



*Scientific, Research and Development*

**UNITED STATES TRANSPORTATION COMMAND (USTRANSCOM) RESEARCH,  
DEVELOPMENT, TEST AND EVALUATION (RDT&E) PROGRAM**

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This instruction establishes policy and procedures necessary to develop, implement, and manage the Research, Development, Test, and Evaluation (RDT&E) Program for USTRANSCOM. It provides the policy, procedures, systems, and responsibilities that apply to USTRANSCOM, the Transportation Component Commands (TCC) and the Joint Enabling Capabilities Command (JECC). Recommendations for changes and improvements are invited. Refer recommended changes and questions about this instruction to the office of primary responsibility using AF Form 847, *Recommendation for Change of Publication*. Ensure that all records created as a result of processes prescribed in this instruction are maintained in accordance with USTRANSCOM Instruction 33-32, *USTRANSCOM Records Management Program*. The TCCs are authorized to publish supplements and/or supporting directives (furnish copies to TCJ5/4-GC).

## **SUMMARY OF CHANGES**

The changes in this instruction ensure synchronization with Corporate Governance Process and acquisition guidance, elimination of attachment 7, Project Baseline Requirement, and minor administrative rewrites.

**1. References and Supporting Information.** References, related publications, abbreviations, acronyms, and terms used in this instruction are listed in Attachment 1.

## **2. General:**

**2.1.** To provide required transformational force projection, deployment and distribution enhancements to the Department of Defense (DOD), USTRANSCOM requires an integrated RDT&E strategy that addresses identified capability gaps. USTRANSCOM vets requirements and allocates resources via the Corporate Governance Process (CGP) which ensures approved RDT&E proposals and unfunded requirements (UFRs) are resourced. Program invests in relevant technologies addressing command & control/optimization/modeling & simulation, end-

to-end visibility, cyber, and global access to enhance warfighter support and improve the efficiency and effectiveness of DOD logistics/supply chain operations while reducing costs.

**2.2.** This program addresses capability gaps identified through Joint Concept Development documents, the Joint Capabilities Integration and Development System process, Joint Experimentation, Joint Deployment and Distribution Enterprise (JDDE) Capability Gaps, operational lessons learned, functional analyses, and capability studies to explore and exploit technologies that increase the responsiveness, efficiency, and effectiveness of the JDDE.

**2.3.** This program seeks transformational changes in force projection and sustainment concepts and capabilities across the full spectrum of operations. It complements established DOD processes involving basic research, applied research, and technology transfer vehicles such as Joint Capability Technology Demonstrations and Advanced Technology Developments. It explores promising technologies to support the rapid projection, sustainment, and reconstitution of force packages in support of our nation's Defense Strategy; and identifies customer needs. To assist in this effort, an RDT&E Management Team is established to ensure the development of a fiscally responsible, executable RDT&E plan for approval of the Commander USTRANSCOM and subsequent consideration during the budget development process. The Management Team will recommend and promote Command efforts for projects that have merit, appear technically feasible, and include a transition/acquisition strategy, as required by DOD regulations, in order to minimize program risk.

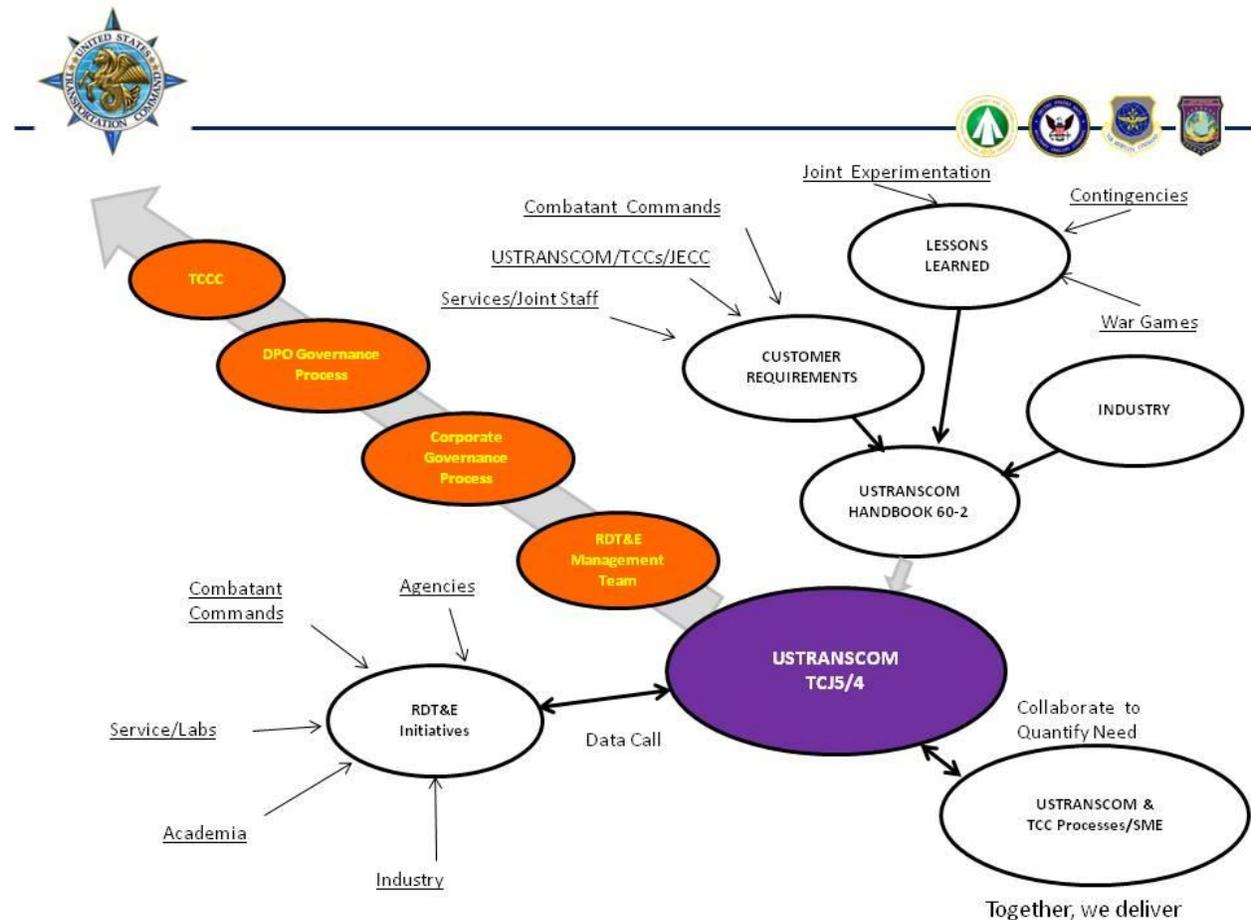
**2.4. RDT&E Management Team Purpose.** The RDT&E Management Team will develop a prioritized, fiscally responsible annual plan against Enterprise Requirements Review Council recommended/command approved areas of interest that align nominated projects to validated JDDE Capability Gaps and USTRANSCOM Handbook 60-2, *USTRANSCOM Research, Development, Test, and Evaluation*, technology challenges. In making its determination, the RDT&E Management Team will ensure the technology is of sufficient maturity and the proposed project supports an identified JDDE capability shortfall to minimize program risk and enhance project development. It will also review the plan for transitioning successful technologies. Factors to consider in evaluating the transition potential of future technology investments include demonstrated understanding of deployment/distribution integration challenges, planned operational utility assessment, expected benefit, and commitment within out-year budget by the transition/integration agency at project selection. USTRANSCOM leverages the CGP to validate requirements and approve announcements seeking RDT&E proposals addressing validated JDDE technology capability gaps, as well as review proposed funding/execution plans as required to support the budget development, submission, and documentation processes. The RDT&E Management Team will meet as convened by the chair.

**2.4.1. RDT&E Management Team Membership.** TCJ5/4-G is the Designated office of primary responsibility for the RDT&E Program. The Chief, TCJ5/4-G, or designated O-6 or civilian equivalent, will serve as the RDT&E Management Team Chair. Other members include representatives from USTRANSCOM Directorates: Operations and Plans (TCJ3); Command, Control, Communications and Computer Systems (TCJ6); Command Acquisition (TCAQ), Joint Distribution Process Analysis Center (TCAC), and the TCCs with advisory support being provided by the Staff Judge Advocate (TCJA) and Program Analysis and Financial Management

(TCJ8). As deemed by the Chair, representatives from other USTRANSCOM directorates and the Command Support Group staff may be added.

**2.4.2.** Figure 2.1 depicts the procedure by which USTRANSCOM or customer-identified technological needs are received; matched against ongoing Defense Agency, Service laboratory, or industry technology initiatives; and translated into a command-approved RDT&E strategy/vision. An in-depth overview is provided in paragraph 4, RDT&E Program Process.

**Figure 2.1. USTRANSCOM Research, Development, Test and Evaluation (RDT&E) Process.**



**3. Roles and Responsibilities:**

**3.1. The Director, TCJ5/4 or designated Deputy will:**

**3.1.1.** Serve as the command’s primary RDT&E advocate and provide overall program management.

**3.1.2.** Maintain the Commander-approved, integrated USTRANSCOM RDT&E Handbook 60-2 linking validated requirements to transformational technical solutions.

**3.1.3.** Develop and execute an RDT&E program to identify and exploit leading edge technology initiatives being pursued by the Services, select Defense agencies, other combatant commands, non-DOD government organizations, commercial industry, and academia.

**3.1.4.** Designate staff members within TCJ5/4 to orchestrate and manage the RDT&E Program.

**3.1.5.** Establish and maintain a Memorandum of Agreement with the Defense Logistics Agency (DLA) to ensure a joint effort with mutual benefits.

**3.1.6.** Ensure the development of integrated annual Program Objective Memorandum RDT&E plans to enhance deployment and distribution operations.

**3.1.7.** Conduct an annual flag level review (normally in June) of approved RDT&E projects.

**3.1.8.** Develop and publish announcements for proposals from the RDT&E community as appropriate.

**3.1.9.** Act as the Principal proponent and accountable senior official for all USTRANSCOM research, development, test, and evaluation.

**3.1.10.** Ensure that the Deputy Under Secretary of Defense (Acquisition Technology and Logistics), the Assistant Secretary of Defense (Research and Engineering), and appropriate Joint Staff Functional Capabilities Boards are informed of efforts and initiatives.

**3.2. The Director, TCJ3** will appoint a representative to the RDT&E Management Team.

**3.3. The Director, TCJ6 will:**

**3.3.1.** Appoint a representative to the RDT&E Management Team.

**3.3.2.** Ensure transformational Information Technology (IT) pursuits are in compliance with Defense Business Systems Management Committee requirements by verifying compatibility with the Joint Deployment and Distribution Architecture – Enhanced.

**3.4. The Director, TCJ8 will:**

**3.4.1.** Act as the financial advisor for the RDT&E Program.

**3.4.2.** Monitor the execution of funds for budget-approved initiatives.

**3.4.3.** Provide obligation and expenditure reports of RDT&E efforts to DLA in accordance with established Memorandum of Agreement.

**3.4.4.** Ensure coordination on RDT&E-related congressional and Office of the Secretary of Defense reports.

- 3.4.5. Provide representative to the RDT&E Management Team.
- 3.4.6. Provide a monthly feeder report to the RDT&E Program Director.
- 3.4.7. Verify Defense Business Systems Management Committee certification is received before issuing funds to USTRANSCOM business systems.
- 3.4.8. Review program-associated financial documentation for accuracy and thoroughness.
- 3.4.9. Ensure proper execution of RDT&E funds.
- 3.5. TCJA will provide legal support and representation for the RDT&E Program.
- 3.6. **TCAQ will:**
  - 3.6.1. Ensure all USTRANSCOM-contracted RDT&E efforts comply with applicable laws, regulations, instructions, and policies.
  - 3.6.2. Appoint representative to the RDT&E Management Team.
  - 3.6.3. Provide contract support, as required, for approved RDT&E projects.
- 3.7. TCAC will appoint representative to the RDT&E Management Team.
- 3.8. **All USTRANSCOM Directorates/Command Support Group will:**
  - 3.8.1. Submit technology proposals to the USTRANSCOM RDT&E Program Director in TCJ5/4-GC using Attachment 2 sample format. A description of the various technology budget activities is contained in Attachment 3. A description of Technology Readiness Levels is in Attachment 4. Detailed funding guidance is contained in DOD 7000.14-R, *Financial Management Regulations*.
  - 3.8.2. Ensure compliance with the management principles and documentation requirements defined in the Chairman, Joint Chiefs of Staff Instruction 3170.01 series, *Joint Capabilities Integration and Development System*, and DODI 5000.02, *Operation of the Defense Acquisition System*.
  - 3.8.3. Provide subject matter experts, as required, to aid in the analysis/evaluation of technology proposals.
  - 3.8.4. Designate a Project Coordinator (PC), for approved projects under their assigned area of responsibility that address capability shortfalls, to manage and assist in orchestrating technology development and transition through the Integrated Product and Process Development (IPPD) principles outlined in Attachment 5. Directors will designate a PC to function as an operational/functional, technical, or transition manager as appropriate, and ensure required program training is attended. Operational/Functional managers provide day-to-day operational

direction and expertise in terms of user requirements to help shape/guide technology development. Technical managers provide day-to-day technical direction and will be more involved in the detail and programmatic of the project. The PC is responsible for overseeing the project/managing USTRANSCOM interests. For example, an innovative technology project may have TCJ3 providing functional support with the TCJ6 providing technical manager expertise. It is recommended that the designated PC be available to manage the project until at least accomplishment of the first milestone. The RDT&E Program Director shall be notified of any change in PC assignment prior to change to ensure training/continuity of effort.

### **3.9. TCCs and JECC will:**

**3.9.1.** Designate an appropriate person as their representative on the RDT&E Management Team.

**3.9.2.** Submit technology proposals to the USTRANSCOM RDT&E Program Director using sample format in Attachment 2. A description of the various technology budget activities is contained in Attachment 3. A description of Technology Readiness Levels is in Attachment 4. Detailed funding guidance is contained in DOD 7000.14-R.

**3.9.3.** Designate a PC for approved projects under their assigned area of responsibility that address capability shortfalls, to manage and assist in orchestrating technology development and transition through IPPD principles outlined in Attachment 5. Operational/Functional managers provide day-to-day operational direction and expertise in terms of user requirements to help shape/guide technology development. Technical managers provide day-to-day technical direction and will be more involved in the detail and programmatic of the project. The PC is responsible for overseeing the project/managing USTRANSCOM interests. Each assigned PC shall attend required program training. The RDT&E Program Director shall be notified of any change in PC.

### **3.10. The Chief, Global Synchronization and Capabilities Division (TCJ5/4-G) will:**

**3.10.1.** Provide overall monitoring of RDT&E program execution.

**3.10.2.** Designate an O-6/GS-15 (or appropriate GS level) to chair the RDT&E Management Team.

**3.10.3.** Designate the RDT&E Program Director (from within TCJ5/4-G) to orchestrate the overall management of the RDT&E Program.

**3.10.4.** Ensure periodic updates regarding program status are provided to senior level management.

### **3.11. The RDT&E Program Director will:**

**3.11.1.** Ensure the daily program management and execution of the command's RDT&E program.

**3.11.2.** Develop and maintain USTRANSCOM Handbook 60-2 which contains a long-range technology strategy and is designed to provide focus to the command's pursuit of transformational technology capability enhancements, as well as inform the Science and Technology community of the command's specific technology capability gaps.

**3.11.3.** Solicit technology proposals to fill or address identified capability gaps, develop annual technology plans, and ensure the timely submission of required documentation. Conduct initial screening of proposals to validate that the proposed project is likely to reduce or remedy identified JDDE capability shortfalls contained within USTRANSCOM Handbook 60-2.

**3.11.4.** Aid the staff in linking identified shortfalls to potential technology solutions in DOD laboratories, academic, and commercial Science and Technology communities. This includes a review of emerging commercial-off-the-shelf and government-off-the-shelf technologies for potential application, even if requirements for the technology have not yet been identified.

**3.11.5.** Develop and maintain the Memorandum of Agreement with DLA to ensure coordinated management and effective execution of projects within the command's RDT&E Program whose funding line and authority reside within DLA's Program Objective Memorandum. Serve as the command focal point for this interaction.

**3.11.6.** Ensure approved RDT&E projects are incorporated into the command's RDT&E plans.

**3.11.7.** In conjunction with TCJ8 and DLA, develop budget documentation and monitor the proper execution of RDT&E funds. Specifically, the RDT&E Program Director will prepare budget exhibits and monitor project obligation/expenditure rates as well as take corrective actions as required to ensure allocated funds are properly executed.

**3.11.8.** Assist PCs in the employment of IPPD principles (Attachment 5) and track projects to ensure funded technology sufficiently improves the initial, adjusted, or updated capability gaps.

**3.11.9.** Conduct review (normally in February) of funded technology projects.

**3.11.10.** Monitor both government and non-government RDT&E activities and aggressively seek active partnerships with the Services, Defense Agencies, and national laboratories as well as combatant commands. This will ensure an integrated and coordinated pursuit of mutual deployment and distribution projects of interest addressing identified capability gaps.

**3.11.11.** Upon request provide periodic updates to TCJ5/4 and senior level management regarding program status.

**3.11.12.** The RDT&E Program Director and Office of Research and Technology Applications will collaborate on proposed technology development concepts to determine which efforts should be addressed solely as a USTRANSCOM-funded RDT&E, a Technology Transfer activity, or pursued as a complementary/parallel effort.

**3.11.13.** Within three months of initial assignment, ensure RDT&E Program personnel are trained on RDT&E Program duties and responsibilities.

**3.11.14.** Designate a Project Monitor for each project. The Monitor represents the RDT&E Program Director and assists the PC through the RDT&E life of the project.

**3.11.15.** Develop, staff, and coordinate a consolidated Military Interdepartmental Purchase Request approval package(s) for RDT&E projects outside USTRANSCOM's accounting system. Internal USTRANSCOM RDT&E project acquisition packages will be developed and processed by the appropriate USTRANSCOM PC.

**3.12. Project Coordinators (PC) will:**

**3.12.1.** Execute assigned, funded initiative(s), through the employment of IPPD principles (Attachment 5).

**3.12.2.** Serve as the command's research facilitators and the transition agent for successfully developed technologies (Attachment 6).

**3.12.3.** Provide accurate and timely completion of all program data call requirements.

**3.12.4.** Provide detailed project updates to the RDT&E Program Director via designated Monitor, as requested.

**3.12.5.** Manage the smooth transition of successfully completed technology exploration efforts.

**3.12.6.** Provide project spend plan, as well as track and report monthly to the RDT&E Program Director project obligation and expenditure rates.

**3.12.7.** Brief proposed projects, as requested by RDT&E Program Director.

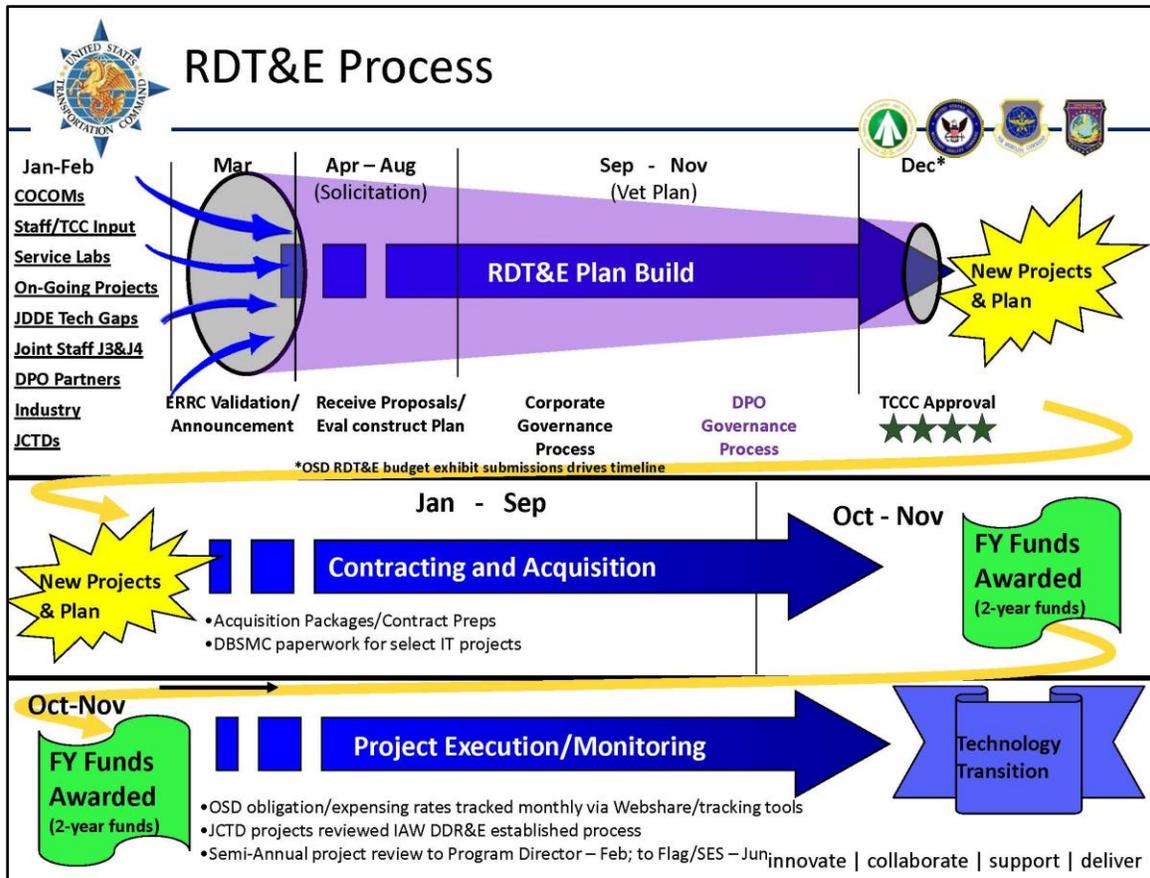
**4. RDT&E Program Process (see Figure 4.1.):**

**4.1.** Based on available funding, the RDT&E Program Director will solicit proposals to address validated technology-related capability shortfalls. The RDT&E Program Director ensures that technology proposals are screened for technical feasibility, expected return on investment, transition strategy, etc. They also develop a prioritized list of projects for incorporation into the annual RDT&E funding plan, and vet proposals with appropriate steering groups before submitting for review by the RDT&E Management Team and the Enterprise Requirements Review Council/RASB in compliance with USTRANSCOMI 90-6, *Corporate Governance Process*.

**4.2.** Proposed plan is then forwarded, via the Distribution Process Owner Governance process, to the Commander for approval. Distribution Process Owner Governance review is sought to ensure the development of joint solutions, provide an additional check to avoid duplication of a

Service/DLA RDT&E initiative, and to garner concurrence with proposed technology transition strategy.

**Figure 4.1. RDT&E Program Management Timeline.**



**4.3.** TCCC-approved plan is returned to the RDT&E Program Director who ensures that:

**4.3.1.** Projects are properly documented within existing DOD RDT&E documents as well as the budget as deemed by Assistant Secretary of Defense (Research & Engineering).

**4.3.2** Formal project reviews are conducted twice per year (normally February and June). These reviews assess project deliverables, spend plan rates, transition strategies, and expected return on investments to ensure viability/suitability for continued funding support. The June review also assesses the validity of next year's spend plans.

SAMUEL D. COX  
Major General, USAF  
Director, Strategy, Policy, Programs,  
and Logistics

Attachments

1. References, Abbreviations and Acronyms
2. USTRANSCOM RDT&E Two-Phase Project Selection Process
3. Definitions of RDT&E Areas
4. Technology Readiness Levels
5. Integrated Product and Process Development
6. Responsibilities of USTRANSCOM RDT&E Project Coordinators

**Attachment 1****GLOSSARY OF REFERENCES, ABBREVIATIONS AND ACRONYMS****Section A - References**

Department of Defense 7000.14-R, *Financial Management Regulations*  
Chairman Joint Chiefs of Staff Instruction 3170.01series, *Joint Capabilities Integration and Development System*  
Department of Defense Instruction 5000.02, *Operation of the Defense Acquisition System*  
USTRANSCOMH 60-2, *USTRANSCOM RDT&E Handbook*  
USTRANSCOMI 63-7, *USTRANSCOM Acquisition Management*  
USTRANSCOMI 90-6, *Corporate Governance Process*

**Section B - Abbreviations and Acronyms**

BA - Budget Activity  
BAA - Broad Area Announcement  
DLA - Defense Logistics Agency  
DOD - Department of Defense  
IPPD - Integrated Product and Process Development  
IT - Information Technology  
JDDE - Joint Deployment and Distribution Enterprise  
PC - Project Coordinator  
P/SOR – Programs/Systems of Record  
RDT&E - Research, Development, Test and Evaluation  
TCAC - Joint Distribution Process Analysis Center  
TCAQ - Command Acquisition  
TCC - Transportation Component Command  
TCCS - Chief of Staff  
TCJ3 - Operations and Plans Directorate  
TCJ5/4 - Strategy, Policy, Programs, and Logistics Directorate  
TCJ5/4-D - Deputy Director, Strategy, Policy, Programs, and Logistics  
TCJ5/4-G - Global Synchronization and Capabilities Division  
TCJ5/4-GC - Capabilities Branch  
TCJ6 - Command, Control, Communications, and Computer Systems Directorate  
TCJ8 - Program Analysis and Financial Management Directorate  
TCJA - Staff Judge Advocate  
USTRANSCOM - United States Transportation Command

**Section C – Terms**

See Attachment 3

## Attachment 2

### USTRANSCOM RESEARCH, DEVELOPMENT, TEST & EVALUATION (RDT&E) Two-Phase Project Selection Process

#### Formats and Content for Proposals

**A2.1.** The likelihood of the success of proposals in both phases will be increased by clearly demonstrating that the capability to be researched/developed covers an important need; that the proposer understands the Joint Deployment and Distribution Enterprise domain and its challenges; and the technical, programmatic, integration, and sustainment challenges of the proposed capability can demonstrate a positive return on investment for the effort; and has an experienced/skilled team of researchers who will be assigned to do the developmental work.

**A2.2. *Phase I*** requires submittal of a “white paper.” White papers are four pages in length with an optional appendix and are intended to preclude unwarranted effort on the part of a proposer whose proposed work is not of interest to USTRANSCOM. The white paper should summarize the full proposal and demonstrate succinctly that the concept is worthy of additional consideration for funding by the government.

**A2.3. *Phase II*** requires submittal of a “proposal.” This portion of the process is only for successful proposers selected from Phase I. Selected proposers will be requested to submit a definitive technical and cost proposal for USTRANSCOM to evaluate. Selection is dependent on the submission of a sound technical and cost proposal and is subject to successful negotiations as well as the availability of funds.

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### **Phase I - White Paper (4-page limit)**

**A2.4.** The white paper must be formatted as stated below. Submittal shall be in Times New Roman font of at least 12 points printed in portrait format. Lines may be single-spaced, though double-spaced is preferred. Pages shall include a 1-in margin at top, bottom, and both sides. A footer within the 1-inch bottom margin containing page number, submittal title, proposer's company name, and appropriate classification or proprietary notice shall be included and must be in least 8-point Times New Roman font. The cover page and optional two-page appendix are not included in the 4-page limitation.

**A2.5. Section A: Cover Page (not included in 4-page limit).** Include title of proposed project and acronym/short title, if appropriate; period of performance; estimated total cost and cost per year of performance; technical and contracting point(s) of contact, phone, fax, e-mail, date, company or agency name, and address; and notice of intellectual property content, security level, and other necessary markings; plus illustrations or logos as chosen by the proposer. This cover page itself should not contain proprietary or otherwise sensitive information.

#### **A2.6. Section B: Project Description:**

**A2.6.1.** Write a brief introduction describing what the RDT&E project will deliver. Acronyms spelled out on the cover page do not have to be repeated, but all other acronyms should be spelled out at first use (here and throughout document).

**A2.6.2.** Describe need being addressed/capability to be researched to demonstrate the proposer knows the domain and its challenges. Cite pertinent formal requirements documentation if it exists.

**A2.6.3.** Describe the maturity of the technology, including Technology Readiness Level (TRL) at project startup and intended TRL at conclusion of the described RDT&E effort to describe the scope of the research effort and its maturity at the end of the project.

**A2.6.4.** Describe anticipated return on investment (ROI) for implementing the proposed capability. A quantified ROI is required and should be calculated without excessive assumptions prior to the RDT&E effort; otherwise, a qualified ROI can be described only during Phase I of the process. Provide documented analysis for ROI as requested.

**A2.6.5.** List the science/engineering/supply chain or other principles which demonstrate that the proposal has technical merit and is likely to be able to solve the problem being addressed.

**A2.6.6.** List the performance metrics by which the RDT&E effort will be measured. This demonstrates the proposer comprehends the factors which dictate success for the effort.

**A2.6.7.** Describe instances where the technical approach has been used in industry or other non-DOD organizations.

**A2.6.8.** List the systems, corporate services, and/or programs of record with which this capability may be integrated, along with corresponding interfaces. If there is already commitment by the Program Management Office of the system or program of record to incorporate the capability, once fully developed, so state. This demonstrates that a transition destination has been considered.

**A2.6.9.** List the numbers and experience of the designated researchers or other individuals who will perform this work and the location(s) where work will be done. This demonstrates the likelihood and level of expertise which will be applied. List the projects completed previously by the assigned researchers, providing telephone and organizational points of contact for the customer and/or user of the capability.

**A2.6.10.** List major deliverables of the project (mid-term or final reports, prototypes, analysis, etc.), a high-level schedule which includes these deliverables, and the funding proposed for each phase of the effort (including by each fiscal year of the project's span). This demonstrates the proposer's technical/programmatic planning capabilities and understanding of the scope of the effort required.

**A2.7. Appendix (not included in 4-page limit).** The proposer may include a 2-page appendix, not included in the body page count, consisting of a diagram, photograph, or other visual aid to further describe the proposed RDT&E project and its deliverables, understanding of the domain and the place the technology will have in it, or other illustrative facts. This appendix is meant to be a visual aid or place for tables or lists, not additional room for the text of the proposal.

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## **Phase II - Proposal (20-page limit)**

**A2.8.** This document is only required from proposers who are notified of the government's selection of their Phase I proposals.

**A2.8.1.** The proposal shall be formatted as stated below. Submittal shall be in Times New Roman font of at least 12 points printed in portrait format. Lines may be single-spaced, though double-spaced is preferred. Pages shall include a 1-inch margin at top, bottom, and both sides. A footer within the 1-inch bottom margin containing page number, submittal title, proposer's company name, and appropriate classification or proprietary notice shall be included and must be in 8-point Times New Roman font. Page limits within each element of the body of the proposal are recommendations; the proposer may utilize the 20 pages allotted as deemed best to describe the proposed project. The cover page and optional appendix are not included in the 20-page limit.

**A2.8.2.** Page limits listed in parentheses for the following sections are recommendations, and may be reallocated by the proposer, as necessary, within the 20-page limit.

**A2.8.3. Cover Page.** Include title and short title, point(s) of contact, phone number(s), fax and email, date, company or agency name, estimated total cost and cost per year of performance, and notice of intellectual property content, security level, and other necessary markings, plus illustrations or logos as chosen by the proposer. This cover page itself should not contain proprietary or otherwise sensitive information.

### **A2.8.4. General Project Summary (1 page):**

**A2.8.4.1.** Describe the critical USTRANSCOM JDDE capabilities which the project addresses. Describe the current system/interface, capability, or process deficiency that the proposal addresses. Describe the operational gap or issue addressed and how the development effort contributes to the solution. Describe the specific deliverables of the RDT&E effort (for example, analysis, report, prototype, experimental results of demonstration, etc.)

**A2.8.4.2.** Identify the technologies to be explored/developed, the end user, and how the technology will enhance that user's capabilities. Consider including a mission scenario, vignette, or Operational View (OV-1) illustration here.

**A2.8.4.3.** List the information technology and/or hardware/platform/vehicle systems/corporate services/interfaces (potential programs or systems of record) with which the technology may be integrated.

### **A2.8.5. Requirements Traceability (2 pages):**

**A2.8.5.1.** Identify the formal requirements, program directives, Joint Capabilities Integration and Development System products, Distribution Process Owner gap, or other formal source of requirements for the effort at the Joint or Service level. Higher priority will be given to those projects that address a Technology Need/Focus Area identified in the annual USTRANSCOM

RDT&E Call for Proposals. Proposals should address the applicable Joint Capability Area (JCA), Tier IV, Logistics, capabilities and will be evaluated against JDDE attributes, Key Performance Indicators (KPI) or Enterprise-level metrics, as outlined in the following paragraphs. If no Tier IV capability applies, then identify the appropriate Tier I and II capability area. Definitions can be found in Chairman, Joint Chiefs of Staff Instruction 3170.01 series, as well as USTRANSCOMH 60-2 for Tier I and II areas. Tier I and II JCA capabilities will be evaluated separately.

**A.2.8.5.1.1.** Expected operational uplift to the JDDE attributes listed below. For each attribute, provide a user-defined metric(s) supporting the proposed operational uplift, if applicable. The JDDE attributes are:

**A2.8.5.1.1.1. Visibility:** Visibility is the capability to determine the status, location, and direction of flow for all forces, requirements, and materiel in the JDDE. Joint end-to-end visibility is required over operational capabilities and capability packages, organizations, people, equipment, and sustainment moving through the pipeline. It also includes the organic military mobility forces and commercial augmentation that move people and things through the pipeline, the financial transactions that support them, and the modes and links comprising the pipeline. Visibility requires the availability of timely, accurate, and usable information essential to the maintenance of a common operating picture within the overall distribution enterprise information network.

**A2.8.5.1.1.2. Reliability:** Reliability is the degree of assurance of dependability that the JDDE will consistently meet its support requirements to specified standards. Reliability instills trust and confidence of the customer in the certainty that the enterprise will meet warfighter demands under clearly established and recognized conditions.

**A2.8.5.1.1.3. Velocity:** Velocity is the speed and direction at which requirements are fulfilled by the JDDE. Rapidity is only one aspect of velocity. Requirements must be fulfilled at the right speed. This means that synchronization of the speeds of the various aspects of the distribution process is required in order to maximize effectiveness. Velocity also incorporates the ability of elements of the JDDE to forecast, anticipate, and plan distribution execution. A JDDE that has sufficient velocity meets performance expectations and satisfies mission requirements, as defined by the supported commanders' concept of operations.

**A2.8.5.1.1.4. Precision:** Precision within the JDDE means the accuracy with which delivery of forces requirements and materiel occurs at the right time, the right place, and in the right amount. Precision also addresses the ability of the JDDE to minimize deviation from acceptable standards as it reacts to dynamically changing conditions and requirements.

**A2.8.5.1.1.5. Survivability:** Ability of an organization to prevail in the face of potential destruction. To ensure continuity of support, critical logistics infrastructure must be identified and plans developed for its protection. Survivability is directly affected by dispersion, design of operation logistics processes, and the allocation of forces to protect critical logistics infrastructure. Examples of critical logistics infrastructure include industrial centers, airfields,

seaports, railheads, supply points, depots, lines of communication, bridges, intersections, logistics centers, and installations.

**A.2.8.5.1.1.6. Economy:** The amount of resources required to deliver a specific outcome. Economy is achieved when support is provided using the fewest resources within acceptable levels of risk. At the tactical and operational levels, economy is reflected in the number of personnel, units, and equipment required to deliver support. Among the key elements of the logistics principle of economy is the identification of unnecessary duplications and redundancies.

**A.2.8.5.1.1.7. Capacity:** The capacity of the JDDE is defined by the physical quantity, size, mix, configuration, and readiness of its assets and infrastructure. Capacity is not a static attribute.

**A.2.8.5.1.2.** Expected uplift to JDDE Key Performance Indicators (KPI) or Enterprise level metrics listed below. For each KPI, address the expected uplift or impact, if applicable. The KPIs or Enterprise level metrics are:

**A.2.8.5.1.2.1. Logistics Response Time:** The average actual cycle time consistently achieved to fulfill customer orders. For each individual order, this cycle time starts from the order receipt and ends with customer acceptance of the order.

**A.2.8.5.1.2.2. Perfect Order Fulfillment:** The percentage of orders meeting delivery performance with complete and accurate documentation and no delivery damage. Components include all items and quantities on time using the customer's definition of on-time, and documentation – packing slips, bills of lading, invoices, etc.

**A.2.8.5.1.2.3. Information Content and Quality:** The status, completeness, and accuracy of information data exchanged from document date to receipt.

**A.2.8.5.1.2.4. Total Supply Chain Costs:** The fixed and operational costs associated with transportation costs, order management, material acquisition, inventory carrying, planning/finance, and information technology costs for deployment or distribution-related functions.

**A.2.8.5.1.2.5. Latest Arrival Date (LAD) Performance:** Latest Arrival Date, applied to force movements Time-Phased Force Deployment Data (TPFDD).

**A.2.8.5.2.** Alternately, if no formal requirement can be identified (see A.2.8.5.1. above), identify any capability shortfalls from the USTRANSCOM RDT&E Handbook (USTRANSCOMH 60-2) not included in formal requirements documentation (previous criteria) that this project will address.

**A.2.8.5.3.** If no formal source of requirements exists, clearly describe the vision and/or a proposed Functional Area Analysis/Needs Assessment that is being addressed. Cite any pertinent exercises, operational experience, and/or experimentation. Definitions of analysis can be found in Chairman,

Joint Chiefs of Staff Instruction 3170.01 series, *Joint Capabilities Integration and Development System*.

**A2.8.6. Project Suitability (2 pages):**

**A2.8.6.1.** Describe the anticipated results and the manner in which the work will contribute to enhancing joint defense distribution and/or transportation capabilities. Describe why the technology/capability sought is not purely a Service (Title 10) responsibility and, therefore, qualified for joint USTRANSCOM RDT&E funding.

**A2.8.6.2.** Demonstrate why the project is innovative/transformational and, therefore, worthy of joint RDT&E funding and not simply an upgrade or modernization of an existing capability. Show the TRL at project start and anticipated TRL at project conclusion.

**A2.8.6.3.** Describe what steps were taken to ensure the effort is not duplicative.

**A2.8.7. Return on Investment (ROI), Affordability, and Business Case (5 pages):**

**A2.8.7.1.** Although this effort is research and development, the proposer must be able to demonstrate, at least quantitatively, that a favorable rate of return for the fielded capability is likely. A quantified ROI is more compelling than a subjective one. For projects of lower technological maturity, ROI/affordability can be based on broader assumptions and less-stringent criteria than would be expected for a go/no-go acquisition decision--as long as these assumptions are stated clearly. Where ROI/affordability of the fielded capability is tentatively projected at the outset, the research plan should explicitly contain activities to refine these measures and refresh the estimates at project completion. A business case for use should be described.

**A2.8.7.2.** Assumptions. List assumptions associated with tangible and intangible costs which are being made about the project which affect (or make possible) the calculation of ROI and affordability.

**A2.8.7.3.** Evaluation of Alternatives. Describe why this RDT&E effort is preferable to non-RDT&E approaches; list other courses of action (including non-materiel solutions) considered and why they are not recommended.

**A2.8.7.4.** Business Case for Implementation/ROI. If possible, quantitatively estimate the cost to implement the proposed capability (lifecycle cost including RDT&E, development/test, procurement, and sustainment) and lifecycle ROI. Describe any existing systems/interfaces which may be retired or personnel support which may be reduced (and thus operating costs saved) by use of the technology. Also describe estimating methods or data sources which were used and how they contributed to the credibility of the cost estimate.

**A2.8.7.5.** Applicability to Industrial Practices and Partnerships. Describe, if possible, instances where the proposed technical approach has been used by industry (e.g., best or innovative practices) and how the capability, if developed and fielded in USTRANSCOM's enterprise, may

assist DOD in working more economically or seamlessly with its commercial and other supply chain partners.

**A2.8.8. Technical Merit and Maturity (4 pages):**

**A2.8.8.1.** Describe the technologies to be developed, their risks for fielding, and methods of better understanding or reducing those risks during RDT&E.

**A2.8.8.2.** State the assessment of experts regarding technical merit of the approach. Is the approach based on sound scientific/engineering principles likely to succeed in achieving stated capabilities? What are the qualifications of the experts who make that judgment?

**A2.8.9. Programmatic (4 pages):**

**A2.8.9.1.** Cost, schedule, and performance are interrelated. This section is meant to show the schedule of activities for the RDT&E effort with accompanying funding requirements for each segment of the project and its deliverables.

**A2.8.9.2.** Provide a detailed schedule, with start and end dates for major activities, appropriate decision point milestones, and completion dates for deliverables such as studies, prototypes, and other outputs of the research, for the entire project. Show links to other development efforts and to Programs/Systems of Record (P/SOR) to illustrate transition paths. If a project has already started, include any activities already completed. Include activities which support transition to further development, demonstration or acquisition, as appropriate.

**A2.8.9.3.** Describe prior expended and requested funding for the RDT&E effort in then-year thousands. Include an estimate of follow-on development, production, and sustainment costs. Recommended format (which may be included in the appendix):

**Figure A2.1. Recommended Format – Lifecycle Funding Estimates.**

<i>\$K, then-year</i>	<i>FYXX</i>						
<b>Prior funding source (name)</b>							
<b>Requested USTRANSCOM R&amp;D</b>							
<b>Estimated additional R&amp;D</b>							
<b>Estimated development/test</b>							
<b>Estimated production/fielding</b>							
<b>Estimated Transition</b>							
<b>Estimated sustainment</b>							

**A2.8.9.4.** Describe the team of experts which will be dedicated to conducting project technical/management activities, citing prior experience and qualifications.

**A2.8.9.5.** List similar prior RDT&E work performed for DOD or other government agencies, if any, and points of contact (name and phone).

**A2.8.9.6.** Describe performance metrics (see table below) to be used during conduct of the research and development effort. (The RDT&E program is also required to report these metrics on



### Attachment 3

#### DEFINITIONS OF RESEARCH, DEVELOPMENT, TEST AND EVALUATION (RDT&E) AREAS

**A3.1. Basic Research (Budget Activity 1/BA1).** Systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and/or observable facts without specific applications toward processes or products in mind.

**A3.2. Applied Research (BA2).** Systematic study to gain knowledge or understanding necessary to determine the means by which a recognized and specific need may be met.

**A3.3. Advanced Technology Development (ATD) (BA3).** This budget activity includes development of subsystems and components and efforts to integrate subsystems and components into system prototypes/interfaces for field experiments and/or tests in a simulated environment. ATD includes concept and technology demonstrations of components and subsystems or system models. The models may be form, fit, and function prototypes or scaled models that serve the same demonstration purpose. The results of this type of effort are proof of technological feasibility and assessment of subsystem and component operability and productivity rather than the development of hardware for Service use. Projects in this category have a direct relevance to identified military needs. ATD demonstrates the general military utility or cost reduction potential of technology when applied to different types of military equipment or techniques. Program elements in this category involve pre-Milestone B efforts, such as system concept demonstration, joint and Service-specific experiments, or technology demonstrations, and generally have technology readiness levels of 4, 5, or 6. Projects in this category do not necessarily lead to subsequent development or procurement phases, but should have the goal of moving out of Science and Technology and into the acquisition process within the future year defense program . Upon successful completion of projects that have military utility, the technology should be available for transition.

**A3.4. Advanced Component Development and Prototypes (BA4).** Includes all efforts necessary to evaluate integrated technologies in as realistic an operating environment as possible to assess the performance or costs reduction potential of advanced technology.

**A3.5. System Development and Demonstration (BA5).** Includes those projects in engineering and manufacturing development for Service use but which have not received approval for full rate production.

**A3.6. RDT&E Management Support (BA6).** Includes RDT&E efforts directed toward support of installation or operations required for general RDT&E use. Included would be test ranges, military construction, maintenance support of laboratories, operations and maintenance of test aircraft and ships, and studies and analyses in support of RDT&E program.

**A3.7. Operational System Development (BA7).** Includes those development projects in support of development acquisition programs or upgrades still in engineering and manufacturing development, but which have received Defense Acquisition Board (DAB) or other approval for

production or for which production funds have been included in the DOD budget submission for the budget or subsequent fiscal year.

## Attachment 4

### TECHNOLOGY READINESS LEVELS (TRLs)

**A4.1.** Most likely entry TRLs for USTRANSCOM RDT&E funding are TRLs 4-6. Work beginning in TRL 7 generally falls in the area of system acquisition, not science and technology.

**A4.2.** Some projects at TRL 3 may compete well for funding; for example, scientifically based studies to refine needs or explore the potential (the possible envelope of performance) for new technologies.

**A4.3.** Lower TRL entry levels suggest follow-on efforts will be additional laboratory work to mature the technology.

**A4.4.** Higher TRL entry levels suggest follow-on work will be in system program offices for integration, test, and operational qualification.

**A4.5.** Highest likely exit TRL for USTRANSCOM RDT&E funding is TRL 7. Work beyond TRL 7 generally falls in system program offices.

**A4.6. TRL Levels Defined (USTRANSCOM RDT&E focus areas in bold type):**

**A4.6.1.** TRL 1. Basic principles observed and reported. Lowest level of technology readiness. Scientific research begins to be translated into applied research and development. Examples might include paper studies of a technology's basic properties.

**A4.6.2.** TRL 2. Technology concept and/or application formulated. Invention begins. Once basic principles are observed, practical applications can be invented. The application is speculative and there is no proof or detailed analysis to support the assumption. Examples are still limited to paper studies.

**A4.6.3.** TRL 3. Analytical and experimental critical function and/or characteristic proof of concept. Active research and development are initiated. This includes analytical studies and laboratory studies to physically validate analytical predictions of separate elements of the technology. Examples include components that are not yet integrated or representative.

**A4.6.4.** TRL 4. Component and/or breadboard validation in laboratory environment. Basic technological components are integrated to establish that the pieces will work together. This is relatively "low fidelity" compared to the eventual system. Examples include integration of "ad hoc" hardware in a laboratory.

**A4.6.5.** TRL 5. Component and/or breadboard validation in relevant environment. Fidelity of breadboard technology increases significantly. The basic technological components are integrated with reasonably realistic supporting elements so that the technology can be tested in a simulated environment. Examples include "high fidelity" laboratory integration of components.

**A4.6.6.** TRL 6. System/subsystem model or prototype demonstration in a relevant environment. Representative model or prototype system, which is well beyond the breadboard prototype evaluated as TRL 5, is tested in a relevant environment. Represents a major step up in a technology's demonstrated readiness. Examples include testing a prototype in a high fidelity laboratory environment or in a simulated operational environment.

**A4.6.7.** TRL 7. System prototype demonstration in an operational environment. Prototype near or at planned operational system. Represents a major step up from TRL 6, requiring the demonstration of an actual system prototype in an operational environment such as an aircraft, vehicle, or space. Examples include testing the prototype in structured or actual field use.

**A4.6.8.** TRL 8. Actual system completed and operationally qualified through test and demonstration. Technology has been proven to work in its final form and under expected conditions. In almost all cases, this TRL represents the end of true system development. Examples include developmental test and evaluation of the system in its intended weapon system to determine if it meets design specifications.

**A4.6.9.** TRL 9. Actual system, proven through successful mission operations. Actual application of the technology in its final form and under mission conditions, such as those encountered in test and evaluation. Examples include using the system under operational mission conditions.

<sup>1</sup> Adapted from GAO/NSIAD-99-162 Best Practices Appendix I Technology Readiness Level Descriptions

**Attachment 5**

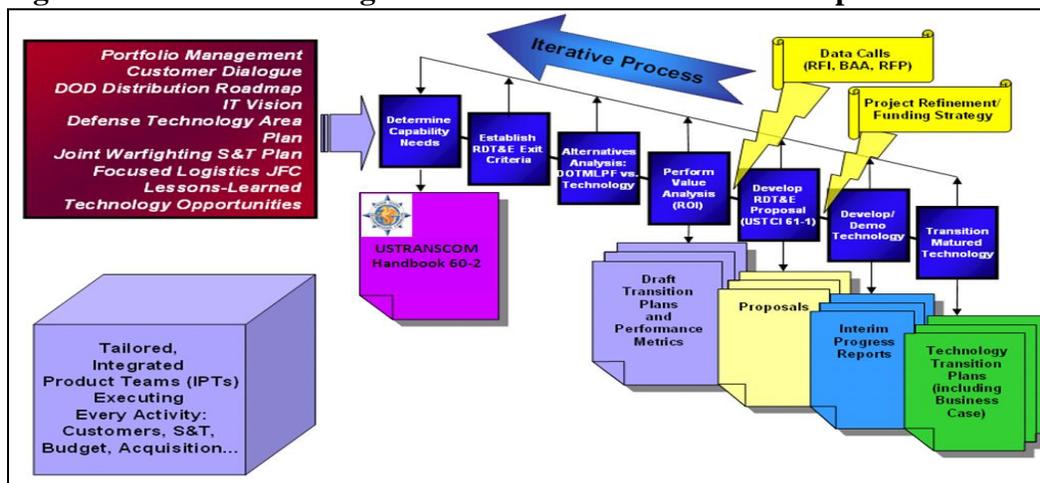
**INTEGRATED PRODUCT AND PROCESS DEVELOPMENT (IPPD)**

**A5.1. Overview.** IPPD is a management technique that simultaneously integrates all essential development and acquisition activities through the use of multi-disciplinary teams to optimize the design, manufacturing, business, and supportability processes. Its ultimate goal is to provide the warfighters with world-class equipment and systems, products, and corporate services at an affordable cost on a schedule responsive to the need.

**A5.2. Definition.** DOD defines IPPD as, “A management process that integrates all activities from product concept through production/field support, using a multi-functional team, to simultaneously optimize the product and its manufacturing and sustainment processes to meet cost and performance objectives.” IPPD activities focus on the customer and meeting customer(s) need. Accurately understanding the users’ needs and establishing realistic requirements early allows trade-off analyses to be made among design, performance, production, support, cost, and operational needs to optimize the acquisition over its life cycle, making cost an independent rather than dependent variable.

**A5.3. Implementation.** IPPD requires a disciplined approach which includes five general activities: understanding the requirements, outlining the approach, planning the effort, allocating resources, and executing and tracking the plan. A disciplined approach provides a framework for utilizing tools, teams, and processes in a structured manner that is responsive to systematic improvements. Tools in this IPPD process include: documents, information systems, methods, and technologies that can be fit into a generic shared framework that focuses on planning, executing, and tracking. Teams are made up of everyone who has a stake in the outcome. Processes are those activities that lead to both end product and associated processes and include capabilities-based analysis and configuration management. Processes should be developed concurrently with the technologies they are producing/products they support. Life cycle planning for a product and its processes begins in the science and technology phase. Integrated Product Teams (IPT) are essential to the IPPD process.

**Figure A5.1. RDT&E Integrated Product and Process Development.**



**A5.4. Integrated Product Team (IPT).** Members of an IPT represent technical, manufacturing, operational, and support functions of the organizations that are critical to the development, transition, and long-term product sustainment. Chartering is an excellent way for the team to understand its roles and responsibilities. Applying the IPPD management philosophy can result in significant benefits with primary benefits being reduced cost/schedule/risk and improved quality.

**A5.5. The Research, Development, Test and Evaluation (RDT&E) IPPD Process:**

**A5.5.1. Implementing the IPPD Process.** The basic functions associated with implementing the IPPD principles are shown in the process diagram (Figure A5.1).

**A5.5.2. Determine Capability Needs.** The process begins with the IPT defining requirements. This should be done with the participation of all stakeholders (i.e., RDT&E personnel, customers, finance, acquisition, and others). A successful IPT achieves the benefit of reduced cost and schedule while maintaining, and often increasing, the quality of the technology being pursued. Appropriate metrics must be established to monitor and adjust the overall strategy/plan to ensure transitionable technologies meet the warfighters stated need.

**A5.5.3. Exit Criteria.** RDT&E exit criteria are the thresholds and objectives (i.e., the must have versus the nice to have) associated with the product's quantifiable metrics (the measures). They are used to estimate future affordability, track technical progress, and ultimately characterize the affordability of new technologies.

**A5.5.4. Technology Alternatives.** This activity addresses the issue of defining Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities (DOTMLPF) alternative/complementary solutions/futuristic technology alternatives which represent various technology configurations, solutions, systems/interface sub-systems, and/or corporate services that can be developed and combined in an effort to satisfy the exit criteria.

**A5.5.5. Perform Value Analysis.** This activity leads to the decision as to whether or not the command should invest in a given RDT&E venture based on the anticipated ROI which includes the extent to which the technology provides the desired capability enhancement within a certain timeframe balanced against its associated cost benefits.

**A5.5.6. Proposal Submission.** This activity involves the preparation and submission of a research and development proposal. Submission format, as well as project selection criteria and details regarding project selection process, are outlined throughout this instruction.

**A5.5.7. Technology Development/Demonstration.** This RDT&E IPPD activity is the technology development and demonstration effort itself. During this phase, the methods and estimates that were used in the preliminary analysis are revisited. Impact analysis reveals the overall impact on system performance, producibility, and cost that may result from changing objectives and thresholds. Customer involvement in this phase is crucial to ensure the delivery of the desired capability.

**A5.5.8. Technology Delivery.** The last activity addresses the final analysis and transitioning of project results. This analysis is captured in the business case portion of the Technology Transition Plan (TTP). The TTP serves as a transition document detailing performance, producibility, and life cycle cost issues, and discussing the overall affordability of the technology in terms of the extent to which it satisfies the exit criteria. The results of the effort are cast in terms of the warfighter's language and perspective. Transition of RDT&E is dependent on the lead system integrator incorporating the new technologies into the system design and/or allowing for its future incorporation through spiral development.

## **Attachment 6**

### **RESPONSIBILITIES OF USTRANSCOM RESEARCH, DEVELOPMENT, TEST, AND EVALUATION (RDT&E) PROJECT COORDINATORS**

#### **A6.1. Introduction:**

**\*A6.1.1.** Project Coordinators (PC) of USTRANSCOM RDT&E projects act as facilitators for the needs of the researchers, conduits for information between researchers, users, higher headquarters, and functional offices (principally budget), and transition agents (Programs/Systems of Record (P/SOR)). As stewards for highly competitive resources, PCs must ensure requirements are understood, projects are carefully scoped and adequately resourced, and every opportunity is taken for successful transition to further development or fielding. Along the way, regular reporting, close liaison with technical managers, and teamwork with finance, legal, and the USTRANSCOM RDT&E Team (TCJ5/4-GC) are essential.

**A6.1.2.** PCs ensure technology developers have access to appropriate DOD information needed to advance the effort toward its goals. PCs should always be on the lookout for problems involving accomplishment of goals and funds expenditure to give the maximum amount of notice so a workaround can be executed.

**A6.1.3.** The USTRANSCOM RDT&E Team, finance, acquisition, and legal experts will assist with specialized knowledge, but the responsibility for accomplishment lies first with the designated PC. The following items describe expectations for PCs of USTRANSCOM RDT&E funded projects:

#### **A6.2. Comprehend purpose and goals of the RDT&E and the context for transitioning it:**

**A6.2.1.** PCs must understand and be able to articulate why the project exists (based on user requirements as well as innovation opportunities). In-depth understanding of requirements means when difficulties are encountered, the PC is able to consider what is important, what can be put aside and how to re-engineer the project without completely losing its utility.

**A6.2.2.** If RDT&E is conducted, it means the exact technique or approach to fulfill the need is not fully determined. The PC needs to have a clear picture of why the RDT&E, in other words the investigation, is necessary. Have other non-developmental alternatives been exhausted? It should be clear why RDT&E was called for, versus a procedural change or merely an acquisition (bolt-on or upgrade of existing systems/interfaces) effort. This takes collaboration with technical experts as well as users who understand the system into which the technology will be introduced.

**A6.2.3.** The PC should understand, through consultation with experts in the field, why the technical approach is valid. Since USTRANSCOM RDT&E projects typically fall in the applied technology or advanced development area, the validity of the science behind the approach should be clear.

**A6.2.4.** The PC needs to understand what the fundamental challenges and risks are for the project. Is technology the major impediment, or is integration with existing systems/interfaces more risky? Perhaps culture or business rules or laws/regulations are more challenging or costly to overcome than the new technology. As a practical example, existing techniques and business rules often are not documented or are not standardized across the enterprise, making it difficult for developers to easily understand the environment and its limitations in which their new technology must operate.

**A6.2.5.** Further, the PC will need to understand how the capability fits into the larger operational picture--how is it proposed to be integrated into existing systems/interfaces, what does it need from them, and what must it supply to them? This step also requires the PC to understand whatever formal requirements, vision documents, or other sources of need can be cited to justify the program's existence.

**A6.2.6.** The PC will need to understand the intended end-state of the research effort; what knowledge is intended to be gained? What deliverables (measured by accomplishment of exit criteria) are to be accomplished? Will the outcome be a new body of knowledge needing further scale-up or will a prototype be tested and qualified for operational use? What constitutes success in either of these outcomes?

**A6.2.7.** In the case of more fundamental research, some of the details of integration may be unanswerable until the basic feasibility of the approach has been determined, but even then, there must be a rationale for pursuing a promising technology at the outset.

### **A6.3. Facilitate project accomplishment:**

**A6.3.1.** Close collaboration with the technical (e.g., laboratory, academia, or industry) manager/engineer or scientist will be necessary. The PC will need a good working relationship with end users, finance, contracting, and potentially testers to ensure all disciplines are properly harnessed for progress. The RDT&E team will assist in making connections between all these agencies.

**A6.3.2.** The PC assists the technical developers in obtaining information needed for full understanding of the need, including understanding the operational environment in which the capability must work. This implies engaging the right subject matter experts. Typical activities include: providing access to operational environments or command and control databases to allow analysis and development to proceed; processing visit requests and hosting visitors to observe operations; and collaboration with budget, contracting, or legal offices to clear any hurdles to progress.

**A6.3.3.** If the project encounters a lack of resources (funding, time, materials or test assets, etc.), the PC will need to assist in obtaining the missing elements. Where resources or other missing elements will significantly impede progress according to earlier plans, the PC must notify their USTRANSCOM RDT&E Team counterpart (i.e., Monitor) and/or the Program Director early enough to allow re-scoping the project before a show stopping event occurs.

**A6.3.4.** By consultation with finance/budget offices, PCs must ensure the integrity of funding by keeping RDT&E funds reserved for appropriate use (e.g., development, not maintenance or procurement) and avoiding obligation of funds in inappropriate fiscal years (avoiding forward financing, etc.).

**A6.3.5.** PCs must also ensure that the government makes no un-resourced obligation when dealing with industry-based technology development--in other words, complying with the Anti-Deficiency Act and other legal requirements. The USTRANSCOM finance and legal staffs are available to assist with compliance.

**A6.3.6.** PCs must rigorously maintain proper standards in protection of classified, For Official Use Only, Source Selection Sensitive, contractor proprietary, U.S. Only, and other controlled information. When information improperly crosses these boundaries, the entire project may be threatened (as well as the whole RDT&E program and even the PC's performance assessments). Good stewardship of sensitive information, regardless of its source, is crucial.

#### **A6.4. Track and report progress:**

**A6.4.1.** The PC monitors and reports on accomplishment in cost, schedule, and technical performance terms. Format for regular reporting will be provided by the USTRANSCOM RDT&E Team. The PC is accountable to ensure that project goals, as agreed to at project initiation, are well-defined and have a strong potential to be accomplished. During execution, goals must be held constant. This entails not losing focus by straying into additional un-scoped work ("gold plating") or by dropping or changing goals without coordination with USTRANSCOM RDT&E Teams members, users, and the P/SOR.

**A6.4.2.** USTRANSCOM requires, at a minimum, the following reports listed below (examples are provided on the RDT&E website accessible from the USTRANSCOM public page <http://www.transcom.mil/rdte>). Project Coordinators also receive the report formats during their initial training session. Formats for the February and June project reviews will be sent to the PC 30 days prior to the scheduled review. Additional reports may also be needed due to unforeseen audits and other reporting requirements.

- Funds obligation and expenditure percentages against goals (monthly)
- A February mid-year project review to the RDT&E Program Director (include status of transition planning)
- A June annual project review (chaired by the Deputy Director, Strategy, Policy, Programs, and Logistics Directorate (TCJ5/4-D)) (include status of transition planning)

**A6.4.3.** The PC should remain sufficiently aware of the technical effort's progress to allow anticipation of problems while they still can be addressed without threatening the project. For example, if objectives of the project prove to be infeasible or funding cannot be expended to reach minimum goals, the PC must notify the RDT&E Team before funds are lost or opportunities to re-scope the effort are no longer possible. This situational awareness will require a close and frequent collaboration between the PC and the technical project manager(s). In short, expectations must be set and adhered to.

**A6.4.4.** Metrics (including Performance-Based Metrics) sufficient to gauge progress should be agreed to at project initiation and monitored by the PC throughout the project's life.

**A6.4.5.** Finally, if the PC encounters a situation requiring additional expertise not already available and beyond the PC's ability to fix, the USTRANSCOM RDT&E Team should be contacted immediately to seek additional assistance, to allow project re-scoping, or to provide other support to get the effort back on track.

**A6.5. Assist in technology transition:**

**A6.5.1.** Without a transition strategy, research is purely an academic activity. While not all transition elements may be known at the outset, a destination P/SOR should be targeted to incorporate and sustain the new capability.

**A6.5.2.** An analogy for a P/SOR is an automobile. The new technology is a satellite radio. The radio developers would need to understand the configuration of the car in which the radio would be installed so the physical, electrical, and human interface features could be designed. In turn, the automobile manufacturer would need to agree to modify the automobile's design to incorporate the new radio (dashboard configuration, electrical hookups), and allow it to operate conveniently and reliably once in the customer's ownership. With DOD's vastly complex and interconnected capabilities, early transition and integration planning are critical to project success. Discussions on transition need to first take place with the P/SOR when the project is proposed. The P/SOR needs to agree to consider integration during early development and will need to be "on board" as formal P/SOR before development ends if transition is to be successful. Simply put, progress toward integration goals must be constantly monitored so the new technology has somewhere to live after the development is completed.

**\*A6.5.3.** Typical activities will include liaison with the intended P/SOR, refinement of goals if transition/integration encounters difficulty, and briefings to decision-making bodies (e.g., the Corporate and Distribution Process Owner governance structures).

**A6.5.4.** PCs may be asked to advocate transition funding via authoring documentation for DOD's Technology Transition Initiative or other "bridging the gap" funds. PCs must effectively use technology transfer tools, where applicable, to support the capabilities and opportunities represented by their projects.

**A6.5.5.** PCs will work with the test and/or experimentation communities to plan for and actually exercise the technology in the appropriate environment prior to hand-off to the next phase of development or, in the case of very mature technology, to actual fielding.

**A6.5.6.** Prior to fielding new IT capabilities costing over \$1M, PCs will as applicable need to satisfy Defense Business Systems Management Committee documentation requirements and also comply with extended documentation and certification requirements that may be imposed by various Investment Review Boards/Processes (e.g. DBSMC, Corporate Governance Process (CGP), JCIDS).

**A6.5.7.** With close coordination with all supporting disciplines (user, functional, and technological), keeping an eye on the goals of the project, and fundamentally a sense of good stewardship, PCs help assure the advancement and fielding of new capabilities.