



DDR&E for Advanced Capabilities Overview and Engineering Update

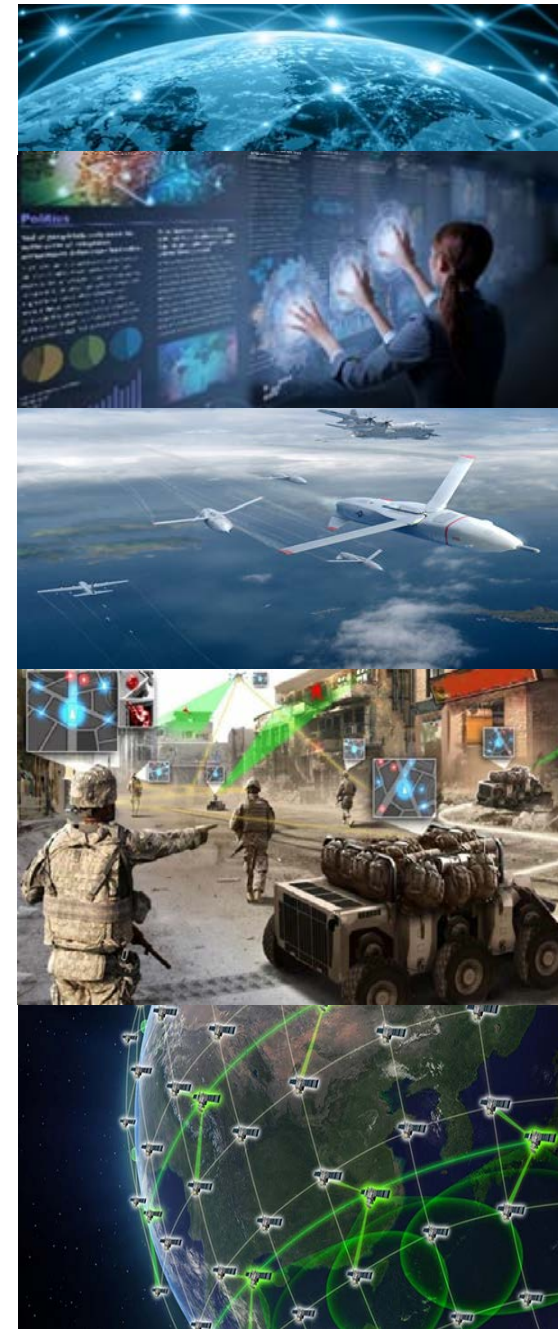
**NDIA 22nd Annual Systems and Mission Engineering Conference
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and

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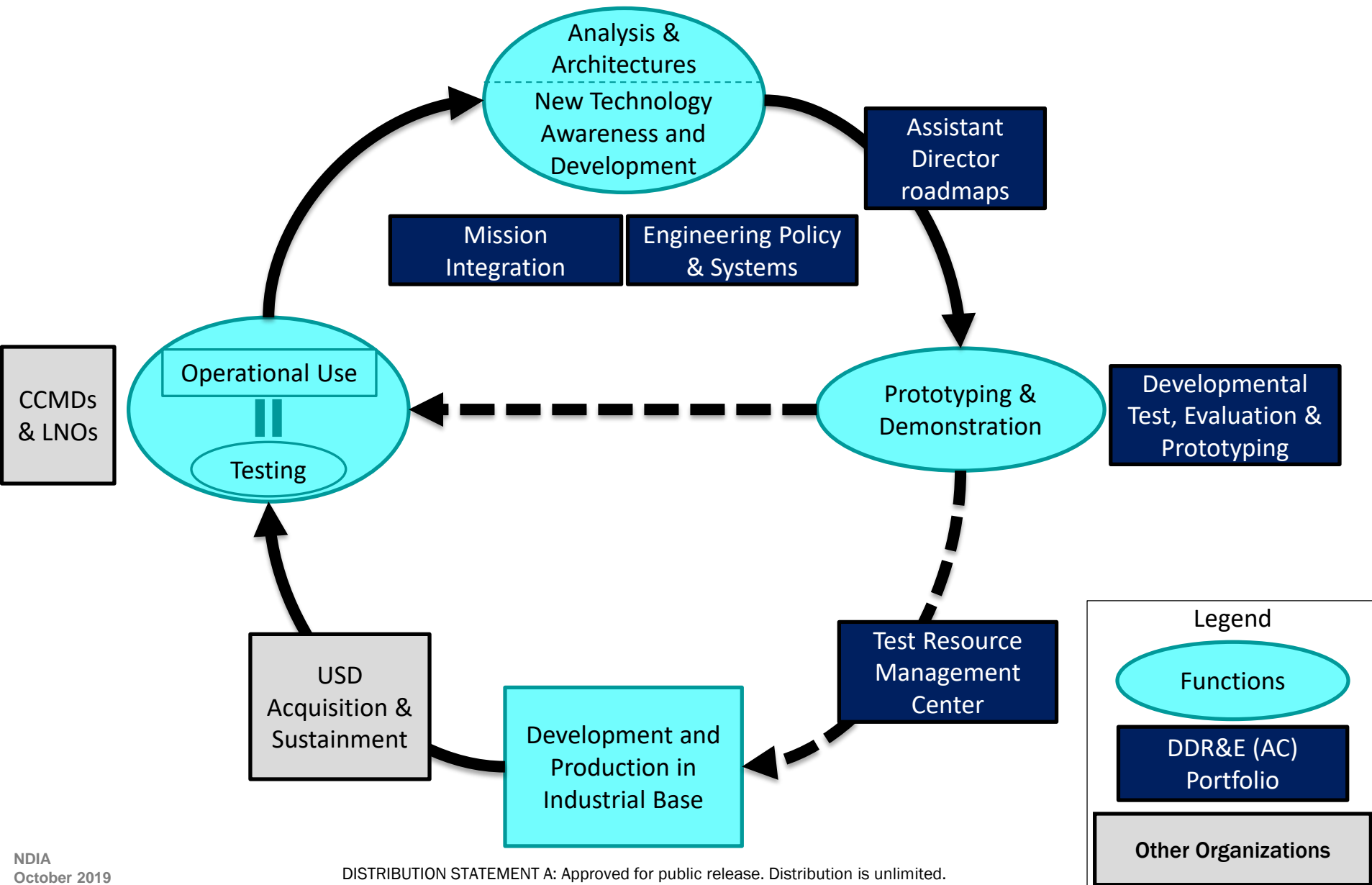


DDR&E Advanced Capabilities: Aligned to the National Defense Strategy

- **National Defense Strategy (NDS) Focus:** Era of Great Power Competition, Modernization Priorities in Response
 - 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





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**



Questions?

