CAU Number(s): Description(s)
CAU 572: Test Cell C Ancillary Building and Structures

CAS Number(s): Description(s)
CAS 25-33-01: Building 3220, Equipment Building
CAS 25-33-02: Building 3230, Motor Drive Building
CAS 25-33-03: Building 3231, Pump House
CAS 25-33-04: Building 3232, Cryogenic Evaluation Lab
CAS 25-33-05: Building 3901, Engine Transport System Maintenance Building

Description of Modifications:
- Create CAU 572: Test Cell C Ancillary Building and Structures, in Appendix II (Industrial Sites DP).
- Create the following CASs in CAU 572:
  - 25-33-01: Building 3220, Equipment Building
  - 25-33-02: Building 3230, Motor Drive Building
  - 25-33-03: Building 3231, Pump House
  - 25-33-04: Building 3232, Cryogenic Evaluation Lab
  - 25-33-05: Building 3901, Engine Transport System Maintenance Building
  - 25-99-22: Ancillary Facilities

Justification: The proposed new CASs include buildings, ancillary facilities, and contaminated soil remaining at the Test Cell C compound that are currently not included in the FFACO. Agreements on funding for these sites have not yet been determined. Until funding agreements are finalized, these sites are being added to the FFACO as DP sites. Due to their association with historical operations at the Test Cell C compound, it is appropriate that releases from these buildings and ancillary facilities (dewars, water tower, piping, tanks) be investigated and closed through the FFACO process.

In addition, Building 3901, Engine Transport System Maintenance Building, near the Engine Maintenance, Assembly, and Disassembly (EMAD) facility in Area 25 will be added as CAS 25-33-05. This building is not included in an existing CAS under the FFACO because it was not previously included in the Environmental Management (EM) inventory. Building 3901 was transferred to the EM inventory in February 2009. Based on the historical operations that occurred in this building and its association with the EMAD facility, it is appropriate that releases from this building be investigated and closed through the FFACO process.

Contractor Approval (A-E): [Signature] Date: 3-1-11
Contractor Approval (M&O): [Signature] Date: 3-22-11
NNSA Approval: [Signature] Date: 3-24-11
Classification Officer Approval: [Signature] Date: 3-28-11
NDEP Approval Required: Yes ☑ No ☐ If Yes: Immediate Letter ☑ Next S-A Meeting ☐
Compliance with FFACO: Review by [Signature] Date: 3-28-11
Change Control No.: [Redacted] Date: 3-28-11
SECTION I: CAS GROUPING WORKSHEET

INSTRUCTIONS: Check the applicable boxes identified on the worksheet and fill in other information, where requested. Yes or No questions checked that contain an asterisk require that an FFACO Database Modification Request Form be completed and submitted. Please provide justification and recommendations for all items checked that contain an asterisk. Recommendations and alternatives should be made based on the results of the worksheet.

1. Can the CAS be characterized using existing technology? YES ☑ NO ☐

2. Is the CAS consistent with the types of sites characterized by the Project? ☑ ☐

3. Should this CAS be transferred to another CAU because the CAU is too large to conduct corrective actions? ☐ ☑

4. Can the CAS be concurrently characterized with other CASs within its CAU? ☑ ☐

5. Is this CAS part of, or adjoined to, a system that is addressed within another CAU? ☐ ☑

6. Is there any other type of potential FFACO modification issue that might exist for this CAS? If yes, what type of issue?
   ☐ CAS description requires modification
   ☐ CAS requires transfer to CAU 5000 (Archived Sites)
   ☐ CAS requires transfer to CAU 4000 (No Further Action Sites)
   ☐ CAS source group requires modification
   ☐ CAS functional category requires modification
   ☐ CAS location requires modification
   ☐ CAU description requires modification

SECTION II: JUSTIFICATION

The proposed new CAS includes a building (Building 3220, Equipment Building) at the Test Cell C compound that is currently not included in the FFACO. Responsibility for this structure was transferred to the Environmental Management (EM) program in February 2009. Due to its association with historical operations at the Test Cell C compound, it is appropriate that this building be investigated and closed through the FFACO process.
SECTION I: CAS GROUPING WORKSHEET

INSTRUCTIONS: Check the applicable boxes identified on the worksheet and fill in other information, where requested. Yes or No questions checked that contain an asterisk require that an FFACO Database Modification Request Form be completed and submitted. Please provide justification and recommendations for all items checked that contain an asterisk. Recommendations and alternatives should be made based on the results of the worksheet.

7. Can the CAS be characterized using existing technology?  
   YES ☒ NO ☐*  

8. Is the CAS consistent with the types of sites characterized by the Project?  
   YES ☒ NO ☐*  

9. Should this CAS be transferred to another CAU because the CAU is too large to conduct corrective actions?  
   YES ☐ NO ☒  

10. Can the CAS be concurrently characterized with other CASs within its CAU?  
    YES ☐ NO ☒  

11. Is this CAS part of, or adjoined to, a system that is addressed within another CAU?  
    YES ☐ NO ☒  

12. Is there any other type of potential FFACO modification issue that might exist for this CAS? If yes, what type of issue?  
    YES ☒ NO ☐  
    □ CAS description requires modification  
    □ CAS requires transfer to CAU 5000 (Archived Sites)  
    □ CAS requires transfer to CAU 4000 (No Further Action Sites)  
    □ CAS source group requires modification  
    □ CAS functional category requires modification  
    □ CAS location requires modification  
    □ CAU description requires modification  
    □ Other* Create CAS 25-33-02: Building 3230, Motor Drive Building, in newly created CAU 572: Test Cell C Ancillary Building and Structures.

SECTION II: JUSTIFICATION

The proposed new CAS includes a building (Building 3230, Motor Drive Building) at the Test Cell C compound that is currently not included in the FFACO. Responsibility for this structure was transferred to the Environmental Management (EM) program in February 2009. Due to its association with historical operations at the Test Cell C compound, it is appropriate that this building be investigated and closed through the FFACO process.
SECTION I: CAS GROUPING WORKSHEET
INSTRUCTIONS: Check the applicable boxes identified on the worksheet and fill in other information, where requested. Yes or No questions checked that contain an asterisk require that an FFACO Database Modification Request Form be completed and submitted. Please provide justification and recommendations for all items checked that contain an asterisk. Recommendations and alternatives should be made based on the results of the worksheet.

13. Can the CAS be characterized using existing technology? [X] YES [ ] NO

14. Is the CAS consistent with the types of sites characterized by the Project? [X] YES [ ] NO

15. Should this CAS be transferred to another CAU because the CAU is too large to conduct corrective actions? [ ] YES [X] NO

16. Can the CAS be concurrently characterized with other CASs within its CAU? [X] YES [ ] NO

17. Is this CAS part of, or adjoined to, a system that is addressed within another CAU? [ ] YES [X] NO

18. Is there any other type of potential FFACO modification issue that might exist for this CAS? If yes, what type of issue?
   [ ] CAS description requires modification
   [ ] CAS requires transfer to CAU 5000 (Archived Sites)
   [ ] CAS requires transfer to CAU 4000 (No Further Action Sites)
   [ ] CAS source group requires modification
   [ ] CAS functional category requires modification
   [ ] CAS location requires modification
   [ ] CAU description requires modification

SECTION II: JUSTIFICATION
The proposed new CAS includes a building (Building 3231, Pump House) at the Test Cell C compound that is currently not included in the FFACO. Responsibility for this structure was transferred to the Environmental Management (EM) program in February 2009. Due to its association with historical operations at the Test Cell C compound, it is appropriate that this building be investigated and closed through the FFACO process.
SECTION I: CAS GROUPING WORKSHEET

INSTRUCTIONS: Check the applicable boxes identified on the worksheet and fill in other information, where requested. Yes or No questions checked that contain an asterisk require that an FFACO Database Modification Request Form be completed and submitted. Please provide justification and recommendations for all items checked that contain an asterisk. Recommendations and alternatives should be made based on the results of the worksheet.

19. Can the CAS be characterized using existing technology? YES ☒ NO ☐*

20. Is the CAS consistent with the types of sites characterized by the Project? YES ☒ NO ☐*

21. Should this CAS be transferred to another CAU because the CAU is too large to conduct corrective actions? YES ☐ NO ☒*

22. Can the CAS be concurrently characterized with other CASs within its CAU? YES ☒ NO ☐*

23. Is this CAS part of, or adjoined to, a system that is addressed within another CAU? YES ☐ NO ☒*

24. Is there any other type of potential FFACO modification issue that might exist for this CAS? If yes, what type of issue?
   ☐ CAS description requires modification
   ☐ CAS requires transfer to CAU 5000 (Archived Sites)
   ☐ CAS requires transfer to CAU 4000 (No Further Action Sites)
   ☐ CAS source group requires modification
   ☐ CAS functional category requires modification
   ☐ CAS location requires modification

SECTION II: JUSTIFICATION

The proposed new CAS includes a building (Building 3232, Cryogenic Evaluation Lab) at the Test Cell C compound that is currently not included in the FFACO. Responsibility for this structure was transferred to the Environmental Management (EM) program in February 2009. Due to its association with historical operations at the Test Cell C compound, it is appropriate that this building be investigated and closed through the FFACO process.
SECTION I: CAS GROUPING WORKSHEET

INSTRUCTIONS: Check the applicable boxes identified on the worksheet and fill in other information, where requested. Yes or No questions checked that contain an asterisk require that an FFACO Database Modification Request Form be completed and submitted. Please provide justification and recommendations for all items checked that contain an asterisk. Recommendations and alternatives should be made based on the results of the worksheet.

25. Can the CAS be characterized using existing technology? YES ☒ NO ☐*

26. Is the CAS consistent with the types of sites characterized by the Project? ☒ ☐*

27. Should this CAS be transferred to another CAU because the CAU is too large to conduct corrective actions? ☐* ☒

28. Can the CAS be concurrently characterized with other CASs within its CAU? ☐ ☒*

29. Is this CAS part of, or adjoined to, a system that is addressed within another CAU? ☐* ☒

30. Is there any other type of potential FFACO modification issue that might exist for this CAS? If yes, what type of issue?

☐ CAS description requires modification
☐ CAS requires transfer to CAU 5000 (Archived Sites)
☐ CAS requires transfer to CAU 4000 (No Further Action Sites)
☐ CAS source group requires modification
☐ CAS functional category requires modification
☐ CAS location requires modification
☐ CAU description requires modification

SECTION II: JUSTIFICATION

The proposed new CAS includes a building (Building 3901, Engine Transport System Maintenance Building) at the EMAD compound that is currently not included in the FFACO. This building is not included in an existing CAS under the FFACO because it was not previously included in the Environmental Management (EM) inventory. Building 3901, Engine Transport System Maintenance Building, was transferred to the EM inventory in February 2009. Based on the historical operations that occurred in this building and its association with the EMAD facility, it is appropriate that this building be investigated and closed through the FFACO process.
**SECTION I: CAS GROUPING WORKSHEET**

**INSTRUCTIONS:** Check the applicable boxes identified on the worksheet and fill in other information, where requested. Yes or No questions checked that contain an asterisk require that an FFACO Database Modification Request Form be completed and submitted. Please provide justification and recommendations for all items checked that contain an asterisk. Recommendations and alternatives should be made based on the results of the worksheet.

31. Can the CAS be characterized using existing technology? [☐] YES [☐] NO

32. Is the CAS consistent with the types of sites characterized by the Project? [☐] YES [☐] NO

33. Should this CAS be transferred to another CAU because the CAU is too large to conduct corrective actions? [☐] YES [☐] NO

34. Can the CAS be concurrently characterized with other CASs within its CAU? [☐] YES [☐] NO

35. Is this CAS part of, or adjoined to, a system that is addressed within another CAU? [☐] YES [☐] NO

36. Is there any other type of potential FFACO modification issue that might exist for this CAS? If yes, what type of issue?

☐ CAS description requires modification
☐ CAS requires transfer to CAU 5000 (Archived Sites)
☐ CAS requires transfer to CAU 4000 (No Further Action Sites)
☐ CAS source group requires modification
☐ CAS functional category requires modification
☐ CAS location requires modification
☐ CAU description requires modification

**SECTION II: JUSTIFICATION**

The proposed new CAS includes ancillary facilities remaining at the Test Cell C compound that are currently not included in the FFACO. Responsibility for these structures was transferred to the Environmental Management (EM) program in February 2009. Due to their association with historical operations at the Test Cell C compound, it is appropriate that these ancillary facilities (dewars, water tower, piping, tanks) be investigated and closed through the FFACO process.

SECTION I: SITE INFORMATION

The proposed new CASs include buildings and ancillary facilities remaining at the Test Cell C compound that are currently not included in the FFACO. Responsibility for these structures was transferred to the Environmental Management (EM) program in February 2009 (Attachment A). Due to their association with historical operations at the Test Cell C compound, it is appropriate that these buildings and ancillary facilities (dewars, water tower, piping, tanks) be investigated and closed through the FFACO process.

The creation of CAU 572: Test Cell C Ancillary Building and Structures, containing CASs 25-33-01, 25-33-02, 25-33-03, 25-33-04, and 25-99-22 is necessary to place the sites under FFACO authority.

In addition, Building 3901, Engine Transport System Maintenance Building, near the Engine Maintenance, Assembly, and Disassembly (EMAD) facility in Area 25 will be added as CAS 25-33-05. This building is not included in an existing CAS under the FFACO because it was not previously included in the Environmental Management (EM) inventory. Building 3901 was transferred to the EM inventory in February 2009 (Attachment A). Based on the historical operations that occurred in this building and its association with the EMAD facility, it is appropriate that this building be investigated and closed through the FFACO process.

All of the proposed CASs except 25-33-05 are located inside the fence surrounding the Test Cell C compound in Area 25 of the Nevada National Security Site (NNSS). This area is posted "Caution Radioactive Material". The compound was used from 1961 to 1973 to conduct the testing of nuclear engine reactors as part of the Nuclear Rocket Development Station (NRDS). The Test Cell C compound also supported the testing of reactor components in cryogenic and nuclear environments. Corrective Action Site 25-33-05 is located at the EMAD compound which was also used to conduct the testing of nuclear engine reactors as part of the Nuclear Rocket Development Station (NRDS). In addition, Building 3901 (CAS 25-33-05) was used to process radioactively contaminated soil.

CAS 25-33-01: Building 3220, Equipment Building, was constructed in 1961 and is an "L"-shaped concrete building with an area of approximately 7,850 square feet (Attachment B). According to a 1967 engineering drawing, this building had multiple rooms, including a cryogenic bench lab, pump and electric shops, water pump room, auxiliary shop, electrical equipment room, local control room, and compressor room (Attachment C).

CAS 25-33-02: Building 3230, Motor Drive Building, was constructed in 1961 and is a square building with an area of approximately 3,820 square feet (Attachment B). According to the NRDS Master Plan 1969-1970, this building was used as the pump motor enclosure (Attachment D). The main building is constructed of reinforced 12-inch thick concrete and a metal roof; an addition to the building is constructed of a steel frame with insulated metal walls (Attachment E). According to the 1996 Decontamination and Decommissioning Facilities Evaluation Report, this building appeared to be used for storage at the time, but was listed "in
excess" on the facility use permit (Attachment E). This report also indicates that Building 3230 contains two open pits, approximately 5 feet deep.

CAS 25·33-03: Building 3231, Pump House, was constructed in 1961 and is a square concrete building with an area of approximately 815 square feet (Attachment B). According to the NRDS Master Plan 1969-1970, this building was used for scrubber experiments (Attachment D). This building is located adjacent to Buildings 3230 and 3232 (Attachment F).

CAS 25·33-04: Building 3232, Cryogenic Evaluation Lab, was constructed in 1961 and is a square metal building with an area of approximately 1,450 square feet (Attachment B). In the NRDS Master Plan 1969-1970, the building use is listed as "cryogenic experiments"; in the NSDP Database Index, the building is listed as 'storage' (Attachments B and D). This building is located adjacent to Building 3231 (Attachment F).

CAS 25·33-05: Building 3901, Engine Transport System Maintenance, is located near the Engine Maintenance, Assembly, and Disassembly (EMAD) facility in Area 25. This building is not included in an existing CAS under the FFACO because it was not previously included in the Environmental Management (EM) inventory. Building 3901 was transferred to the EM inventory in February 2009 (Attachment A). Based on the historical operations that occurred in this building and its association with the EMAD facility, it is appropriate that this building be investigated and closed through the FFACO process.

CAS 25·33-05: Engine Transport System Maintenance Building, was constructed in 1965 and originally used as a maintenance building for the trains that supported Nuclear Rocket Development Station work in Area 25. The building is located north of the EMAD facility (Building 3900): The steel-frame shed is approximately 110 feet long, 47 feet 8 inches wide, and 50 feet tall and approximately 5,280 square feet in area (Attachments H and I). The building features a below-grade service pit that runs the approximate length of the building, which allowed the trains to be serviced from below (Attachment H). The building was used in the mid-1980s for limited treatability tests on plutonium-contaminated soil, which resulted in contamination of the building interior (Attachment J). The building is a Beryllium legacy site and is currently posted for radiological control as a "Contamination Area".

CAS 25·99·22: Ancillary Facilities, includes the following:

- **Dewars #1, #2, #4, and #5:** Dewars #1 and #2, referred to collectively as Building 3218, are located west (Attachment F) of Building 3210, Test Cell C Facility. These two metal above-ground storage tanks each have a capacity of 500,000 gallons and were used to hold liquid hydrogen during Test Cell C operations (Attachments D and G). Dewars #4 and #5, referred to collectively as Building 3213, are located east of Building 3231 and each have a capacity of 50,000 gallons. These two dewars were also used to store liquid hydrogen (Attachment D).

- **Borated Water, Shield and Privy System:** This system is located east of Building 3220 ("L"-shaped building highlighted on Attachment C – use Attachment C and Attachment F to locate structures within Test Cell C) and includes Buildings 3203 (utility water cooling tower – found on Attachment C, east of Building 3220 as the northernmost highlighted structure labeled COOLING TOWER), 3207 (150,000-gallon borated water storage tank – found on Attachment C, east of Building 3220 as the second most northern highlighted structure that is octagonal shaped with cross hatch pattern), 3208 (150,000-gallon elevated water tank – found on Attachment C, east of Building 3220 as the southernmost highlighted structure labeled ELEV. WATER TANK), and a mix tank.
(found on Attachment C, east of Building 3220 as the yellow highlighted structure south of the 150,000-gallon borated water storage tank, round in shape with a cross hatch pattern).

- **Process Water Storage Tank and Boiler/Heater**: This aboveground storage tank and associated boiler/heater are located just inside the fence line, west of Building 3220 ("L"-shaped building in Attachments C and F). These features are not identified with a building number on the engineering drawings reviewed. The building list in Attachment D refers to a "Process Water Tank" as Building 3209, however it is uncertain if this is the same tank identified on the drawings. The building list indicates the tank was used for the storage of process water.

- **Flare Stack Line**: This feature is visible on Test Cell C engineering drawings (Attachments C and F) and appears to originate between Buildings 3210 and 3232. According to the drawings, the line extends approximately 1,000 meters to the east where it terminates at the "main flare stack". Any existing surface feature still present at the "main flare stack" will also be included in this CAS.

**SECTION II: ATTACHMENTS**

Attachment B: Excerpt from "NSDP Database Index", 1993
Attachment C: Engineering Drawing, "Test Cell C Layout", 1967
Attachment E: Excerpt from Decontamination and Decommissioning Facilities Evaluation Report, 1996
Attachment F: Engineering Drawing, "Existing Water and Sewer Layout, Test Cell C", 1984
Attachment G: Photograph of Dewars #1 and #2, 1998
Attachment H: Engineering Drawing of Building 3901, 1966
Attachment I: Record of Environmental Condition form for CAU 114, CAS 25-41-03, 2006
Attachment J: Excerpt from Facility Evaluations document, 1993
Attachment A
MEMORANDUM FOR THOMAS P. D'AGOSTINO
ADMINISTRATOR AND UNDER SECRETARY FOR
NUCLEAR SECURITY NATIONAL NUCLEAR
SECURITY ADMINISTRATION

FROM: INÉS R. TRIAY
ACTING ASSISTANT SECRETARY FOR
ENVIRONMENTAL MANAGEMENT

SUBJECT: Environmental Management Transfer Decisions for Office
of National Nuclear Security Administration Excess
Facilities and Materials

In December 2007, the Assistant Secretary for Environmental Management (EM)
requested the Department of Energy Program Secretarial Offices (PSOs) of Nuclear
Energy, Science, and the National Nuclear Security Administration (NNSA) to
nominate facilities and legacy materials for possible transfer to EM. The impetus
for that request was the Deputy Secretary of Energy’s fiscal year (FY) 2008
Program Decision Memorandum (PDM) EM-08-1 Rev 1, dated August 10, 2006,
which mandated that EM begin accepting surplus assets from other PSOs into its
program. In accordance with the PDM, former EM Assistant Secretary
James Rispoli issued a memorandum to other DOE Program Offices on
December 21, 2007, outlining the process for nominating assets for transfer to EM.

NNSA’s response to EM’s December 2007 request, dated February 12, 2008,
identified legacy unfunded liabilities for possible transfer at four sites, the Nevada
Test Site (NTS), the Lawrence Livermore National Laboratory (LLNL), the Los
Alamos National Laboratory (LANL) and the Savannah River Site (SRS). With
regard to those nominations, this memorandum documents EM’s final decisions on
the excess facilities EM will accept from NNSA. EM made these determinations
after a thorough review of the candidate facilities, which included comprehensive
in-person facility assessments (“walkdowns”), document reviews and discussions
with NNSA Headquarters and field personnel. Attachment 1 of this memorandum
identifies the fourteen surplus facilities and ancillary structures EM will accept for
transfer. The mandatory generic and specific pre-transfer requirements for each
facility are noted in the Assessments of Facilities, Materials and Wastes Proposed
for Transfer to DOE EM, September 23, 2008. It is also mandatory for all nuclear
facilities to be transferred and must have compliant safety basis documents pursuant
to 10 CFR 830, Nuclear Safety Management.

EM would like to begin discussions with NNSA as soon as possible to reach
agreement on a formal schedule for facility transfers. In determining the actual
timing, EM will consider both the urgency and/or priority of transfer and the
availability of EM funds to perform the work. EM would like to complete the
schedule with NNSA by the end of June 2009, so that facilities to be transferred can
be included in FY10 EM baseline planning. EM requests that NNSA identify a
point-of-contact who will work with my staff to achieve a final schedule.

To initiate the next steps, please have your assigned staff contact
Mr. Jay Rhoderick, Director, Office of Strategic Planning and Analysis, at
(301) 903-7211.

Attachment

cc:
James Owendoff, EM-3
Cynthia Anderson, EM-3
James Fiore, EM-5/6
Frank Marcinowski, EM-10
Christine Gelles, EM-12
Mark Gilbertson, EM-20
Yvette Collazo, EM-23
Merle Sykes, EM-30
Jay Rhoderick, EM-32
Jack Surash, EM-50
Tom Evans, EM-53
Lowell Ely, EM-53
LANL:
IA-3 Ion Beam, Building 3-16
NOTE: Contaminated facility meeting criteria in 430.1B. NNSA has implemented EM's prior stabilization requirements.

LLNL:
Slab and Sub-Grade, Building 212
NOTE: Contaminated facility meeting criteria in 430.1B.

Heavy Element Facility D&D, Building 251
NOTE: Contaminated facility meeting criteria in 430.1B.

Hot Cell Foundation, Slab and Sub-Grade, Building 412
NOTE: Contaminated facility meeting criteria in 430.1B.

Advanced Test Accelerator Facility, Building 865
NOTE: Contaminated facility meeting criteria in 430.1B.

NTS:
Equipment Building 25-3220
NOTE: Contaminated facilities meeting criteria in 430.1B. Also associated with current EM D&D projects.

Motor Drive Building 25-3230
NOTE: Contaminated facilities meeting criteria in 430.1B. Also associated with current EM D&D projects.

Pump Shop, Building 25-3231
NOTE: Contaminated facilities meeting criteria in 430.1B. Also associated with current EM D&D projects.

Cryogenic Laboratory, Building 25-3232
NOTE: Contaminated facilities meeting criteria in 430.1B. Also associated with current EM D&D projects.

Locomotive Storage Shed, Building 25-3901
NOTE: Contaminated facilities meeting criteria in 430.1B. Also associated with current EM D&D projects.

Ancillary facilities part of the Test Cell C facility compound (other than those above)
NOTE: These are ancillary facilities, such as large hydrogen dewars and cooling towers directly related to EM scope in the same immediate area. This is scope identified by NTS, subsequent to the January 2008 submittals.
SRS:
Tritium Manufacturing Facility, Building 232-H
NOTE: Contaminated facility meeting criteria in 430.1B.

Two Ancillary Concrete Stacks, Building 232-H
NOTE: Contaminated facility meeting criteria in 430.1B.
Attachment B
NSDP
Database Index

Raytheon Services Nevada
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Attachment C
Attachment D
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<th>GROSS AREA</th>
<th>YEAR BUILT</th>
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<td>LH₂ Truck Unloading Station</td>
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<td>LH₂ Pump House (EL Drive)</td>
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<td>#3232 TCC</td>
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SECTION 8

FUNCTIONAL DESCRIPTION TEST CELL "C"

Test Cell "C" is designed for testing of Nuclear Rocket Reactors. The reactors are mounted on a railroad car and fired upward. The designed thermal power is 10,000 MW.

Certain propellants and pressurants are required for the testing of Nuclear Rocket Reactors. The Test Cell "C" storage capacity for these is:

- **Liquid Hydrogen**: 1,108,000 gallons
- **Gaseous Hydrogen**: 12,535/1 (2,410,570 SCF) @ 3,500 psi
- **Gaseous Hydrogen**: 13,535/1 (57,170 SCF) @ 3,500 psi
- **Gaseous Nitrogen**: 112,086/1 (541,700 SCF) @ 3,500 psi
- **Gaseous Nitrogen**: 35,985# (1,541,700 SCF) @ 3,500 psi
- **Gaseous Helium**: 7,718# (474,110 SCF) @ 3,500 psi
- **Liquid Nitrogen**: 84,000 gallons

Liquid hydrogen is used to cool the reactor and the resulting hot gaseous hydrogen is exhausted through a converging, diverging nozzle. The liquid is delivered to the reactor by two parallel pumps capable of approximately 185 lb/sec each. Hydrogen gas is used to pressurize the dewars and thereby providing the required Net Positive Suction Head to the pumps. The pumps are driven by turbines which are driven by hydrogen gas derived from the vaporization of the LH being passed through a water/H2O heat exchanger. The water is heated to 200°F by a propane heater.

All hydrogen is delivered to the test cell in the liquid form. The test cell is equipped with a hydrogen vaporizer that is used to charge the gaseous hydrogen storage vessels. The vaporizer pumps the liquid up to pressure and then converts the high pressure liquid to gas by the addition of heat. It will convert liquid at a rate of 40,000 SCF/hr and requires a minimum inlet pressure of 40 psi.

Liquid hydrogen can be loaded into the two 500,000 gallon dewars at a rate of 40,000 gal/hr. The two 50,000 gallon dewars can be filled at a rate of 175,000 gal/hr.

All enclosed areas are monitored to determine the presence of hydrogen. The equipment used are Beckman oxygen analyzers. These are connected to an alarm system which automatically sounds when the hydrogen level exceeds a predetermined setting.

During reactor operations, these enclosed areas are inerted with nitrogen and the oxygen content is monitored utilizing Beckman oxygen analyzers.

Helium is used for purging hydrogen lines and for emergency reactor cooling. The bottles can be charged at a rate of 12,000 SCF/hr.

Nitrogen gas is used for purging, pressurizing, cooling and room inerting. All buildings through which the main hydrogen line passes are filled with nitrogen prior to a test. This prevents a fire and/or explosion in the event of a hydrogen leak.

The test cell is equipped with a nitrogen vaporizer which converts liquid nitrogen from the storage dewars to gaseous nitrogen. The flow capability of the system is 60,000 SCF/hr, and can pump to a pressure of 3,500 psi.

The power available to the facility consists of a 69 KV 3-phase AC commercial system, 2 emergency diesel generators capable of producing 700 KW at 2,000 ft. EL., and a 28 V DC system for emergency valve control and shutdown. The generator is always on line parallel with the commercial system during reactor operations.

The facility is equipped with a 150,000 gallon elevated water tank, a 250,000 gallon tank for heated borated water and a 225,000 gallon tank for 200°F water. This last tank supplies water to the H2O/H2O heat exchanger.

Photo bunkers are located on the 1,000 foot arc north and west of the test cell. In addition, a 50-foot photo tower is located approximately 2,000 feet west of the cell. All are equipped with radiation hardened camera equipment for high speed motion pictures and/or stills.

Eight television chains are utilized to scan the entire facility during test operations. Some are radiation hardened and the remainder are standard commercial equipment.

A cryogenic evaluation laboratory is located in the facility. It is equipped with two large vacuum chambers in line with an 8-inch liquid hydrogen loop flowing from one 50,000 gallon dewar to the other. Controlled flow and pressure is provided by a 5,000 hp AC/DC motor drive which drives an LH2 pump capable of flowing approximately 75 lb/sec.

The entire facility is operated from a remote control point two miles away. All remote team switches all systems to remote control and the facility is vacated during a test. For more information on the Reactor Control Point, see its functional description elsewhere in this document.
Attachment E
Decontamination and Decommissioning Facilities Evaluation Report

July 1996
The main building has no windows; the exterior walls are 20 inches thick; and all openings are sealed with the exception of the east wall which has an opening near the bottom, approximately 3 feet deep by 8 feet wide. The exterior walls are in good structural condition. The exterior doors are metal and in good condition. The interior walls are reinforced concrete, 12 inches thick, and in good condition. There was no sign of water leaks on the interior walls, roof, or floors. All pressure gauges were zero, except PCV gauge 131 on the northwest end of the building. This gauge contained a reading of 150 pounds per square inch, but survey personnel could not determine to what the gauge was connected. Electrical Substation 25-12 appeared not to be operating and was not secured. Test Cell A (building 3113) and the Test Cell A addition (building 3113A) are not being used and are under User Permit Numbers 90-403 and 90-417 respectively.

**Recommendations**
The pressure gauge PCV 131 should be checked, and the system to which it is connected should be depressurized. The opening on the east wall should be sealed.

### 2.4 Test Cell C

Test Cell C Facility consists of the Test Cell C building, the motor drive building, the cryogenic evaluation laboratory, the pump house, the administrative building, and the air intake building. The buildings evaluated were the Test Cell C building (3210), the motor drive building (3230), the cryogenic evaluation laboratory (3232), and the pump house (3220) (see Figure 4).

Test Cell C building (3210) is constructed of reinforced concrete. The roof and walls are 20 inches thick. Some small cracks in the roof were noted on the west side, but there was no evidence of any leaks on the interior. The electrical power to the building is energized. The walls on the east side have unsealed openings. The exterior walls are in good structural condition. The exterior doors are metal and in good condition. The interior walls are reinforced concrete, 12 inches thick, and in good condition. There is no sign of water leaks on the interior walls, roofs, or floors. All pressure gauges read zero. Two nitrogen cylinders in the building are not properly capped or secured. Piping on the roof has possible ACM pipe insulation which is exposed and deteriorating. A 4-ft section of railing was missing from the east side of the roof creating a fall hazard. Several bolts are missing from the base of a yellow hoist on the northeast side of the roof, which could cause a severe injury if the hoist fell over. The building is currently being used as a training exercise location for BN under User Permit Number 96-0215.
The motor drive building (3230) is constructed of reinforced concrete walls, 12 inches thick, and has a metal roof. An addition has been made to this building, constructed of a steel frame with insulated metal walls. All sections of this building are in satisfactory structural condition with no apparent water damage to the roof, walls, or floor. Two pits, approximately 5 feet deep, did not contain protective railings, presenting a fall hazard. A section of 6-inch diameter, stainless steel piping, not properly supported is located on the east side of the building and could cause an injury if it fell over. The pump house is being used for storage possibly by the U.S. Geological Survey Water Resource Division. The facility use permit (number 90-408) states that the facility is “in excess” and is not occupied.

The cryogenic evaluation lab building (3232) is steel frame construction with insulated metal walls and roof, all in satisfactory structural condition. The building is not being used and is under User Permit Number 90-0256.

The pump house building (3220) consists of a north wing and an east wing. The north wing is constructed of reinforced concrete walls, and the roof is in satisfactory structural condition. The east wing is constructed of cinder block walls with a metal panel roof covered with tar and crushed rock on the exterior. The east wing roof is in very poor condition with a 1/2-inch crack running along the entire length. The roofing material has deteriorated along the crack and is very soft. The interior of the building exhibits many water stains along the walls and floor, and the interior metal roofing panels and supports have begun to rust. There are several open roof vents on the east wing, and the air conditioning (A/C) ducts are open. Exposed electrical wiring is present within and on the roof of the building. A flammable storage cabinet containing three small cylinders (1.3 cubic feet) of propane and a 1-gallon can of exterior house paint is present. A former lab area had possible acid stains (white, foam-like residue) located on the pallets and floor. The building is not being used and is under User Permit Number 90-0408.

**Recommendations**

The east wing of Building 3220 should be demolished because the damage to the roof is beyond repair and will continue to deteriorate, creating a safety hazard, and the opening on the east wall of Building 3210 should be sealed. The two open pits in Building 3230 need protective railings installed. The yellow hoist on the northeast corner of Building 3210 roof needs to be secured to the roof or taken down. Replace the four foot section of railing missing from the east side of the Building 3210 roof. Properly secure the 6-inch diameter stainless steel piping on the east side of building 3230. Two nitrogen bottles located in Building 3210 need to be correctly capped and secured or removed.
Attachment F
File: 254105cs7
Note: Photograph 9859-16, taken on October 29, 1998, shows the dewars and piping associated with the TCC Facility. Building 3210 is located behind the dewars in this photograph. This photograph was taken facing northeast. (IT, 1998-2000)
Attachment H
Attachment I
**Description**
Building 3901 could not be accessed. The door on the northwest side of the building is posted as "Caution Contamination Area." The door on the southeast side of the building is posted as "Caution Contamination Area" and "Danger Foot Protection Mandatory."

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<td>Dimensions are estimated and are taken from aerial photographs. Dimensions are of Building 3901.</td>
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<th>Width</th>
<th>Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>Feet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Height/Depth</th>
<th>Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Volume</th>
<th>N/A</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Diameter</th>
<th>N/A</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Container Volume</th>
<th>N/A</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Form</th>
<th>Liquid</th>
<th>Solid</th>
<th>Gas</th>
<th>Sludge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Waste Location</th>
<th>Surface</th>
<th>Near Surface (0-10 in)</th>
<th>Subsurface (Below 10 in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments/Justification**
Waste is solid and at the surface.
Attachment J
FACILITY EVALUATIONS

Prepared for:
DOE Nevada Operations Office
Las Vegas, Nevada

Prepared by:
IT CORPORATION
4330 South Valley View Boulevard, Suite 114
Las Vegas, Nevada 89103

Work Performed Under Contract No:
DE-AC08-92NV10972

October 1993
hazards presented by loose ceiling tiles, partially fallen light fixtures, and ceiling-suspended buckets collecting tar from the roof. The REECo Site Maintenance representative reported that the grade of tar used on the roof was too viscous. Also, on the west-side gallery, sheet rock covering steel building columns has been separated from the sheet-rock walls. The damage does not appear to be structural and was apparently caused by an earthquake in 1992. The first-floor roof is accessible from a door on the south side of building on second floor. The roof holds large air compressors and ducting. The overall condition on the second floor is satisfactory with the exception of the overhead obstruction hazard which represents an unsatisfactory condition and should be repaired. There's no contamination unless the transformer leaked or exploded. Should only be properly removed and disposed.

Third and Fourth Floors
On the third floor, extensive water stains were observed on the floor. These areas are marked on Figure 3-3. Loose radiological contamination exists in the crane maintenance room on "equipment" according to Smith (1981). The Change Room, Room 305, was posted as a radiation contamination area, but past surveys indicate the room to be uncontaminated (Smith, 1981). The fourth floor was not entered since access was obtained only by a vertical ladder. There is no record of radiological contamination on the fourth floor. Maintenance recommendations for the third floor are to determine the source of the water leak and to repair it. The leak represents a potential contaminant migration pathway.

Engine Transport System Maintenance Building
The Maintenance Building was posted as a radiation contamination area, and was not entered. Experiments involving separation of plutonium from soil were reportedly disturbed by weeds which apparently entered through large access doors in each end of the building and scattered the radioactive soils. The DOE and Lockheed Missile and Space Company Inc. currently