Group L

Group L Map

Building 4010

Includes Site 4807, Electrical Equipment Pad
Includes Site 4808, Electrical Equipment Pad
Includes Site 4809, Air Blast Heat Exchanger Pad

Building 4012

Includes Building 4713, Substation

Building 4013

Includes Building 4713, Substation
Includes Building 4823, Time Clock
Includes Building 4413, Uninterruptible Power Supply (UPS)

Building 4019

Includes Building 4719, Substation

Building 4228

Includes Building 4708, Substation for Inbound Power
Includes Site 4807, Electrical Equipment Pads
Includes Site 4808, Electrical Equipment Pads
Includes Site 4809, Air Blast Heat Exchanger Pad
Includes Building 4710, SCTI Power Pak Cooling Tower

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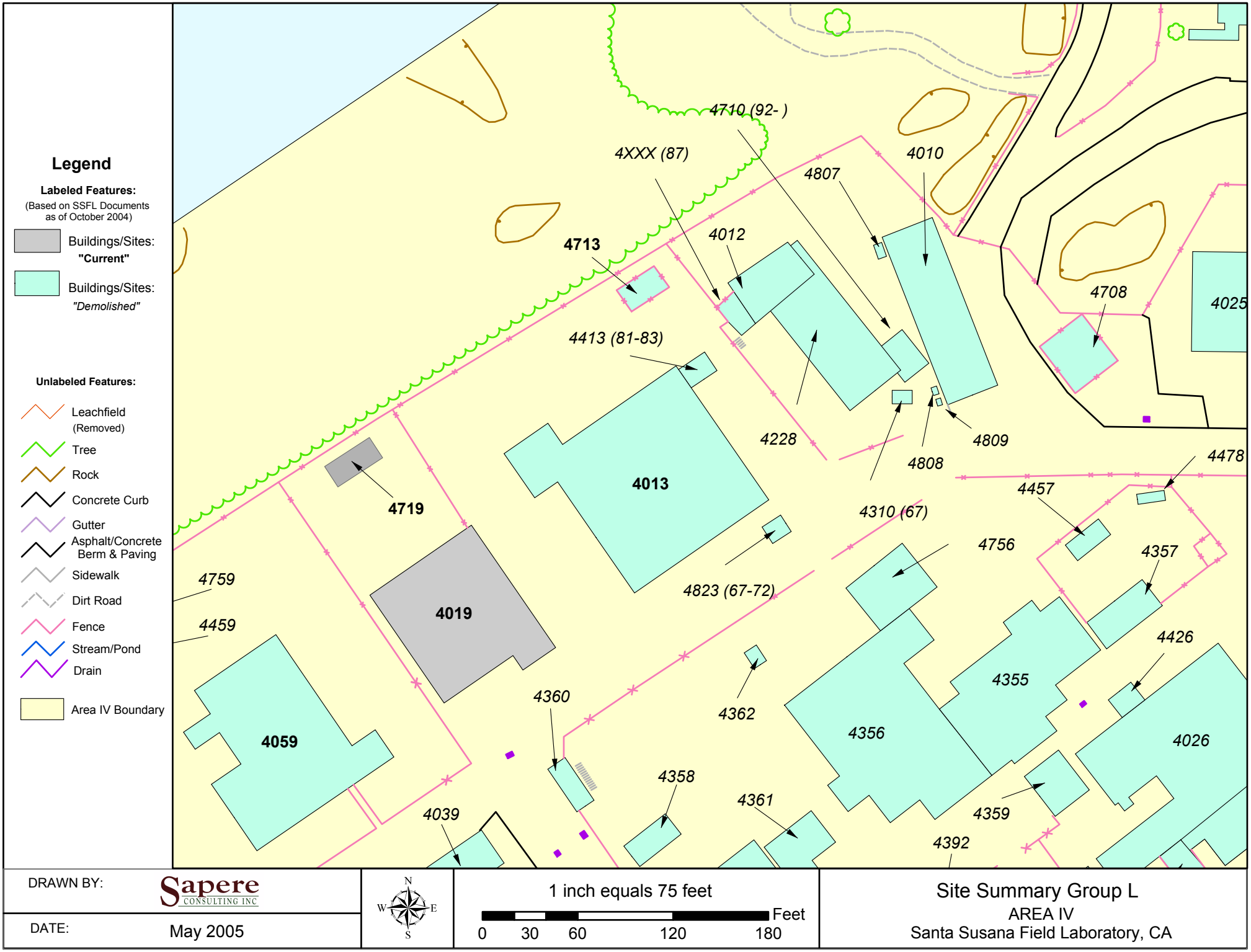
Legend
Labeled Features:
(Based on SSFL Documents as of October 2004)
Buildings/Sites: "Current"
Buildings/Sites: "Demolished"
Unlabeled Features:
Leachfield (Removed)
Tree
Rock
Concrete Curb
Gutter
Asphalt/Concrete Berm & Paving
Sidewalk
Dirt Road
Fence
Stream/Pond
Drain
Area IV Boundary
4710 (92-)
4XXX (87)
4010
4807
4012
4713
4708
4025
4413 (81-83)
4228
4809
4808
4478
4719
4013
4457
4310 (67)
4756
4357
4759
4823 (67-72)
4019
4459
4426
4355
4360
4362
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4026
4059
4358
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Sapere CONSULTING INC
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May 2005
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Feet
Site Summary Group L
AREA IV
Santa Susana Field Laboratory, CA

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Site Summary – Building 4010

Site Identification:

Building 4010
Systems for Nuclear Auxiliary Power (SNAP) 8 Experimental Reactor (S8ER) Facility
Includes Site 4807, Electrical Equipment Pad
Includes Site 4808, Electrical Equipment Pad
Includes Site 4809, Air Blast Heat Exchanger Pad

Operational Use/History:

- Constructed in 1959.
- Building 4010 was used for the 50 kWt SNAP 2 Experimental Reactor test. After completion of the SNAP 2 test on November 19, 1960, the reactor and associated test equipment were removed from the building.[1]
- In 1961, modifications were made to allow the safe operation of the facility with the S8ER. Tests of the S8ER began in 1963 and following completion of the SNAP 8 tests on April 15, 1965, the reactor and associated test equipment were removed from the building.[1]
- In 1974, the S8ER was declared excess to the government's needs.[2]
- In September 1977, removal of all radioactive materials began. Activities included removing the reactor containment vessel and razing the building.[2]
- Demolished in 1978 after decontamination.[3]

Site Description:

- Building 4010 was a rigid, steel-framed structure with corrugated metal siding and roofing. It was 60 feet long by 24 feet wide, with 17-foot ceilings.[2]
- The subsurface structure of Building 4010 was at least 14 feet below grade. This structure contained three steel reinforced concrete vaults, two of which were lined with steel.[2]
    - The primary containment vessel consisted of a 38-inch diameter by 15.5-foot high carbon steel pressure vessel embedded in concrete ranging from 18 to 27 inches thick.[4]
    - The primary system vault consisted of a carbon steel vault liner embedded in concrete. Removable shield plugs covered the top.[2]
    - The secondary equipment pit was a small, unlined concrete vault. All passageways to the primary vault were welded shut to prevent exposure.[2]
- The amount of radioactive waste produced by test reactor operations was minimal, so major waste collection and processing systems were not included in Building 4010.[2]

- The building was surrounded by several small concrete pads (Site 4807, Site 4808 and Site 4809) that were initially labeled separately, but were absorbed by the 4010 footprint by 1964.

Relevant Site Information:

- The change room was connected to a septic tank and leach field located west of Building 4010 until 1961, when the central sanitary sewer system became available.[1]
- Building 4010 was eventually abandoned in place; it was later removed.[5]
- The entire vault complex was provided with a sub-foundation drainage system consisting of circuits of perforated metal pipe surrounded by gravel fill. The system drained into a pipe well sump at the east end of the building. From the sump, water was pumped into a tank for controlled disposal if contaminated, or released to the surface drainage system if it tested clean.[1]
- Three incidents occurred in Building 4010 that could have resulted in a release to the environment:
    - On April 30, 1961, it is known that an incident occurred, however, no details of the incident could be found. Incident Report A0598, dated June 27, 1961 referenced the April incident, but only indicated that the processing of samples from the April incident would be delayed (A0598).
    - On January 1, 1964, fission product was released to the cover gas and NaK coolant as a result of cladding failure of SNAP-8 reactor fuel (A0277).
    - On October 19, 1965, cutting of the control drum drive rods resulted in Co-60, Mn-54 and Fe-59 contamination in the high bay area. The level of contamination was found to be 200 mrad/hr, including 100 mR/hr due to gamma. The contamination was cleaned and no workers received an unacceptable exposure (A0349).

Radiological Surveys:

- Guide limits for the cleanup were as follows:[6]
    - Beta-gamma emitters:
        - 0.1 mrad/hr at 1 cm total.
        - 1000 dpm/100 cm^2 removable.
    - Alpha emitters:
        - 100 dpm/100 cm^2 total.
        - 20 dpm/100 cm^2 removable.
    - Activated soil:
        - As close to background as practicable, but not greater than 100 pCi/g gross detectable beta activity.
- Prior to demolition, Atomics International personnel conducted a survey to determine the level of radioactivity in activated structures within Building 4010.[4]

  - The principal nuclides in the reactor containment vessel and cooling coils were Mn-54 and Fe-55. The total specific activity of these contaminants was 5.1 x 10^{1} µCi/gm and the total activity was 3.6 x 10^{7} µCi.
  - The principal nuclides in the reinforcing rods were Mn-54 and Fe-55. The total specific activity of these contaminants was 5.1 x 10^{2} µCi/gm and the total activity was 3.1 x 10^{7} µCi.
  - The principal nuclides in ordinary concrete were tritium, Ar-39, Ca-41, Fe-55, Co-60 and C-14. The total specific activity of these contaminants was 8.7 x 10^{2} µCi/gm and the total activity was 3.8 x 10^{8} µCi.
  - The principal nuclide in high-density concrete was Fe-55. The maximum specific activity of this contaminant was 2.2 x 10^{2} µCi/gm.
  - The principal nuclide in the thermobestos insulation was Ca-41. The specific activity of this contaminant was 5.5 x 10^{-1} µCi/gm of insulation.
  - The principal nuclide in silver braze of the shielding was Ag-108. The maximum specific activity of this contaminant was 1.4 x 10^{4} µCi/gm.
  - The principal nuclides in stainless steel of the shield were Mn-54 with specific activity level of 1.9 x 10^{-1} µCi/gm, Fe-55 with a specific activity level of 3.2 x 10^{1} µCi/gm, Ni-63 with a specific activity level of 1.7 x 10^{1} µCi/gm and Co-60 with a specific activity level 5.6 x 10^{1}µCi/gm.
  - The principal nuclides in stainless steel of the instruments in the reactor vessel thimbles were Mn-54 with a specific activity level of 6.8 x 10^{-2} µCi/gm, Fe-55 with a specific activity level of 1.1 x 10^{1} µCi/gm, Ni-63 with a specific activity level of 6.1 x 10^{0} µCi/gm and Co-60 with a specific activity level of 2.1 x 10^{1} µCi/gm.
    - A radiation measurement taken in the reactor vault indicated maximum radiation levels of 120 R/hr. The activated stainless steel in the thimbles was thought to be the source of this reading.

- During dismantlement and excavation activities, water and air samples were collected to assure the safety of workers and to monitor the discharge of effluents.[2]
  - None of the water samples indicated concentrations greater than 4.5 x 10^{-8} µCi/ml beta—well below the limit of 3 x 10^{-7} µCi/ml for Sr-90.
  - None of the air samples indicated radioactive particulate concentrations exceeding 10^{-11} µCi/ml beta, other than naturally occurring airborne radioactivity. The limit for Co-60 is 3x10^{-10} µCi/ml.
- Following demolition in 1977-1978, Atomics International personnel conducted a radiological survey to verify that remediation attained accepted cleanup levels to support unrestricted release.[5]
  - Approximately 200 smears for removable contamination were taken on concrete, piping and steel.
    - No smears were found to exceed 50 dpm/100 cm^{2} for beta.
    - Alpha contamination was not expected in this area, and none was detected.

  - In a complete walk-through survey, the maximum surface contamination detected was 0.05 mrad/hr. Average background is 0.04 mrad/hr. All readings were below the 0.1 mrad/hr limit.
  - Prior to backfilling, concrete samples were taken from a portion of a vault wall. All samples were less than 50 pCi/g gross beta. [All clean concrete was used as backfill for ditch repair between Area 1 and Area 2.]
  - Soil samples were collected in the area after the excavation was filled with clean backfill. All samples were less than 50 pCi/g gross beta.
  - During the dismantling of the sump drain system and vessel pit, water samples were collected and no samples exceeded 4.5×10^{-8} µCi/cc, below the limit of 3×10^{-7} µCi/cc for Sr-90.
- In September of 1979, the Formerly Utilized Sites Remedial Action Program (FUSRAP) Survey Group from Argonne National Laboratory conducted a certification survey to ensure that the facility met unrestricted release criteria. At the time of the survey, the building had already been demolished and the asphalt parking area was already in place.[6]
  - The survey included a walkover, soil borings through the asphalt and soil coring.
    - The walkover survey indicated some elevated reading on the asphalt pad, ranging from 15-30 µR/hr (natural background is 9-15 µR/hr).
      - Further investigation revealed that elevated reading were most likely a result of radioactive materials stored on the hill to the east (Radioactive Material Handling Facility (RMHF)).
    - The soil borings indicated that no U-235 or U-238 were present. Other nuclides were found in the following ranges:
      - Cs-137 from 0.00 ± 0.00 pCi/g to 0.42 ± 0.03 pCi/g;
      - Th-232 from 0.147 ± 0.23 pCi/g to 2.27 ± 0.16 pCi/g;
      - Ra-226 from 0.358 ± 0.081 pCi/g to 3.46 ± 0.24 pCi/g;
      - Co-60 from <0.03 pCi/g to 7.32 ± 0.07 pCi/g.
- In November of 1979 and October of 1981, the FUSRAP Survey Group from Argonne National Laboratory revisited Building 4010 to conduct a certification survey to ensure that the facility continued to meet unrestricted release criteria. At the time of the survey, the building had already been demolished and the asphalt parking area was already in place.[7]
  - The survey confirmed the results of the previous Argonne survey, and the following conclusions were developed:
    - The Co-60 found in soil was well below the criteria set by the Department of Energy (DOE) for the site.
    - Gamma background readings at the surface were influenced by shine from the RMHF. The Co-60 found in soil was not believed to contribute to the total background readings.
    - The site met the criteria for an unrestricted release.

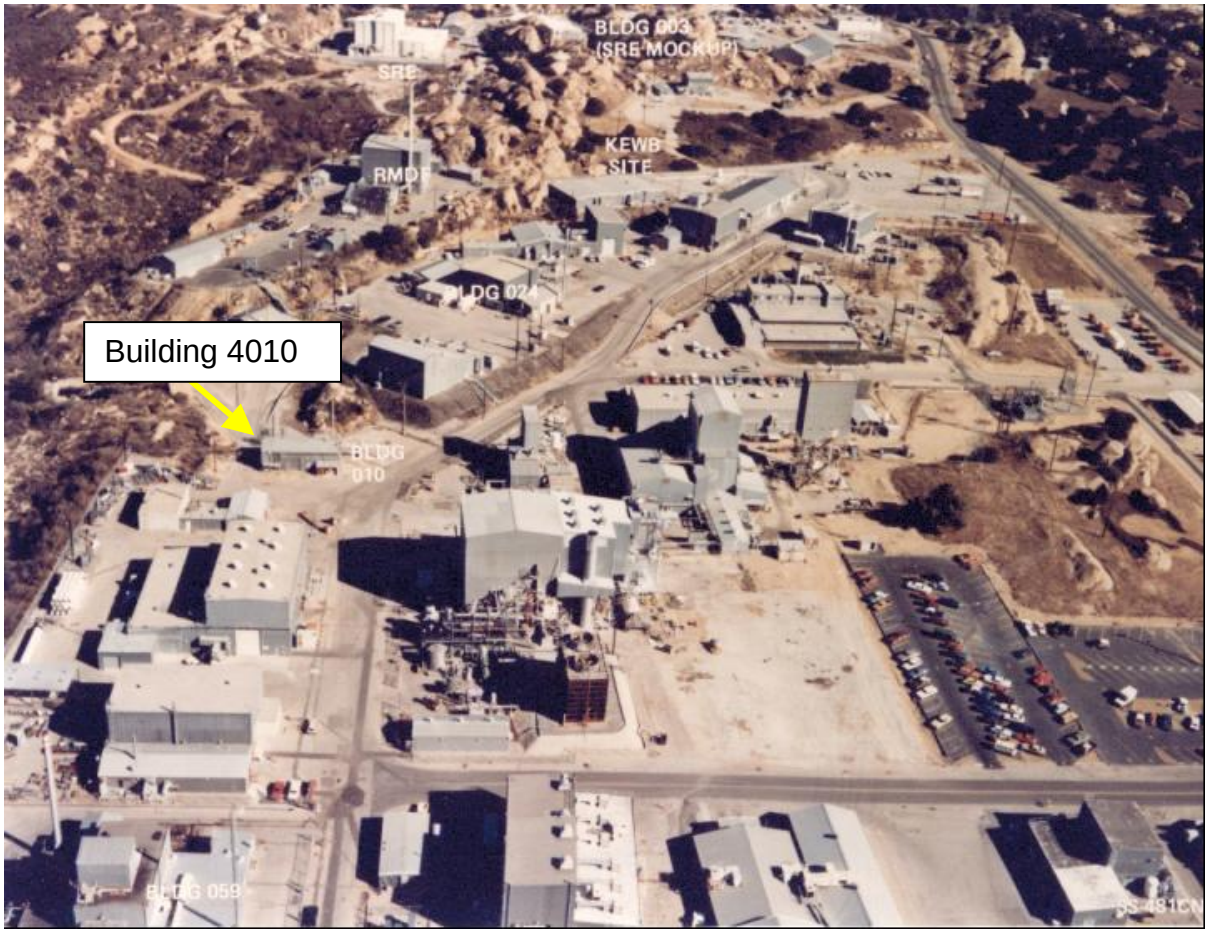
Status:

- DOE released Building 4010 for unrestricted use December 12, 1982.[8]
- Building 4010 was decontaminated and demolished in 1977-1978.
- Following demolition, an asphalt parking lot was built where the Building 4010 once stood.[2]

References:

1- Rockwell International Document, N704FDP990005, "Facilities Dismantling Plan for Building 010 (S8ER)," December 10, 1976.
2- Rockwell International Document, ESG-DOE-13237, "S8ER Facilities Decommissioning Final Report," February 28, 1979.
3- Rockwell International Document, Use Authorization No. 111, "Decontamination and Disposition of Building 010," January 16, 1978.
4- Atomics International Document, SA-652-130-002, "Determination of Levels of Radioactivity and Significant Radionuclides Present in Neutron-Activated Structures in Building T010," June 28, 1973.
5- Rockwell International Document, N704TI990041, "Radiological Survey Results—Release to Unrestricted Use, Building 010 at SSFL," August 28, 1978.
6- Argonne National Laboratory Report, no document number, "Certification Survey of the SNAP 8 Experimental Reactor (S8ER) Facility in Building 10, Santa Susana Field Laboratories of the Energy Systems Group of Rockwell International at Santa Susana, California," September 1979.
7- Argonne National Laboratory Report, no document number, "Interim Post Remedial Action Survey Report for Systems for Nuclear Auxiliary Power-8 (SNAP-8) Experimental Reactor Facility (Building 010), Santa Susana Field Laboratory, Rockwell International, Canoga Park, California," May 1983.
8- Rockwell International, Letter #2726, "S8ER Facilities Decommissioning Final Report Number ESG-DOE-13237," from Len Lanni (DOE) to C. C. Connors (Atomics International), December 15, 1982.
9- Historical Site Photographs from Boeing Database.
10- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4010



Site Summary – Building 4012

Site Identification:

Building 4012
SNAP Critical Test Facility Number 2
Heavy Metal Reflected Fast Spectrum Reactor Critical Test Facility
Energy Technology Engineering Center (ETEC) X-Ray Facility/Storage
Includes Building 4713, Substation

Operational Use/History:

- Constructed prior to 1962.[10]
- Building 4012 Operated with SNAP critical assemblies intermittently between 1962 and 1968.[1]
- In 1969 and 1970, the critical assembly machine was modified for use in the Heavy Metal Reflected Fast Spectrum Reactor (HMRFSR) project and operated for the HMRFSR project from 1970 to 1972.[1]
- In 1979, the concrete portion of Building 4012 was modified for use as an x-ray and source radiography facility.[1]
- Building 4012 operated as ETEC X-Ray Facility and Storage from 1979 to 1992. [1]
- Demolished in 2003.

Site Description:

- Building 4012 had 1,292 square feet of floor space. In 1986, the passageway and metal portion containing the operations and control rooms of Building 4012 were demolished in order to build the ETEC Sodium Component Test Installation (SCTI) Power Pak section of the Cogeneration Project.[1]
- The remaining concrete vault consisted of two rooms, Room 109 (fuel storage/equipment room) and Room 110 (critical cell). A 20-inch borated concrete wall containing fuel storage tubes divided Room 109. An air conditioning duct ran the length of the room over the fuel storage area.
- The critical cell (Room 110) was a concrete chamber with 4-foot thick concrete walls lined with steel and was secured by a heavy shield (vault-type) door.[1]
- Serviced by Substation 4713.

Relevant Site Information:

- Radioactive material was managed at Building 4012. The potential contaminants of concern are primarily Cs, Sr, U, Th and Pu.[1]
- There are no Incident Reports associated with Building 4012.[2]

Radiological Surveys:

- In 1985, a comprehensive radiological survey of Building 4012 and surrounding areas was performed.[3]
    - Allowable limits: Ambient exposure of rate <5 μR/hr above background at 1 meter.
    - Radiological contamination was not detected in the radiography room, radiographer's office and dark room.
    - Contamination levels (maximum dpm was 6,500 dpm alpha/100 cm^2) in rooms 109 and 110 were found to require radiological monitoring and control of waste disposal.
- Initial demolition efforts in Building 4012 were completed in 1986 to accommodate the construction of the Power Pack section of the SCTI Cogeneration Project.[4]
- Final decontamination and decommissioning (D&D) of the remaining portion of Building 4012 was performed in 1995.[1]
- Following D&D efforts, a comprehensive final radiological survey was completed.[4]
    - Allowable limits: <5 μR/hr above background at 1 meter; and 1,000 dpm/100 cm^2 removable alpha and beta and 5,000 dpm/100 cm^2 total alpha and beta.
    - The results of the final survey indicated that the facility was suitable for release without radiological restrictions.
- A verification survey was conducted by the Oak Ridge Institute of Science and Education (ORISE) in October 1996.[5] The total alpha surface activity ranged from less than 34 dpm to 170 dpm in 100 cm^2 of soil. The total beta surface activity ranged from 230 dpm to 480 dpm in 100 cm^2 of soil. The exposure rates were as follows:
    - Limit: 5 μR/hr above background.
    - Average background: 14 μR/hr
    - Observed Rates: 12 μR/hr to 15 μR/hr.
    - ORISE concluded that Building 4012 met DOE guidelines for unrestricted release.
- The California Department of Health Services (DHS) performed a confirmation survey of Building 4012 on July 31, 1996.[6]
- The Environmental Protection Agency (EPA) conducted an oversight verification survey in 2001.[7] The surveys included scans and fixed point measurements for alpha and beta. The contaminants of concern (COCs) for Building 4012 were mixed fission products, uranium and activation products on the floors and walls.
    - Acceptable limits for the survey were consistent with NRC regulatory guide 1.86 and the proposed site-wide release criteria.[6]
    - None of the field measurements indicated the presence of radionuclides above acceptable limits.
    - EPA field measurements confirmed the conclusions reached by both Rocketdyne and ORISE.

- Immediately following building demolition in 2003, 24 soil samples were taken in a MARSSIM grid pattern over the original building footprint. Gamma spectroscopy did not detect any man-made gamma emitting radionuclides. Subsequent analysis by an outside laboratory did not detect any man-made radionuclides.[8,9]

Status:

- DOE released the facility for unrestricted use in October 1997.[10,11]
- DHS concurred with release the release of the facility in November 1997.[6]
- Building 4012 was demolished in 2003.

References:

1- Rocketdyne Report, 012-AR-0001, "Decontamination and Decommissioning of Building T012," May 8, 1997.
2- Review of Radiation Safety Records Management System, 2003.
3- Rocketdyne Report, 355-ZR-0012, "Radiation Survey of Building T012, SCTI Cogeneration Project, Rev. A," June 26, 1985.
4- Rocketdyne Report, 012-AR-0002, "Final Radiological Survey Report for Building T012," June 14, 1996.
5- ORISE Report, 96-0869, "Verification Survey of Building T012, SSFL, Rockwell International, Ventura County, California," October 1996.
6- DHS/RHB, Letter, "Boeing's Request for Concurrence in Release for Use Without Radiological Restriction, Rocketdyne Santa Susana Field Laboratory Building T012," from Gerard Wong (DHS/RHB) to James Barnes, November 26, 1997.
7- U.S. EPA Report, Contract Number 68-W-02-021,"Final Oversight Verification and Confirmation Radiological Survey Report for Buildings T-012, T-029, and T-363," December 20, 2002.
8- Personnel Interview, Phil Rutherford, April 2004 (Area IV Database for Onsite and Offsite Surveys).
9- Boeing Document, RD04-170, "Site Environmental Report for Calendar Year 2003 DOE Operations at The Boeing Company, Rocketdyne Propulsion & Power," September 2004.
10- Federal Resister Vol. 62 N0. 195 pg. 52528-52530, "Certification of the Radiological Condition of Building T012 at ETEC near Chatsworth, California," October 8, 1997.
11- DOE/CD-ETEC-012, "Certification Docket for the Release of Building T012 at ETEC," November 1997.
12- Historical Site Photographs from Boeing Database.
13- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4012

Site Summary – Building 4013

Site Identification:

Building 4013
Thermal Transient Test Facility
Non-Nuclear Component Assembly and Packaging Building
SNAP System Assembly and Checkout Building
Includes Building 4713, Substation
Includes Building 4823, Time Clock
Includes Building 4413, Uninterruptible Power Supply (UPS)

Operational Use/History:

- Constructed in 1962.[1]
- Building 4013 was used to assemble non-nuclear SNAP 10A and SNAP 2 ground test and flight test systems and was subsequently used for thermal transient testing.[2]
- In addition, in Building 4013 thermal and mechanical testing was combined in order to simulate seismic events for the purpose of stress testing.[2]
- Building 4013 was demolished in 2003.

Site Description:

- Building 4013 is a single story multi-room, Butler-type building. The ceiling is split, with a height of 15 feet in one portion and 33 feet in the other. The steel frame is anchored to a concrete slab floor with corrugated metal siding. The roof is constructed from composition and galvanized materials. There is a 5-ton bridge crane.
- Building 4013 is attached to the site sewer system.[2]
- Serviced by Substation 4713.
- Serviced by Time Clock 4823.
- Service by UPS 4413

Relevant Site Information:

- No incidents occurred in Building 4013 that might have resulted in a release of contamination to the environment.[3]

Radiological Surveys:

- In August 1988, a radiological survey was conducted on the interior of Building 4013.[4]
    - Average ambient gamma radiation: 6.8 μR/hr.
    - Background: between 14 μR/hr to 16 μR/hr.
    - Survey results were below the acceptable limits.

Status:

- Building 4013 was demolished in 2003.

References:

1- DOE Document, Site Development and Facility Utilization Planning, SSFL.
2- Rocketdyne Internal Document, no document number, "Assessment of Department of Energy Buildings within the SSFL," September 30, 1996.
3- Review of Radiation Safety Records Management System, 2003.
4- Boeing Document, EID-04374, "Final Report, Decontamination and Dismantlement Operations at SSFL Building 4019 for Release Without Radiological Restrictions," September 11, 1999.
5- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
6- Historical Site Photographs from Boeing Database.

Photograph – Building 4013

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Site Summary – Building 4019

Site Identification:

Building 4019
SNAP Flight System Critical Facility
Acceptance Test Facility
ETEC Construction Staging and Computer Facility
Includes Building 4719, Substation

Operational Use/History:

- Constructed in 1962.
- Building 4019 was built to perform criticality acceptance tests of SNAP reactors before they were delivered for launch.[1]
- Three reactors (FS-1, FS-4 and FS-5) were assembled and tested from 1964 to 1965.[2]
- In 1965, all nuclear materials were removed from Building 4019 when the last SNAP reactor was removed.[1]
- Building 4019 was reassigned for non-nuclear use in the 1970s and 1980s.[2]
- In 1998, the small area identified in the 1996 ORISE survey was decontaminated.[2]
- Building 4019 is now inactive.[3]

Site Description:

- Building 4019 is a steel-framed building with a built-up roof on a concrete slab. The 10- foot tall low bay section is 60 x 28 feet and contains offices, conference room, restrooms and an equipment room. The 36-foot tall high bay section is 60 x 45 feet and contains a cinder block storage room and a below-grade vacuum test vault.[3]
- Serviced by Substation 4719.

Relevant Site Information:

- All radioactive and nuclear material handled at the facility was fully encapsulated.[3]
- One incident was reported that could have resulted in a release to the environment.
    - On April 10, 1976, a quality assurance inspection personnel was unable to return a source material to the safe directly after use. It was later discovered that the source had detached from its travel cable and the source was reattached and returned to the safe. Release of contamination to the environment as a result of this incident was unlikely (A0304).

Radiological Surveys:

- In 1988, Rocketdyne performed a radiological survey to determine if any radioactive material had been accidentally left behind to such an extent that further radiological inspection and/or decontamination was warranted.

- The survey covered Building 4019 along with one other building and two adjacent areas through ambient gamma exposure rate surveys.[4]
    - Ambient gamma exposure rates corrected for background measured in Building 4019 varied from 0.04 µR/hr ± 1.09 µR/hr (limit is 5.0 µR/hr above background).
    - The survey concluded that none of the areas were contaminated with residual radioactivity and that all areas meet the unrestricted use criteria for release.
    - One anomalous measurement was recorded in the high bay but 21 subsequent measurements and a survey for beta activity in the area proved that it was an anomaly.
- ORISE performed a verification survey in 1996 to validate the cleanup procedures and survey methods used by Rockwell/Rocketdyne. The survey conducted surface scans, surface activity level measurements and exposure rate measurements.[5]
    - The survey concluded that the unrestricted use release criteria were exceeded in a small area of Building 4019, the documentation of previous surveys was not adequate, and the vault of Building 4019 was not accessible for survey.
    - The document review found that the documentation did not provide a clear description of the sequence of events necessary for demonstrating that the subject areas meet the requirements for release to unrestricted use.
    - Surface scans found one area of elevated beta radiation in the high bay portion of Building 4019. No other areas had elevated levels of alpha, beta or gamma radiation.
        - Total surface alpha: <55 dpm/100cm^2 (limit is 5,000 dpm/100cm^2).
        - Total surface beta: <1,400 – 11,000 dpm/100cm^2 (limit is 5,000 dpm/100cm^2).
        - Removable alpha: <12 dpm/100cm^2 (limit is 1,000 dpm/100cm^2).
        - Removable beta: <16 dpm/100cm^2 (limit is 1,000 dpm/100cm^2).
        - Ambient gamma: between 10 and 11 µR/hr compared to a background rate of 8 µR/hr (limit is 5.0 µR/hr above background).
- In 1998, Boeing performed a final status survey. The survey covered the entire facility through direct radiation measurements, removable contamination swipes and an ambient gamma exposure survey.[3]
    - Maximum direct alpha radiation: 11 dpm/100cm^2 (limit is 5,000 dpm/100cm^2). Maximum direct bet radiation: 961 dpm/100cm^2 (limit is 5,000 dpm/100cm^2).
    - Maximum removable alpha: 5 dpm/100cm^2 (limit is 1,000 dpm/100cm^2).
    - Maximum removable beta: 25 dpm/100cm^2 (limit is 1,000 dpm/100cm^2).
    - Maximum ambient gamma: 15.7 µR/hr.
    - Background: 13.3 µR/hr.
    - Acceptable limit: 5.0 µR/hr above background.
    - The survey concluded that Building 4019 met the unrestricted use criteria approved by DOE and DHS.

- In 1998, ORISE performed a supplementary verification survey to evaluate the shortcomings found in 1996. The survey covered Buildings 4019 and 4024 through surface scans, surface activity level measurements, and exposure rate measurements.[6]
    - Total surface activity levels ranged from 14 to 43 dpm/100cm^2 alpha (limit is 5,000 dpm/100cm^2) and –190 to 550 dpm/100cm^2 beta (limit is 5,000 dpm/100cm^2).
    - Removable activity levels were all less than the minimum detection concentration levels of 9 dpm/100cm^2 alpha and 12 beta dpm/100cm^2.
    - The ambient gamma exposure rate measured within the vault was 12 μR/hr compared to a background level of 8 μR/hr (limit is 5.0 μR/hr above background).
    - The survey concluded that the facilities met the criteria for release to unrestricted use.
- DHS performed verification sampling in 1998.
- In 2001, EPA conducted an oversight verification survey for alpha, beta, beta-gamma radiation (total and removable) and gamma radiation.[7] Surveys were performed to a quality level equal to a final status survey as defined by the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM). The contaminants of concern were: mixed fission products, uranium, transuranic compounds, and activation and corrosion products. EPA also collected concrete core samples, which were analyzed for photon-emitting isotopes.
    - Acceptable limits for the survey were consistent with NRC regulatory guide 1.86 and the proposed site-wide release criteria as defined in the 1996 Area IV survey.[8]
    - None of the field measurements indicated the presence of radionuclides above acceptable limits.
    - EPA field measurements confirmed the conclusions reached by both Rocketdyne and ORISE.

Status:

- In February, 2005 DOE provided a letter to Boeing declaring that Boeing and ORISE surveys had confirmed that DOE and DHS approved cleanup limits had been met, and that Building 4019 was suitable for release for unrestricted use.[9]
- Building 4019 is now inactive.[3]

References:

1- Phil Rutherford Website, http://rdweb/shea/radiationsafety/, accessed August 2003.
2- Boeing Document, EID-04374 “Final Report, Decontamination and Dismantlement Operations at SSFL Building 4019 for Release Without Radiological Restrictions,” September 11, 1999.
3- Boeing Report, RS-00009, “Building 4019, Final Status Survey Report,” June 10, 1999.

4- Rocketdyne Report, GEN-ZR-0010, "Radiological Survey of Buildings T019 and T013; an Area Northwest of T059, T019, T013, and T012; and a Storage Yard West of Buildings T626 and T038," August 26, 1988.
5- ORISE Report, 96/C-5, "Verification Survey of Buildings T019 and T024, Santa Susana Field Laboratory, Rockwell International, Ventura County, California," February 1996.
6- ORISE Letter, "Addendum to the Verification Survey Report for Buildings T019 and T024, Santa Susana Field Laboratory, Ventura County, California," February 16, 1999.
7- U.S. EPA, Contract Number 68-W-02-021, "Final Oversight Verification and Confirmation Radiological Survey Report for Buildings T-011, T-019, T-055, and T-100," December 20, 2002.
8- Rocketdyne Document, A4CM-ZR-0011, Rev. A, Area IV Radiological Characterization Survey, August 15, 1996.
9- DOE Letter, "Release of Building 4019," from M. Lopez (DOE) to M. Lee (Boeing), February 1, 2005.
10- Historical Site Photographs from Boeing Database.
11- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.

Photograph – Building 4019

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Site Summary – Building 4228

Site Identification:

Building 4228
Power Pak Facility
SCTI Co-Generation Plant
Includes Building 4708, Substation for Inbound Power
Includes Site 4807, Electrical Equipment Pads
Includes Site 4808, Electrical Equipment Pads
Includes Site 4809, Air Blast Heat Exchanger Pad
Includes Building 4710, SCTI Power Pak Cooling Tower

Operational Use/History:

- Constructed in the early 1980s.[1]
- The SCTI Power Pak facility was designed to harness the steam produced through SCTI's sodium experiments and generate commercial electric power. The system operated from 1988 through 1993. The power generated was sold onto the grid through Edison Power.[2]
- Demolished in 2003.

Site Description:

- Building 4228 was located east of Building 4013. The northwest end of Building 4228 was built on top of Building 4012.
- Serviced by Substation 4708.
- Serviced by Electrical Equipment Pad 4807.
- Serviced by Electrical Equipment Pad 4808.
- Serviced by Air Blast Heat Exchanger Pad 4809.
- Serviced by Cooling Tower 4710.

Relevant Site Information:

- There are no Use Authorizations and no Incident Reports associated with Building 4228.[3]

Radiological Surveys:

- When Building 4228 was demolished, Building 4012 had been released by DOE. The SHEA Impact Review Checklist found the demolition of Building 4228 neither involved radioactive materials nor was conducted in a radiological area. This conclusion was confirmed by the release and demolition of Building 4012.
- Further radiological surveys specific to Building 4228 have not been conducted.

Status:

- Building 4228 was demolished in 2003.[4]

References:

1- SSFL Area IV, ETEC Industrial Planning Maps, 1962-1992.
2- Personnel Interview, Sandy Samuels, September 16, 2003.
3- Review of Radiation Safety Records Management System, 2003.
4- Boeing Internal Document, no document number, "Demolition Binder: Power Pak Buildings 4428 & 4710."
5- Historical Site Photographs from Boeing Database.

Photograph – Building 4228

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