



U.S. DEPARTMENT OF
ENERGY



Department of Energy - Savannah River Site Common Infrastructure Update

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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

H-Canyon



Common Infrastructure:

Basic Common Infrastructure:

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



Badge Office

Utilities:

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



Biomass Plant (Steam)

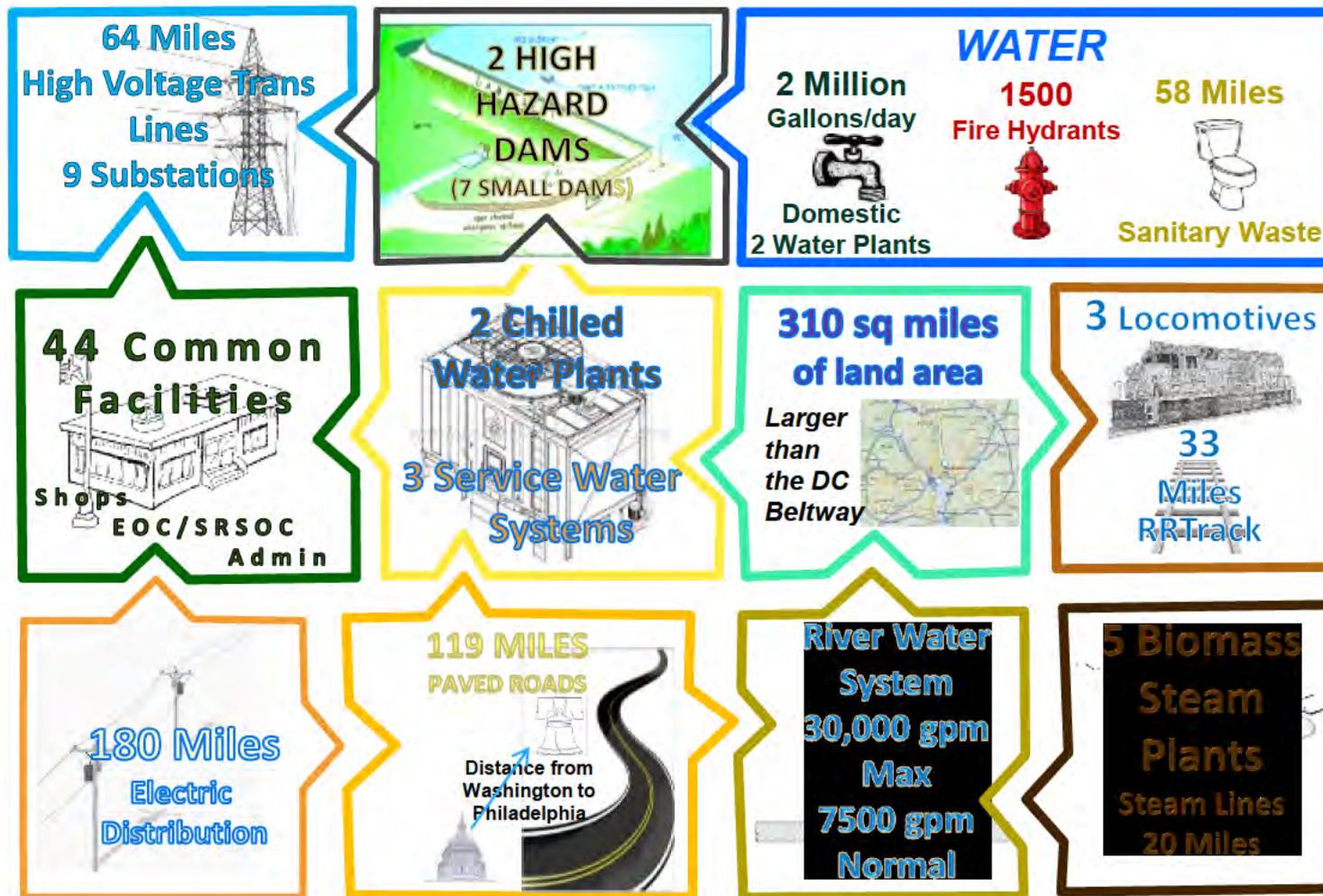
Service Centers:

Common Infrastructure that enables a critical service in supports of more than one Site tenant
(examples: IT services, radios, telephones)

Calibration Shop



SRS Common Infrastructure Snapshot – Critical Systems



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

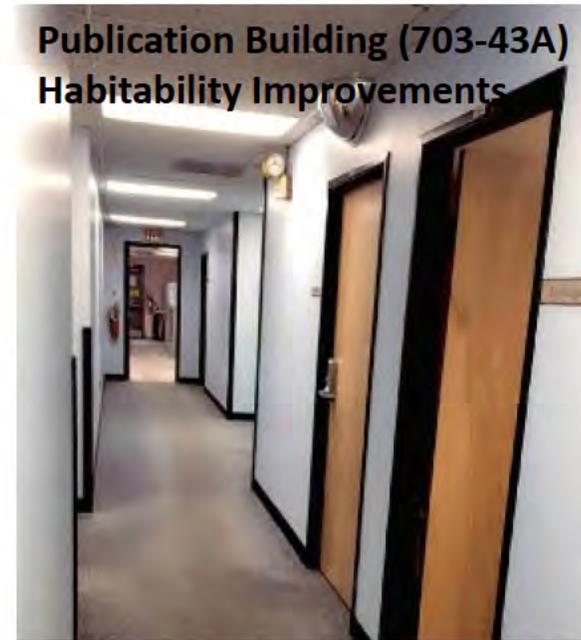
- New Ellenton Gate to J/S/Z Areas (Road F)
- Road C Culvert Replacements



- Jackson Gate to Cloverleaf (Road C)



Recent Facility Accomplishments



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

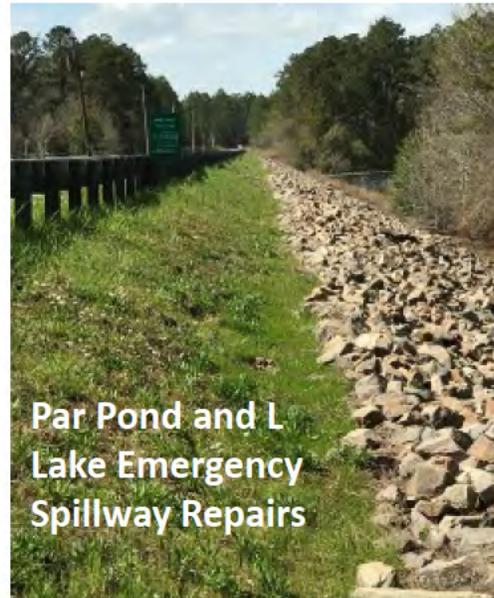
- 730-2B Carpeting Replacement
- Savannah River Ecology Building Roof Replacement



Utilities

- New Domestic Water Line to Salt Waste Processing (J-Area)

Future Year Planned Projects



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**



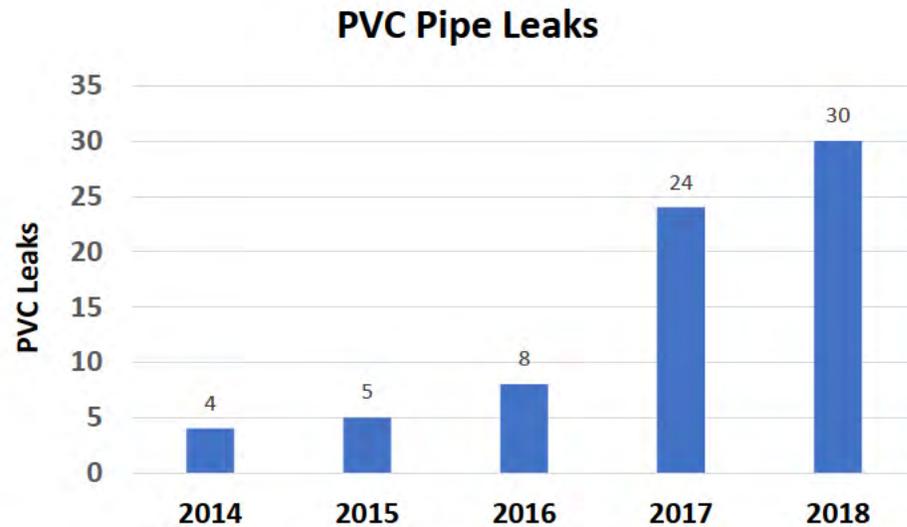
Utility Scale Solar Initiative Progress

- **Request for Information (RFI) released March 21, 2019**
https://www.fbo.gov/index?s=opportunity&mode=form&id=d0b4559cbd17a9118901dfdce892e208&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**

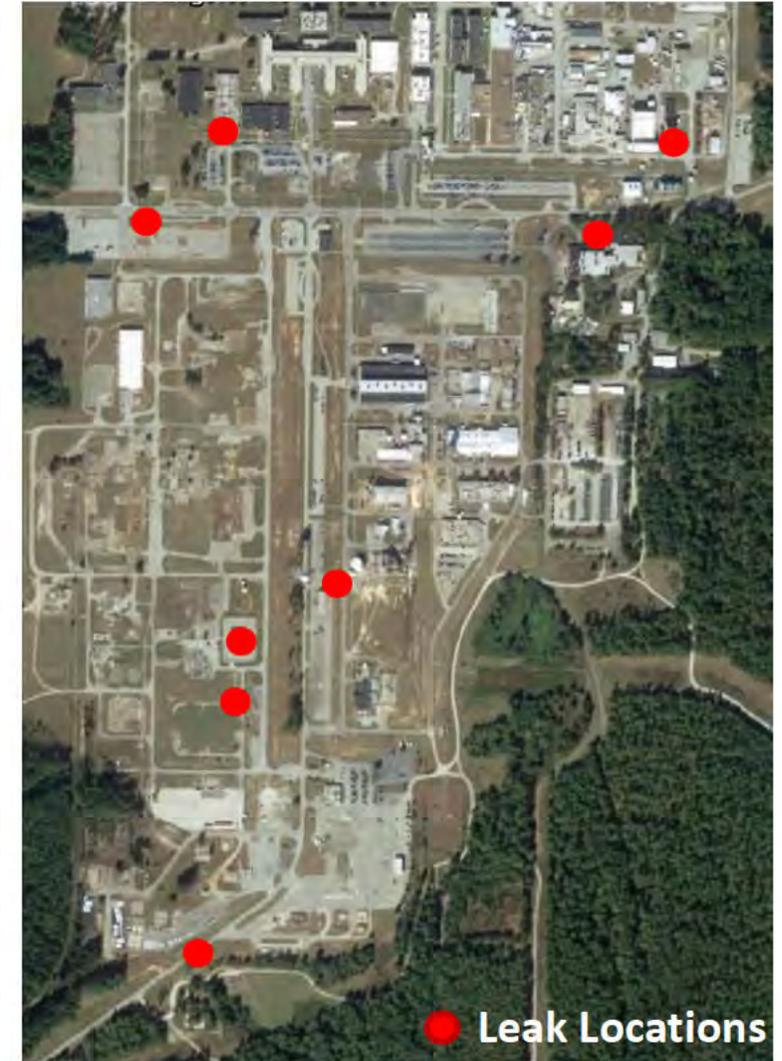


Water Line Challenges (Domestic, Fire, Sanitary, Chilled)

- 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)



A-Area Domestic Water Line Breaks
3/1/17 – 3/1/18



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



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



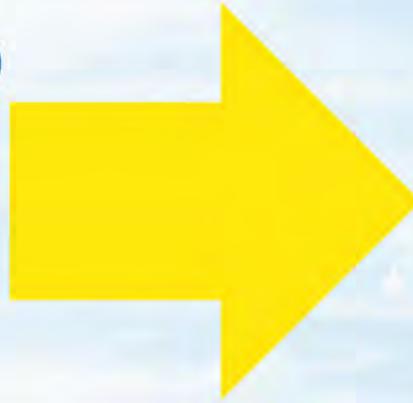
Stressed 10" Main PVC Pipe



Longitudinal Crack due to stress

Savannah River Site Common Infrastructure Update - Conclusion

- Consistent Resourcing (\$)
- Realistic Planning
- Disciplined Execution
- Innovative Management
- Skilled Workforce



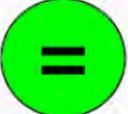
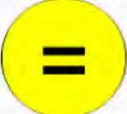
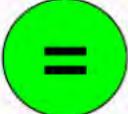
Safe, Efficient, and Durable Common Infrastructure that enables SRS to meet current and future mission needs



BACKUP

SIE- March 2019 System Dashboard

(page 2/2) Status Date 03/27/2019

Steam Generation & Distribution	Outfalls, Dams, Basins, Lakes, & Landfills	Roads, Bridges, & Railroads	Rigging & Transportation																						
 MIL Items No	 MIL Items Yes	 MIL Items Yes	 MIL Items Yes																						
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<p>F & H Area Lines: Osmose steam pole inspections are ongoing.</p> <p>Note: Annual A-area Steam Outage tentatively scheduled for May 6th – June 17th</p>	<p>Dams: The Potential Failure Mode Analyses (PFMA) have been completed for both Par Pond Dam and Steel Creek Dam. Action items are being developed based on the results of the analyses. The 2019 FERC visit was conducted in March. The visit report is expected in May.</p> <p>Landfills: Annual ash movement occurred between 03/12 and 03/22. Approximately 1,212 tons of ash were moved to the landfill, finishing up activities on the east side of the landfill area. Vegetation has been established at the bulk soil stockpile area as well as on top of 288-F. Minimal maintenance activities performed due to limited funding.</p> <p>Outfalls: H-12 outfall experienced a copper exceedance in March. Issue review Scheduled.</p>	<p>Roads: Roads are aged and routinely monitored for immediate maintenance needs (potholes, etc.). Repairs are scheduled as needed. The site Pavement Condition Index (PCI) is predicted by the deterioration curve as "very poor" or "approaching failure". The culvert replacement project for Road C is complete. Milling and paving of Road C began at the Jackson Barricade on 2/15. The Southbound lanes from the barricade to just north of the cloverleaf are complete.</p> <p>Railroads: Subcontractor performed maintenance for FY19 is scheduled and will include crossing signal improvements, switch repairs, and tie replacements. Currently meeting Modified Federal Railroad Administration (FRA) Class III Standards per the USA.</p>	<p>Fuel: For the H Area fuel station. Taking two additional soil samples, approximately 15 feet apart (linearly, by depth) to determine Naphthalene concentrations.</p>																						
<p>Additional Comments MIL</p> <p>Note: Infrastructure is a composite of structures, systems and components which are within different stages of their life cycle (many have exceeded their design life). Lack of recapitalization facilitates degradation. Degradation is a slow continuous process and will eventually impact overall reliability.</p> <p>MIL Revision 1 FY20 (2/15/18) - SS Facilities and Support: A2016276 "Replace Degraded Roof, 766-H" SRNS Ranking #0 (Funded FY19), A2016205 "Phase II of the B Area 730 Building (730-B, 730-1B, 730-2B and 730-4B) HVAC System Sustainment Scope" SRNS Ranking #6, A2017003 "Replace Degrading Public-Address System (Safety Alarm System) Site Services (wired Portions in A, B, C, E, G & N Areas)" SRNS Ranking #19, A2017001 "Replace Degraded Roof, 705-C" SRNS Ranking #46, A2017014 "Replace Degraded Roofs, 703-45A, 703-42A" SRNS Ranking #48, A2016182 "Replace Obsolete Fire Alarm Panels, Common Infrastructure Facilities" SRNS Ranking #50, A2016210 "Replace package HVAC units for Common Infrastructure Facilities (R22 Phase Out)" SRNS Ranking #61, A2016212 "Perform Interior/Exterior Building Electrical equipment rehabilitation for Common Facilities" SRNS Ranking #62, A2016211 "Perform exterior Building Structure/Surface rehabilitation for Common Facilities" SRNS Ranking #63, A2016220 "Perform interior flooring rehabilitation for Common Facilities" SRNS Ranking #64, A2016219 "Perform interior Building Structure/Surface rehabilitation for Common Facilities" SRNS Ranking #66, Electrical Distributions: A2016088 "A-Area Reliable Power" (to include replacing 151-1K 13.8 kV switchgear) / PBS 11C SRNS Ranking #0 (Funded), A2016118 "L-Area Reliable Power" (to include replacing 151-1L 13.8 kV switchgear) / PBS 12 SRNS Ranking #0 (Funded), A2016184 "Transformer(s) procurement and replacement" SRNS Ranking #6, Domestic Water: A2016199 - River Water A2016199 - A2017002 "Replace Degrading Switchgear At 681-3G River Water Pumphouse" SRNS Ranking #31, Fire Water: A2016199 - A2016170 "A-Area Fire Water Supply Repair/Replacement" SRNS Ranking #7, Outfalls, Dams, Basins, Lakes, and Landfills: A2016173 "Site Dams Inspection and Recommendation/Action" SRNS Ranking #16, A2016193 "288-F Class 2 Landfill Ash Reclamation Project" SRNS Ranking #61, A2016214 "Paint Steel Creek Access Bridge, 686-C" SRNS Ranking #52, Chilled Water: A2016199 - Process/Service Water: A2016199 - A2016004 "Replace 285-H Unit Substations (2.4kV and 480V)" PBS 11C SRNS Ranking #26, A2016005 "Replace Return Basin (281-2H) Substation & Transformer" PBS 11C SRNS Ranking #35, A2016273 "Cooling Tower Improvements - 285-H" SRNS Ranking #76, A2016228 "Evaluate and Replace A-Area Service Water System" SRNS Ranking #78, Sanitary Wastewater: None, Steam Distribution and Generation: None, Roads, Bridges and Railroads: A2016243 "Reconstruct SRS Culverts Crossing Primary Roadway" SRNS Ranking #37, A2016172 "Additional M&R - Road Systems Maintenance/Repair" SRNS Ranking #49, A2016190 "Rebuild, Repair & Replace Fatigued Sections of Road C from Barricade 1 to Rd 3 (8.07 mi)" SRNS Ranking #54, A2016201 "Rebuild, Repair & Replace Fatigued Sections of Road 4 (2.91 mi)" SRNS Ranking #55, A2018009 "Sealing and Re-striping Parking Lots" SRNS Ranking #79, A2016216 "Repair Site Railroad Infrastructure Phase 1 - supports H, K, L, and E Areas" SRNS Ranking #98, Rigging and Transportation: A2016265 "Replace Fire Ladder Truck 1 or renew Lease" SRNS Ranking #28, A2016239 "Replace one degraded Mobile 100 Ton Crane for Reliability" SRNS Ranking #39, A2016199 "Water System Consolidation Feasibility Study and Water System Upgrades" SRNS Ranking #74.</p>																									

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LEGEND & DEFINITIONS:

	Satisfactory - System fulfilling customers' needs.		Marginal - Deficiencies' are present that may cause an interruption in service; however, system is currently fulfilling customers' needs.		Unsatisfactory - System or subsystem has degradation such that failure will have significant operational impacts.
	Equal Sign indicates system status remained the same from last month.		Up Arrow indicates system status improved from last month.		Down Arrow indicates system status deteriorated from last month.

BACKUP

Site Services - March 2014 System Health Dashboard

(page 2/2) Status Date 3/1/2014

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<p>7B4-7A Biomass: 7B4-7A biomass boiler went off-line due to a failed oxygen sensor caused by excessive heat build up in the powerhouse due to a failed ventilation fan. The fan was repaired and oxygen sensor is scheduled to be on site 2/21/14. Continuous Improvement Quick Hit initiated to establish a program to address steam tracer issues. F-Area Lines: strainer screen & support pole issues. H-Area Lines: strainer screen issue; including repairs needed.</p>	<p>Dams: Issue discovered at Dam 685-750 (New Fire Pond). Unexpected flow found around conduit outlet after inlet was deiced. Structure currently appears stable. Path forward is being developed, de-watering pumps have been ordered to drain the pond and pursuing an estimate to remove the dam. Outfalls: Outfall F-09 flow/sampling methods need upgrades. Basins: trees need removal. Landfills: Obtained Operating Permit on 2/21/14 from SCDHEC to move adjacent ash to 28B-F Ash Landfill.</p>	<p>Roads: Damaged overtrail in several locations due to recent ice storms. Temporary barrier walls have been installed in critical locations until repairs are made. Road shoulders are littered with heavy debris due to recent ice storms. Clean up recovery is in progress. Some road signs have been destroyed or displaced due to falling trees and limbs. Replacement/repair is in process. Estimate to repair overtrails has been received. Railroads: Debris from recent ice storm has been removed from all active railroad lines. Lack of maintenance contract.</p>	<p>Emerg. Vehicles: Unit 1 (Ladder Truck) will be replaced.</p>																						

Additional Comments CIPL

CIPL Revision B-55 Facilities & Support: "Replace Degrading Site Radio System" CIPL Ranking #16, "Replace Roof for 703-A" CIPL Ranking #73, "Replace Degraded Roof for 703-47A" CIPL Ranking #112, "Replace Degraded Roof for 730-2B" CIPL Ranking #113, "Replace Degraded Roof for 730-4B" CIPL Ranking #114, "Replace Three Degraded Roofs Site Services Roofs for (730-13, 717-F, 151-1U)" CIPL Ranking #126, "Replace Three Degraded Roofs Site Services Roofs for (703-C, 703-46A, 151-2L)" CIPL Ranking #132, "Replace Oil Deck 710-6N" CIPL Ranking #115, **Electrical Distribution:** "K-Area Reliable Power" CIPL Ranking #9, "Replace Degraded L-Area Non Power Supply (L-Area Reliable Power)" CIPL Ranking #5 | CIPL Ranking #9 & #15 are NVM Items), **Domestic Water:** None, **River Water:** "Repair/Replace 21 Degraded River Water Line Valve Houses" CIPL Ranking #80, **Fire Water:** "A-Area Fire Water Supply Upgrades" CIPL Ranking #11, "Replace Most Critical Fire Hydrants (Installed Before 1970) for Reliability" CIPL Ranking #94, "Replace Obsolete Fire Alarm Panels" CIPL Ranking #89, **Chilled Water:** None, **Process/Service Water:** "Replace Return Basin (2B1-2H) Substation & Transformer (Procurement & Installation)" CIPL Ranking #6, "Replace 2B5 H Unit Substation (2.4kV and 483V) (Procurement & Installation)" CIPL Ranking #8 (CIPL Ranking #6 & #9 are NVM Items), **Sanitary Wastewater:** None, **Steam Generation & Distribution:** None, **Outfalls, Dams, Basins, Lakes, & Landfills:** "Site Dams Federal Energy Regulatory Commission (FERC) Recommendation/Actions" CIPL Ranking #109, **Roads, Bridges, & Railroads:** "Rebuild, Repair & Replace Fatigued Sections of Road C" CIPL Ranking #97, **Rigging & Transportation:** "Replace 3 Degraded Mobile Cranes (30, 40 & 90 Ton) for Reliability" CIPL Ranking #68, "Replace Ladder Truck" CIPL Ranking #40 | CIPL Ranking #40 is an ESH Item

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SRS Infrastructure 101 – Common Infrastructure Funding

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

