Department of Energy - Savannah River Site
Common Infrastructure Update

David Bender
Director, Infrastructure and Area Completion Division
Assistant Manager for Infrastructure and Environmental Stewardship

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Purpose and Basic Definitions

- **Purpose:** Provide an update of how DOE-SR manages and maintains Savannah River Site’s Common Infrastructure

- **Basic Definitions:**
  - **Infrastructure:** Natural or manmade physical structures and supporting equipment that is necessary to accomplish a defined mission or specific purpose
  - **Common Infrastructure:** Infrastructure that supports one or more missions, tenants, or DOE organizations
SRS Common Infrastructure 101 – Infrastructure Types

Mission Specific (Program) Infrastructure:
Dedicated to a specific DOE mission or task

Common Infrastructure:

Basic Common Infrastructure:
Maintenance of Site common infrastructure
(examples: common use facilities, administrative facilities, roads, parking areas, and bridges ....)

Utilities:
Common Infrastructure that provides utility commodities in support of more than one Site tenant
(examples: electrical distribution, domestic water, steam, sanitary waste ....)

Service Centers:
Common Infrastructure that enables a critical service in supports of more than one Site tenant
(examples: IT services, radios, telephones ....)
SRS Common Infrastructure Snapshot – Critical Systems

64 Miles
High Voltage Trans
Lines
9 Substations

2 HIGH
HAZARD
DAMS
(7 SMALL DAMS)

2 Million
Gallons/day
Domestic
2 Water Plants

58 Miles
1500
Fire Hydrants
Sanitary Waste

44 Common
Facilities
Shops
EOC/SRSOC
Admin

2 Chilled
Water Plants

310 sq miles
of land area
Larger
than the DC
Beltway

3 Locomotives

119 MILES
PAVED ROADS
Distance from
Washington to
Philadelphia

River Water
System
30,000 gpm
Max
7500 gpm
Normal

5 Biomass
Steam
Plants
Steam Lines
20 Miles

180 Miles
Electric
Distribution
Recent Major Accomplishments (FY19 to date)

Roads
- Resurfaced 10 miles of two lane roads
  - New Ellenton barricade to S-area facilities (Road F)
  - Jackson barricade to B-area complex (Road C)
- Replaced 78 Culverts on 7.5 miles of major four lane highway (Road C)

Buildings
- 716-2A Habitability Renovation
- Replaced 3 failed major facility roofs with “Cool Roofs”
- Installed Dining Hall (766-H) Outdoor Shades - “Sails”

Utilities
- Removed 7 River Water System valve houses
- Overhauled 2 Major Chiller units
Recent Road Refurbishment Accomplishments

- New Ellenton Gate to J/S/Z Areas (Road F)
- Road C Culvert Replacements
- Jackson Gate to Cloverleaf (Road C)
Recent Facility Accomplishments

716-2A Roof Replacement: Before

716-2A Roof Replacement: After

Publication Building (703-43A) Habitability Improvements

766-H Dining Outdoor “Sails”
Recent Utility Accomplishments

Chiller Plant Overhauls (A and B Areas)

River Water Valve House Replacement: Before

151-1K Sump Pump (Before)  151-1K Sump Pump (After)

River Water Valve House Replacement: After
Ongoing Major Project Work

- A-Area Fire Water Project
- 703-47A Renovation
- Tritium Power Line Relocation
- C-Road Paving Continuation
Major Project Work to Start and Complete this FY

**Roads**
- Road C Paving from Cloverleaf to E-Road

**Buildings**
- 730-2B Carpeting Replacement
- Savannah River Ecology Building Roof Replacement

**Utilities**
- New Domestic Water Line to Salt Waste Processing (J-Area)
Future Year Planned Projects

- Site Training and Dining Facility Roof Replacement (766-H)
- Steam Distribution Repairs
- River Water Pump House Switchgear Replacement (681-3G)
- Par Pond and L Lake Emergency Spillway Repairs
- Road E and Road 4 Resurfacing
Sustainability Initiatives

- Repurpose Road Project Millings to upgrade secondary roads and SRSCRO

- “Cool Roof” Roof Replacements

- Utility Scale Solar Power Initiative

- Right Sizing:
  - River Water Pump House Electric Power Switch Gear
  - A-Area “Service” Water System
Utility Scale Solar Initiative Progress

• Request for Information (RFI) released March 21, 2019
  https://www.fbo.gov/index?s=opportunity&mode=form&id=d0b4559cbd17a91118901dfde892e208&tab=core&_cview=0

• Two parts:
  A) Utility Scale Electrical Power
  B) Utility Scale Test Bed for Research

• RFI Closed April 22
• Discussions with Respondents ongoing
• Report and Brief planned for September CAB
Water Line Challenges (Domestic, Fire, Sanitary, Chilled)

- Increased number of water line leaks
  - Majority on PVC Pipe
  - Domestic Water System is primarily PVC

- Leak locations random primarily on secondary distribution lines

- PVC Pipe design life is 50-70 years (up to 100 years)
Water Line Challenges

- Leaks can occur due to:
  - Corrosion (metal pipe)
  - Freezing
  - Over-pressurization
  - Installation errors
    - Improper depth or and/bedding
    - Stress by bending
    - Gluing errors
    - Improper connections

- Rock caused hole in Steel firewater line

- Improper Backfill caused hole Domestic Water line

- Difficult repair beneath S-Area buildings
Water Line Leaks Analysis

- Installation errors found to cause majority of leaks
- Installation errors can take up to 20 years to manifest
- Most of PVC Pipe installed late ‘90s
- Industry experience indicates number of repairs due to installation errors recede after 30 years

Water Line Leaks Way Ahead

- SRS Domestic Water System is well maintained and safe (Passed SCDHEC’s Annual Inspection in March)
- Continue to make repairs, trend, and analyze
- Replace entire lines as conditions dictate

Stressed 10” Main PVC Pipe

Longitudinal Crack due to stress
Savannah River Site Common Infrastructure Progress

Common Infrastructure System Health Reports

March 2014

March 2019

SNAPSHOTS
☐ Consistent Resourcing ($)
☑ Realistic Planning
☑ Disciplined Execution
☑ Innovative Management
☑ Skilled Workforce

Safe, Efficient, and Durable Common Infrastructure that enables SRS to meet current and future mission needs
<table>
<thead>
<tr>
<th>SIE- March 2019 System Dashboard</th>
<th>MII Items</th>
<th>MII Items</th>
<th>MII Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steady Generation &amp; Distribution</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Outfalls, Dams, Basins, Lakes, &amp; Lainiffs</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Roads, Bridges, &amp; Railroads</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Rigging &amp; Transportation</td>
<td>Yes</td>
<td>Yes</td>
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</tbody>
</table>

**Additional Comments MII**

- **Note:** Information in this report is subject to change as systems and components are within different stages of their life cycle (many have exceeded their design life). Lack of visual data facilitates degradation. Degradation is a function of age, exposure to environment, and use. For any questions or comments, please contact the SRS Project Manager or System Manager.

**Legend & Definitions:**

- **Satisfactory - System is fulfilling customers' needs.**
- **Marginal - Deficiencies are present that may cause an interruption in service; however, system is currently fulfilling customers' needs.**
- **Unsatisfactory - System or sub-system has degradation such that failure will have significant operational impacts.**

**Notes:**

1. **RED BOLD UNDERLINE** - Identifies the system or sub-system has turned red and is unsatisfactory.
2. **BLACK BOLD UNDERLINE** - Identifies the system or sub-system improved or decreased with the system or sub-system green or yellow.

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**Status Date:** 03/27/2019

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SRS Infrastructure 101 – Common Infrastructure Funding

$$$ Appropriation Level - Defense Environmental Cleanup $$$
Program Level (Risk Management Operations, Rad Liquid Tank Waste, ...)

Program Baseline Summary – PBS (Control Point Level)
The budgeting and funding mechanism to resource specific DOE-SRS programs that are contained within the DOE-Environmental Management Work Breakdown Structure (PBS 14 – Liquid Waste Disposition, PBS 30 – Soil and Water Remediation, ...)

Utilities and Services

- DOE-SR Establishes Set Rate (s)
- Common Infrastructure

Utilities (Pool) (commodity and infrastructure)

Services (Pool) (service and infrastructure)