DDR&E for Advanced Capabilities Overview and Engineering Update

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DDR&E Advanced Capabilities: Aligned to the National Defense Strategy

  - Lethality, Partnerships, Reform
- USD(R&E) Mission: Creating the Technologies of the Future Fight
  - Ensure Technological Superiority for the U.S. Military
  - Focus on Modernization
- DDR&E Advanced Capabilities Role:
  - Accelerate Modernization
  - Mature Technology to Capability, from Prototyping to Acquisition
- DDR&E Advanced Capabilities Goals:
  - Establish mission integration analytics
  - Support Assistant Director (AD) technology roadmap development and execution
  - Drive NDS responsive projects that close gaps in joint service capabilities
  - Define technical risk and opportunities in major programs
  - Enhance policy to accelerate modernization (remove barriers)
How We Operate: High-level Development Cycle

Analysis & Architectures
New Technology Awareness and Development

Mission Integration
Engineering Policy & Systems

Assistant Director roadmaps

Operational Use
Testing

Prototyping & Demonstration

Test Resource Management Center

Developmental Test, Evaluation & Prototyping

USD Acquisition & Sustainment
Development and Production in Industrial Base

CCMDs & LNOs

Legend
Functions
DDR&E (AC) Portfolio
Other Organizations

NDIA
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Engineering – FY2020 Plans

- **Balancing Priorities**
  - Independent Technical Risk Assessments (ITRA)
  - Mission Engineering Support

- **Engineering Policy and Implementation**
  - DoDI 5000.02 Engineering Policy rewrite
  - Collaborate with A&S and Services to share technical innovations and best practices across programs
  - Software Engineering

- **Increase working-level exchanges between industry and government**
  - Establish Engineering Technical Fellows program
Mission Engineering (ME) – FY2020 Plans

- Time-sensitive Target Defeat / Time-sensitive Target Mission Payloads (FY19)
  - Evaluating concepts against a mission profile for phase 3 prototype efforts.

- Advanced Electronic Warfare (EW) Capability (FY19)
  - Effort to provide foundational elements to provide game-changing EW capabilities to counter peer threats.
  - Phase 2 contracts awarded 30 September.

- Next Mission Areas (FY20 and Beyond):
  - Fully Networked Command, Control and Communications (FNC3)
  - Integrated Fires

- Establishing a Knowledge Management / Cloud Computing Enterprise for ME
Engineering Policy – FY2020 Activities

- Update policies to be compliant with statute and DoD guidance memos
  - DoDI 5000 Engineering Instruction to incorporate several enhancements to improve systems/mission engineering
  - DoDI 5000 T&E Instruction to include additional focus on integrated testing
  - Clearly defining the role of the Lead System Engineer
  - Update Existing Engineering and T&E guidance documents

- Develop new engineering guidance (i.e. Digital Engineering, Mission Engineering)

- Develop Intellectual Property (IP) Policy
  - Policy will preserve the Government’s rights in IP, while protecting industry’s investments in R&D and S&T
Technical Fellows Program – FY2020

- **Vision:**
  - Improve collaboration between USD (R&E) and its Industrial ecosystem; collaboration across the core technology domains of strategic interest; and improve the technical excellence of the R&E enterprise.

- **Mission:**
  - Develop a Technical Fellows Program that meets the needs of DDR&E(AC).

- **Goal:**
  - Selected Technical Fellows (from the Defense Industrial Base) will complete a one-year assignment working on a *Technical Problem* composed by selected science and technology leaders within DDR&E(AC). The sponsoring leaders will serve as mentors to maintain constant contact with the Technical Fellow during the one year tenure.
Developmental Test, Evaluation and Prototyping – FY2020 Plans

- Prototyping and Experimentation
  - Execute projects to deliver leap-ahead and disruptive technologies; address the most critical capability gaps identified by the Joint Staff and Combatant Commands.
  - Direct investment and sponsor co-funding toward countering peer competition in contested environments across multiple domains in accordance with the Secretary's Senior Leadership Conference.
  - Ensure proper coordination/synchronization of Prototyping and Experimentation investments through semi-annual Joint Mission Forums and quarterly Prototyping Senior Steering Group reviews.
  - Execute Allied Prototyping Initiative projects with Joint and international partners.

- Developmental Test and Evaluation (DT&E)
  - Support Major Defense Acquisition Programs (MDAPs), priority Defense Business Systems (DBS), and Middle Tier Acquisition (MTA) programs to ensure comprehensive, affordable, and efficient DT&E strategies are implemented.
  - Implement DT&E data access policies to reflect R&E responsibilities.
  - Emphasize Integrated Testing and shift Developmental Test/Operational Test left in the development cycle.
  - Expand DT&E methodologies to improve efficiency of R&E modernization areas and keep pace with emerging technology; deliver capabilities faster to the warfighter.
Allied Prototyping Initiative (API)

- Started in 2019
- Develop cooperative prototyping projects to provide leap-ahead capabilities in the 5-7 year time horizon focused on the top 9 OUSD(R&E) modernization priorities.
- Secure OUSD(R&E), service(s), and partner nation funding for selected projects, negotiate Project Arrangements (PAs), and staff PA’s for approval to completion
- Manage Project Execution
- API Focus Areas for 2020
  - Space
  - Fully Networked Command Control and Communications
  - Microelectronics
  - Cybersecurity – Offense and Defense
  - Hypersonics – Offense and Defense
  - Directed Energy
  - Machine Learning and Artificial Intelligence
  - Autonomous Systems
  - Quantum Science
Test Resource Management Center – FY2020 Plans

- Align Strategic Plan, Investments, & Budget Certification processes

- Develop critical test capabilities to advance the NDS
  - **Hypersonics**: Improve ground test facilities for true flight temperatures & conditions
  - **Hypersonics**: Develop SkyRange, expand capability/availability of long range corridors
  - **Directed Energy**: Establish a Special Use Space Range (SUSR) over White Sands
  - **Directed Energy**: Develop HEL & HPM mobile diagnostics suites
  - **Cyber**: Transition and expand National Cyber Range Complex (NCRC) to new facilities
  - **Electronic Warfare**: Deliver multi-source, high-density ground test stimulators
  - **Autonomy**: Develop safety & risk analysis tools for cognitive software assessments
  - **Nuclear**: Complete prototype of new uranium core alloy for Fast Burst Reactor
  - **Space**: Develop detailed investment roadmap for Space Test Range infrastructure

- Strengthen partnerships with other Federal agencies (NASA, DoT, DHS) and allied partners to improve test infrastructure