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United States Government **National Nuclear Security Administration (NNSA)**
Savannah River Site Office (SRSO)

Memorandum

DATE: **07/12/2012**

REPLY TO
ATTN OF: SV (Stanley Pyram, 803-208-1122)

SUBJECT: NNSA-SRSO Fiscal Year (FY) 2013 - 2037 Twenty Five Year Site Plan (TYSP)

TO: Mr. Jefferson Underwood, Director of Office for Infrastructure and Capital Planning (NA-161)

Attached is the NNSA-SRSO Twenty Five Year Site Plan FY 2013 – 2037 for the NNSA facilities at the Savannah River Site (SRS) for your acceptance. The document gives an overview of the NNSA missions at SRS during the next twenty five years and is in compliance with the requirements of the FY 2013 – 2037 Twenty Five Year Site Plan Guidance. The SRS Office of Fissile Materials Disposition has reviewed and concurred with this document.

Douglas J. Dearolph
Manager

SV:DD:acr

COR-SRSOFP-7.9.2012-450974

Attachment: As stated

cc w/attach: Ann Walls, NA-161
Anne Harrington, NA-20
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Bill Clark, NA-26

NNSA-SRSO
Twenty-Five Year Site Plan
FY 2013 – FY 2037

Revision 1
July 2012

UNCLASSIFIED
DOES NOT CONTAIN
UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION

Reviewing
Official: Susan Arnold, Program Mgr, BP&I
(Name and Title)
Date: 7/2/2012

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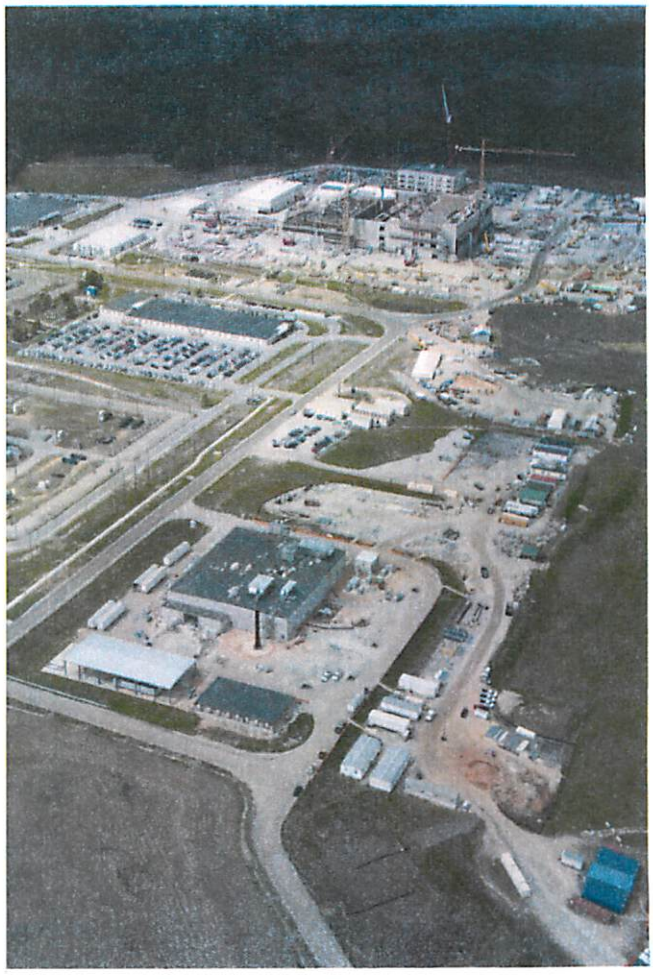
SRS
Tritium Facilities



SRS Nuclear Nonproliferation Facilities
Under Construction (March 2012)

1.0 Executive Summary

NNSA Core Capabilities and Missions at SRS

At the Savannah River Site (SRS), the two largest NNSA programs are focused on the integrated tritium supply chain and plutonium disposition supporting the capability for storage, protection, and handling of nuclear material and weapon components. The tritium core capability at SRS includes tritium research and development, manufacturing and storage and is administered by the Savannah River Site Office (SRSO) as part of the Infrastructure and Operations organization (NA-00). The SRS Plutonium Disposition Program is managed by the Office of Fissile Materials Disposition (OFMD) as part of the Nuclear Nonproliferation organization (NA-20).

The facilities and infrastructure supporting the integrated tritium supply chain activities at SRS are the central focus of this document. These facilities have been operational for a number of years (beginning in 1955) and are readily evaluated based on the TYSP guidance. The Plutonium Disposition Program facilities are currently in various phases of construction and are scheduled to begin operations over the next 10 years. The mission and related program plans associated with plutonium disposition at SRS will be presented to illustrate the expansion of NNSA missions at SRS.

The NNSA missions presented in this plan include:

Tritium Supply – extraction of tritium from irradiated target rods and management of the tritium inventory for the nuclear stockpile.

Nuclear Stockpile Maintenance – loading of tritium and deuterium into reservoirs that are used in the gas transfer system of a nuclear weapon.

Nuclear Stockpile Evaluation – surveillance of gas transfer systems to assure reliability in the absence of nuclear testing.

Helium-3 Recovery – recovery of this byproduct of tritium's radioactive decay for use in neutron detectors and various commercial applications.

Fissile Material Disposition (NN) – disposition of special nuclear materials including highly enriched uranium (HEU) and surplus weapons-usable plutonium (referred to as "surplus plutonium") as fuel for commercial nuclear reactors and convert the material into a form that cannot be used in a nuclear weapon.

Program of Record documents emphasize retaining required production and experimental capabilities sustained with physical infrastructure evolving into more efficient, modernized facilities with reduced footprint, less environmental impact and improved operational costs. Consistent with this vision, NNSA facilities at SRS will undergo construction of new facilities supporting tritium modernization and new plutonium disposition capabilities, implement Tritium Responsive Infrastructure Modifications (TRIM) including relocation of tritium manufacturing processes resulting in reduced risk and deferred maintenance, and will begin disposition of surplus tritium facilities over the 25-year planning horizon.

FY2011 Accomplishments

Tritium Programs

Tritium Programs' success in supporting U.S. nuclear security through tritium production, maintenance and testing of gas transfer systems and research and development topped the list of FY 2011 accomplishments that included advancements in safety, helium-3 production, conduct of operations, and productivity.

In addition to achieving more than 990,000 safe hours worked and completing the fiscal year without a lost workday due to injury, NNSA's tritium program continued to consistently deliver on-time, high-quality reservoir shipments to the military. Quality Assurance continued to implement improvements and efficiencies to ensure that critical quality standards were met or exceeded at reasonable cost to NNSA, increasing the acceptance rate of initial inspections to 99.6 percent, a full percentage point more than 2010 performance.

Fostering a culture of continuous improvement, Tritium Programs established a process for achieving and validating productivity savings from improvement initiatives, exceeding the $2.1 million annual productivity

savings goal. The organization provided process improvement training to employees and validated 37 improvement initiatives for the year.

The Tritium Programs were recognized for safely executing a plan to accelerate shipments over several months to support emerging customer requirements, participating in a workforce restructuring initiative and qualifying 20 new process operators while maintaining focus and high standards of performance, achieving a 98.3 percent facility availability rate for the year.

In conjunction with Savannah River National Laboratory (SRNL), Tritium Programs continued to develop and mature significant new technologies affecting nuclear security, tritium and helium-3 production while maintaining capabilities and expertise essential to the Defense Programs mission. The partnership between Tritium Programs and SRNL enabled significant developments in hydrogen isotope separation, solid state hydrogen storage, sensor technologies, non-destructive testing, nanotechnology and catalysis. A joint effort between SRNL, Tritium Programs and the National Security Agency resulted in an ultra-secure short range wireless sensor network to be deployed at SRS. The network is being considered for use in Department of Defense applications. Developments in the Thermal Cycling Absorption Process used to separate hydrogen isotopes led to a prototype that delivers better product purity, has a significantly smaller footprint and requires 60 percent less energy.

Other notable Tritium Programs accomplishments for FY 2011 include:

- Tritium Programs developed the Tritium Programs Operational Excellence Plan, establishing a comprehensive program of operational discipline, based on underlying human performance principles, to assure sustained operational excellence.
- Tritium Programs completed all function test requirements for gas transfer system surveillance, delivering vital information to design agencies in support of the annual stockpile certification. Tritium Programs met all helium-3 shipping requirements in support of homeland security initiatives.
- The Tritium Extraction Facility (TEF) completed all annual tritium extraction requirements ahead of schedule and without incident. TEF extracts tritium from target rods that have been irradiated in a commercial light water reactor by the Tennessee Valley Authority.
- Tritium Programs achieved on-time mechanical completion of three important projects that serve to upgrade and relocate process equipment and systems. These projects enabled the replacement of corroded piping in the Purge Stripper/Zeolite Bed Recovery system, the relocation of the helium-3 separation and bottling function from a cold war-era facility, and the integration of the distributed control systems from three facilities to allow for future consolidation of the duplicate control room functions. This is part of the Tritium Responsive Infrastructure Modifications (TRIM) initiative to modernize infrastructure and reduce costs over the next 10 years.
- Tritium Programs implemented various aspects of the NNSA Transformational Governance Oversight Policy. This initiative works to right size the government and contractor interface by implementing improved communication, measurement and reporting tools.

Fissile Materials Disposition

To reduce the threat of nuclear weapons proliferation, the U.S. Department of Energy (DOE) is engaged in a program to disposition U.S. surplus plutonium in a safe, secure, and environmentally sound manner, by converting such plutonium into proliferation-resistant forms that can never again be readily used in nuclear weapons. NNSA is responsible for implementing this nonproliferation approach which commits the U.S. and Russia to render at least 34 metric tons (MT) of weapons-grade plutonium unsuitable for use in nuclear weapons. The facilities across the U.S. DOE complex that may have a role in this approach include the Pantex Facility (Texas), Los Alamos National Laboratory (New Mexico), SRS-H Canyon/HB-Line Facility, K-Area Facility and the Mixed Oxide Fuel Fabrication Facility (South Carolina).

In FY 2011, the Fissile Materials Disposition Program accomplished the following:

- Completed construction of 11 of the 16 auxiliary MOX buildings.

- Completed assembly of the first On-Site Process Unit, demonstrating successful conversion from the French reference plant process unit design into a U.S. design.
- Completed first in-advance test on a glovebox, demonstrating successful conversion and function from the French reference plant technology and designs to the U.S. design.
- Completed MOX glovebox process design to meet U.S. codes, standards and regulatory requirements.
- Installed over 76,000 cubic yards of reinforced concrete and more than 15,000 tons of rebar for the MFFF, and installed all 23 trapped tanks on the first floor.
- Completed facility structural foundation for the WSB, and initiated Balance-of-Plant (BOP) construction activities for the WSB.
- Los Alamos National Laboratory (LANL) continued production of plutonium oxide, as early feedstock for MOX.
- Continued Interagency Agreement with the TVA to evaluate the irradiation of MOX Fuel in up to 5 TVA reactors.

Current State and Future Plans

In 2011 SRS released a new strategic plan for increased mission impact on three principal business segments: environmental stewardship, national security, and clean energy. The plan projected work scope in these segments through 2041, and NNSA missions for Defense Programs and Defense Nuclear Nonproliferation are the largest components of the national security efforts. The current state and future plans of these programs are discussed below.

Tritium Programs

SRS' current Mission Critical footprint is comprised of older, Cold War-legacy facilities and more modern facilities that will endure throughout the 10- and 25-year planning horizons. The older facilities and associated infrastructure are expensive to maintain, larger than necessary to support the current stockpile, and energy-inefficient. The vision for the next ten years is to expedite relocation and right-sizing of the remaining functions from these older facilities into the more modern facilities via an initiative known as Tritium Responsive Infrastructure Modifications (TRIM). Implementing the TRIM effort is noted as a risk mitigating action for ensuring future capacity in the Program of Record. TRIM enabling activities in FY2011 included the initial construction phases of new buildings for engineering and process support personnel.

TRIM has many discrete elements that can be accomplished with available funding via capital equipment / general plant projects (CE/GPPs), but relocation of some of the remaining functions in the H-Area Old Manufacturing (HAOM) facility cannot. A line item that would complete the TRIM scope: "Sustaining HAOM Facility, SRS," is preauthorized by the Construction Working Group (CWG) to start in FY2017.

A refurbishment of the H-Area New Manufacturing Facility (HANM) is anticipated near the end of the 25-year planning horizon that will consist primarily of major system replacements and renovations.

Fissile Materials Disposition

NNSA is establishing the capability to disassemble surplus plutonium pits and process weapons grade plutonium as feedstock for the production of MOX fuel and subsequent irradiation in commercial nuclear power reactors. The production of MOX fuel assemblies at SRS aligns with the SRS mission to support national priorities and builds on the existing site core competencies and assets. Two major projects at SRS are in various stages of implementation to establish the required infrastructure for production of MOX fuel from weapons grade plutonium.

SRS' current mission is four-fold: store surplus plutonium materials pending their transfer to MFFF (K-Area Facility), convert plutonium materials into an oxide form as feed suitable for MFFF (H Canyon/HB-Line Facility), produce a "mixed fuel" suitable for nuclear commercial reactors (Mixed Oxide Fuel Fabrication Facility), and disposition low/high activity waste generated by MFFF (Waste Solidification Building). This

mission relies on the continued operation and maintenance of EM facilities', K-Area and H Canyon/HB-Line, through FY2025 and 2020 respectively.

K-Area Facility currently stores surplus non-pit plutonium material and will continue to store these type of materials pending their disposition. This facility has the capability and capacity to store additional materials.

H Canyon/HB-Line Facility will be utilized to convert up to 3.7 metric tons of non-pit plutonium materials, known as Alternate Feed Stock (AFS), to an oxide suitable as feed for the MFFF. This campaign will begin in calendar year 2012 through 2017. The oxide product will be stored in K-Area along with other feed stock from across the complex pending their disposition to MFFF. In addition, pit plutonium materials could be processed through these facilities pending their utilization in years 2018 through 2020.

MFFF is currently in the construction phase of the project and will finish construction, conduct start-up testing, and begin operations in 2016. The MFFF processing rate will increase over the first several years of operations. Operations are expected to continue through 2032 for the initial 34 metric tons of surplus weapons grade plutonium. Construction of the WSB started in December 2009, and is scheduled to be completed in June 2013, and will be available as needed to support MFFF water runs, chemical runs, and radioactive waste operations in 2016.

Highly Enriched Uranium Blend Down

The U.S. has declared a total of 174.3 metric tons of highly enriched uranium (HEU) surplus to future weapons needs. One path for making this material unsuitable for nuclear weapons is through a dilution process called "blend down," which makes this material suitable for use in commercial reactors. Of the 174.3 metric tons of HEU, approximately 90 percent will be down blended and converted to commercial or research reactor fuel. The remaining HEU will be disposed of as waste.

Approximately 60 metric tons of the HEU identified for manufacture reactor fuel is considered off-specification because impurities exceed the standard commercial nuclear fuel specifications; however, once blended with natural uranium this material has been proven to perform identically to on-spec fuel. Of the approximately 60 metric tons of off-specification HEU, approximately 26 metric tons is being down blended at SRS. Using Environmental Management (EM) facilities in H Area, 16 of the 26 metric tons was legacy HEU located at SRS and owned by the EM program and has been successfully down blended and shipped for production of commercial nuclear fuel. Another five metric tons of HEU has been shipped directly to a Tennessee Valley Authority vendor (Nuclear Fuel Services) for blend down and the remaining 5 metric tons of HEU will come from various NNSA sites throughout the DOE complex to complete the SRS mission. Since 2003, the site has "down blended" or diluted the quality HEU to the point where it is useless for nuclear weaponry, removing more than 22 metric tons of HEU from the DOE nuclear weapons production stockpile.

Should DOE amend its record of decision, disposition of an additional 13 metric tons of excess HEU could continue in H Area until 2021 and would be made commercially available for production of reactor fuel.

2.0 Site Overview and Snapshot

Location: Aiken, South Carolina
Type: Multi-Program Site
Website: www.srs.gov

Contractor Operator: SRNS & Shaw Areva MOX Services
Responsible Field Office: SRSO
Site Manager: Douglas J. Dearolph, SRSO

Site Overview:

At SRS, NNSA executes Tritium and plutonium disposition missions in support of U.S. national security.

The Tritium area occupies approximately 29 acres in H Area. Tritium's enduring missions have been executed successfully since operations began in 1955. Savannah River Nuclear Solutions, LLC (SRNS) currently manages and operates the Tritium facilities with a combined (direct and support) staff of approximately 770 full-time equivalents (FTEs). The tritium core capability at SRS includes tritium R&D, manufacturing and storage.

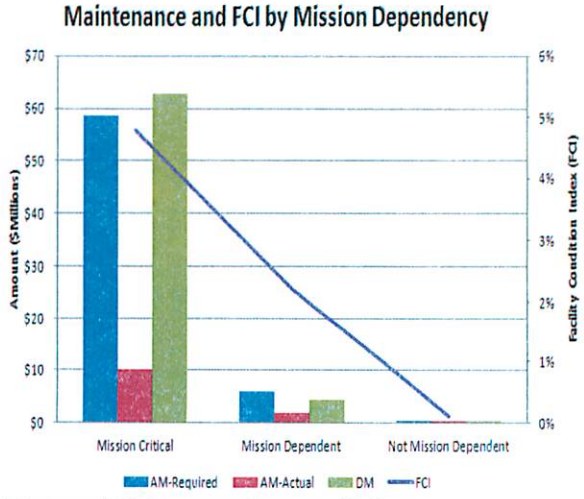
NNSA will establish capability to execute the nuclear nonproliferation objectives aligned with the Plutonium Disposition Program. As part of the nonproliferation mission, the MFFF will use plutonium feedstock from pit disassembly and conversion capability (and smaller amounts from other DOE sources) to manufacture MOX fuel assemblies for use in commercial nuclear power reactors. WSB will process the liquid waste streams from MFFF to generate solid waste forms for disposal. The MFFF and WSB are capital asset projects and are under construction in the F Area at SRS.

All Tritium real property assets exist for the purpose of maintaining core capabilities to execute mission and program requirements. The same will be true of OFMD real property assets when constructed.

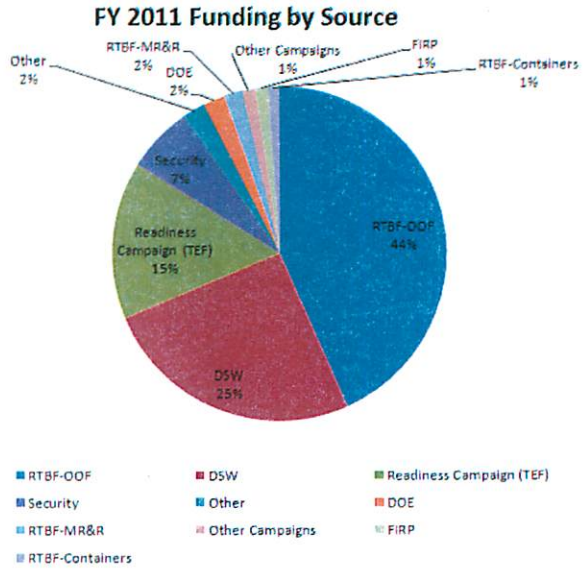
Note: All information shown below is for Tritium Programs (as of the end of FY 2011).

Real Property:
29 Acres (Owned)
37 Buildings/Trailers
299,909 gsf Active & Operational
83,588 gsf Non-Operational
0 gsf Leased
Replacement Plant Value: $1.8B
Deferred Maintenance: $68M
Facility Condition Index (FCI):
Mission Critical: 4.8%
Mission Dependent: 2.2%
Asset Utilization Index (Overall): 100%

FY2011 Funding by Source:
FY2011 Total Site Operating Cost: $236M
FY2011 Total NNSA Funding: $231M
FY2011 Total DOE (non-NNSA) Funding: $5M
FY2011 Total Other Funding: $0M



AM= Annual Maintenance Costs per FIMS



3.0 Assumptions

Tritium Programs

1. Tritium Programs will continue to implement the Nuclear Weapons Complex (NWC) Transformation Record of Decision including compliance to congressional requirements.
2. Tritium Operations will be managed as a defined, severable work activity within M&O contract structure so that it will be positioned to be responsive to any future direction within the Nuclear Weapons Complex. However, infrastructure impacts due to severing are not projected in this plan.
3. Funding levels for the operating budget are assumed to the current Future-Years Nuclear Security Program (FYNSP).
4. Future direction of facilities and infrastructure and technology utilization will be consistent with SRNS Tritium Programs 2011-2015 Strategic Plan, recognizing that this plan is not FYNSP constrained.
5. Line item funding support for Tritium Responsive Infrastructure Modifications (TRIM) will be accelerated and implemented to support SRS Strategic Plan initiatives and NNSA infrastructure modernization, consolidation, and footprint reduction strategies.
6. Condition Assessment Surveys will be completed in 2013 as required.
7. Funding will be allocated for all preventive, predictive and corrective maintenance (including recapitalization) required to execute Tritium missions.
8. Federal sustainability performance goals continue to be managed at the site level and through DOE-EM.
9. NNSA will approve cessation of reservoir reclamation operations in FY 2015.

Fissile Materials Disposition

The following are the key assumptions associated with execution of the surplus plutonium disposition program:

1. Funding for the program is consistent with commitments identified in the FY 2012 Project Data Sheets and the approved project baselines.
2. The Surplus Plutonium Disposition Supplemental Environmental Impact Statement (SEIS) Record of Decision (ROD) will be completed in second quarter FY 2013 and supports implementation of the Preferred Alternative, which includes use of MOX to disposition non-pit and pit surplus weapons plutonium and the use of a combination of existing facilities to establish the capabilities for pit disassembly and conversion, including TA-55 at Los Alamos National Laboratory (LANL), H Canyon/HB-Line, K Area and MFFF at SRS.
3. LANL and H Canyon will continue with current scope to provide early feedstock for MFFF.
4. K-Area will provide storage of early feed materials as well as steady state feed materials through at least 2025, until such time that MFFF can accept all plutonium receipts. K-Area and MFFF will be able to support all packaging configurations.
5. The Office of Secure Transportation (OST) will provide transportation of surplus plutonium pits, pit nuclear materials, and by-products to LANL and the Savannah River Site (SRS). OST will also provide transportation of fresh fuel assemblies to the reactor facilities. SRS transportation resources will provide on-site nuclear material transfers to H-Canyon and MFFF. Certified packages will exist throughout program.
6. MFFF will add Direct Metal Oxidation (DMO) capability to convert plutonium metal into oxide powder, consistent with the Preferred Alternative planning basis.
7. MFFF will begin hot start-up/nuclear operations in October 2016 (FY 2017).
8. Additional surplus plutonium declarations are not included in this planning basis but will be added after appropriate NEPA analysis and Record of Decision is issued.
9. Reactor facilities will be licensed to use MOX fuel and begin irradiation of MFFF product in FY 2018.
10. Regulatory oversight for WSB, PDC and site operations is provided by the Defense Nuclear Facilities Safety Board (DNFSB), and Regulatory oversight for MFFF is provided by the Nuclear Regulatory Commission (NRC).

4.0 Changes from Prior Year TYSP

Key changes from the NNSA-SRSO Limited Ten Year Site Plan, FY 2012 – FY 2021 (issued May 2011) include:

- The current TYSP has an expanded planning horizon of 25-years per NNSA guidance.
- Execution of TRIM enabling projects was well underway in FY2011 with construction of two new buildings: an Engineering Building (246-1H) and a Process Support Building (246-2H).
- NNSA has canceled the Pit Disassembly & Conversion line item project. However, NNSA plans to implement a Preferred Alternative, which includes use of MOX to disposition non-pit and pit surplus weapons plutonium and the use of a combination of existing facilities to establish the capabilities for pit disassembly and conversion, including TA-55 at Los Alamos National Laboratory (LANL), H Canyon/HB-Line, K Area and MFFF at SRS.

5.0 Future Vision and Core Capabilities

5.1 Tritium R&D and Manufacturing Tactical & Strategic Planning

Tritium processing capabilities are utilized in the SRS Tritium facilities to execute the Program of Record and NNSA's Tritium missions, which are expected to endure throughout the 10- and 25-year planning horizons. The table below links Tritium manufacturing capability functions to specific Tritium process facilities (i.e. real property assets). The future vision will transfer HAOM, 238-H and 236-H operations into more modern process facilities via infrastructure modifications described in Section 5.2.

			Tritium Process Facilities (Year Built)					
Mission	Deliverables	Operations	HAOM (1958)	236-H (1966)	238-H (1969)	HANM (1994)	TEF (2003)	234-7H (2003)
Tritium Supply	Tritium gas	Tritium extraction						
		Reservoir unloading						
Nuclear Stockpile Maintenance	War Reserve (WR) - quality reservoirs filled with T2 / D2 or inert gases	WR component receipt						
		Reservoir reclamation						
		Gas processing						
		Reservoir loading	Inert			T_2/D_2		
		Reservoir finishing						
		Final inspection						
		Packaging						
		Reservoir storage						
Nuclear Stockpile Evaluation	Reports containing GTS surveillance data supporting the annual certification of the stockpile	Environmental conditioning						
		Function testing						
		Burst testing						
		Material characterization						
		Life storage (reservoir aging)						
Helium-3 Recovery	Helium-3 cylinders	Helium-3 purification				2012		
		Cylinder loading				2012		

SRNL's research and development (R&D) capabilities are also essential to execute the Tritium missions. SRNL applies science to the Tritium plant and to the new gas transfer systems needed for the stockpile Life Extension Programs (LEPs).

Figure 5-1 shows the anticipated DSW-funded workload for the next ten years for Tritium operations. The LEPs are introducing reservoirs that require additional processing time, which is reflected in the workload increase from FY 2017 to FY 2020. LEP reservoirs will continue to be produced thereafter, but workload is expected to gradually decline as the stockpile size is reduced. The planned infrastructure modifications described in Section 5.2 will enable cost-effective operations with a smaller workload.

Figure 5-1: Reservoir Operation Workload

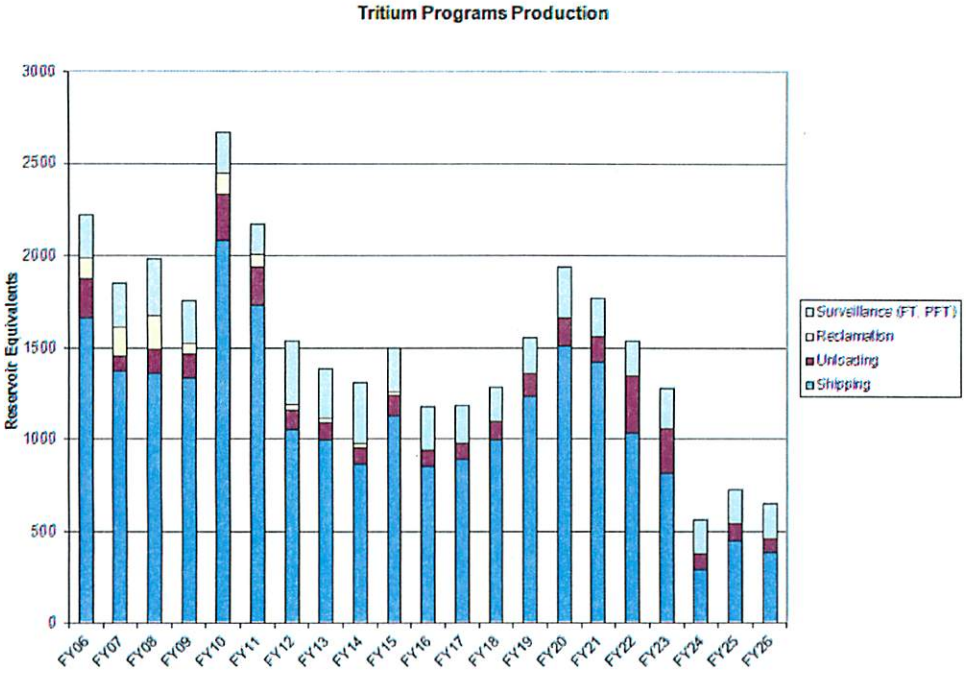
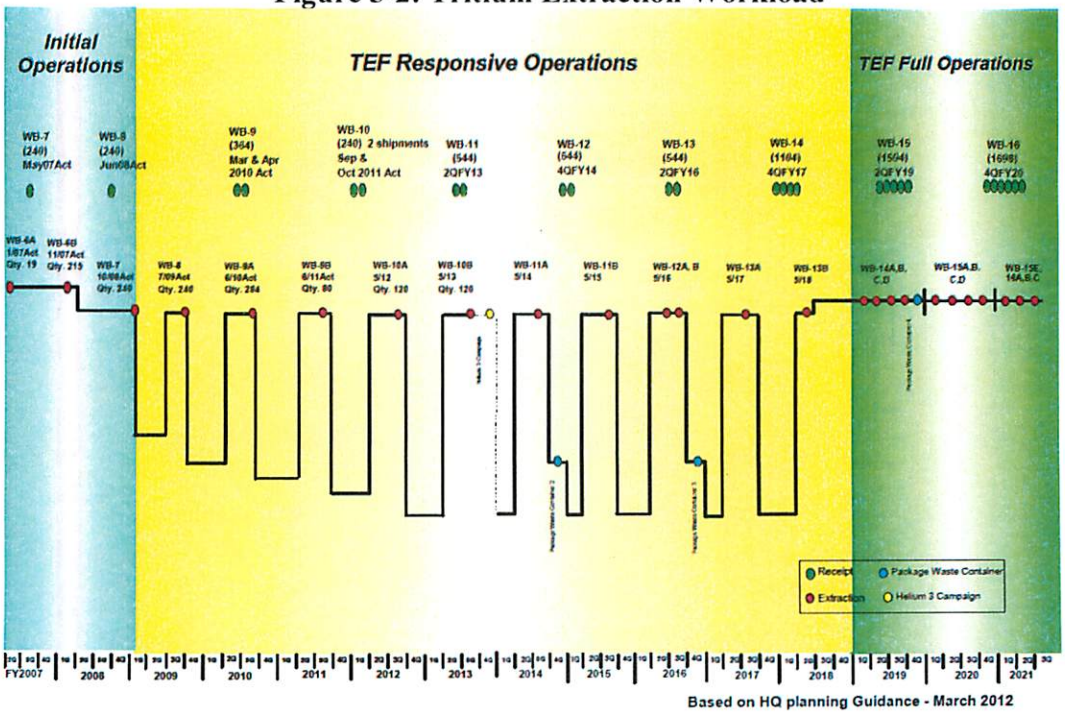


Figure 5-2 depicts both the vision and workload for the Tritium Readiness Campaign-funded extraction activities through FY 2021. "TEF Responsive Operations," which involves cost-effective sharing of cross-trained personnel between facilities, will be conducted through FY 2017 before transitioning to full operations. The extraction workload beyond FY 2019 is expected to remain fairly constant, as shown for full operations. Target irradiation and extraction schedules are based on Nuclear Posture Review requirements.

Figure 5-2: Tritium Extraction Workload



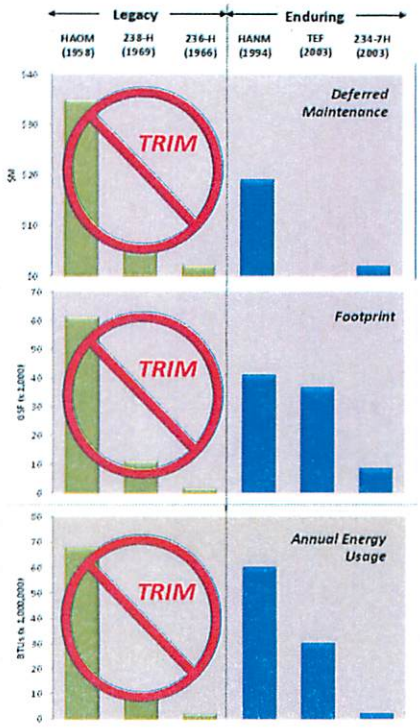
5.2 Tritium Infrastructure Tactical & Strategic Planning

Continual capability to execute NNSA's enduring Tritium missions depends on having adequate facilities and infrastructure. SRS' current Mission Critical footprint is comprised of older, Cold War-legacy facilities and more modern facilities that will endure throughout the 10- and 25-year planning horizons. The older facilities are expensive to operate, larger than necessary to support the current stockpile, and energy-inefficient. Consistent with Program of Record infrastructure goals, the vision for the next ten years is to expedite relocation and right-sizing of the remaining functions from these older facilities into the more modern facilities via an initiative known as Tritium Responsive Infrastructure Modifications (TRIM).

Some of the key benefits include:

- Reducing annual operating cost by $28M (12%) and avoiding the $145M to $195M cost to maintain the HAOM facility in a minimum safe operating condition for another 20 years
- Reducing active Mission Critical footprint by 44% (160K to 89K GSF)
- Reducing energy usage by 86 billion BTUs per year (43%)
- Reducing the number of mission critical production facilities from 8 to 5 (38%)
- Reducing deferred maintenance by $47M (55%)

Figure 5-3: Current Mission Critical SRS Tritium Facilities



To the maximum practical extent, this vision will be realized via CE/GPPs. Several initiatives are being pursued to reduce operating cost and thereby maximize the amount of available funding that can be allocated to these CE/GPPs. Examples include:

- An aggressive Continuous Improvement program
- Governance reform
- Cross training personnel
- Centralizing control of all operations in the HANM facility

With available funding maximized by cost reductions, most TRIM scope can be accomplished via CE/GPPs, but relocation of some of the remaining functions in the HAOM facility cannot. A line item that would complete the TRIM scope: "Sustaining HAOM Facility, SRS," is preauthorized by the Construction Working Group (CWG) to start in FY2017.

Current CE/GPPs are establishing new office space for personnel who currently reside in the HAOM facility. (See Section 6.1 for more detailed information.) This is the only significant impact of these consolidation plans to real property assets, and it is being adequately addressed.

Because the HANM facility will receive most of the TRIM-relocated functions and become the control center for all Tritium operations, it will be important to maximize its life via ongoing maintenance and recapitalization / upgrade projects. For this reason, the long-term vision includes a line item project to refurbish the HANM facility (FY 2036 – FY 2041) to extend its life by approximately 20 years.

An aerial photograph of the current state of the complex and a similar rendering of the future end state following these modifications and subsequent dispositions are shown below. All dispositions, except for the HAOM/217-H disposition, are expected to occur within the 25-year planning period.

Figure 5-4:

BEFORE

Current State
Before TRIM

Figure 5-5:

AFTER

End State After
TRIM & Facility
Dispositions

5.3 Fissile Materials Disposition Tactical & Strategic Planning

Implementation of the NNSA Fissile Materials Disposition Program at SRS focuses on the use and optimization of four facilities, two existing EM facilities (H Canyon/HB-Line and K-Area) and two under construction (WSB and MFFF).

Figure 5-6: Mixed Oxide Fuel Fabrication Facility (March 2012)

H Canyon/HB-Line facilities will complete preparation during calendar year 2012 to begin converting non-pit plutonium AFS materials to an oxide form suitable for feed to the MFFF. These facilities will produce up to 3.7 metric tons of AP-grade oxide during the next five years. In addition, these facilities have the capability to process pit materials and produce oxide feed that could be fed to MFFF mixed oxide unit operations.

In the next five years, two OFMD projects at SRS are anticipated to finish construction, conduct start-up testing, and begin operations.

Construction of the WSB started in December 2009, and is scheduled to be completed by June 2013. The WSB will be available as needed to support MFFF water runs, chemical runs, and radioactive waste operations.

Construction of the MFFF started in FY2007 and is anticipated to begin hot operations in FY2016. The MP-Grade plutonium oxide product is blended with a depleted uranium oxide to form the final oxide product (PuO2) which will be converted into a pellet form and used as fuel in commercial nuclear reactors. The MFFF processing rate will increase over the first several years of operation.

Figure 5-7: Waste Solidification Building (March 2012)

Figure 5-8: H Canyon/HB-Line Facilities

6.0 Real Property Asset Management

6.1 Site Footprint (Current and Future)

Prudent management of real property assets is essential to long-term mission success. This section discusses the key aspects of real property asset management, particularly in the Tritium facilities, which will undergo significant transformation in the coming years. The table below provides a summary of key information about the Tritium facilities as of the end of FY 2011.

Replacement Plant Value (RPV)		$1844		Million		
Total Deferred Maintenance (DM)		$67.6		Million		
Site Wide Facility Condition Index (FCI)		3.7%**				
		Facility Condition Index (FCI)	Asset Condition Index (ACI)	Asset Utilization Index (AUI)	# of Assets	Gross Square Feet (GSF) Buildings & Trailers (000s)
Mission Dependency	Mission Critical**	4.8%	95.2%	100%	8	160.747
	Mission Dependent	2.2%	97.8%	100%	22	133.474
	Not Mission Dependent	0.1%	99.9%	6%***	7	89.276
Facility Use	Office	18.4%	81.6%	100%	5	34.237
	Warehouse	2.5%	97.5%	100%	5	16.701
	Laboratory	5.1%	94.9%	100%	1	8.392
	Housing	N/A	N/A	N/A	0	0

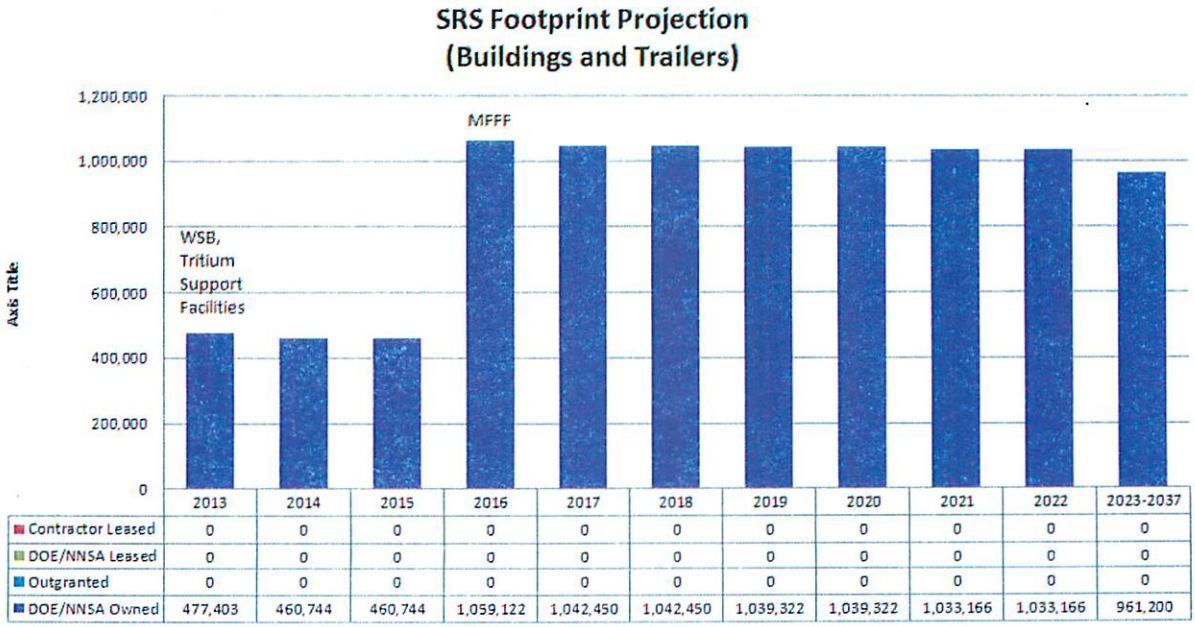
** TEF, which has no deferred maintenance and a relatively large RPV, artificially masks the condition of the other Mission Critical facilities.
*** Includes deactivated buildings 232-H and 232-1H.

As a site, SRS meets and exceeds the Congressional requirement for footprint reduction for current operations and for all projected new construction, and is well situated to offset any new footprint requirements for NNSA new-construction priorities, including the new NN facilities. The total footprint of the Tritium facilities at the end of FY 2011 was 383,497 GSF, including 37 buildings and trailers within 29 acres. When constructed, the NN facilities will have a total footprint of 633,000 GSF. All permanent facilities required to execute the NN mission will be completed by the line item projects. No other facility needs are anticipated throughout the lifetime of the NN mission. The following table provides information about recently completed and upcoming footprint changes.

FY	GSF Δ	Facility Use*	Reason
2011	+14,700	Administrative	Project Building 217-3H constructed – replacement for 1957 Shop Storage Building 232-1H and provides office space for Project personnel (TRIM enabler).
2011	+14,000	Storage	TEF Warehouse 263-170H constructed – provides needed storage space for TEF equipment and materials.
2011	+720	Service	New Entrance Control "Facility" (3 turnstiles) constructed on west fence.
2012	+16,150	Administrative	Engineering Building 246-1H constructed – provides office space for Engineering personnel (TRIM enabler).
2012	+10,570	Administrative	Process Support Building 246-2H constructed – provides office space for process-support personnel (TRIM enabler).
2012	+33,000	Industrial	WSB constructed.
2012	+4766	Administrative	Building 719-H transferred from EM to NNSA to provide office space for Tritium Programs personnel.
2015	0	Industrial	Building 249-H renovated to receive HAOM functions, reclassifying 10,417 GSF of footprint from Mission Dependent Not Critical to Mission Critical.
2016	+600,000	Industrial	MFFF constructed.

*Assumed Building Usage Code category as listed in FIMS.

Figure 6-1: SRS Footprint Projection
(Includes Tritium and NN facilities)



No Plutonium Disposition Program facilities are expected to be eligible for excess and disposition during the 10- or 25-year planning horizons.

To take advantage of the radioactive decay of tritium, deactivated facilities are maintained in a cost-effective long-term surveillance and maintenance (LTSM) mode. Building 232-H (71,966 GSF) is currently deactivated, and LTSM costs approximately $250K per year. A similar minimal cost is expected for LTSM of the HAOM Facility when it is deactivated. Because of the LTSM strategy, deactivated buildings are not declared excess until they are funded for disposition. As TRIM is executed, other facilities will be deactivated that either were not exposed to tritium or had low levels of tritium and could be demolished with dedicated funding. The TRIM strategy is to maximize utilization of available funding to relocate remaining functions from the older facilities into the more modern facilities. Facilities that could be declared excess and demolished within the 25-year planning period include:

Building	Earliest FY	Footprint Reduction (GSF)
232-1H	2014	11,622
Modular Offices (4 total)	2014	5037
236-H	2016	1,622
237/238-H	2017	16,672
701-3H	2019	3,128
233-22H	2021	6,156
232-H	2031	71966
Total:		**116,203**

All real property within the Tritium facilities footprint is considered "DOE Owned", with no fee simple land ownings, in-grants, or out-grants. No on-site space is currently leased, and there are no plans to lease on-site space in the future. Shaw- Areva MOX Services is leasing approximately 100,000 GSF of off-site warehouse space to temporarily store process equipment and materials until they can be installed in the facility. This is a cost-effective arrangement because the alternative was to build on-site additional warehouse space that would no longer be needed after two years.

6.2 Deferred Maintenance Reduction & Facility Condition

The NN facilities have no deferred maintenance (DM) because they are currently under construction, and no DM is projected during the tactical (i.e. 10-year) planning period. DM growth in the NN facilities will be minimized in the following years by ongoing investment in maintenance and facility infrastructure repairs and upgrades.

In the SRS Tritium facilities, DM is calculated based on comprehensive facility condition assessments that are performed every five years, primarily by the Engineering staff. The first of these assessments was conducted in FY 2003, and a DM baseline of $52.0M was established. Through the effective utilization of Facilities and Infrastructure Recapitalization Program (FIRP) funding, this "legacy" DM has been reduced to $26.7M. The most recent comprehensive assessment of the Tritium facilities was completed in FY 2008, and overall DM was determined to be $53.7M. DM calculations are updated annually. At the end of FY 2011 Tritium had $67.6M of DM.

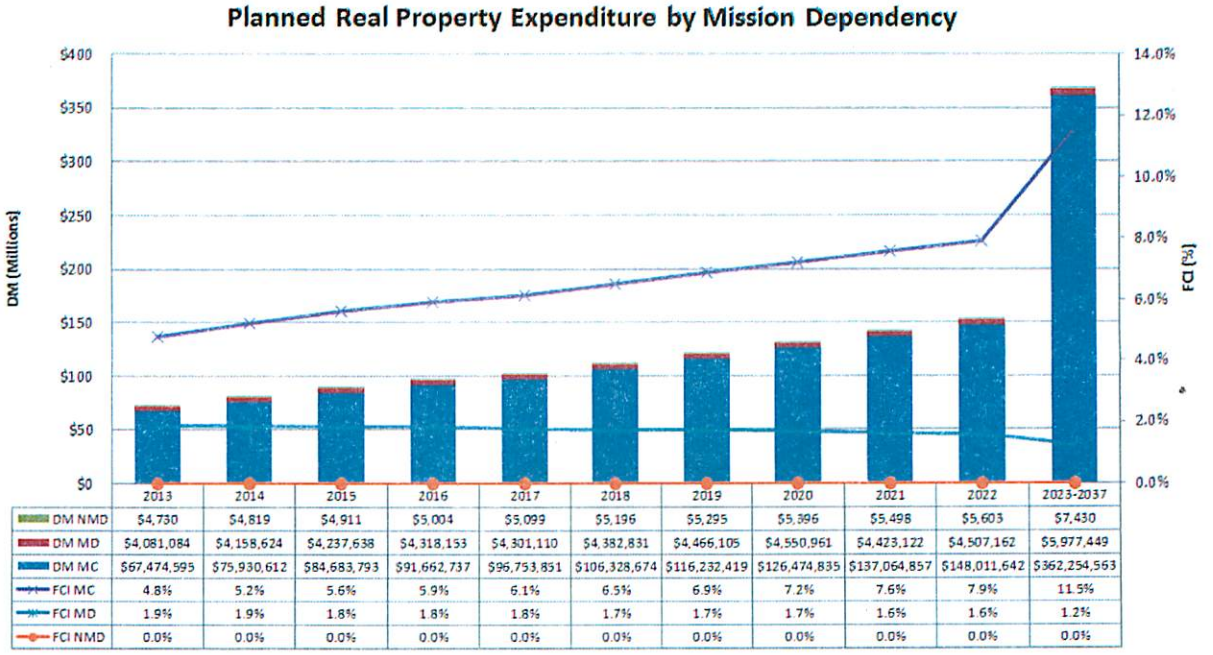
Figure 6-2 shows that Tritium's overall DM and the associated Facility Condition Index (FCI) will grow steadily. This reflects the TRIM strategy, and should be viewed as the short-term cost of establishing viable facilities and infrastructure for the enduring Tritium missions. Available funding will continue to be allocated to all corrective, preventive, and predictive maintenance required to execute the Tritium missions. Optimized maintenance strategies will be ensured through implementing Reliability-Centered Maintenance (RCM) best practices. However, discretionary recapitalization of obsolete, end-of-life systems will be deferred as long as possible to expedite TRIM implementation. For example, the Capability Based Facilities and Infrastructure

(CBFI) projects are focused on implementation of TRIM and reduction of risk in the enduring HANM facility. Although these projects will make a modest contribution to DM reduction in the near term, the real goal is to complete TRIM, thereby reducing the overall DM by approximately 55%.

The DM for Tritium's Mission Dependent Not Critical facilities is projected to remain stable throughout the 10-year planning period. Tritium's most modern Mission Critical facilities are TEF and 234-7H. DM growth is expected as these facilities mature, beginning within the first 10-year planning period (i.e. tactical planning horizon). Most of the near-term DM growth will be experienced in the HANM Facility, as more systems become obsolete and reach end of life. The current Tritium operations have little impact on facility condition because they are robust, protected from the environment, and were designed for a much larger throughput. Projected Facility Condition Index (FCI) versus NNSA's RTBF Key Milestones is shown in the following table.

Tactical Milestone	Projection
Mission Critical: FCI<5% by 2017	The current FCI of Tritium's Mission Critical facilities is 4.8%, but is projected to rise to 5.2% by FY 2014. *[It should be noted that TEF, which has no DM and a relatively large RPV, artificially masks the true condition of the other Mission Critical facilities.]*
Mission Dependent: FCI<8% by 2015	The FCI for Tritium's Mission Dependent Not Critical facilities will remain stable at approximately 1.9%, easily meeting this goal.
Not Mission Dependent: (No milestone)	The FCI for Tritium's Not Mission Dependent facilities was 0.1% in FY 2011.

Figure 6-2: Projection of Tritium Deferred Maintenance and Facility Condition Index



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023-2037
DM NMD	$4,730	$4,819	$4,911	$5,004	$5,099	$5,196	$5,295	$5,396	$5,498	$5,603	$7,430
DM MD	$4,081,084	$4,158,624	$4,237,638	$4,318,153	$4,301,110	$4,382,831	$4,466,105	$4,550,961	$4,423,122	$4,507,162	$5,977,449
DM MC	$67,474,595	$75,930,612	$84,683,793	$91,662,737	$96,753,851	$106,328,674	$116,232,419	$126,474,835	$137,064,857	$148,011,642	$362,254,563
FCI MC	4.8%	5.2%	5.6%	5.9%	6.1%	6.5%	6.9%	7.2%	7.6%	7.9%	11.5%
FCI MD	1.9%	1.9%	1.8%	1.8%	1.8%	1.7%	1.7%	1.7%	1.6%	1.6%	1.2%
FCI NMD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

6.3 Space Utilization and Consolidation

Space utilization and consolidation are key factors of the TRIM strategy. SRNS carefully plans the movement of people and equipment / infrastructure to ensure a smooth transition with continual mission success. For people, a database is maintained that shows all offices in the facility, who resides in each, and which offices are empty. This planning tool was used to assess the additional office space needed in the new Engineering (246-1H), Process Support (246-2H), and Project (217-3H) buildings when people are moved out of the HAOM facility. Formal Conceptual Design Proposals are completed before moving any equipment / infrastructure.

6.4 Sustainability/Energy

SRS has a single Site Sustainability Plan (SSP) and associated Consolidated Energy Data Report (CEDR) for the entire site that is submitted through DOE (EM). Status of meeting the goals, planned actions, and key issues are documented in the SRS SSP. NNSA sustainability/energy contributions are captured within this SSP. A Tritium-specific program was established in FY 2010 as part of the SSP, including a new Energy Manager position. Initial activities focused on gathering information, establishing metrics, and identifying specific actions to support the site's sustainability performance goals.

Through FY2011 the Tritium facilities had experienced a 7.8% reduction in energy intensity since FY2003 and a 16% reduction in water intensity since FY2007. Also, a metering project was completed in FY2012 for improved electricity billing allocation and data center energy performance monitoring.