

# INTEGRATED DEEPWATER SYSTEM

## Draft Test and Evaluation Master Plan (TEMP)



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**Executive Summary**

Integrated Deepwater System (IDS) Test and Evaluation (T&E) is conducted at the IDS and its super-asset, asset, system, sub-system, equipment and component levels to ensure IDS mission performance. T&E is an evolutionary and iterative process that is ultimately focused on mission success. The IDS Test and Evaluation Master Plan (TEMP) details the structure and objectives of the T&E program. This plan provides the framework within which detailed test plans are developed. Detailed test plans will contain the methods, schedule, resources and structure of specific T&E events. Annexes A through E provide templates for the development of Asset TEMPS (Surface; Air; command, control, communications, computer, intelligence, surveillance, and reconnaissance (C4ISR); Logistic and Other) and similar system and super-asset test plans. The IDS TEMP details two types of T&E; Developmental Test and Evaluation (DT&E) and Operational Test and Evaluation (OT&E). DT&E goals include demonstrating the feasibility of technical approaches, minimizing risk, identifying design alternatives and conducting trade-offs. Emphasis is placed on contractor testing to ensure that the IDS and its super-assets, assets, systems, sub-systems, equipment and components meet specification and that all elements of product design, development and manufacturing processes are fully mature. OT&E goals include assessing operational effectiveness and operational suitability, identifying deficiencies requiring modification, evaluating system utility, verifying critical technical parameters, determining deployment feasibility and developing tactics. OT&E is United States Coast Guard (USCG) focused at the IDS, super-asset, and asset levels in a realistic operational environment.

As the Coast Guard heads into the 21<sup>st</sup> century, all surface and air assets that perform missions in the Deepwater environment are approaching the end of their respective service lives. Deepwater missions are those missions that generally occur beyond 50 nautical miles (NM) from U.S. shores. These missions typically require extended on-scene presence, long transit distance to reach the operating area, forward deployment of forces, or a combination of these factors. In addition, the Coast Guard is faced with a constrained budget. The Coast Guard must therefore concentrate its scarce resources on an integrated system of capable surface and air assets tied together with an overarching C4ISR architecture and assets supported by a solid foundation of logistics systems and assets to maximize operational effectiveness while minimizing acquisition and life-cycle costs. To accomplish this, the Coast Guard is seeking solutions from industry in a two-phase acquisition program.

Phase I is the Concept Development phase. Based on the Coast Guard's statutory-mandated missions and current and planned asset capabilities, each Industry Team will develop an IDS concept of surface, air, C4ISR, and logistics assets. The Industry Teams will consider the options associated with acquiring new assets and/or retaining, retiring, or upgrading current assets while maximizing operational effectiveness and minimizing acquisition and life-cycle costs. The Phase I Industry Teams will develop an IDS concept, provide specific asset performance and cost information, prepare a phased plan for the acquisition and deployment of the proposed IDS concepts, and have the capability to construct, modify, and/or acquire the individual assets in its proposed IDS concept.

In Phase II, the selected Phase I Industry Teams will submit proposals with refined designs and costs to provide the system. The Coast Guard will evaluate these Phase II proposals and intends to award a contract to one of the Industry Teams to build and provide the IDS. T&E planning begins in Phase II.

The IDS TEMP detailed in the following pages provides:

- A Capstone planning document for all IDS T&E including IDS, its super-assets, assets, systems, sub-systems, equipment and components.
- An Outline of Developmental Test and Evaluation (DT&E) and Operational Test and Evaluation (OT&E) processes and phases.
- Templates for the development of Asset TEMPS (Surface, Air, C4ISR, Logistic and Other) (Annexes A thorough E).
- Identification of Operational Effectiveness and Suitability Thresholds, Operational Environmental Baseline Conditions, Critical Technical Parameters, Integrated Test Program Schedule, Critical Operational Issues and T&E Resource Summary.

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## Chapter 1. INTRODUCTION

**A. Background.** Deepwater missions are those missions that generally occur beyond 50 nautical miles (NM) from U.S. shores. These missions typically require extended on-scene presence, long transit distance to reach the operating area, forward deployment of forces, or a combination of these factors. In addition, the Coast Guard is faced with a constrained budget. The Coast Guard must therefore concentrate its scarce resources on an integrated system of capable surface and air assets tied together with an overarching C4ISR architecture and assets supported by a solid foundation of logistics systems and assets to maximize operational effectiveness while minimizing acquisition and life-cycle costs. To accomplish this, the Coast Guard is seeking solutions from industry in a two-phase acquisition program.

Phase I is the Concept Development phase. Based on the Coast Guard's statutory-mandated missions and current and planned asset capabilities, each Industry Team will develop an IDS concept of surface, air, C4ISR, and logistics assets. The Industry Teams will consider the options associated with acquiring new assets and/or retaining, retiring, or upgrading current assets while maximizing operational effectiveness and minimizing acquisition and life-cycle costs. The Phase I Industry Teams will develop an IDS concept, provide specific asset performance and cost information, prepare a phased plan for the acquisition and deployment of the proposed IDS concepts, and have the capability to construct, modify, and/or acquire the individual assets in its proposed IDS concept.

In Phase II, the selected Phase I Industry Teams will submit proposals with refined designs and costs to provide the system. The Coast Guard will evaluate these Phase II proposals and intends to award a contract to one of the Industry Teams to build and provide the IDS.

Based on the IDS concept selected; IDS, super-asset, asset, system, sub-system, equipment and component test requirements will be developed. Using the IDS TEMP as a framework, detailed DT&E and OT&E plans will be written to specify the objectives, methods, resources and structures of discrete T&E events. Paramount to T&E program performance is the goal of IDS mission success.

## **B. Operational Performance Requirements**

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1. Table 1 describes operational effectiveness and suitability thresholds. The IDS threshold column represents the minimum operational performance requirements as stated in section 4.0 of the IDS Operational Requirements Document (ORD). Table 2, Operational Environment Baseline Conditions, provides the baseline environmental conditions for meeting the performance parameters in Table 1. The parameters are defined in terms that are both verifiable by testing and are consistent with Deepwater operations. The IDS ORD and IDS System Performance Specifications identify the constraints to consider during system development. They include:

**TABLE 1 - OPERATIONAL EFFECTIVENESS  
AND SUITABILITY THRESHOLDS**

<b>Operational Effectiveness</b>			
<b>Requirement</b>	<b>Parameter</b>	<b>Threshold</b>	<b>Notes</b>
<b>Detect and Track</b>	$P_d$	$\geq 90\%$	1
<b>On-scene Assistance</b>	$P_{aos}$	$\geq 90\%$	2
	$T_{aos}$	$\leq 2$ hrs	
<b>Respond to NERO</b>	$T_{aos}$	$\leq 48$ hrs	
<b>Boardings</b>	Persons/Weight	$\geq 8$ persons/ $\geq 150$ lbs	3
<b>At-sea Transfers</b>	Persons/Weight	$\geq 12$ persons/ $\geq 150$ lbs	4
<b>Towing</b>	Minimum Length/ Displacement	$\geq 200$ ft/ $\geq 3000$ tons	5
<b>Support Operations</b>	On-scene Presence	$\geq 45$ days	6
	FWSMSS/Time	$\geq 150$ migrants/ $\geq 4$ weeks	7
		$\geq 300$ migrants/ $\geq 72$ hrs	8
	Messing/Berthing	$\geq 16$ persons/ $\geq 72$ hrs	9
		$\geq 6$ persons/ $\geq 30$ days	10
<b>NSC</b>	Operational Speed	$\geq 23$ knots	
		Maneuvering Speed	$\geq 28$ knots
<b>Endurance</b>	Duration/Distance	$\geq 60$ days/ $\geq 12000$ NM	11
<b>Operational Suitability</b>			
<b>Requirement</b>	<b>Parameter</b>	<b>Threshold</b>	<b>Notes</b>
<b>Operational Availability</b>	$A_o$	100%	12

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**TABLE 1 - OPERATIONAL EFFECTIVENESS  
AND SUITABILITY THRESHOLDS (Cont)**

NERO	National Emergency Response Operations
P <sub>d</sub>	Probability of detection
P <sub>aos</sub>	Probability of arrival on-scene
T <sub>aos</sub>	Time of arrival on-scene
FWSMSS	Food, water, sanitation, medical services and shelter
Notes:	
<ol style="list-style-type: none"> <li>1. Probability of detecting and tracking targets of any material, as small as a single person in the water and as small as an airborne single engine civil aircraft in the air.</li> <li>2. Probability of arriving on-scene and rendering assistance to at least 90% of all distress incidents within 2 hours.</li> <li>3. Safely and effectively launch and recover multiple, simultaneous boarding teams as large as eight persons with up to 150 pounds of equipment to and from vessels at sea.</li> <li>4. Safely and effectively conduct transfers of up to 12 personnel and 150 pounds of equipment, including personnel unfamiliar with at-sea evolutions, to and from vessels.</li> <li>5. Tow vessels up to 200 feet and/or 3000 ton, and equal in size of the towing vessel.</li> <li>6. Provide an adequate health care facility to include triage, resuscitation, and coordinated transfer of patients in order to operate independently for 45 days. Provide logistical/support services to subordinate units, including embarked air assets (USCG and/or Department of Defense), surface, and Port Security Unit (PSU) unit(s) for 45 days.</li> <li>7. Provide and/or coordinate with other applicable agencies for food, water, sanitation, medical services, separate from own forces' facilities and the IDS asset, for 150 migrants at sea over four (4) weeks.</li> <li>8. Provide food, water, sanitation, medical services and shelter, separate from own forces' facilities for 300 migrants at sea over 72 hours.</li> <li>9. Provide support, including berthing and messing for 16 additional personnel for 72 hours.</li> <li>10. Provide support, including berthing and messing for six (6) representatives from other agencies or allied forces for 30 days.</li> <li>11. The endurance necessary to provide on-station presence for 60 days and conducting extended independent operations over 12,000 NM.</li> <li>12. A<sub>o</sub> for the IDS is defined: <div style="text-align: center; margin-top: 10px;"> <math display="block">A_o = \frac{\text{Number of Times Assets are Available for a Mission}}{\text{Number of Missions}}</math> </div> </li> </ol>	

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**TABLE 2 - OPERATIONAL ENVIRONMENT BASELINE CONDITIONS**

Parameter	Threshold	Notes
Operating hours	24 hours a day/365 days a year	
Weather Conditions	Moderate rain, fog, snow, sleet and other adverse weather conditions	
Sea State (SS)	Up to and including SS 5	1
Temperature	-40°C (-40°F) to 51.7°C (125°F)	
Humidity	20 to 100%	
Sea Water Temperature	-2°C (28°F) to 35°C (95°F)	
Note:		
<p>1. SS as defined in the Handbook of Ocean and Underwater Engineering, Myers, Holm, and McAllister, McGraw-Hill, New York, 1969. Sea state will be determined by measuring the maximum significant wave height and significant wave period range with an oceanographic wave buoy. Based on reference, sea state assignments are:</p>		
Sea State Maximum	Significant Wave Height (ft)	Significant Wave Period Range (sec)
0	$0 < x \leq 0.8$	$\leq 1.2$
1	$0.8 < x \leq 1.0$	0.8 - 5.0
2	$1.0 < x \leq 2.9$	1.4 - 7.6
3	$2.9 < x \leq 4.6$	1.6 - 8.8
4	$4.6 < x \leq 6.9$	2.5 - 10.6
5	$6.9 < x \leq 12.0$	3.0 - 13.5

**C. Critical Technical Parameters.** Table 3 lists the IDS critical technical parameters (CTPs) that will be evaluated during developmental testing. These parameters have been derived from the operational parameters and critical system characteristics of the IDS ORD and technical performance measures developed from the systems engineering process. These parameters determine the fundamental characteristics of the primary subsystems that drive the operational characteristics and are used to validate the adequacy of the total system. Operational performance requirements and CTPs, to the extent practical, will initially be evaluated in virtual testing through simulation and modeling during the initial phase of development testing (DT). Subsequent DT phases will include land based tests, at-sea tests, and continued testing through modeling and simulation.

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TABLE-3 - CRITICAL TECHNICAL PARAMETER MATRIX

Critical Technical Parameter	Test Event	Technical Threshold	Location	Schedule	Decision Supported
% Lives Saved		$\geq 93\%$			
% Property Saved		$\geq 80\%$			
Fatalities		$\leq 40$			
Response Time - Distress		$\geq 90\%$			
Datum Time		$\geq 90\%$			
Limits of All Know Ice (LAKI) Error		$\leq 5\%$			
LAKI Accuracy		$\geq 95\%$			
General Law Enforcement (GLE) Response		100%			
		100%			
		100%			
GLE Intercepts		$\geq 80\%$			
Alien Migrant Interdiction Operations (AMIO) Probability of Detection (POD)		$\geq 40\%$			
Maritime Migrant Success		$\leq 13\%$			

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AMIO Target of Interest (TOI) Intercepts		100%			
AMIO Event Interdiction		≥40%			
AMIO Search and Rescue (SAR)		≥90%			
Drug POD		≥40%			
Drug Intercepts		100%			
Drug Intelligence		≥60%			
Drug Interdictions		≥40%			
Cocaine Seized		≥50%			
Marijuana Seized		≥50%			
Living Marine Resources Enforcement (LMR) Foreign Encroachment - POD		100%			
LMR Foreign Encroachment - Intercept		100%			
LMR POD		≥80% High Threat Area ≥20% Low Threat Area			
LMR Intercepts		100%			
LMR Violation Rate		≥90% High Threat Area ≥90% Low Threat Area			

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LMR Boarding Rate		$\geq 20\%$ High Threat Area $\geq 10\%$ Low Threat Area			
Deployed port Operations, Security, and Defense (DPOSD) Response		100%			
DPOSD Fill Rate		$\geq 80\%$			
GDO Response		100%			
GDO Fill Rate		$\geq 80\%$			
Peacetime Military Engagement (PME) Response		$\geq 75\%$			
PME Fill Rate		$\geq 75\%$			
Maritime Intercept Operations (MIO) Response		100%			
MIO Fill Rate		$\geq 80\%$			
EDO Response		100%			
EDO Fill Rate		$\geq 80\%$			
Foreign Vessel Inspection (FVI) Boardings		$\geq 10\%$			
FVI Delay Time		$\leq 3$ hours			
Lightering Zone Enforcement (LZE) Inspections		$\geq 10\%$			
LZE Surveillance		$\geq 10\%$			

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LZE Spill Detection		100%			
Maritime Pollution (MARPOL) Event Detections		≥90%			
MARPOL Event Response		≥90%			
MARPOL Response Time		≤6 hours			
Non-Deepwater Aviation Demands (NDAD) Response - Hours		100% - Rotary Wing 100% - Fixed Wing			
NDAD Response - Sorties		100% - Rotary Wing 100% - Fixed Wing			
Area of Responsibility (AOR) Awareness		≥90% Detection 90% Classification ≥90% Identification			
AOR Coverage - Areas		≥90% High Threat Area ≥30% Low Threat Area			
AOR Coverage - Times		≥40% High Threat Area ≥10% Low Threat Area			
Communications Failures		≤5%			
Alternative Communications		≥2			
Communications		100% USCG Assets			

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Interoperability		$\geq 90\%$ External Assets			
Asset Awareness Plots		$\geq 90\%$ Friendly Assets $\geq 90\%$ TOI			

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**Chapter 2. PROGRAM SUMMARY****A. Integrated Test Program Schedule**

1. The IDS program's acquisition approach is to develop and field a Deepwater system that meets the IDS ORD. The IDS is based upon evolutionary systems that will be progressively integrated into legacy assets to ultimately achieve all operational requirements. Figure II-1 provides an overview of the test programs, test article availability, and the acquisition program milestones supported by the test program.

2. The IDS will undergo TECHEVAL and OPEVAL and will be required to meet all operational effectiveness and suitability requirements.

**B. Management.** The IDS T&E program will be a combined effort between the government and the systems integrator. The government will have and maintain overall control, management and oversight of the program. The government will review and approve all test plans and test results as well as execute, participate and witness test events. The systems integrator will take an active role in the T&E program by developing test plans and strategies in support of requirements reviews, program processes and test events as well as in executing, participating and witnessing test events as approved in the TEMP/test plans. The emphasis on responsibility for each phase of T&E will change. The systems integrator will be responsible for executing DT&E in accordance with the TEMP and approved test plans. The government and/or its designee may witness test events as it determines necessary and will approve all results. OT&E will be a combined effort of the government and the systems integrator. Although maximum utilization of the systems integrator is expected, overall responsibility and management will rest with the government. Operational forces will be required to provide support to G-ADW and the systems integrator to accomplish T&E.

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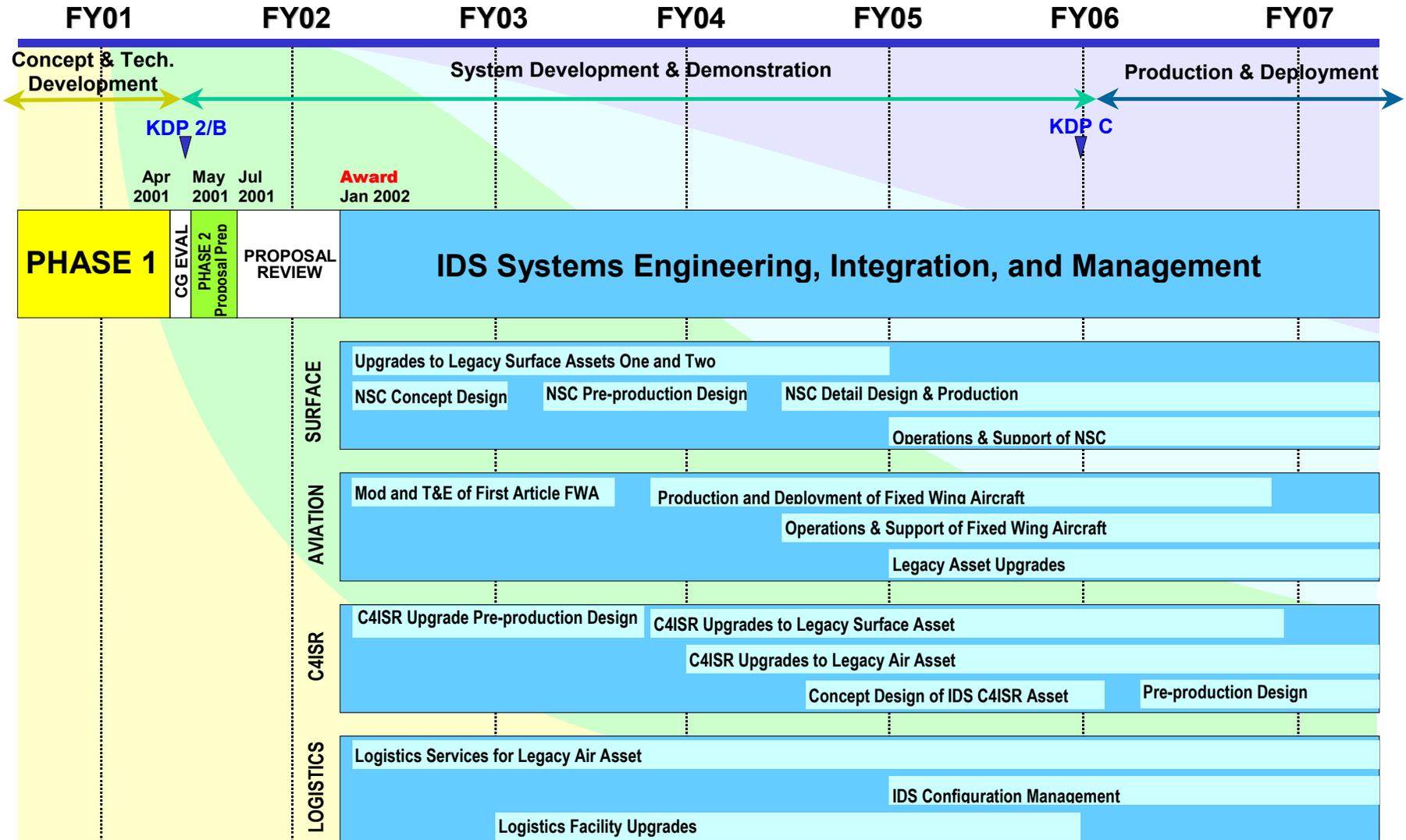


Figure II-1. Integrated Test Program Schedule

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## Chapter 3. DEVELOPMENTAL TEST AND EVALUATION (DT&E) OUTLINE

### A. DT&E Overview

1. IDS DT&E will be an iterative process of design, build, test, identify deficiencies, fix, retest and repeat as necessary. DT&E will be conducted for the IDS and its super-assets, assets, systems, sub-systems, equipment and components as indicated. DT&E goals include demonstrating the feasibility of technical approaches, minimizing risk, identifying design alternatives and conducting trade-offs. Emphasis will be placed on contractor testing to ensure that product performance meets specification and that all elements of product design, development and manufacturing processes are fully mature. Both USCG and contractor personnel will participate in DT&E. For the contractor, DT&E activities will aid in reducing product risk, validating product design and ensuring products are ready for USCG acceptance. For the USCG, DT&E activities will confirm that products perform as technically specified.

2. DT&E of IDS will be accomplished in three phases. In the first phase, the design of the IDS products will be evaluated through an Early Operational Assessment in which Modeling and Simulation, testing and analysis will be conducted to verify the design approach relative to specified requirements. Additional DT&E will occur during the detailed design and manufacturing efforts (second phase of DT&E). At the asset level, testing will focus on product achievement of specification parameters. At the IDS level, testing will focus on asset cohesion and mission performance. Such testing may include IDS Functionality, Ship/Aircraft Construction Test and Trials, C4ISR Integration, Logistics Testing and Post-delivery Test/Trials. During product design, the primary emphasis of DT&E will be to incorporate lessons learned from other programs, evaluation of functional layouts/designs, and model/mockup testing. Test results will demonstrate that the engineering design is robust, that the integration and development process is complete, that products perform as technically specified, that manufacturing processes are verified and that products are ready for operational testing. The final phase of DT&E will be the Technical Evaluation (TECHEVAL) in which various mission scenarios will be used to assess product readiness for an Operational Evaluation (OPEVAL). Test Planning for asset DT&E will be incorporated as ANNEXES to the TEMP.

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3. ANNEXES A through E provide templates for the development of Asset TEMPS (Surface, Air, C4ISR, Logistics and Other). Depth of individual product DT&E will vary by source of product (i.e. Commercial and non-developmental Items (CANDI), developmental, upgrade, etc.). The USCG will review and approve all DT&E test plans prior to testing, witness or participate in testing and approve all test results.

**B. DT&E to Date. None.**

**C. Future DT&E**

1. DT-I (TBD)

a. Configuration Description. DT-I configuration will include preliminary design drawings, program documentation, trade-off studies, and modeling/simulation.

b. DT-I Objectives. DT-I concentrates on the assessment of alternative products, prototypes, or pre-production articles to gather data for calculating product performance effectiveness, suitability and supportability. Computer models and simulations are employed to select the preferred technical approach that will best satisfy performance-based requirements. Program risks are identified and corrective actions/plans are developed to eliminate or reduce the risk to acceptable limits. Tests are developed defining the detailed DT-I test requirements, resources needed, schedules, and related costs. The objective of DT-I is to gain early insight into the development of the functional baseline and by using test results to provide an early performance assessment of asset designs.

c. DT-I Events, Scope of Testing and Basic Scenarios. Accomplished by the systems integrator and evaluated by the government, all testing verifies design approaches.

d. Limitations. All testing during DT-I will be conducted in controlled environments and with design and program documentation.

2. DT-IIA: Detail Design (TBD)

a. Configuration Description. The lead ship, aircraft, etc. will be the production assets. The Detail Design phase consists primarily of the engineering effort required to complete the design of the IDS assets prior to the beginning of

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construction. The systems integrator creates models and/or mock-ups, as needed, to assist in the Detail Design effort. Developmental tests and analysis will be performed at various levels of product assembly and include evaluation and compatibility checks. Particular emphasis will be applied to establish tests that identify potential design and construction problems. DT-IIA is divided into Modeling and Mockups Testing, GFE Testing, and Design Integration Testing.

**b. DT-IIA Objectives.** Testing during DT-IIA supports Detailed Design and determines if the IDS design meets the contract requirements in preparation for Lead Asset Construction. Inspection and analysis of the design as well as testing are used to ensure Critical Technical Parameters (listed in Table I-2) are achievable.

**c. DT-IIA Events, Scope of Testing and Basic Scenarios**

**1. Model and Mockups Testing.** Accomplished by the systems integrator and evaluated by the government, model and mockup testing verifies design approaches. Product models and mockups will contain physical and descriptive information such as material, size, vendor data, weight, location, quantities, orientation, etc. and will support service life activities such as maintenance, modernization, repair and overhaul.

**2. Government Furnished Equipment (GFE) Testing.** Testing will be accomplished to integrate any GFE with the asset. The Coast Guard and/or the systems integrator may perform this testing.

**3. Design Integration Testing.** The systems integrator will evaluate the physical, functional, and operational integration of hardware-to-hardware interfaces, computer program-to-hardware interfaces, and computer-to-computer program interfaces for Contractor Furnished Equipment (CFE) systems. The systems integrator will demonstrate the compatibility of CFE and GFE systems. System operability, program load and reconfigurability, functional stress, communication protocol, data integrity, stress and endurance, external interface validation, and total asset operability testing will be accomplished. The systems integrator will interface and coordinate with test managers of various systems to develop an overall test plan and schedule.

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**d. Limitations.** During DT-IIA, model testing as well as integration and GFE testing will be conducted in controlled environments. Testing and operations may not be conducted in all environments or under all operational conditions. Testing may be conducted on equivalent components and not necessarily on actual asset installation components. These limitations do not impact the validity or usefulness of the tests.

**3. DT-IIB: Construction Test and Trials. (TBD)**

**a. Configuration Description.** This phase of the test program will focus on testing on the lead ship, aircraft, etc.

**b. DT-IIB Objectives.** Testing during DT-IIB will verify that the assets and system, as constructed, meets contract requirements and that industrial work has been conducted satisfactorily. The system's material readiness will be verified for USCG operations.

**c. DT-II Events, Scope of Testing and Basic Scenarios.** A combination of various events will be used to assess the individual assets as well as the system's readiness and to ensure that the system meets all requirements.

**d. Limitations.** During DT-II, testing and operations may not be conducted in all environments or under all operational conditions. These limitations do not impact the validity or usefulness of the tests.

**4. DT-IIC: TECHEVAL. (TBD)**

**a. Configuration Description.** Testing will be conducted on the lead assets, singularly and in combination with other assets.

**b. DT-IIC Objectives.** The principal objectives during DT-IIC are to evaluate the system's performance and capability to meet mission requirements, demonstrate performance of specific assets, and to assess the system's readiness for operational evaluation.

**c. DT-IIC Events, Scope of Testing and Basic Scenarios.** A combination of various events will be used to

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assess the individual assets as well as the system's readiness and to evaluate that the system meets all mission requirements.

**d. Limitations.** During DT-II, testing and operations may not be conducted in all environments or under all operational conditions. These limitations do not impact the validity or usefulness of the tests.

**5. DT-III: Follow-on Developmental Test and Evaluation**  
**(TBD)**

**a. Configuration Description.** Follow-on systems.

**b. DT-III Objectives.** Testing during DT-III will verify the operational effectiveness and operational suitability of the IDS, verify correction of deficiencies identified in previous DT/OT and to complete deferred or incomplete DT&E.

**c. DT-III Events, Scope of Testing and Basic Scenarios.** (TBD)

**d. Limitations.** (TBD)

**D. Special DT&E Topics.** None.

**E. DT&E Plans and Reports.** DT&E plans will be written by the Contractor for all phases of DT and will be submitted for final approval by the Government at least 30 days prior to testing. Report of testing will be completed and distributed no later than 90 days following testing.

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## Chapter 4. OPERATIONAL TEST AND EVALUATION (OT&E) OUTLINE

### A. OT&E Overview

1. IDS OT&E will be conducted at the IDS and its super-asset, asset, system, sub-system, equipment and component levels. As the IDS matures, OT&E events will increasingly focus on super-asset and system performance. OT&E goals include assessing operational effectiveness and suitability, identifying deficiencies requiring modification, evaluating system utility, verifying critical technical parameters, determining deployment feasibility and developing tactics. OT&E is conducted by the USCG and supported by the contractor using production representative products and typical operational personnel in a typical operational environment. Modeling and Simulation will be an integral part of OT&E using data derived from developmental testing. OT&E of the IDS consists of three phases: OT-I, Early Operational Assessment (EOA); OT-II, to determine effectiveness and suitability and to support a decision for full rate production/USCG introduction; and OT-III, Follow-on Operational Test and Evaluation (FOT&E). FOT&E is conducted to verify correction of deficiencies and to complete deferred or incomplete OT&E. Where appropriate and applicable, some DT&E testing may be combined with OT&E testing. During the test planning process, distinct test plans will be written to support OT&E events in formats consistent with applicable ANNEXES. The USCG will review and approve all OT&E test plans prior to testing and approve all test results.

2. EOA (OT-I) will be conducted by USCG subject matter experts (SMEs) and/or contracted laboratory personnel. The EOA will focus on review of preliminary product design and planning documents, and will assess levels of risk associated with the critical operational issues.

3. OT-II will be conducted in three phases; OT-IIA will focus on review of the detailed design, OT-IIB will be conducted at various locations including land based test sites and will include a review of product and system integration testing, and OT-IIC (OPEVAL) will test assets and super-assets as they become available under various environmental conditions, in various mission scenarios to provide realistic tests to support resolution of critical operational issues. USCG and/or Contractor personnel will operate system, super-asset and/or assets during test events.

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4. Every opportunity to gather data to support resolution of COIs during OT-II will be exploited. This includes participation in program engineering/software readiness reviews, DT-test readiness reviews and software development reviews. Additionally, the use of combined or concurrent DT/OT during OT-II will be encouraged.

5. FOT&E (OT-III) events are scheduled to resolve problems and issues that surface during earlier OT&E events. In summary, OT&E provides an evaluation of the utility of IDS products, the feasibility of deploying them and ultimately, product contribution to IDS mission success.

**B. Critical Operational Issues.** The following are critical operational issues for resolution during Operational Test and Evaluation (OT&E) to evaluate/assess the system's capability to safely perform its mission:

**1. Effectiveness Issues**

a. Maritime Law Enforcement. Is the IDS capable of performing drug interdiction, AMIO, LMR, and general law enforcement operations in its intended operating environment?

b. Maritime Safety. Is the IDS capable of performing SAR and International Ice Patrol operations in its intended operating environment?

c. National Defense. Is the IDS capable of performing general defense, MIO, DPOSD, environmental defense and PME operations in its intended operating environment?

d. Marine Environmental Protection. Is the IDS capable of performing MARPOL, lightering zone enforcement and foreign vessel inspection operations in its intended operating environment?

e. Non-Deepwater Aviation Demands (NDAD). Is the IDS capable of performing NDAD in its intended operating environment?

f. Operational Picture (OP). Is the IDS capable of maintaining and providing a shared Situational Awareness (SA) of the AOR?

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**g. Survivability.** Will the susceptibility and vulnerability characteristics of IDS enhance the successful accomplishment of its mission?

## **2. Suitability Issues**

**a. Reliability.** Will the reliability of IDS support completion of its missions?

**b. Maintainability.** Will the IDS be maintainable by assigned personnel?

**c. Availability.** Will the availability of IDS support completion of its missions?

**d. Logistic Supportability.** Will IDS be logistically supportable?

**e. Compatibility.** Will IDS be compatible with its operating environment?

**f. Interoperability.** Will IDS be interoperable with the systems with which it must interface?

**g. Training.** Will IDS training support system operation and maintenance by assigned personnel?

**h. Human Factors.** Will the human factors aspects of IDS support completion of its missions?

**i. Safety.** Will IDS be safe to operate and maintain?

**j. Documentation.** Will the technical documentation support operation and maintenance of the IDS?

**C. IOA Overview.** An independent assessment during the various phases of development for IDS is anticipated. A Memorandum of Understanding with Commander, Operational Test and Evaluation Force or an independent contractor will be initiated to assess the operational effectiveness and operational suitability of the IDS, the individual assets, and/or super-assets.

**D. IOA Plans and Reports.** The independent agent conducting the assessment of IDS will participate in the

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development of test plans and will provide a Letter of Observation to G-AWD within 90 days after observing testing.

**E. OT&E to Date.** None.

**F. Future OT&E**

**1. OT-I EOA (Dates TBD)**

**a. Configuration Description.** Preliminary design drawings, program documentation and trade-off studies.

**b. OT&E Objectives.** The purpose of OT-I is to identify areas of risk in the IDS program and to assess the potential operational effectiveness and operational suitability of the IDS. No COIs will be resolved.

**c. OT&E Events/Scope of Testing/Scenarios.** The EOA will be conducted in a series of events based upon release of design drawings and documentation from the Contractor. As design drawings are released, the IDS program office will provide drawings to the appropriate organizations for review by staff and SME's. Upon completion of each block review, a letter of observation will be generated. Upon completion of OT-I, a final report addressing the potential operational effectiveness and suitability of the IDS and/or assets will be issued.

**d. Limitations.** OT-I will be conducted using design and program documentation, no COIs will be resolved, and only an assessment of potential operational effectiveness and operational suitability will be concluded.

**2. OT-IIA OA (Dates TBD)**

**a. Configuration Description.** Program documentation developed as a result of the detailed design process and system mockups.

**b. OT&E Objectives.** The purpose of OT-IIA is to assess the operational effectiveness and operational suitability of the IDS. The primary focus of the operational assessment will be to review the individual assets/super-assets and to evaluate areas of risk. OT-IIA critical operational issues are:

## DRAFT

Operational Effectiveness

Maritime Law Enforcement  
 Maritime Safety  
 National Defense  
 Marine Environmental Projection  
 Non-Deepwater Aviation Demands  
 Operational Picture  
 Survivability

Operational Suitability

Reliability  
 Maintainability  
 Availability  
 Logistic Supportability  
 Compatibility  
 Interoperability  
 Training  
 Human Factors  
 Safety  
 Documentation

**c.** OT&E Events/Scope of Testing/Scenarios. OT-IIA will be conducted in a series of events based upon release of detail design drawings and documentation from the Contractor. As detailed design drawings are released, the IDS program office will provide drawings to the appropriate organizations for review by staff and SME's. Upon completion of each block review, a letter of observation will be generated. Upon completion of OT-IIA, a final report addressing the potential operational effectiveness and suitability of the IDS and/or assets will be issued.

**d.** Limitations. OT-IIA will be conducted using detailed design and program documentation, no COIs will be resolved, and only an assessment of potential operational effectiveness and operational suitability will be concluded.

**3.** OT-IIB OA (Dates TBD)

**a.** Configuration Description. Land based test sights developed to support design integration testing and first article assets.

**b.** OT&E Objectives. The purpose of OT-IIB is to assess the operational effectiveness and operational suitability of the IDS. The primary focus of the operational assessment will be to evaluate the integration of assets and system components and to re-evaluate areas of risk identified during previous assessments. OT-IIB critical operational issues are:

# DRAFT

Operational Effectiveness

Maritime Law Enforcement  
 Maritime Safety  
 National Defense  
 Marine Environmental Projection  
 Non-Deepwater Aviation Demands  
 Operational Picture  
 Survivability

Operational Suitability

Reliability  
 Maintainability  
 Availability  
 Logistic Supportability  
 Compatibility  
 Interoperability  
 Training  
 Human Factors  
 Safety  
 Documentation

**c.** OT&E Events/Scope of Testing/Scenarios. OT-IIB will be conducted in a series of phases. Each phase will be followed by a letter of observation to the program office, information copy to all concerned.

**d.** Limitations. OT-IIB will be conducted at land based test sites, no COIs will be resolved, and only an assessment of potential operational effectiveness and operational suitability will be concluded.

**4.** OT-IIC OPEVAL (Dates TBD)

**a.** Configuration Description. Testing will be conducted on the lead assets, singularly and in combination with other assets.

**b.** OT&E Objectives. The purpose of OT-IIC is to determine the operational effectiveness and operational suitability of the IDS. OT-IIC critical operational issues are:

Operational Effectiveness

Maritime Law Enforcement  
 Maritime Safety  
 National Defense  
 Marine Environmental Projection  
 Non-Deepwater Aviation Demands  
 Operational Picture  
 Survivability

Operational Suitability

Reliability  
 Maintainability  
 Availability  
 Logistic Supportability  
 Compatibility  
 Interoperability  
 Training  
 Human Factors  
 Safety  
 Documentation

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## c. OT&E Events/Scope of Testing/Scenarios

(1) Events. OT-IIC will consist of dedicated testing of the IDS assets, either singularly or in combination, to demonstrate the IDS's ability to execute the Deepwater missions. During OT-IIC, IDS assets and super-assets will execute operations in accordance with the OPEVAL test plan to fully flex the system.

(2) Scope of Testing. OPEVAL will be conducted over an extended period of time in conjunction with Fleet operations, as assets and super-assets become available.

(3) Scenarios. The scenarios will emphasize operational realism and will be conducted under available environmental conditions. Detailed scenarios will be set forth in the OT-IIC test plan to ensure the capabilities of the IDS asset's crews, subsystems, C4ISR suites and auxiliary systems are fully flexed. Planned scenarios include:

(a) Conducting day and night, sequential and simultaneous, operations under a variety of meteorological and environmental conditions.

(b) Detecting, tracking and engaging surface and air targets in various environmental and electronic warfare conditions.

(c) Observing the capability of the C4ISR suite to support effective data exchange and preclude mutual interference in the electromagnetic environment. The adequacy of the communication suite to support USCG and inter-agency communications and intelligence requirements will be evaluated.

(d) Operation of the propulsion plants and auxiliary machinery and subsystems during inport, normal at-sea steaming and Condition I steaming.

(e) Conducting damage control exercises including mass-conflagration and Chemical, Biological and Radiation (CBR) drills.

(f) Conducting casualty control drills.

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(g) Conducting observations and collection of data involving all systems and equipment to support the evaluation of reliability, maintainability and availability.

d. Limitations

(1) IDS will be tested with single assets and super-assets as they become available. This limitation may result in only partial resolution of the COIs but will not preclude the formulation of conclusions concerning operational effectiveness and operational suitability.

(2) The following limitations affect testing, but will not impact the resolution of COIs and will not preclude the formulation of conclusions concerning operational effectiveness and operational suitability.

(a) Operations will not be conducted in a combat environment.

(b) Operations may not be conducted in the full range of environmental conditions in which the IDS is designed to operate.

(c) Threat targets and resources will be simulated by available test assets and may not be fully threat representative.

5. OT-III (FOT&E) (TBD)

**G. OT&E Plans and Reports.** OT&E plans will be developed for each phase of OT and will be submitted to the program office for review at least 30 days prior to testing. Letters of observation or test reports will be completed within 90 days of testing.

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**Chapter 5. TEST AND EVALUATION RESOURCE SUMMARY**

**A. General.** The information contained in this section and in Table 4 is notional and reflects current practices, resources, and the baseline for test and evaluation. As the IDS design is finalized, the details of test plans and required resources for T&E will be identified and changes will be made to update Table 4. Updates will be promulgated to the T&E community through change pages to this TEMP.

**B. Test Articles and Schedule.** The test articles in the IDS program will be identified as the design is finalized. Modeling will be done throughout the design phase. For an overall schedule of activities, see the Integrated Test Program Schedule, Figure II-1.

**C. Test Sites.** Test sites/ranges will be used for IDS. See Table 4 for a list of the test site locations anticipated for the IDS testing.

**D. Test Instrumentation/Equipment.** See Table 4 for a summary of the test instrumentation and equipment.

**E. Threat Systems/Simulators.** See Table 4 for a list of threat systems/simulators required.

**F. Test Targets and Expendables.** See Table 4 for a summary of test targets and expendables required for testing.

**G. Operational Force Test Support.** See Table 4 for a summary of Operational Force test support required. Major DT&E and OT&E events requiring major assets will be planned to run in series with ongoing exercises to reduce program costs.

**H. Simulations, Models and Testbeds.** See Table 4 for a summary of simulations, models and test beds required.

**I. Special Requirements.** Currently there are no special requirements (such as data processing/data bases, unique mapping/charting/geodesy products, extreme physical environmental conditions or restricted/special use air/sea/landscape) for IDS testing.

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**J. Financial Summary.** A summary of the funding requirements to support the IDS test program is contained in Table 4.

**K. Manpower and Training.** Comprehensive crew orientation and familiarization will be provided prior to testing using both classroom and onboard equipment/system familiarization seminars. Prior to delivery, the systems integrator will be primarily responsible for the conduct of tests and testing. After delivery, the crews must be certified for all operations.

**L. Summary.** A summary of the T&E resources is provided in the following table:

**TABLE 4 - TEST AND EVALUATION RESOURCE SUMMARY**

TEST RESOURCES					OPEVAL
<b>TEST ARTICLES</b>					
<b>TEST SITES AND INSTRUMENTATION (Note 1)</b>					
Instrumentation					
<b>TEST SUPPORT EQUIPMENT (Note 2)</b>					
DGPS	N/A	All Sites	All Sites	TBD	TBD
Data Recorder (Note 3)	N/A	Automated DC	Automated DC	Automated DC	Automated DC
Environmental Prediction Device	N/A	All Sites	All Sites	All Sites	All Sites
Oceanographic Equipment	Wind Speed, Wave Buoy	CTD, Current, Wind Speed, Transmissometer, Wave Buoy			
<b>THREAT SYSTEMS/SIMULATORS</b>					
<b>TEST TARGETS AND EXPENDABLES</b>					
<b>OPERATIONAL FORCE TEST SUPPORT</b>					
<b>SPECIAL REQUIREMENTS</b>					

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TEST RESOURCES					OPEVAL
T&E FUNDING REQUIREMENTS					
\$ (K)	\$xxx K				
MANPOWER/PERSONNEL TRAINING					
Fleet Personnel (Note 5)					
NOTES:					
<ol style="list-style-type: none"> <li>1. Test Sites and Instrumentation: Instrumentation needed to support testing will be defined by xxx and contractor as development of the system progresses.</li> <li>2. Test Support Equipment: Contractor will provide shipboard and shore-based test support equipment. Contractor will also furnish preliminary operator's and maintenance publications, maintenance drawings, and spares. Contractor assistance is to be available as needed.</li> <li>3.</li> <li>4. Time represents installation, testing, and restoration.</li> <li>5. The duration represented here does not include time for training.</li> </ol>					

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## ACRONYMS

AMIO	alien migrant interdiction operations
AOR	area of responsibility
ATEMP	asset temp
C4ISR	command, control, communications, computer, intelligence, surveillance, and reconnaissance
CANDI	commercial and non-developmental items
DPOSD	deployed port operations, security and defense
DT&E	developmental test and evaluation
EOA	early operational assessment
FVI	foreign vessel inspection
GLE	general law enforcement
IDS	Integrated Deepwater System
LAKI	limits of all known ice
LMR	living marine resources enforcement
LZE	lightering zone enforcement
MARPOL	maritime pollution
MIO	maritime intercept operations
NDAD	non-deepwater aviation demands
NM	nautical miles
ORD	operational requirements document
OT&E	operational test and evaluation
PME	peacetime military engagement
POD	probability of detection
PSU	port security unit
SAR	search and rescue
SME	subject matter expert
SS	sea state
T&E	test and evaluation
TOI	targets of interest
TEMP	Test and Evaluation Master Plan
USCG	United States Coast Guard

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**BIBLIOGRAPHY**

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U.S. Coast Guard (G-OMB). Systems Acquisition Manual (COMDTINST M4150.2E) of 11 Dec 97.

U.S. Coast Guard (G-ADW). United States Coast Guard Deepwater Capability Replacement Analysis Modeling and Simulation Master Plan (MSMP) of 21 Sep 98.

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## POINTS OF CONTACT

Rank/Name	Title/Code	Address	Phone

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## **ANNEX A** **Surface Asset**

Note: Surface Asset TEMP (ATEMP) will follow the format of the IDS TEMP and will include introductory (background, operational performance requirements, and critical technical parameters) program summary(integrated schedule and management), DT&E (overview, testing to date, future testing, special topics, plans and reports), OT&E (overview, testing to date, future testing, special topics, plans and reports), T&E resource summary and applicable enclosures. Critical Technical Parameters will include but not be limited to those listed in the IDS TEMP plus physical, performance, personnel, C4ISR subsystem, logistic subsystem, mission support and other parameters. For each parameter, objective/ threshold values, verification methods and planned testing events will be specified.

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## **ANNEX B** **Air Asset**

Note: Air ATEMP will follow the format of the IDS TEMP and will include introductory (background, operational performance requirements, and critical technical parameters) program summary (integrated schedule and management), DT&E (overview, testing to date, future testing, special topics, plans and reports), OT&E (overview, testing to date, future testing, special topics, plans and reports), T&E resource summary and applicable enclosures. Critical Technical Parameters will include but not be limited to those listed in the IDS TEMP plus physical, performance, personnel, C4ISR subsystem, logistic subsystem, mission support and other parameters. For each parameter, objective/ threshold values, verification methods and planned testing events will be specified.

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## **ANNEX C** **C4ISR Asset**

Note: C4ISR ATEMP will follow the format of the IDS TEMP and will include introductory (background, operational performance requirements, and critical technical parameters) program summary (integrated schedule and management), DT&E (overview, testing to date, future testing, special topics, plans and reports), OT&E (overview, testing to date, future testing, special topics, plans and reports), T&E resource summary and applicable enclosures. Critical Technical Parameters will include but not be limited to those listed in the IDS TEMP plus physical, performance, personnel, interfaces, logistic subsystem, mission support and other parameters. For each parameter, objective/threshold values, verification methods and planned testing events will be specified.

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## **ANNEX D** **Logistics Asset**

Note: Logistics ATEMP will follow the format of the IDS TEMP and will include introductory (background, operational performance requirements, and critical technical parameters) program summary (integrated schedule and management), DT&E (overview, testing to date, future testing, special topics, plans and reports), OT&E (overview, testing to date, future testing, special topics, plans and reports), T&E resource summary and applicable enclosures. Critical Technical Parameters will include but not be limited to those listed in the IDS TEMP and other parameters. For each parameter, objective/ threshold values, verification methods and planned testing events will be specified.

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## **ANNEX E** **Other Asset**

Note: Other ATEMP will follow the format of the IDS TEMP and will include introductory (background, operational performance requirements, and critical technical parameters) program summary (integrated schedule and management), DT&E (overview, testing to date, future testing, special topics, plans and reports), OT&E (overview, testing to date, future testing, special topics, plans and reports), T&E resource summary and applicable enclosures. Critical Technical Parameters will include but not be limited to those listed in the IDS TEMP and other parameters. For each parameter, objective/ threshold values, verification methods and planned testing events will be specified.