to the site revealed that blast overpressures could produce slight to moderate damage to plant buildings (Reference 7). However, Reference 6 used a hazard model to estimate the likelihood of a propane truck accident on Highway 234/176 and the subsequent explosion that could impact plant operations. The calculated yearly probability of the hazard is 2.07×10^{-6}, which would meet the ISA guideline for a highly unlikely event. Therefore, an initiating index of (-5) is appropriate.

3.4 Other Nearby Facilities

As an external event, an accident at a nearby facility is considered not credible if the probability of the event initiation is less than 10^{-6} per year in accordance with NUREG-1520 (Reference 4). If the probability is greater than 10^{-6} per year, the event is considered credible. For a credible accident at nearby facilities, the accident is conservatively assumed to be a High Consequence event. The associated risk will be acceptable if the probability is less than 10^{-5}. Thus, the maximum probability of an accident at a nearby facility to the proposed site is limited to 10^{-5}, for the event risk to be acceptable.

The purpose of this assessment section is to summarize the information gathered related to the use and storage of hazardous materials in production operations near the NEF (Attachments A-C).

The Standard Review Plan (SRP), Section 2.2.1-2.2.2 (Reference 2), when identifying potential hazards to a facility uses site location and separation distance with respect to transportation routes. In particular, hazards identified within 5 miles should be reviewed. Hazards at greater distances, however, should be reviewed only "if they otherwise have the potential for affecting plant safety-related features."

The types of facilities, hazardous material use and storage within 5 miles of the NEF are not anticipated to be of concern to the operation of NEF. This engineering judgment is based on a site evaluation program performed by CH2MHill (Reference 8), information gathered from site visits (Reference 9), and U.S. EPA reports on their EnviroMapper web site (www.epa.gov/enviro/html/em/index.html).

There are three nearby facilities. The property on the east border of the proposed NEF is Waste Control Specialists (WCS) a hazardous waste treatment, storage and disposal facility; Wallach Sand and Gravel Company gravel pits northwest of the proposed site; and the Lea County Landfill is south of the proposed site across State Highway 234. CH2MHill (see Attachment D) noted that there are no facilities storing or handling large quantities of hazardous chemicals within 5 miles of the proposed site. The adjacent WCS facility does treat and disposes of large quantities of hazardous wastes as well as treats and stores low-level mixed wastes. But the types of materials at the WCS (see Attachment C) have limited, if any, potential to affect plant operations such as explode. CH2MHill also stated that the site is not within the general emergency area of any hazardous operations facility, but there are facilities that could provide a

nearby emissions source that may affect air quality. Finally, there are no U.S. EPA Superfund (CERCLA) sites in the area (Figure 2).

Based on the above information and the review criteria established in SRP Section 2.2.1-2.2.2 (Reference 2), it is deemed by engineering judgment that there is no potential hazard to NEF from nearby facilities. The probability of an event initiation therefore is essentially zero. An initiating event index of (-6) is appropriate. This meets the definition of "not credible."

3.5 Railroads

As an external event, a railroad accident is considered not credible if the probability of the event initiation is less than 10^{-6} per year in accordance with NUREG-1520 (Reference 4). If the probability is greater than 10^{-6} per year, the event is considered credible. For a credible railroad accident, the accident is conservatively assumed to be a High Consequence event. The associated risk will be acceptable if the probability is less than 10^{-5}. Thus, the maximum probability of a railroad accident at the proposed site is limited to 10^{-5}, for the event risk to be acceptable.

The purpose of this assessment section is to summarize the information gathered related to railroad transport near the NEF.

The Standard Review Plan (SRP), Section 2.2.1-2.2.2 (Reference 2), when identifying potential hazards to a facility uses site location and separation distance with respect to transportation routes. In particular, hazards identified within 5 miles should be reviewed. Hazards at greater distances, however, should be reviewed only "if they otherwise have the potential for affecting plant safety-related features."

The Iowa Pacific Holdings LLC operates the only railroad within 5 miles of NEF site, the Texas & New Mexico Railroad (TNMR); it also operates a spur line the runs along the northern edge and through the northeast corner of the site. The types of hazardous materials transported on the rail line, based on telephone information and a 2002 inventory, include some poisonous gas, hydrochloric acid, flammable chemicals like methanol, and lube oils. The spur hauls "contaminated dirt" to the adjacent WCS facility located east in Andrews County, TX. These types of materials, although hazardous to plant personnel, are not hazardous to plant operations. Highly flammable or explosive materials like propane that could be hazardous to plant operations are transported on the rail line north of Eunice, well beyond 5 miles of the site (see Attachment A). Attachment B is a detailed listing of the hazardous materials moved by the TNMR, by month and frequency for calendar year 2002.

Based on the above information and the review criteria established in SRP Section 2.2.1-2.2.2 (Reference 2), it is deemed by engineering judgment that there is no potential hazard to NEF from railroad traffic and the probability of an event initiation is essentially zero. Therefore, an initiating event index of (-6) is appropriate, which meets the definition of "not credible."

3.6 On-Site Use of Natural Gas at CUB

As an external event, an on-site natural gas line accident at the Central Utilities Building (CUB) is considered not credible if the probability of the event initiation is less than 10^{-6} per year in accordance with NUREG-1520 (Reference 4). If the probability is greater than 10^{-6} per year, the event is considered credible. For a credible gas explosion at the CUB, the accident is conservatively assumed to be a High Consequence category event. This is a very conservative assumption as described below. The associated risk will be acceptable if the probability is less than 10^{-5}. Thus, the maximum probability of an on-site accident at the proposed site is limited to 10^{-5}, for the event risk to be acceptable.

The CUB itself is not a location for UF_6 or Uranium storage or use. An explosion event within the CUB would need to breach the building and impact adjacent buildings where UF_6 or Uranium is used or handled. Buildings where UF_6 or Uranium is used or handled will be designed for earthquakes and tornadoes and, therefore, will have robust building envelopes. Damage to these types of structures from explosions in adjacent buildings is not credible given the type of natural gas explosions. Damage would need to be of sufficient magnitude to lead to a UF_6 or Uranium release that could produce consequence categories higher than Low. Therefore, assuming that an explosion due to a gas leak in the CUB could produce a High Consequence category event is very conservative.

The purpose of this assessment is to examine using natural gas to fire a boiler located in the CUB and the potential adverse impact to the NEF from a natural gas release and subsequent explosion.

The bounding event selected for evaluation is a gas leak within the CUB from gas piping within the building. As a subset of this event, an explosion of the boiler (terminus of gas piping in the building) was evaluated as follows. For an explosion of gas buildup within the boiler itself, it was concluded by engineering judgment not to be a credible initiating event for a UF_6 or Uranium release due to separation distances to the UF_6 and Uranium areas in the plant. Given typical boiler unit size, there would not be sufficient gas volume to produce an explosion that could damage equipment within adjacent well-designed structures or initiate an event that could lead to a UF_6 or Uranium release in an adjacent well-designed building. An explosion within the CUB would need to be of sufficient magnitude to damage the building exterior walls, produce overpressures that would need to traverse the open space between the adjacent buildings, impact the exterior walls of the separations plant, fail these walls inward onto UF_6 or Uranium handling/process equipment, and lead to a release of UF_6 or Uranium. A boiler explosion producing this chain of events is simply not credible.

Regardless, for a gas explosion to occur there must first be a natural gas leak/rupture, which in turn must form an air-fuel mixture within the explosion range of the gas inside the confined space, i.e. inside the building, followed by ignition and subsequent detonation. The explosion must also be of sufficient energy, *e.g.*, a detonation, to produce reflective overpressures within the CUB to knock down its walls and then damage adjacent buildings

before there is any impact to nearby UF_6 or Uranium areas. Most times this chain of events lead to deflagrations rather than detonations.

From engineering judgment, the probability of such a scenario occurring is highly unlikely. For instance, using the pipeline incident data noted in Reference 5 as a guide, one can anticipate the likelihood of a significant gas leak/ rupture in the CUB being on the order of between 10^{-4} and 10^{-5}, say, 10^{-4} per year for conservatism. By engineering judgment, this is taken as applicable to all significant gas leaks that could occur within the CUB regardless of cause. Again, from Reference 5, the likelihood following the gas leak that an explosion will occur is about 10^{-1}, bringing the total annual probability to a conservative 10^{-5}. Given the explosion, as stated above, it must be a detonation of sufficient energy to damage both the CUB and any adjacent building with UF_6 or Uranium areas and result in a release of UF_6 or Uranium. As a result, it is reasonable to assume that the total probability of an explosion in the CUB causing a release of UF_6 or Uranium in an adjacent well-designed structure is less than 10^{-5}, which meets the definition of "highly unlikely." Hence, an initiating event index of (-5) is appropriate.

4.0 Conclusions

Based on the above Sections 3.1 through 3.6, no design basis external events for transportation and nearby facilities were identified that require an explicit design basis for the NEF.

The ISA Accident Sequence and Risk Index for other (transportation and nearby facility accidents) external event hazards is provided in Table 1. The ISA Accident Description for external events –other is provided in Table 2.

The objective of this document has been met.

5.0 References

1. Framatome ANP Document 32-2400569-00, Aircraft Hazard Risk Determination.
2. Standard Review Plan, NUREG-0800, Section 3.5.1.6, Aircraft Hazards, U.S. Nuclear Regulatory Commission, Washington, DC, Office of Nuclear Reactor Regulation, Rev. 2, July 1981.
3. NUREG-0800, SRP Section 2.2.1-2.2.2, Identification of Potential Hazards in Site Vicinity, Rev. 2, July 1981.
4. NUREG-1520, Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, March 2002.
5. Framatome ANP Document 32-2400572-01, Natural Gas Pipeline Hazard Risk Determination.
6. Framatome ANP Document 32-2400573-00, Highway Propane Explosion Risk Determination.

7. Framatome ANP Document 51-2400528-00, Due Diligence Report for Proposed LES Enrichment Plant Site, Eunice, New Mexico.
8. CH2MHill, "Site Evaluation Program," Supplement to Final Report for URENCO, Ltd., United Kingdom, and Louisiana Energy Services, August 2003, Atlanta GA. (Attachment D)
9. FANP Document 51-2400503-00, GPS Coordinates at Various Locations Near the NEF Site, October 2003.
10. FANP Document 38-2400064-00, Letter from M. Lynch dated September 9, 2003, Urenco Authorization of Use of Documents for Design Input.

6.0 Quality Assurance

In addition to Urenco supplied design inputs, FANP is also using design inputs supplied by Lockwood Greene. Urenco has authorized FANP in writing (Reference 10, Attachment E) to use design inputs from Lockwood Greene for work in the preparation of the NEF License Application under the context of the FANP QA program.

Table 1
Accident Sequence and Risk Index
External Event – Other (Transportation and Nearby Facility Accidents)

Accident Identifier	Initiating Event Index	Preventive Safety Parameter 1 or IROFS 1 Failure Index	Preventive Safety Parameter 2 or IROFS 2 Failure Index	Mitigation IROFS Failure Index	Likelihood Index T Uncontrolled (U) / Controlled (C)	Likelihood Category	Consequence Category (Type of Accident; T=Chemical)	Risk Index (h=f x g) Uncontrolled (U) / Controlled (C)	Comments & Recommendations
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	
EE-AIRCRAFT	-6 (Note 1)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Credible Event (see Section 3.1)
EE-PIPELINE	-5 (Note 2)	N/A	N/A	N/A	-5 (U)	1 (U)	3(T)	3 (U)	Acceptable Risk (see Section 3.2)
EE-HIGHWAY	-5 (Note 3)	N/A	N/A	N/A	N/A	1 (U)	3(T)	3(U)	Acceptable Risk (see Section 3.3)
EE-OTHER NEARBY FACILITIES	-6 (Note 4)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Credible Event (see Section 3.4)
EE-RAILROAD	-6 (Note 4)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Credible Event (see Section 3.5)
EE-CUB-GAS	-5 (Note 5)	N/A	N/A	N/A	-5 (U)	1 (U)	3 (T)	3 (U)	Acceptable Risk (see Section 3.6)

Notes:

1. Annual probability of aircraft crashing into NEF site has been conservatively calculated to be 3.4×10^{-7}.
2. Nearby pipeline has been evaluated for all potential adverse impacts at NEF. Hazard posed by the accidental rupture of a gas pipeline is estimated to be 8.08×10^{-6} per year.
3. Nearby highway has been evaluated for all potential adverse impacts at NEF. Hazard posed by the accidental rupture of a gas pipeline is estimated to be 2.07×10^{-6} per year.
4. Based on the types of chemicals stored at nearby facilities and shipped on the and railroad, these events are "not credible." No other nearby facilities has been identified with potential to adversely impact plant except pipeline which was evaluated separately.
5. Hazard posed by the accidental rupture of a gas pipeline inside the CUB using Reference 5 data is estimated to be $<10^{-5}$ per year.

Table 2
ISA Accident Description for
External Events – Other (Transportation and Nearby Facility Accidents)

Accident Identifier (See Table 1)	Description
EE-AIRCRAFT	Aircraft crash into facility from local airport traffic and commercial or military routes in the vicinity of the facility meets the definition of not credible. Based on detailed probabilistic analysis, the annual probability of an aircraft crash onto the site is less than 1.0E-6 (see section 3.1). This yields an initiating event index of (-6). This probability meets definition of "not credible;" therefore, no IROFS are needed.
EE-PIPELINE	Oil industry pipelines located near the facility. Based on detailed probabilistic analyses, the hazards due to thermal radiation, missile generation and plant contamination by gas and/or explosion were shown to have an annual probability less than 1.0E-5 (see Section 3.2) and an initiating index of (-5) is appropriate. This meets the definition of "highly unlikely," therefore, no IROFS are needed. Consequence category conservatively assumed as high.
EE-HIGHWAY	Potential adverse impact to the facility from chemical releases or explosions from trucks on nearby highway was evaluated. Detailed probabilistic analyses show the annual probability of an explosion adversely impacting the plant is less than 1.0E-5 (see Section 3.3) and an initiating event index of (-5) is appropriate. This meets the definition of "highly unlikely", therefore, no IROFS are needed. Consequence category conservatively assumed as high.
EE-OTHER NEARBY FACILITIES	Potential adverse impact to the facility from chemical releases/explosions from nearby industrial or military facilities. No such facilities identified within proximity to enrichment plant (see Section 3.4). Therefore, an initiating event index of (-6) is appropriate which meets the definition of "not credible" and no IROFS are needed.
EE-RAILROAD	Potential adverse impact to the facility from chemical releases/explosions from nearby railroad traffic. Rail spur to WCS facility along north side of NEF site does not transport explosive materials. No other railroads identified within proximity to the facility (see Section 3.5). Therefore, an initiating event index of (-6) is appropriate which meets the definition of credible" and no IROFS are needed. "not

Accident Identifier (See Table 1)	Description
EE-CUB-GAS	Potential adverse impact to the facility from natural gas release in the Central Utilities Building (CUB) and subsequent explosion. Natural gas used to fire plant boiler. The initiating event is an assumed explosion in the CUB that could potentially impact nearby UF_6 areas in nearby adjacent buildings. Hazard shown by probabilistic analysis to be less than 1E-05 which meets definition of "highly unlikely," therefore, an initiating event index of (-5) is appropriate and no IROFS are needed (see Section 3.6). Consequence category conservatively assumed as high.

Figure 1
NEF Transportation Routes
(Source: Reference 8)

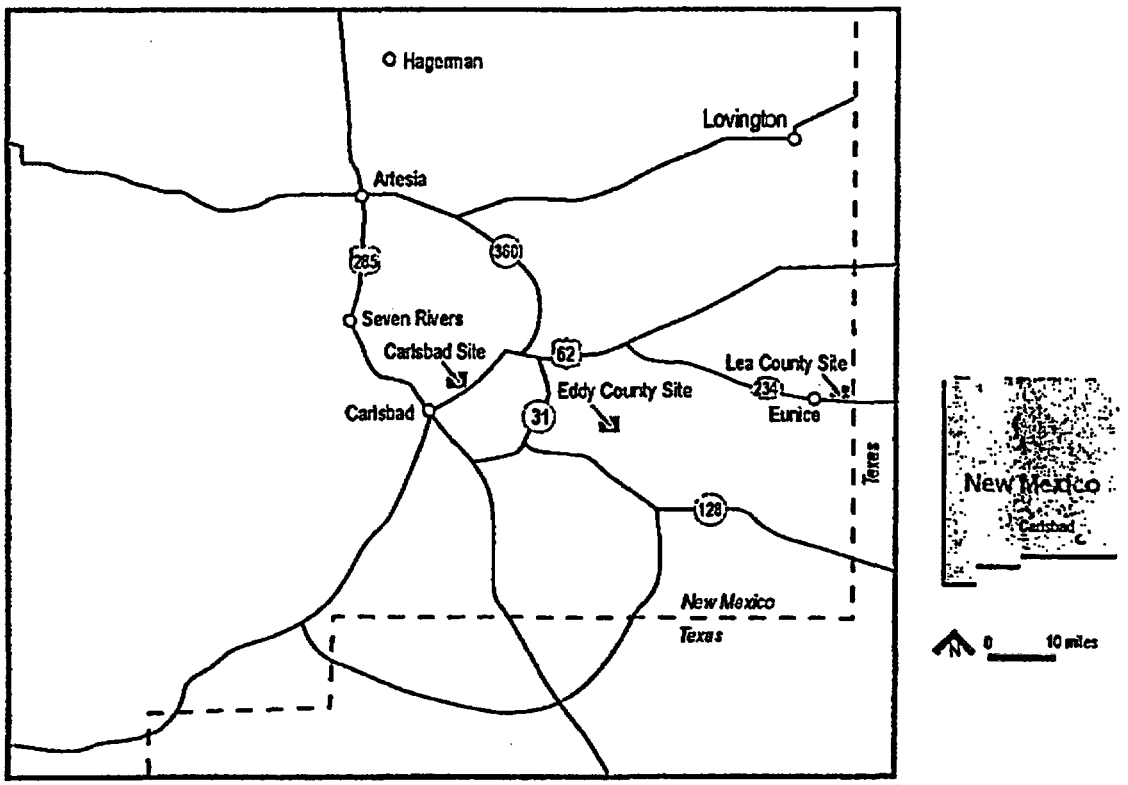
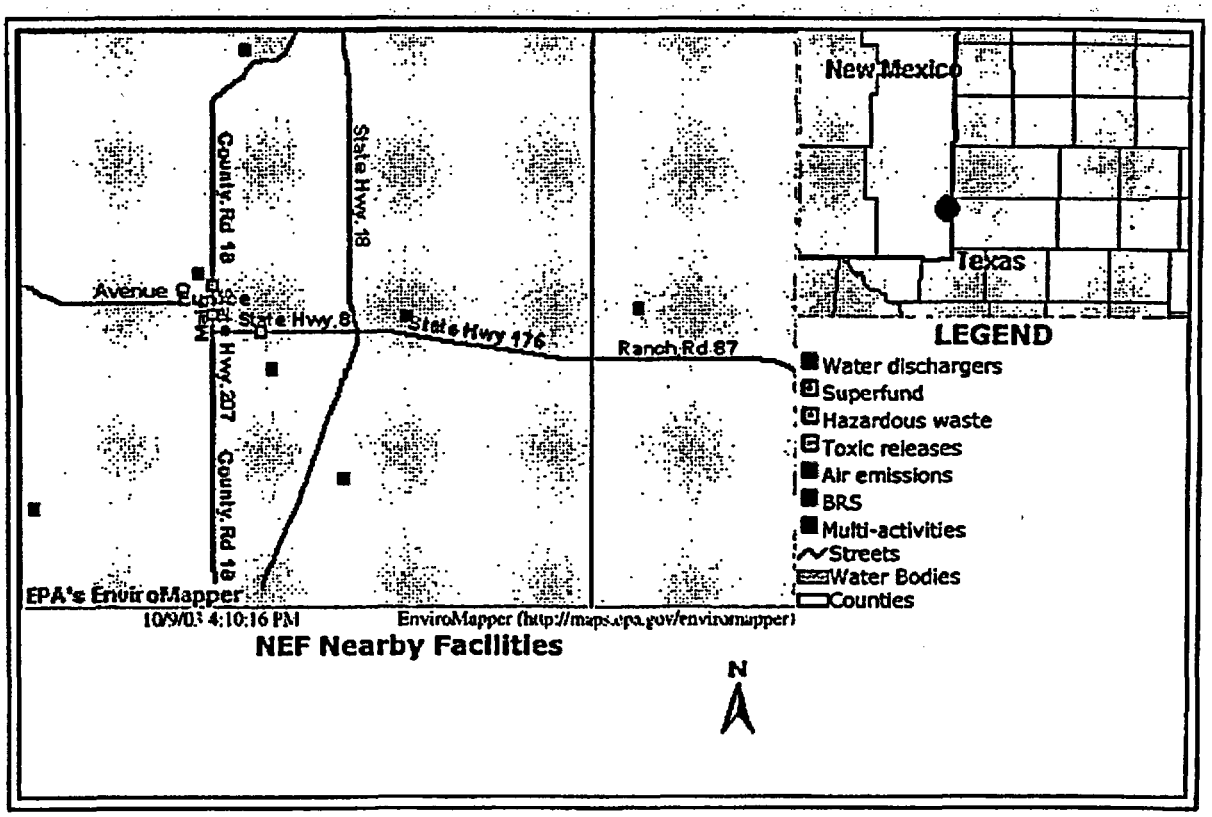


Figure 1-2
Carlsbad, Eddy County,
and Lea County Sites Location Map
Supplement to Final Report

Figure 2
NEF Nearby Facilites



Attachment A – Telephone Conversation Chronologies

TELEPHONE CHRONOLOGY
REGULATORY COMPLIANCE PROGRAMS- MARLBOROUGH

Call With	See Below	**Date**	See Below
Phone #	See Below	**Time**	See Below
By	J.H. Snooks	**PID**	
Subject	LES-NM: Airways		

DISCUSSION:

07/01/2003 Called FAA Information Services, Wash D.C. (800-457-6656) to info on airways in vicinity of Eunice. Left voice-mail message w/ Mike Cook.

07/01/2003 Called FAA Publications (800-638-8972) and ordered airways sectional map for Albuquerque and local enroute maps. [Sectional map arrived 7/3; enroute map backordered.]

07/02/2003 Mike Cook, FAA Information Services, returned my call w/ info on airways within 10 miles of Eunice [Had talked earlier in day, when I requested airways within 10 miles of Eunice and gave Cook the lat/long of site: 32°25'55"N, 103°03'05"W]. There are 2 airways: one high altitude (>18,000 ft), Jet-66-9, and one low altitude (<18,000 ft), V-68-6.

07/07/2003 Checked Albuquerque section map; V-68 is about 8 miles from Eunice. This falls within the 2 miles SRP guidance (8-mile air route width plus 2 miles) to evaluate flights further.

TELEPHONE CHRONOLOGY
REGULATORY COMPLIANCE PROGRAMS- MARLBOROUGH

Call With	See Below	**Date**	See Below
Phone #	See Below	**Time**	See Below
By	J.H. Snooks	**PID**	
Subject	LES-NM: Gas Lines		

DISCUSSION:

6/30/2003 Reviewed gas line maps and was able to identify the closest gas line as the 16" Fullerton Loop Line, which nearly parallel to NM Rte 234-Tx Rte 176. Called "One Call" (800-321-2537) to get info on gas line owner. Dispatcher named three companies: Trinity CO2, Texaco, and Sid Richardson Energy Services. Requested number for SR since gas maps were labeled as SR. Called SR (505-395-2116), but no one available.

7/1/2003 Called SR again, spoke w/ Royce, who gave me general info. The gas line is low pressure (< 50 psi) and carries "wet sour gas," which is unprocessed, field gas from the well being sent for processing. The gas line is buried to about 36", but could vary more or less in sandy soil due to the wind. Royce said he would have someone get back to me on characteristics of gas, e.g., percent methane, etc.

7/10/2003 Returned Royce Dunn's call. RD had additional info on gas line specs and gas characteristics as follows: methane = 72%, ethane = 11%, propane = 7%, H2S = 695ppm. The gas line flow is between 200-500 thousand cubic feet per day. It is 14-15 miles in length, with manual block valves at each end and in the middle. There also has a check valve at the connection with the main service line located near Eunice and Hwy 176. The likelihood of internal rupture is small because of the low pressure (<50psi).

8/8/2003 Called "One Call" (800-321-2537) to place a pipeline location request for Sections 32 and 33. Used town ID# 838. One Call said there were three operators in area: Sid Richardson, Trinity, and Texaco. Companies will call in 2-5 business days with info. One Call confirmation number is 2003323641.

8/8/2003 Goose Armstrong from Sid Richardson responded to the One call inquiry to say they had two pipelines in Sections 32 and 33, both running parallel to the southern boarder along Rte 234/176. One is 14-inch line that is "idle," i.e., in active. The

other is a 16-inch line carrying natural gas. [See 7/1 and 7/10 above for more details.]

8/8/2003 Brent Washington from Conoco-Phillips (505-390-3425) returned my many calls to various Conoco offices to get info on potential pipelines near Eunice. Brent said there were no known lines, but that he would conduct a site walk down on 8/11 to confirm.

8/11/2003 Brent Washington from Conoco-Phillips (505-390-3425) called to say he walked the site and did not locate any Conoco-Phillips pipelines.

8/13/2003 Lon Briley from Trinity Gas (442-661-0162) responded to the One Call inquiry and said Trinity had one carbon dioxide line crossing Section 32. The line carries liquid CO2 at 2100 psi; the flow is about 15 MMcf per day. Briley said that there manual shut offs about 2 miles north and south of the site and that it would take 45 min to 1 hr to close the values. There also is an electronic shut down system, but it would still take about 45 min to 1 hr to shut off supply and "bleed the system." Alternate contact is Barry Petty (who Ed Maher has spoken to.) His tele no is 432-683-8262.

9/4/2003 Called Royce Dunn at Sid Richardson (505-395-2116) to ask if SR had a DOT risk report in case of a leak like Trinity CO2 gas. RD didn't know of any; he said there wouldn't be a fire or "blowout" explosion, like might occur in the CO2 line because SR gas line is low pressure. RD gave the web site of the state agency responsible for oil sites: www.emnrd.state.nm.us/ocd/.

TELEPHONE CHRONOLOGY
REGULATORY COMPLIANCE PROGRAMS- MARLBOROUGH

Call With	See Below	Date	See Below
Phone #	See Below	Time	See Below
By	J.H. Snooks	PID	
Subject	LES-NM: Highways		

DISCUSSION:

07/01/2003 Lou Ethridge (505-396-8602), secretary to Lea Count Manager Dennis Holmberg, called with the name of local propane distributor. I had called early in the day to get name of propane distributor because I was unable to contact Little's Transport Co., the name on a 10K-gal propane delivery truck w/ Missouri plates seen by GAH on a recent visit to the site. The distributor is Eddins-Walcher (915-758-2705) in Seminole, TX; local contact in Hobbs, NM, is Mike Kneese (505-393-2197).

07/01/2003 Called Mike Kneese (505-393-2197) to get info on size and frequency of propane deliveries using Hwy Rt 234/176. Kneese said they have deliveries passing the area daily. They use 10k-gal trucks, but only fill to about 80%, or ~9,200 gal due to a weight limit. The DOT fill limit is 85%. Asked about other distributors, like Little's Transport. Kneese said K&W Fuels is also located in Hobbs and that the Little's truck could have been coming from Mexico.

07/08/2003 Called Mike Kneese (505-393-2197) to get additional info on size and frequency of propane deliveries using Hwy Rt 234/176. Transport trucks (10K-gal) traverse Rt 234/176 about 2-3 times per day, alternating 5 days one week and 6 days the next week. Contact at K&W Fuels is Keith Pearson (505-393-5135)

07/08/2003 Called K&W Fuels (505-393-5135) to get info on propane transport along Rts 234/176. Mike Pearson took the call. K&W don't use transport trucks (10K-gal), instead, have 3 "bob tails" ranging between 2,100-2,600 gals. Usually don't go south of Hobbs to Rt 234/176 area; if so, only once every 2 weeks. Asked MP about transport trucks traveling from Mexico. MP said gas companies used trucks to bring propane from processing plants to Mexico, but not too frequent and usually only when trouble w/ gas pipelines.

TELEPHONE CONVERSATION
REGULATORY COMPLIANCE PROGRAMS- MARLBOROUGH

Call With	See Below	Date	See Below
Phone #	See Below	Time	See Below
By	J.H. Snooks	PID	
Subject	LES-NM: Railroads		

DISCUSSION:

6/30/2003 Called Curtis Goodin (806-637-8323) to get info on hazardous materials transported on rail line near site. Goodin wanted a letter request on company letterhead before releasing any info.

7/1/2003 Jim Berry (505-318-4260) returned my called of yesterday w/ another railroad contact: Tracy Davis (312-466-0900, x14 or cell 312-371-6485, e-mail: davist@iwapacific.com).

7/2/2003 Called Tracy Davis re: info on hazardous materials transported on rail line, namely high flammables/explosives like propane. Davis said propane is transported only north of Eunice (beyond 5 miles from NEF); hazmat through Enuice includes some poisonous gas, hydrochloric acid, and lub oils. The spur hauls "contaminated dirt."

Davis said a detailed list would require a letter request, which I prepared and sent via fax (312-466-9589) and e-mail. See attached.

FRAMATOME ANP

An AREVA and Siemens Company

FRAMATOME ANP, Inc.

July 2, 2003
RCP 03-006

Mr. Tracy Davis
Iowa Pacific Holdings, LLC
P.O. Box 618181
Chicago, IL 60661

Dear Mr. Davis:

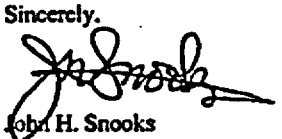
As mentioned in our telephone conversation today, Framatome ANP (FANP) has been contacted to conduct a preliminary engineering risk and environmental investigation of two land parcels near Eunice, New Mexico. Part of our investigation includes gathering data on hazardous materials that could potentially affect the operation of the facility being considered for development on the land parcels.

The two land parcels are referred in New Mexico as Sections 32 and 33. They are adjacent to New Mexico Highway 234, about five miles east of Eunice. The sites are also a short distance from the Iowa Pacific rail line that runs north-south through Eunice, with a rail spur running through the parcels to the WCS facility in nearby Texas.

Please provide us with a list of hazardous materials, their quantities, and frequencies of transport on the rail line and spur. We are principally interested in materials that could explode or cause large fires, such as propane and butane, and toxic materials, such as chlorine or other poisonous gases.

FANP appreciates your assistance in our efforts and thanks you for your cooperation. I am available to answer any questions or provide additional information, if needed.

Sincerely,



John H. Snooks
Senior Environmental Consultant

978-568-2725 (work)
978-568-3731 (fax)
john.snooks@framatome-anp.com

Attachment B –Hazardous Materials Transported by Railroad, 2002

2002

Commodity	Car Type	Destination	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Notes
Hydrochloric acid	tankcar	Eunice	10	26	14	13	26	18	10	7	17	15	22	15	195	hydrochloric acid, destination south of Windmill Hill switch
Petroleum	tankcar	Hobbs	3	3	2	3	11	3	3	1	4	3	3	4	43	lubrication oil
Hydrochloric acid	tankcar	Hobbs	23	5	8	16	13	16	13	16	10	13	20	16	173	hydrochloric acid
Lube Oils	tankcar	Hobbs								1	1	2	1	1	6	lube oil, methanol
Chemicals	tankcar	Hobbs	7	7	3	8	3	8	5	6	7	9	7	4	74	methanol, xylenes, petroleum distillates
Hydrochloric acid	tankcar	Hobbs	10	1	14	7	13	8	16	4	12	3	9	16	117	hydrochloric acid
Chemicals	tankcar	Levington	2	1	1	2		2	2	1	1	1	2	2	17	hydrogen chloride gas (hazard zone "B")
Haz Soils/Waste	gondolacontainer	Windmill Hill	115	34	28	87	6		11	11	10	41	12	7	362	contaminated earth, low-level radiation contaminated earth
Storage Cars	various										116	44	42	21	223	various, including liquefied petroleum gas residue, anhydrous ammonia residue
		Total	170	77	76	136	74	85	62	47	176	131	116	90	1210	

Attachment C – WCS Chemical Inventory

EPA - Envirofacts Warehouse - TRI

Toxics Release Inventory (TRI)

Recent Additions | Contact Us | Print Version EF Search:

EPA Home > Envirofacts > TRI > Chemical Report

This script opens a separate window for reporting data errors

Chemical Report

WASTE CONTROL SPECIALISTS L.L.C.
TRI Facility ID: 79714WSTCN9998H
Query executed on OCT-09-2003
Results are based on data extracted on SEP-26-2003

Chemical NameTRI Chemical ID2001200019991998
2,4,5-TRICHLOROPHENOL000095954Not ReportedReportedNot ReportedNot Reported
ALUMINUM OXIDE (FIBROUS FORMS)001344281ReportedReportedNot ReportedNot Reported
ARSENIC007440382ReportedReportedReportedReported
ASBESTOS (FRIABLE)001332214ReportedNot ReportedNot ReportedNot Reported
BARIUM007440393ReportedReportedReportedReported
CADMIUM007440439Not ReportedReportedReportedReported
CHROMIUM007440473ReportedReportedReportedReported
COBALT COMPOUNDSN096Not ReportedReportedNot ReportedNot Reported
COPPER007440508ReportedReportedNot ReportedNot Reported
CRESOL (MIXED ISOMERS)001319773Not ReportedReportedNot ReportedNot Reported
CYANIDE COMPOUNDSN106Not ReportedNot ReportedReportedReported
DIETHANOLAMINE000111422Not ReportedNot ReportedReportedReported
DIOXIN AND DIOXIN-LIKE COMPOUNDSN150Not ReportedReportedNot ReportedNot Reported
ETHYLENE GLYCOL000107211Not ReportedReportedReportedReported
LEAD007439921Not ReportedReportedReportedReported
LEAD COMPOUNDSN420ReportedNot ReportedNot ReportedNot Reported
MANGANESE COMPOUNDSN450ReportedReportedNot ReportedNot Reported
MERCURY007439976Not ReportedReportedNot ReportedNot Reported
MOLYBDENUM TRIOXIDE001313275Not ReportedReportedNot ReportedNot Reported
NICKEL007440020ReportedReportedNot ReportedNot Reported

NICKEL COMPOUNDSN495Not ReportedNot ReportedReportedReported
PHOSPHORUS (YELLOW OR WHITE)007723140ReportedNot ReportedNot ReportedNot Reported
POLYCHLORINATED BIPHENYLS001336363ReportedReportedReportedReported
POLYCYCLIC AROMATIC COMPOUNDSN590Not ReportedReportedNot ReportedNot Reported
TOLUENE000108883ReportedReportedNot ReportedNot Reported
TRICHLOROETHYLENE000079016Not ReportedReportedNot ReportedNot Reported
VANADIUM (EXCEPT WHEN CONTAINED IN AN ALLOY)007440622Not ReportedReportedNot ReportedNot Reported
XYLENE (MIXED ISOMERS)001330207ReportedReportedNot ReportedNot Reported
ZINC COMPOUNDSN982Not ReportedNot ReportedReportedReported

Attachment D – CH2MHill Site Evaluation Report

Site Evaluation Program

Supplement to Final Report

Prepared for

URENCO, Ltd.
United Kingdom
and
Louisiana Energy Services

August 2003

Prepared by

CH2MHILL
115 Perimeter Center Place
Suite 700
Atlanta, GA 30346

4.2.4 Criterion 8, Proximity to Hazardous Operations/High Risk Facilities

The evaluation of this criterion established the risk to the proposed facility from any nearby facilities. For analysis purposes, extant nuclear-related facilities were not considered a detriment.

4.2.4.1 Eddy County, NM

There are no facilities storing or handling large quantities of hazardous chemicals within 5 miles. However, the adjacent WIPP Site handles large quantities of transuranic wastes. There are no major propane pipelines within 2 miles of the site, although a high-pressure gas line runs through the WIPP Site, approximately 0.5 miles south of the site. There are no commercial airports within 10 miles, and the site is not located in a general emergency area. Other than the WIPP facility, there are no facilities within 5 miles that would provide a nearby emissions source that could potentially affect air quality.

4.2.4.2 Lea County, NM

There are no facilities storing or handling large quantities of hazardous chemicals within 5 miles. However, the adjacent WCS Site treats and disposes of large quantities of hazardous wastes and treats and stores low-level mixed wastes. There are no major propane pipelines within 2 miles of the site. There are no commercial airports within 10 miles, and the site is not located in a general emergency area. Neighboring industry, e.g., Wallach Sand and Gravel Company, oil and gas extraction wells, etc., have particulate and organic emissions that could potentially have a negative impact on air quality at the proposed facility.

4.2.5 Criterion 9, Ease of Decommissioning

The evaluation of this criterion analyzed potential sites for characteristics that would make demolition and decommissioning more difficult. Both sites score high for this criterion. With proper controls, stormwater can be managed acceptably at both sites. No issues with property transfer and redevelopment or residual contamination are expected.

4.2.6 Criterion 10, Adjacent Sites' Medium-/Long-Term Plans

The evaluation of this criterion analyzed the potential that construction activities adjacent to sites would cause nuisance issues, including noise, dust, and traffic.

4.2.6.1 Eddy County, NM

Little or no future development activity is anticipated in the area surrounding the site during the next 3 to 5 years; therefore, no nuisance issues associated with construction activities adjacent to the site are anticipated.

4.2.6.2 Lea County, NM

Construction activities are anticipated to continue at the neighboring facilities, e.g., Wallach Sand and Gravel Company, Lea County Landfill, and the WCS Landfill; and these activities could cause nuisance issues, such as dust. However, minimal noise and traffic issues are anticipated as a result of these ongoing activities.

Attachment E – External Events ISA for NEF – ISA Team Meeting – 9/24/03

External Events ISA for NEF
ISA Team Meeting – 9/24/03

ISA Team
Allan Brown – Urenco
Dave Pepe – Framatome ANP
Scott Tyler – Framatome ANP
Herold Voschezang – Urenco
Randy Campbell – Lockwood Greene
George Harper – Framatome (External Events)

Enrichment Plant – Areas Requiring External Event Design Basis of "Highly Unlikely"

- Separations Building Module (UF_6 areas, Cascade Halls and Process Service Areas)
- Blending and Liquid sampling
- CRDB
- TSB (portions)
- Centrifuge Test Facility
- UBC Storage (Flooding, Local Intense Precipitation and Transportation and Nearby Facilities (Aircraft, Highways, Railroads and Pipelines)

<u>NEF External Events</u>

Tornado and High Winds – Site-specific study nearing completion. Will provide 10^{-5} tornado wind speed, straight wind speed and tornado missiles. Assuming tornado damage could produce "high consequence" requires "highly unlikely" likelihood category. Bounds dust storms.

Seismic – Site-specific study nearing completion. Will provide 10^{-1} to 10^{-5} seismic hazard, PGA. Assuming seismic damage could produce "high consequence" requires "highly unlikely" likelihood category.

Local Intense Precipitation – Site-specific study results provide 17.3 inches in 1-hour. Developed in accordance with NRC guides and should meet "highly unlikely" likelihood category. Should be applied in detailed roof design to ensure roof ponding will not exceed roof design. Controlled by parapet height limit or by scuppers. Local site topography should be established to preclude flooding from local area runoff

Flooding – No nearby rivers. Monument Draw is located several miles away. Flooding from this source is "not credible". Large on-site water storage tanks will need detailed design that supports no flooding of critical plant areas. On-site ponds will need detailed design that supports no flooding of critical plant areas.

Snow – Site-specific study results provide ground snow load of 32 psf (100-year snow load plus 48-hour probable maximum winter precipitation. Developed in accordance with NRC guides and should meet "highly unlikely" likelihood category. Should be applied in detailed roof design to ensure against roof collapse.

Transportation and Nearby Facilities (Aircraft, Highway, Railroads, Pipelines and On-site use of Gas)

- Aircraft data is still being collected, expected to be "highly unlikely" or "not credible".
- Highway – Adverse impact from explosion of propane trucks traveling by site will be "highly unlikely" or better.
- Railroads – Adverse impact from explosion is "not credible."
- Pipeline – Adverse impact from explosion will be "highly unlikely" or better. Worker safety not an ISA issue.
- Use of gas in CUB for heating – Adverse impact from explosion is "highly unlikely".

External Event Drawing Review

Review drawings and identify areas that require "highly unlikely" likelihood category. This requirement is based on the assumed accident producing "high consequence" to the public. Therefore accident initiator needs to be eliminated/mitigated. All drawings are Revision A, except as noted.

During the meeting, the entire team reviewed each of the drawings listed below along with each external event under consideration. Areas or buildings require explicit design basis were discussed and identified.

1000A2000:	All areas require "highly unlikely" external events design basis for all external events.
1000A2100:	All areas require "highly unlikely" external events design basis for all external events.
1000A2200:	All areas require "highly unlikely" external events design basis for all external events.
1000A4000:	All areas require "highly unlikely" external events design basis for all external events.
1100A2000a:	All areas require "highly unlikely" external events design basis for all external events.
1100A2000b:	All areas require "highly unlikely" external events design basis for all external events.
1200A2000:	All areas require "highly unlikely" external events design basis for all external events.
1300A2000:	Centrifuge Test Facility require "highly unlikely" external events design basis for all external events.

1300A2100: Centrifuge Test Facility require "highly unlikely" external events design basis for all external events.

1300A2200: Centrifuge Test Facility require "highly unlikely" external events design basis for all external events.

1500A2000: Specific Rooms (Solid Waste Collection, Ventilated, Chem Lab – Sample Storage and Decontamination (Tornado only)) require "highly unlikely" external events design basis for all external events.

1500A2100: Specific Rooms (Solid Waste Collection, Ventilated, Chem Lab – Sample Storage and Decontamination (Tornado only)) require "highly unlikely" external events design basis for all external events.

1600A2000: No areas require "highly unlikely" external event design basis.

C-2, Rev. 0: Potentially contaminated evaporative pond – only external event considered was tornado, others screened out. Since pond normally will have water in it, dispersal of uranium during site tornado hit is not likely. Furthermore, wind dispersal of any uranium picked up would be large. Team decided the pond is only an occupational and public dose issue and not an ISA issue.

UBC Storage Pad - Seismic screened out. Tornado also screened out due to cylinder weight, missiles not likely to produce large release. Pad area needs to be protected from flooding. Others (aircraft, pipeline explosions, etc.) screened out.

Attachment F - Design Verification Checklist

RAMATOME ANP

DESIGN VERIFICATION CHECKLIST

Document Identifier 51 - 2400552 - 01

Title Assessment of Other External Event Hazards at NEF for ISA and Design Basis

1.	Were the inputs correctly selected and incorporated into design or analysis?	☒ Y	☐ N	☐ N/A
2.	Are assumptions necessary to perform the design or analysis activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent re-verifications when the detailed design activities are completed?	☒ Y	☐ N	☐ N/A
3.	Are the appropriate quality and quality assurance requirements specified? Or, for documents prepared per FANP procedures, have the procedural requirements been met?	☒ Y	☐ N	☐ N/A
4.	If the design or analysis cites or is required to cite requirements or criteria based upon applicable codes, standards, specific regulatory requirements, including issue and addenda, are these properly identified, and are the requirements/criteria for design or analysis met?	☒ Y	☐ N	☐ N/A
5.	Have applicable construction and operating experience been considered?	☐ Y	☐ N	☒ N/A
6.	Have the design interface requirements been satisfied?	☐ Y	☐ N	☒ N/A
7.	Was an appropriate design or analytical method used?	☒ Y	☐ N	☐ N/A
8.	Is the output reasonable compared to inputs?	☒ Y	☐ N	☐ N/A
9.	Are the specified parts, equipment and processes suitable for the required application?	☐ Y	☐ N	☒ N/A
10.	Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?	☐ Y	☐ N	☒ N/A
11.	Have adequate maintenance features and requirements been specified?	☐ Y	☐ N	☒ N/A
12.	Are accessibility and other design provisions adequate for performance of needed maintenance and repair?	☐ Y	☐ N	☒ N/A
13.	Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant life?	☐ Y	☐ N	☒ N/A
14.	Has the design properly considered radiation exposure to the public and plant personnel?	☐ Y	☐ N	☒ N/A
15.	Are the acceptance criteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished?	☐ Y	☐ N	☒ N/A
16.	Have adequate pre-operational and subsequent periodic test requirements been appropriately specified?	☐ Y	☐ N	☒ N/A
17.	Are adequate handling, storage, cleaning and shipping requirements specified?	☐ Y	☐ N	☒ N/A
18.	Are adequate identification requirements specified?	☐ Y	☐ N	☒ N/A
19.	Is the document prepared and being released under the FANP Quality Assurance Program? If not, are requirements for record preparation review, approval, retention, etc., adequately specified?	☒ Y	☐ N	☐ N/A

RAMATOME ANP

DESIGN VERIFICATION CHECKLIST

Comments: None

Verified By:	D.M. Pepe		12/15/03
(First, MI, Last)	Printed / Typed Name	Signature	Date