DOE Project Management
The Year in Review

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Director, Office of Project Management
Oversight and Assessments
Agenda – Hitting the Wave Tops

• Project Management Order (413) Update
• Energy Systems Acquisition Advisory Board (ESAAB) and Major System Project Highlights
• Project Portfolio Status: Then and Now
• Project Management Success Metrics Update
• Earned Value Management System (EVMS) and Project Assessment & Reporting System (PARS IIe) Developments
• GAO High-Risk List Update
• PM Website Status
• Closing Thoughts
Critical Decision (CD) Milestones

- **Start Project Peer Reviews**
  - Operating Funds

- **Independent Review (EIR) to Validate Scope, Cost, Schedule >$100M**
  - Design Funds

- **External Review for Projects >$750M**
  - Construction Funds

- **Start of Construction or Execution**
  - Operating Funds

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**Critical Decisions ("CDs")**

- **CD-0**
  - Approve Mission Need

- **CD-1**
  - Approve Alternative Selection and Cost Range

- **CD-2**
  - Approve Performance Baseline (PB)

- **CD-3**
  - Approve Start of Construction or Execution

- **CD-4**
  - Approve Start of Operations or Project Completion

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- Projects Report Earned Value ≥ $20M
- Project Assessment and Reporting System (PARS IIe) for Projects ≥ $10M

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**Deputy Secretary is the Chief Executive for Project Management, overseeing Major System Projects (MSP) – those > $750M**
Order 413 Update – Key Changes (Updated May 12, 2016)

- Only codified Secretarial policies
- Monetary threshold change: From—$50M → To—$10M
- Strengthened the Energy Systems Acquisition Advisory Board (ESAAB) – chaired by Deputy Secretary
- Institutionalized the Project Management Risk Committee (PMRC)
- Improved upfront planning: design maturity and technology readiness (TRL-7 at CD-2)
- Implemented best practices: independent cost estimates, alternatives analysis, and integrated master scheduling
- Improved Project Peer Review (PPR) processes
- Transferred Earned Value Management System (EVMS) compliance and surveillance reviews to contractors, projects <$100M
### ESAAB’s – Recent Deputy Secretary Critical Decisions
(Authorized Over $40 Billion – This Past Year +)

<table>
<thead>
<tr>
<th>No.</th>
<th>ESAAB Mtg Date</th>
<th>Project Title</th>
<th>Critical Decision</th>
<th>Cost*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>September 11, 2015</td>
<td>Strategic Petroleum Reserve Life Extension Phase 2 (SPR-LE2)</td>
<td>CD-0</td>
<td>$1.4B</td>
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<tr>
<td>2</td>
<td>October 5, 2015</td>
<td>Plutonium Modular Approach (PMA)</td>
<td>CD-0</td>
<td>$3.0B</td>
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<td>3</td>
<td>December 21, 2015</td>
<td>Matter-Radiation Interactions in Extremes (MaRIE)</td>
<td>CD-0</td>
<td>$3.7B</td>
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<td>4</td>
<td>July 28, 2016</td>
<td>Exascale Computing Project (ECP)</td>
<td>CD-0</td>
<td>$5.1B</td>
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<tr>
<td>5</td>
<td>August 11, 2016</td>
<td>Strategic Petroleum Reserve Marine Terminal Enhancements (SPR-MTE)</td>
<td>CD-0</td>
<td>$1.5B</td>
</tr>
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<td>6</td>
<td>September 26, 2016</td>
<td>Waste Treatment and Immobilization Plant (WTP) – ORP</td>
<td>BCP</td>
<td>$16.8B</td>
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</tbody>
</table>

* Pre-CD-2 costs reflect the upper end of the cost range.
### ESAAB’s – Recent Deputy Secretary Critical Decisions
(Eleven** ESAABs in Six Months)

<table>
<thead>
<tr>
<th>No.</th>
<th>ESAAB Mtg Date</th>
<th>Project Title</th>
<th>Critical Decision</th>
<th>Cost*</th>
</tr>
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<tbody>
<tr>
<td>7</td>
<td>October 27, 2016</td>
<td>River Corridor Closure Project (RCCP) – Richland</td>
<td>BCP</td>
<td>$1.85B</td>
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<td>8</td>
<td>November 7, 2016</td>
<td>Trusted Microsystems Capability (TMC)</td>
<td>CD-0</td>
<td>$3.7B</td>
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<td>9</td>
<td>November 16, 2016</td>
<td>Exascale Computing Project (ECP)</td>
<td>CD-1/3A</td>
<td>$5.7B</td>
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<tr>
<td>10</td>
<td>November 28, 2016</td>
<td>Strategic Petroleum Reserve Life Extension Phase 2 (SPR-LE2) – TX and LA</td>
<td>CD-1</td>
<td>$1.4B</td>
</tr>
<tr>
<td>11</td>
<td>December 13, 2016</td>
<td>Domestic Uranium Enrichment (DUE)</td>
<td>CD-0</td>
<td>$14.1B</td>
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<tr>
<td>12</td>
<td>January 12, 2017</td>
<td>International Thermonuclear Experimental Reactor (ITER) First Plasma – France</td>
<td>CD-1R (CD-2/3)</td>
<td>$6.5B ($2.5B)</td>
</tr>
</tbody>
</table>

**GRAND TOTAL**  
$41.5B

* Pre-CD-2 costs reflect the upper end of the cost range. ** Including two QPR’s, Quarterly Project Reviews.
Strategic Petroleum Reserve: (2) Projects

(1) Life Extension, Phase 2 (SPR-LE2) Project [Bryan Mound, Big Hill, West Hackberry, and Bayou Choctaw]
• Critical Decision (CD)-1, $750M-$1.4B, FY22-FY24

(2) Marine Terminal Enhancements (MTE) Project [Seaway, Texoma, and Capline]
• Critical Decision (CD)-0, $500M-$1.5B, FY23-FY25
Storage Cavern

Drawdown

Water In

Oil Out

Oil Out

Oil Out

Oil

Brine

Salt Dome
Strategic Petroleum Reserve: (2) Projects

(1) Life Extension, Phase 2 (SPR-LE2) Project [Bryan Mound, Big Hill, West Hackberry, and Bayou Choctaw]
   • Critical Decision (CD)-1, $750M-$1.4B, FY22-FY24

(2) Marine Terminal Enhancements (MTE) Project [Seaway, Texoma, and Capline]
   • Critical Decision (CD)-0, $500M-$1.5B, FY23-FY25
Transistors → Printed on → Wafers

- NNSA requires a trusted supply of strategic radiation-hardened advanced microsystems
- Required migration from 8” to 12” wafer equipment does not fit in current MESA Silicon Fabrication Facility
- U.S. nuclear weapons stockpile relies upon the use of radiation-hardened electronics
- Fragility of current infrastructure has increased risk to current production and enduring stockpiles

Trusted Microsystems Capability (TMC) Critical Decision (CD)-0, $900M-$3.7B, FY27-29
Domestic Uranium Enrichment (DUE) (Make Tritium)

Critical Decision (CD)-0, $3.3B-$14.1B, FY27-FY39

High End Cost Range
- Centrus’ AC100 “Large” centrifuge technology successfully tested in demonstration cascade at Portsmouth Site

Low End Cost Range
- “Small” centrifuge design being developed by ORNL
- Goal is to design a lower-cost option, closer to industry standard

Centrus AC100

ORNL “Small” Centrifuge
U.S. ITER Subproject-1, First Plasma Critical Decision (CD)-3, $2.5B, December 2027

Full Project CD-1: $4.7B to $6.5B

ITER is the world’s “burning plasma” experiment:
- Demonstrate the technical viability of generating energy through fusion
- Today: 10 MW, 1 sec, gain < 1
- ITER: 500 MW, > 400 sec, gain ≥ 10; 3000 seconds, gain = 5
- Major contributions from U.S. industry
- U.S. contributing (12) components, to include: magnet systems, cooling water systems, and vacuum pumping and fueling systems
- “First Plasma” in 2025; burning fusion plasmas in 2030’s

An international collaboration:
- 7 partners, 50% of world’s population
ITER – In Five Minutes
1. EM, Waste Treatment & Immobilization Plant (WTP) – Hanford, WA ($16.813B)
2. EM, Salt Waste Processing Facility (SWPF) – Savannah River, SC ($2.322B)
3. EM, River Corridor Closure Project (RCCP) – Richland, WA ($1.85B)
4. NA, Mixed Oxide Fuel Fabrication Facility (MOX) – Savannah River, SC ($4.857B)
5. NA, Uranium Processing Facility (UPF) – Oak Ridge (CD-1 Range: $4.2B - $6.5B)
6. NA, Chemistry and Metallurgy Research Replacement (CMRR)** – LANL (CD-1 Range: $2.4B - $2.9B)
7. FE, Strategic Petroleum Reserve, Life Extension Phase 2 (SPR-LE2) – Multiple (CD-1 Range: $750M - $1.4B)
8. FE, Strategic Petroleum Reserve, Marine Terminal Enhancements (SPR-MTE) – Multiple (CD-0 Range: $0.5B - $1.5B)
9. NA, Plutonium Modular Approach (PMA) – LANL (CD-0 Range: $1.3B - $3B)
10. NA, Trusted Microsystems Capability (TMC) – (CD-0 Range: $900M - $3.7B)
11. NA, Matter-Radiation Interactions in Extremes (MaRIE) – LANL (CD-0 Range: $1.9B - $3.7B)
12. NA, Domestic Uranium Enrichment (DUE) – (CD-0 Range: $3.3B - $14.1B)
13. EM, Calcine Disposition Project – INL (CD-0 Range: $2B - $16B)

Above listing does not include: (Non-Capital Asset Projects and SC Projects)
(1) SC, Long Baseline Neutrino Facility (LBNF) – FNAL (CD-1R Range: $1.26B-$1.86B), CD-3A
(2) SC, Linac Coherent Light Source II (LCLS-II) – SLAC ($1.045B), CD-2/3
(3) SC, Advanced Photon Source-Upgrade (APS-U) – ANL (CD-1 Range: $700M - $1B), CD-3A

*Projects greater than $750 million.
**All CMRR subprojects are less than $750 million.
## March 2016 vs. March 2017 Project Portfolio Status (Then and Now)

<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>Mar 2016 vs. Feb 2017</th>
<th>Total Project Portfolio</th>
<th>Total Active Projects Post CD-2</th>
<th>Total Projects Post CD-2 Green</th>
<th>Total Projects Post CD-2 Yellow</th>
<th>Total Projects Post CD-2 Red</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>$(M)</td>
<td>No.</td>
<td>$(M)</td>
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<tr>
<td>EM</td>
<td>2016</td>
<td>37</td>
<td>$52,876</td>
<td>12</td>
<td>$18,031</td>
<td>7</td>
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<td></td>
<td>2017</td>
<td>43</td>
<td>$55,349</td>
<td>15</td>
<td>$22,241</td>
<td>12</td>
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<tr>
<td>NNSA</td>
<td>2016</td>
<td>27</td>
<td>$23,036</td>
<td>6</td>
<td>$5,355</td>
<td>3</td>
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<tr>
<td></td>
<td>2017</td>
<td>40</td>
<td>$40,796</td>
<td>11</td>
<td>$6,642</td>
<td>9</td>
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<tr>
<td>SC</td>
<td>2016</td>
<td>32</td>
<td>$8,498</td>
<td>14</td>
<td>$1,302</td>
<td>13</td>
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<tr>
<td></td>
<td>2017</td>
<td>36</td>
<td>$9,282</td>
<td>17</td>
<td>$2,540</td>
<td>16</td>
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<tr>
<td>Other</td>
<td>2016</td>
<td>4</td>
<td>$1,663</td>
<td>1</td>
<td>$78</td>
<td>1</td>
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<tr>
<td></td>
<td>2017</td>
<td>6</td>
<td>$3,208</td>
<td>1</td>
<td>$78</td>
<td>1</td>
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<tr>
<td>Total</td>
<td>2016</td>
<td>100</td>
<td>$86,073</td>
<td>33</td>
<td>$24,766</td>
<td>24</td>
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<td>2017</td>
<td>125</td>
<td>$108,635</td>
<td>44</td>
<td>$31,501</td>
<td>38</td>
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</table>
### Project Management Success Metrics

(Target 90% - Based on 3-year rolling timeline)

<table>
<thead>
<tr>
<th>Capital Asset</th>
<th>FY10 Actual</th>
<th>FY13 Actual</th>
<th>FY14 Actual</th>
<th>FY15 Actual</th>
<th>FY16 Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>75%&lt;sup&gt;(27/36)&lt;/sup&gt;</td>
<td>84%&lt;sup&gt;(36/43)&lt;/sup&gt;</td>
<td>82%&lt;sup&gt;(31/38)&lt;/sup&gt;</td>
<td>83%&lt;sup&gt;(30/36)&lt;/sup&gt;</td>
<td>91%&lt;sup&gt;(21/23)&lt;/sup&gt;</td>
</tr>
<tr>
<td>SC</td>
<td>92%&lt;sup&gt;(12/13)&lt;/sup&gt;</td>
<td>100%&lt;sup&gt;(17/17)&lt;/sup&gt;</td>
<td>100%&lt;sup&gt;(17/17)&lt;/sup&gt;</td>
<td>100%&lt;sup&gt;(17/17)&lt;/sup&gt;</td>
<td>100%&lt;sup&gt;(14/14)&lt;/sup&gt;</td>
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<tr>
<td>EM</td>
<td>--</td>
<td>0%&lt;sup&gt;(0/3)&lt;/sup&gt;</td>
<td>0%&lt;sup&gt;(0/2)&lt;/sup&gt;</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>NNSA</td>
<td>68%&lt;sup&gt;(15/22)&lt;/sup&gt;</td>
<td>64%&lt;sup&gt;(7/11)&lt;/sup&gt;</td>
<td>55%&lt;sup&gt;(6/11)&lt;/sup&gt;</td>
<td>54%&lt;sup&gt;(7/13)&lt;/sup&gt;</td>
<td>75%&lt;sup&gt;(6/8)&lt;/sup&gt;</td>
</tr>
<tr>
<td>Other</td>
<td>0%&lt;sup&gt;(0/1)&lt;/sup&gt;</td>
<td>100%&lt;sup&gt;(12/12)&lt;/sup&gt;</td>
<td>100%&lt;sup&gt;(8/8)&lt;/sup&gt;</td>
<td>100%&lt;sup&gt;(6/6)&lt;/sup&gt;</td>
<td>100%&lt;sup&gt;(1/1)&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Project Management Success: complete project within the original scope and within 110% of the original cost baseline at Critical Decision (CD)-4, over three-year rolling timeline.

Green ≥ 90%; Yellow < 90% to 70%; Red < 70%
<table>
<thead>
<tr>
<th>Contract/Project Management Secondary Performance Metrics</th>
<th>Target</th>
<th>FY10 Actual</th>
<th>FY15 Actual</th>
<th>FY16 Actual</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certified Earned Value Management (EVM) System: Post CD-3, 95% of projects (TPC &gt; $20M).</td>
<td>95%</td>
<td>86% Env. Cleanup 97% Line Item</td>
<td>88%</td>
<td>100%</td>
<td>CD-3 is “Approve Start of Construction/Execution.” [Stats: 12 of 12]</td>
</tr>
<tr>
<td>Certified Federal Project Directors (FPDs) at CD-1: No later than CD-1, 95% of projects have certified FPDs.</td>
<td>95%</td>
<td>98%</td>
<td>100%</td>
<td>94%</td>
<td>CD-1 is “Approve Alternative Selection and Cost Range.” [Stats: 68 of 72]</td>
</tr>
<tr>
<td>Certified FPDs at CD-3: No later than CD-3, 90% of projects have FPDs certified at the appropriate level assigned to projects.</td>
<td>90%</td>
<td>87%</td>
<td>100%</td>
<td>89%</td>
<td>CD-3 is “Approve Start of Construction/Execution.” [Stats: 31 of 35]</td>
</tr>
<tr>
<td>Certified Contracting Staff: 85% of the “1102” contracting specialist series will be certified.</td>
<td>85%</td>
<td>85%</td>
<td>97%</td>
<td>99%</td>
<td>Includes those with waivers.</td>
</tr>
</tbody>
</table>
EVMS and PARS* Developments

• Earned Value Management System (EVMS) Enhancements
  ✓ Released EVMS Interpretation Handbook v2.0 August 2016
    ▪ Page Count: 456 pages → 172 pages
    ▪ Lines of Inquiry (LOIs): 274 → 134 → 95
    ▪ Test Count: 772 → 597 → 271 (CNS Pilot)
      ❖ Automation: 10% → 19% → 87% (or 235 of 271) (CNS Pilot)
  ✓ Conducted seven roadside assist visits

• PARS* IIe Highlights: “BIRST” software upgrade
  ✓ Effective February 6, 2017 – along with “suggestion box”
  ✓ Improved usability and operability
  ✓ Increased performance and response times
  ✓ Included point-and-click navigation
  ✓ Introduced an analysis and reporting engine
  ✓ Trained the user community

* PARS – Project Assessment and Reporting Systems
## GAO High-Risk List Update (Feb 2017)
### NNSA/EM Contract (Project) Management

The five criteria:
1. Demonstrate strong commitment and leadership
2. Demonstrate progress in implementing corrective measures
3. Develop a corrective action plan that identifies root causes, effective solutions, and a near-term plan
4. Have the capacity (people and resources) to resolve the problems
5. Monitor/independently validate effectiveness and sustainability of corrective measures

<table>
<thead>
<tr>
<th>No.</th>
<th>2007</th>
<th>2009</th>
<th>2011</th>
<th>2013</th>
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</tr>
</tbody>
</table>

- **All of DOE**
- **NNSA & EM Only**
- **No change NNSA & EM Only**
- **NNSA & EM >$750M**
- **No change NNSA & EM >$750M**
PM Website Status (MAX.gov)

• Established intranet website: OMB’s “MAX.gov”

• Content includes:
  • 413 resource center; ESAAB and PMRC repository
  • Review procedures and success metrics
  • Project peer review collaboration site
  • Access to PARS IIe and EVMS guidance
  • FPD training and certification resources

• Internet: still maintain presence on Energy.gov:
  • PM mission, leadership, organization, history
  • Annual awards presented at our Workshops
  • Newsletter (again) and summary monthly report
Closing Thoughts

• The DOE Missions: Diverse – Essential – Amazing

• Our project management is better than ever before – consistent, disciplined implementation is key for continued success

• Our workload is massive – never ending

• Take pride in DOE

• Keep charging!
Questions?