AGING INFRASTRUCTURE AT NNSA SITES

Jim McConnell
Associate Administrator for Safety, Infrastructure, and Operations
National Nuclear Security Administration
November 20, 2019
OVERVIEW

NNSA SAFETY, INFRASTRUCTURE & OPERATIONS

MAKING THE RIGHT THINGS HAPPEN

A VAST AND COMPLEX ENTERPRISE

Vision
We contribute to national security now and in the future by managing the complex NNSA risks of safety, infrastructure, materials, and the environment.

Mission
Enable safe operations, ensure effective infrastructure, and provide enterprise services to meet National Nuclear Security Administration needs.

OVERVIEW

41,000
LABORATORY, PLANT & SITE EMPLOYEES

2,000 miles of roads

NEARLY THE DRIVING DISTANCE FROM DC TO LOS ALAMOS

TRACK 400,000 METRIC TONS OF NUCLEAR MATERIAL TRANSACTIONS

safety for nuclear and hazardous facilities

2,100 square miles of land area

ABOUT THE LAND AREA OF DELAWARE

(≈ six Pentagons worth)

36 MILLION SQUARE FEET OF ACTIVE FACILITY SPACE

8.4 Trillion BTUs ANNUAL ENERGY CONSUMPTION

Enough to travel to the moon and back

NNSA packages ship over 500,000 miles per year

enough to power 237,600 homes for one year

APRIL 2019
A science-based infrastructure stewardship approach using risk-based, data-driven metrics to prioritize investments in order to enable the mission.

**Tools**
- BUILDER
- Mission Dependency Index (MDI)
- Enterprise Risk Management
- Excess-Facility Risk Index
- G2 Program Management System
- Prioritization Methodologies

**Planning**
- Strategic Integrated Roadmap (SIR)
- SSMP Chapter 4
- Master Asset Plan (MAP)
- Deep Dives
- Area Plans
- Disposition Strategic Plan

**Pilots**
- $50M Minor Construction
- Standard Acquisition (STAR)
A science-based infrastructure stewardship approach using risk-based, data-driven metrics to prioritize investments in order to enable the mission.

**TOOLS**

**Enterprise Risk Management (ERM)**

- Highlights the risk posed by each asset and risk trending across the enterprise

**Mission Dependency Index**

<table>
<thead>
<tr>
<th>MDI</th>
<th>Site</th>
<th>Asset Name</th>
<th>Condition</th>
<th>Haz</th>
<th>RPV</th>
<th>GSF</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Y-12</td>
<td>Production</td>
<td>62</td>
<td>2</td>
<td>$973.3M</td>
<td>442.3k</td>
<td>74</td>
</tr>
<tr>
<td>82</td>
<td>Y-12</td>
<td>Alpha 5 West</td>
<td>86</td>
<td>R</td>
<td>$97.6M</td>
<td>70.0k</td>
<td>52</td>
</tr>
<tr>
<td>62</td>
<td>Y-12</td>
<td>Production</td>
<td>84</td>
<td>2</td>
<td>$212.1M</td>
<td>152.1k</td>
<td>65</td>
</tr>
<tr>
<td>34</td>
<td>Y-12</td>
<td>DU Binary</td>
<td>88</td>
<td>2</td>
<td>$41.7M</td>
<td>42.2k</td>
<td>69</td>
</tr>
<tr>
<td>14</td>
<td>Y-12</td>
<td>Change Houses</td>
<td>85</td>
<td>2</td>
<td>$49.3M</td>
<td>75.6k</td>
<td>36</td>
</tr>
</tbody>
</table>

Measures likelihood of losing a facility

Measures mission impact if a facility is lost

**G2**

Award-winning program management system and Program Management Plan (PMP)
NNSA is using our **new tools to develop strategic and area plans** in order to drive prioritized, integrated infrastructure investments across the enterprise.

- **Prioritizing investments** with the greatest impact on mission via new tools
- Conducting **Deep Dives** at each site to better understand the long-term, requirements-based needs
- Publishing an annual **Master Asset Plan (MAP)** which is the integrated, NNSA-wide infrastructure strategic plan
- Developing detailed **Area Plans** to synchronize Maintenance, Recapitalization, Line-Item, and Leasing investments
- Increasing emphasis on timely **Disposition** of excess facilities to reduce mission risk, unencumber valuable site real estate, and save cost
- Emphasizing greater **project-level** planning prior to submission on funding
A science-based infrastructure stewardship approach using risk-based, data-driven metrics to prioritize investments in order to enable the mission.

Mission Dependency Index (MDI)
LANL Facilities
- DARHT MDI 99
- EOC MDI 47
- Otowi Building (Office Space) MDI 13

Maintenance Prioritization
MDI & BUILDER Standards & Policies

<table>
<thead>
<tr>
<th>Standard</th>
<th>Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
<td>CI</td>
</tr>
<tr>
<td>Very High</td>
<td>90</td>
</tr>
<tr>
<td>High</td>
<td>80</td>
</tr>
<tr>
<td>High</td>
<td>75-100</td>
</tr>
<tr>
<td>Medium</td>
<td>70</td>
</tr>
<tr>
<td>Low/Default</td>
<td>60</td>
</tr>
<tr>
<td>No repair/End of Life</td>
<td>0</td>
</tr>
</tbody>
</table>

Recapitalization Prioritization

- DM Reduction, 10%
- Sustainability & Productivity ROI, 20%
- Program Risk Reduction, 35%
- Safety Risk Reduction, 35%
2001 – 2013: Facilities and Infrastructure Recapitalization Program (FIRP) was NNSA’s method for funding disposition

- FIRP’s focus on footprint and deferred maintenance reduction meant higher risk excess assets were not addressed

In FY 2014, NNSA reinvigorated direct funded disposition

- 2014: $1.04M to disposition Y-12’s 9744
- 2015: $2.5M to disposition Y-12’s 9808
- 2015: $3M to disposition LANL’s CASAs 2 and 3
- Annual funding of ~$50M starting in 2017
- NNSA has disposed of 5.7M GSF since 2014
• NNSA is deploying new data-driven, risk-informed tools to create a science-based infrastructure stewardship model, which is being applied to facility disposition.

• The tools include:
  
  • Excess-facility Risk Index – 1-100 score for excess facilities calculating the risk posed by structural and safety conditions; potential impact of contaminants; and proximity of the excess asset to workers, public, environmental receptors, and high importance facilities.

  • Disposition Strategic Plan – annual plan laying out an integrated, enterprise-wide approach to address NNSA’s aging Excess infrastructure reflecting the priorities documented in NNSA’s Master Asset Plan.

An ERI score of 70 – 100 indicates a High-Risk Facility.
NNSA is using our new tools and authorities to develop strategic and area plans in order to drive **prioritized, integrated infrastructure investments** across the enterprise.
In FY 2018, NNSA received authority to disposition process-contaminated facilities under $50M to help:

- Reduce risk to mission by disposing of small excess facilities near mission work
- Freeing up prime real estate for NNSA to build new facilities on
- Most of these disposition projects are in the $2M to $3M range
• Continue to stabilize and reduce risk at process-contaminated facilities until EM can address them

• Current excess on NNSA Sites
  • 3.5M GSF
  • 384 assets
  • 84% GSF process-contaminated

• Excess in the next 10 Years will add
  • 2.3M GSF
  • 413 facilities
  • >50% GSF process-contaminated
CONCLUSION

- Data-Driven, Risk-informed Planning
  - Real World Changes
  - Increase in Resources, Support, and Authority
  - Continuous Improvement
  - Still More to Do

We did not get into the situation overnight
And we will not get out of it overnight.