SRNS Update

Stuart MacVean
President & CEO, Savannah River Nuclear Solutions

Governors Nuclear Advisory Council
October 17, 2019
SRNS: Our four mission areas supply solutions around the world

- **Environmental Stewardship** for soil, water and facilities
- **Nuclear Materials for National Security** nuclear weapons deterrent
- **Securing Nuclear Materials** to prevent unwanted proliferation
- **Transforming Nuclear Materials** into assets and stable wasteforms

**Savannah River National Laboratory** putting science to work

**Support Services**
- Emergency Services • Water • Electrical
- Cyber/IT • Roads • Construction • Maintenance

6,600 Employees “Making the World Safer”

World-class safety culture

Strong community support
Environmental Stewardship

Completed
- Ash removal at Dunbarton Bay
- C Area groundwater bioremediation (organics treatment w/ emulsified oil/microbes)
- F Area groundwater remediation (I-129 treatment w/ silver chloride)
- A & M Areas groundwater remediation (organics treatment w/ chemical oxidants)

Started
- H Area groundwater remediation (organics treatment with Base injection)
- P Area Groundwater Reactive Barrier (organics treatment w/ 760 tons of iron)
- G Area Oil Seepage Basin remediation (backfill to natural grade with clean soil and place vegetative cover over basin area)

Results
- Achieved D Ash CD-4 - $9M below budget, 14 mo. Early
- Terminated active remediation of M Area groundwater (500,000 pounds of solvents removed); $1M savings
- Achieved 63 FFA Milestones in FY19
- Since 1993, achieved 3,843 CERCLA milestones and RCRA Permit commitments on or ahead of schedule.
- Demolished 10 miscellaneous structures in FY19, 4 planned for FY20
EM Operations

- Completed NRU/NRX mission – Spent fuel returns from Canada
  6 months early
- Met all processing deliverables in H Canyon
- High hazard deactivation safely executed on or ahead of schedule
  - HB Line
  - 235F
  - F/H Lab
- K Area posture change from surveillance to operations
SRNL approached delivery of $300M in scope in FY19 for the first time.

Increased flight times of UAVs using a hydrogen-supplied fuel cell over batteries.

Mark 18A mock-up facility established to train for Pu-244 recovery.

Recognized as world leader in tritium science and technology.

Response team to quickly recover nuclear materials.

Nuclear materials and high level waste processing innovation.

~12% of LDRD Program funding allocated for discovery science.
Infrastructure Investment

• Refurbished ~40 miles of paved roads
• Replaced 22 roofs
• Refurbished 29 firewater systems
• Replaced all emergency vehicles
• Replaced 13 of 16 SRNL shielded cell windows
• Replaced radio systems
• Replaced major power distribution systems
• Habitability upgrades
• Installed dissolver in H Canyon – preparing to replace electrolytic dissolver

$350M spent on infrastructure improvements in FY16 - FY19

$100M annual investment
~$180M in flight
Changing SRNS Customer Landscape

**Our Missions**

**Environmental Management**
- Management, stabilization and disposition of nuclear materials
- Management and disposition of solid, liquid and transuranic wastes
- Spent fuel management
- Environmental remediation and cleanup

**National Nuclear Security Administration**
- Tritium operations and extraction
- Helium-3 recovery
- Nonproliferation support
- Uranium blending and shipping
- Foreign fuel receipts

**Work for Others**
- Other federal agencies
- Other DOE sites
- Private industry
- Other minor entities

**ADDS**
- MOX Transition
- Proposed Pit Production Mission
- Surplus Plutonium Disposition Acceleration
- Tritium Finishing Facility
SRS support for nation’s nuclear deterrent continues, while adding other missions in nuclear material stabilization, waste treatment, environmental cleanup, etc.

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>1950</td>
<td>SRS created to supply nuclear materials for the nation’s nuclear deterrent</td>
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<tr>
<td>1955</td>
<td>Permanent Tritium Facilities operational</td>
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<tr>
<td>1997</td>
<td>K-Reacto building converted for handling and interim storage of excess nuclear materials</td>
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<tr>
<td>2000</td>
<td>Nonproliferation Program established</td>
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<tr>
<td>2000</td>
<td>NNSA established as semi-autonomous agency within DOE</td>
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<tr>
<td>2007</td>
<td>Tritium Extraction Facility starts operation</td>
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<tr>
<td>2019</td>
<td>SRS NNSA mission grows</td>
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Tritium Operations
Increased Production Period 2020-2024

• Tritium production, extraction and processing capabilities must increase to meet demand
• Requires 6 extractions per year by 2023
• Reservoir loading and testing complexity will increase; more complicated surveillance
• Work in progress in three key areas
  • Plant preparation
    – $74M Projects Execution Plan
    – Tritium Finishing Facility
  • Focused hiring
    – 134 hired in FY18 and 110 in FY19
    – Total headcount: ~700
  • Performance improvement
    – Maintenance and product quality
    – Improved efficiency and response capability
Proposed SRPPF

Progress

- Organizations established for proposed SRPPF and MOX Termination.
  - SRPPF staff at 125 FTEs +75 on the subcontract supporting the BOP design
  - MOX Termination SRNS & Contractor staff at 145 FTEs
  - Design Engineering – Aiken, Los Alamos, Greenville, Denver

- Submitted cost and strategy for Critical Decision (CD)-1

- Began conceptual design of proposed SRPPF
  - Process equipment, gloveboxes, utility systems, support buildings

- MOX property being repurposed for UPF, PPF, SPD and other NNSA missions

“I am confident that the recommended alternative of repurposing the Mixed Oxide Fuel Fabrication Facility at SRS while maintaining Los Alamos as the Nation’s Plutonium Center of Excellence for Research and Development is the best path forward”

- Under Secretary of Defense for Acquisition and Sustainment and NWC Chair Ellen Lord
Surplus Plutonium Disposition Program

- Repackaged and shipped one metric ton of plutonium from South Carolina to meet a court order by January 2020.
- Transition from MOX Fuel approach to Dilute and Dispose approach
- Modifying existing glovebox to increase throughput/shifting to 24/7 operations
- In design phase for a new $500M 3-glovebox line in K Area

Photo: Preparing to package a can of downblended plutonium for shipment out of South Carolina.
Projected Jobs*

* Based on past capital asset projects
** Subject to Congressional appropriations

April 2019

1,000
2,000
500
1,500
1,000
500

FY 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 50+ years

Milestones**

NNSA conducts conceptual design for SRPPF
Deputy Secretary of Energy selects preferred alternative (Critical Decision 1)
NNSA establishes formal project baseline with 90 percent design (Critical Decision 2)
NNSA approves start of construction (Critical Decision 3)
NNSA approves start of operations
50 pits per year capability

* MOX Transition
** Dilute & Dispose
*** Pit Production

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Changing Workforce Landscape

- 3,512 new full-service employees (FY14-present)
- 80% hired from local area
- 47 average age of employees, down from 54 in 2008

50% employees < 6 years experience
Hundreds of applications per opening

<table>
<thead>
<tr>
<th>Year</th>
<th>New Hires</th>
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<td>FY14</td>
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<tr>
<td>FY15</td>
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<td>FY16</td>
<td>438</td>
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<td>FY19</td>
<td>1099</td>
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<td>FY20</td>
<td>1000</td>
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Oct 19
New Missions and Hiring Impacts

Agile and Responsive
Onboarding • Training • Offices and Parking • Knowledge Transfer

SAVANNAH RIVER NUCLEAR SOLUTIONS
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Nuclear Operations Accomplishments

- HFR campaign underway
- Plutonium downblend in K-Area - ongoing
- TRM receipts continue
- FY18 TRM Receipts continue

- SRTE Portable 7-Bed RA Complete
- TDR Effectiveness Review Complete
- Completed 176 lbs of plutonium oxide in HEU Line
- Completed FY17 TRM receipts
- Completed FY17 plutonium down-blend in K-Area
- Completed 1.1 TRM/DHR fuel receipts
- Dissolved 4 MRX batches of SNF
- Completed 3 shipments to WIPP
- Completed RA and 3 Tritium extractions
- Readiness to ship to WIPP

- H Canyon Head End and First Cycle Readiness Assessment
- MRU/MOX outloading readiness achieved
- Fully exited Deliberate Operations
- HE Line shipping JES-2 Pu oxide to K-Area readiness achieved

- HFR 4 Batches Completed
- Completed FY18 Pu Downblend
- SRTE Portable 7-Bed RA Complete
- MOX Transacton Complete
- Completed Resin Retrieval from HE-Line

- 235-F MAR removal (ONF/3B)
- $5M in Infrastructure Project Upgrades
- 1 Metric Ton of Pu Moved out of S.C.
- HE-Line Layup Continued

- Completed D-Ash Project
- SRTE Portable 7-Bed RA Complete

- 2015
  - BUDGET: $899M

- 2016
  - BUDGET: $906M

- 2017
  - BUDGET: $943M

- 2018
  - BUDGET: $1.2B

- 2019
  - BUDGET: $1.5B
ORPS Reportable Events (FY16-FY19)

- FY19 had lowest number of personnel related ORPS events in over 9 years
- Best 2 years, with 50% of workforce having less than 6 years of experience
SRNS: We make the world safer.