

2009 Naval Human Systems Integration Management Plan

(Annex to the OSD HSI Management Plan)



Version 2.2

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CONTENTS

| | |
|---|----|
| 1.0 INTRODUCTION | 9 |
| 1.1 Purpose | 10 |
| 1.2 Scope | 10 |
| 1-3 Document Revision History | 10 |
| 1-4 References | 10 |
| 2.0 NAVAL HSI ORGANIZATION AND RESPONSIBILITIES | 11 |
| 3.0 NAVAL HUMAN SYSTEMS INTEGRATION REQUIREMENTS | 16 |
| 3.1 Naval HSI Life Cycle Process (Execution) | 18 |
| 4.0 NAVAL HSI ACQUISITION PROCESS INTEGRATION (EXECUTION) | 18 |
| 4.1 Naval HSI Acquisition Process Partnerships | 19 |
| 4.2 Naval HSI Acquisition Process | 19 |
| 4.2.1 Development of DoDAF Human Views (HVs) | 19 |
| 4.2.2 Coordination of organizations in JCIDS and early acquisition process | 20 |
| 4.2.3 Independent Technical Authority to monitor and evaluate all program reviews | 20 |
| 4.2.4 Integration into prototyping activities | 20 |
| 4.2.5 Integration into Developmental Test / Operational Test activities | 20 |
| 5.0 NAVAL HSI WORKFORCE DEVELOPMENT | 20 |
| 6.0 NAVAL HSI FY09 KEY TASKS | 21 |
| 6.1 Organizational Coordination | 21 |
| 6.2 Workforce Sustainment and Improvement | 22 |
| 6.3 Program Assessments | 24 |
| 6.4 Process, Methods, and Measures | 25 |
| 6.5 Infrastructure and Tools | 25 |
| 6.6 Policy | 26 |
| 7.0 NAVAL HSI RESOURCE REQUIREMENTS | 27 |
| 8.0 NAVAL HSI MATURITY METRICS | 27 |
| 8.1 Program-Level Implementation | 27 |
| 8.2 Organizational Coordination | 28 |
| 8.3 Workforce Sustainment | 28 |
| 8.4 Program Assessments | 28 |
| 8.5 Processes, Methods, and Measures | 28 |
| 8.6 Infrastructure and Tools | 29 |
| 8.7 Policy | 29 |
| 9.0 HSI RESEARCH AND DEVELOPMENT (HSI R&D) | 30 |
| 9.1 Future Naval Capability | 30 |
| 9.2 Enabling Capabilities | 31 |

A. ACRONYMS33

B. NAVAL HSI ACTIVITIES WITHIN THE DODI 5000.02 ACQUISITION LIFE
CYCLE.39

Figures

| | |
|---|----|
| Figure 2-1 Naval HSI Organizational Chart..... | 12 |
| Figure 3-1 Integrated Defense Acquisition Process, SECNAV Gated Review Process, and the NTSP process for programs initiated at Milestone A | 17 |
| Figure 3-2 Integrated Defense Acquisition Process, SECNAV Gated Review Process, and the NTSP process for programs initiated at Milestone B | 17 |
| Figure 3-3 DoD 5000.02 Defense Acquisition Management System | 18 |
| Figure 3-4 Levels of complex systems Life Cycle Framework..... | |
| Figure 9-1 Future Naval Capabilities. | 30 |

Tables

| | |
|--|----|
| Table 2-1 Naval HSI Organizations | 13 |
| Table 2-2 Activities in HSI Domains | 15 |
| Table 6-1 FY09 Organizational Coordination Tasks | 21 |
| Table 6-2 FY09 Workforce Sustainment and Improvement Tasks | 22 |
| Table 6-3 FY09 Program Assessment Tasks..... | 24 |
| Table 6-4 FY09 Process, Methods, and Measures Tasks | 25 |
| Table 6-5 FY09 Infrastructure and Tools Tasks..... | 25 |
| Table 6-6 FY09 Policy Tasks | 26 |

1.0 INTRODUCTION

The oceans connect the nations of the world, even those countries that are landlocked. Because the maritime domain- the world's oceans, seas, bays, estuaries, islands, coastal areas, littorals, and the airspace above them- supports 90% of the world's trade, it carries the lifeblood of a global system that links every country on earth. As it has always been, these critical tasks will be carried out by our people – the key to success in any military strategy. Accordingly, we will provide our people – our Sailors, Marines, and Coast Guardsmen – with the training, education, and tools necessary to promote peace and prevail in conflict.¹

To accomplish this goal, the Navy must invest in a robust, shipbuilding, aviation, and a net-centric force. Over the past ten years, system life cycle costs have risen significantly. Consequently, the Department of Defense (DoD) revised the mandatory procedures for implementation of the Joint Capabilities Integrated Development System (JCIDS) and the Defense Acquisition System (DAS) for major and non-major acquisition and information technology programs. The revised policy established a two-pass/Six Gate review process to improve governance and oversight in the development, establishment, and execution of acquisition programs in DoD, including the Department of the Navy (DoN).

The revised policy provided that (a) authority for oversight, source selection, and contract negotiations/award shall not be vested in a single individual, (b) added the requirement for Naval JCIDS capabilities documents to be vetted through the Naval Capabilities Board and the Resource Requirements Review Board prior to approval, (c) added increased emphasis on system safety in engineering, and other statutory reporting requirements for ACAT 1A programs, and (d) added statutory requirement for Key Performance Parameters (KPPs) for force protection, training, and survivability.

While the revised policy increases oversight during program execution, total ownership costs are not being sufficiently analyzed during the requirements generation process. Life cycle costs should encompass direct and indirect costs associated with program requirements. Many times new technologies and materiel solutions are developed outside of a holistic capabilities based development process resulting in inefficiencies, increased risk and cost.

Secretary of the Navy Instruction 5000.2D (SECNAVINST 5000.2D) requires Resource Sponsors and Program Managers (PMs) to initiate an Human Systems Integration (HSI) effort as early in the acquisition process as possible and address HSI throughout all phases of the acquisition process to optimize total system performance, minimize total ownership costs, and ensure that the system is built to accommodate the characteristics of the user population that will operate,

¹ National Maritime Strategy, 2009.

maintain, and support the system

1.1 Purpose

The Human Systems Integration Management Plan (HSIMP) outlines the roles and responsibilities of Naval HSI organizations, processes, and required resources.

1.2 Scope

The HSIMP establishes a framework for implementation and management of HSI requirements within the DoN acquisition life cycle process. The HSIMP identifies the Naval organizations with responsibilities in HSI and its constituent domains. It also describes key FY09 tasks for HSI oversight and infrastructure, in addition to, mechanisms for coordination and synchronization across the designated HSI organizations noted in Section 2.0.

1-3 Document Revision History

| Version | Date | Description | Status |
|---------|-------------|--|--|
| 2.1 | 18 Feb 2009 | Human Systems Integration Management Plan 2009 | Adjudication Review Draft ASN RD&A CHENG, SYSCOMs, ONR, Safety, Marine Corps Adjudication |
| 2.2 | 27 Feb 2009 | | |

1-4 References

| Title | Doc. No. | Date |
|--|----------------------------|----------|
| The Defense Acquisition System | DoD Directive | May 03 |
| Operation of the Defense Acquisition System | DoDI 5000.02 | Dec 08 |
| Implementation and Operation of the Defense Acquisition System and the Joint Capabilities Integration and Development System | SECNAV Instruction 5000.2D | Oct 08 |
| Joint Capabilities Integration and Development System | CJCSI 3170.o1F | 1 May 07 |
| DON Policy for Safety, Mishap Prevention, Occupational Health and Fire Protection Program | SECNAVINST 5100.10J | Oct 05 |
| Independent Logistics Assessment and Certification Requirements | SECNAVINST 4105.1A | Mar 04 |
| Navy Total Force Manpower Policies and Procedures | OPNAVINST 1000.16K | Aug 07 |
| Navy System Safety Program Policy | OPNAVINST | Feb 07 |

| | | |
|---|---------------------------|-----------|
| | 5100.24B | |
| Shipboard Habitability Program | OPNAVINST 9640.1A | Sep 06 |
| Standard Practice for System Safety | MIL-STD-882D | Jan 93 |
| Naval Training System Requirements, Acquisition, and Management | OPNAVINST 1500.76A | Oct 06 |
| Surface Ship Survivability Training Requirements | OPNAVINST 3541.1E | Mar 05 |
| Environmental Compliance Afloat | OPNAVINST 5090.1C | Oct 07 |
| Logistic Support Analysis | MIL-STD-1388-1 | Oct 73 |
| Human Engineering | MIL-STD-1472E | Mar 98 |
| Department of the Navy (DON) Acquisition and Capabilities Guidebook | SECNAV M-5000.2 | Dec 08 |
| Memorandum of Agreement to Achieve a More Common Approach to Human Systems Integration | NAVSEA 5400 Ser 00/087 | Oct 03 |
| Shore Safety Manual, Chapter 23 Navy Ergonomics Program | OPNAVINST 5100.23G | 30 Dec 05 |
| Navy System Safety Program | OPNAVINST 5100.24B | 7 Feb 07 |
| Naval Systems Engineering Technical Review Handbook | DRAFT 1.0 | Dec 08 |
| Independent Logistics Assessment Handbook, Department of the Navy Guide for Conducting Independent Logistics Assessments | NAVSO P-3692 | Sep 06 |

2.0 NAVAL HSI ORGANIZATION AND RESPONSIBILITIES

The primary Naval organizations with responsibilities related to HSI are shown in Figure 2-1. Program requirements and resources are established and controlled within the Chief of Naval Operations (CNO) organization. Program execution, technical oversight, and infrastructure for HSI are provided from the Assistant Secretary of the Navy for Research, Development, and Acquisition (ASN RD&A) organization. Each organization establishes policies for HSI within their respective areas of responsibility.

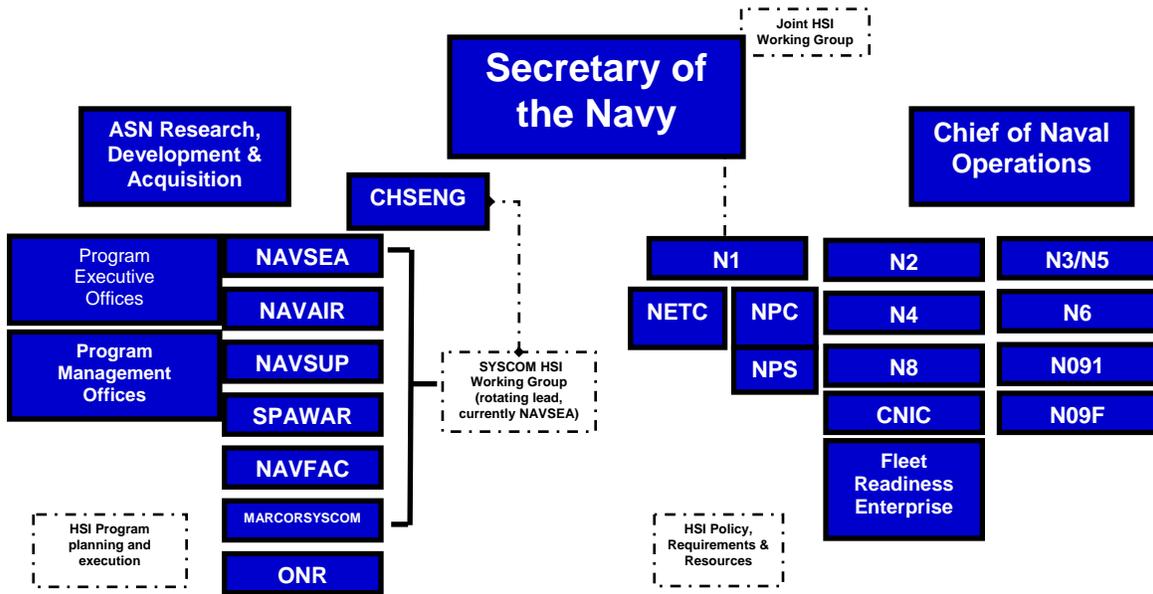


Figure 2-1 Naval HSI Organizational Chart

The Director, Total Force Requirements Division (CNO N15) is the resource sponsor for manpower, personnel, and individual training and education. Furthermore, CNO N15 is the Navy’s approval authority for capabilities documents containing training, education, and related HSI requirements. They have concurrence authority on JCIDS requirements documents and forward to the Resource Sponsor for planning, programming, and execution. CNO N15 serves as the single governance authority for HSI policy and requirements and participates in the identification of enterprise manpower, personnel, training, and education shortfalls.

The Naval System Commands (SYSCOMS) (e.g., Naval Sea Systems Command (NAVSEA), Naval Air Systems Command (NAVAIR), Naval Supply Systems Command (NAVSUP), Space and Naval Warfare Systems Command (SPAWAR), Naval Facilities, and Marine Corps Systems Command) are responsible for the standards, planning, execution, and technical authority of HSI activities. To facilitate HSI planning and execution, the HSI Working Group (HSIWG) was established. The HSIWG is a voluntary, collaborative entity used to identify and define inter- and intra- SYSCOM roles and responsibilities necessary to implement HSI (see Table 2-1).

Table 2-1 Naval HSI Organizations

| Organization | Major HSI Responsibilities and Activities |
|--|---|
| Assistant Secretary of the Navy for Research, Development, and Acquisition (ASN RDA) | <ul style="list-style-type: none"> ▪ Acquisition Executive responsible for DON acquisition and reporting senior for PEOs and Direct Reporting Program Managers (DRPMs) |
| OPNAV N15 | <ul style="list-style-type: none"> ▪ Validate Joint Capabilities Integration and Development System (JCIDS) HSI Requirements for Naval & Joint Acquisition Programs ▪ Governance authority for policy, requirements, and resources; identify shortfalls, investigate innovative approaches in Research, Development, Testing and Evaluation (RDT&E) and Science & Technology to optimize performance ▪ Support the Program Executive Offices, Systems Commands, and Direct Reporting Program Managers by assisting in exploring options that maximize use of technology to reduce manpower, personnel, and training requirements and life-cycle cost |
| Naval Personnel Command | <ul style="list-style-type: none"> ▪ Execute Personnel responsibilities |
| Naval Education & Training Command (NETC) / Training And Education Command (TECOM) | <ul style="list-style-type: none"> ▪ Execute Training Agent responsibilities ▪ Develop, coordinate, resource, execute, and evaluate training and education concepts, policies, plans, and programs to ensure war fighters are prepared to meet the challenges of present and future operational environments |
| Naval Manpower Analysis Center (NAVMAC) | <ul style="list-style-type: none"> ▪ Assist Naval Program Managers and Integrated Product Teams with manpower requirements estimates, independent manpower impact statements, and contractor-developed manpower estimates. |
| Naval Postgraduate School (NPS) | <ul style="list-style-type: none"> ▪ Execute HSI Graduate Education Program ▪ Develop and execute Distance Learning HSI Certificate Program |
| OPNAV N2, N4, N6, N8 | <ul style="list-style-type: none"> ▪ Plan, program, and budget HSI and program requirements and resources |
| Program Executive Offices (PEOs) | <ul style="list-style-type: none"> ▪ Authority, responsibility and accountability for life-cycle management of all acquisition programs within their cognizance. ▪ Apply HSI as part of a systems engineering approach |
| Acquisition Systems Commands (NAVAIR, NAVSEA, NAVSUP, SPAWAR, MARCORSSYSCOM) | <ul style="list-style-type: none"> ▪ Maintain and execute HSI standards, policy, and guidance ▪ Coordinate and administer HSI training to the workforce ▪ Execute HSI tasks and activities across programs ▪ Independently assesses program HSI activities and progress through the Systems Engineering Technical Review (SETR) ▪ Executes Human Systems TA certification and oversight for acquisition programs ▪ Conducts applicable Human Performance/HSI research for |

| | |
|---|---|
| | <p>Naval organizations and programs</p> <ul style="list-style-type: none"> ▪ Coordinate HSI work practices with Joint and international partners ▪ Responsible for the development of the Naval HSI competency and development of a Competency Aligned Organization (CAO) business model for the optimization of HSI-related program support throughout the SYSCOMs. |
| Chief of Naval Research (Office of Naval Research, Naval Research Laboratory) | <ul style="list-style-type: none"> ▪ Conduct Science and Technology planning, research, and development efforts supporting Future Naval Capability and other HSI requirements. Approves technology readiness assessments for ACAT I, IA, and II programs |
| Commander, Operational Test and Evaluation Force (COMOPTEVFOR) / Marine Corps Operational Test and Evaluation Activity (MCOTEA) | <ul style="list-style-type: none"> ▪ Responsible for independent OT&E of assigned Navy and Marine Corps acquisition programs |
| Naval Center for Cost Analysis (NCCA) | <ul style="list-style-type: none"> ▪ Prepare life cycle independent cost estimates for Major Defense Acquisition Programs designated ACAT IC at Milestone B and C and Full-Rate Production Decision Reviews and for component cost analysis of Major Automated Information System programs at Milestone A/B and Full Rate Production Decision Reviews ▪ Conduct component cost analyses for joint ACAT IAM programs for which DON is the lead |
| Naval Safety Center | <ul style="list-style-type: none"> ▪ Reviews mishap data ▪ Develops and maintains mishap reporting systems ▪ Assists or conducts investigations of major (class A and B mishaps) ▪ Provides training for field users (via Navy environmental Safety Training Center) |
| BUMED/Navy and marine Corps Public Health Center | <ul style="list-style-type: none"> ▪ Conduct Environmental Safety & Occupational Health evaluations. ▪ Provides technical guidance for industrial hygiene and occupational health evaluations |
| Fleet Users | <ul style="list-style-type: none"> ▪ Provide SME input to design requirements ▪ Participate in fleet feedback and usability evaluations |

Table 2-2 provides an overview of the processes and organizations associated with each HSI domain.

Table 2-2 Activities in HSI Domains

| HSI Domain | Naval Activities |
|---------------------------------|--|
| Human Factors Engineering (HFE) | HFE applies consideration of human capabilities and limitations (whether physical, cognitive, or social) to the design of systems. ASN RD&A CHENG and the SYSCOMs provide oversight of this area. The application of HFE to acquisition activities is the responsibility of the PEOs. Research in HFE is ongoing at ONR and the SYSCOMs. |
| Manpower | Manpower addresses the numbers of personnel (military, civilian and contractor) required, authorized and potentially available to operate, maintain, train, and support each capability and/or system. OPNAV N1 provides oversight of this area. The PEOs are responsible for working with the manpower community to determine the most efficient and cost-effective manpower and workload levels required to attain mission accomplishment. Research in manpower is ongoing at N1, NAVMAC, ONR and the SYSCOMs. |
| Personnel | Personnel define the human knowledge, skills, abilities, aptitudes, competencies, characteristics, and capabilities required to operate maintain and support each capability and/or system in peacetime or war. OPNAV N1 provides oversight of this area. PEOs are responsible for consulting with personnel authorities to identify qualification, readiness, personnel tempo, and funding issues that impact program execution, and for designing systems require achievable skillsets. Research in Personnel is ongoing at ONR and the SYSCOMs. |
| Training | Training addresses the comprehensive solutions for content, scope & sequence, facilities, and planning necessary to impart the requisite knowledge, skills, and abilities to the users to effectively operate and maintain systems. OPNAV N15 and Naval Education and Training Command (NETC) have oversight of this area. PEOs are responsible to consult with the training community to develop options for individual, collective, and joint training for operators, maintainers and support personnel, for developing initial system training and/or embedded training, and for designing systems that require less training for operations, maintenance, and repair. Research in Training is ongoing at ONR and the SYSCOMs. |
| Habitability | Habitability addresses requirements for the physical environment, personnel services (e.g., medical and mess), and living conditions (e.g., berthing and personal hygiene). PEOs are responsible to consult with the habitability community to develop options for living space designs that have a direct impact on quality of life and morale. Recruitment or retention may be degraded by poor habitability. OPNAV N4, CNIC, and SYSCOMS have oversight of this area: NAVSEA has oversight for ships and NAVAIR for aircraft. Habitability features for Shipboard Medical Facilities are the responsibility of the PEOs, with oversight by NAVSEA and BUMED. Research in habitability is the responsibility of ONR and the SYSCOMs. |
| Personnel Survivability | Personnel Survivability represents those characteristics of a system that reduce the risk of fratricide and personal detection or targeting, prevent personal attack if |

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|---|--|
| | detected or targeted, increase survival and prevent injury if personally attacked or located within an entity being attacked, minimize medical implications if wounded or otherwise injured, and minimize physical and mental fatigue. Personnel Survivability is managed through the System Safety Process. |
| Environment, Safety, and Occupational Health (ESOH) | ESOH determines system design characteristics that can minimize the risks of acute or chronic illness, disability, or death or injury to operators and maintainers. The PEOs are responsible to ensure that appropriate ESOH efforts are integrated across disciplines and into systems engineering. ESOH is managed by the CNO N09FB and Navy Safety Center through the shore and afloat safety manuals, OPNAVINST 5100.23 and OPNAVINST 5100.19. The Navy Ergonomics Working Group provides technical guidance and coordination via NAVFAC 9facilites) BUMED (occupational health/industrial hygiene) and SYSCOM members. N4/N45 provide guidance for environmental compliance which is generally distinct from occupational safety and health |

3.0 NAVAL HUMAN SYSTEMS INTEGRATION REQUIREMENTS

The established procedure for identifying, evaluating, and prioritizing joint military capability needs is contained in JCIDS. Validated and approved JCIDS documents (e.g., Initial Capability Document (ICD), Capability Development Document (CDD), & Capability Production Document (CPD)) provide a record of the Joint Requirements Oversight Council's (JROC) evaluation and assessment in support of statutory mandates.

The revised DoDI 5000.02 places a greater emphasis upon articulating the need for materiel (acquisition) solutions. Major roles and responsibilities for HSI within the materiel solutions analysis are defined to ensure human performance objectives are stated as part of capability requirements within the ICD and considered in the Analysis of Alternatives (AoA). HSI considerations can have a major impact on system effectiveness, suitability, and affordability. Moreover, non-materiel solution analyses should reflect HSI considerations / requirements adequately in the ICD and other relevant requirements and capability documentation.

DoN's mandatory procedures for major and non-major defense acquisition programs are issued in SECNAVINST 5000.2D Enclosure (7). This policy identifies the HSI domains and requires PMs and Resource Sponsors to address HSI throughout all phases of the acquisition process. CNO N15's role is to validate HSI requirements documents based on compliance with applicable KPPs, Key Systems Attributes (KSA), Military Standards (MIL-STD), instructions, and policies. In coordination with CNO N151 HSI and Acquisitions Branch, the SYSCOM technical authority provides concurrence review of the HSIP, ICD, AoA, Job Task Analysis, Preliminary Ship Manning Document, Crew Scheduling and Phasing Plan, CDD, Manpower Estimate Report (MER), and Naval Training System Plan (NTSP). The SYSCOM provides certification of the HSIP, Target Audience Description, System Engineering Plan (SEP), ICD, AoA, Technology Readiness Assessment (TRA), CDD, CPD, Testing and Evaluation Master Plan (TEMP), and the Personnel Environmental Solutions, Safety, Hazard list. OPNAV and SECNAV collaborate to

identify opportunities for decreasing operating costs and optimizing human performance. Upon certification and validation, final documents are forwarded to the Resource Sponsor, for planning, programming, and execution.

In 2008, SECNAVINST 5000.2D changed the methodology for definitive iterative reviews of requirements and execution to the two pass gated review process (see Figures 3-1 and 3-2).

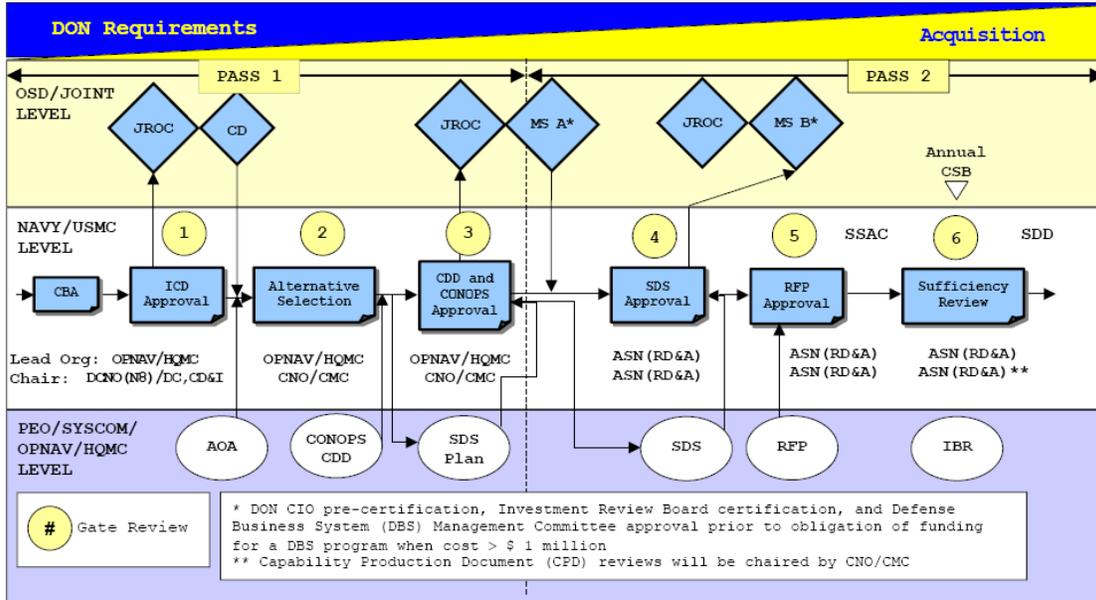


Figure 3-1 Integrated Defense Acquisition Process, & SECNAV Gated Review Process for programs initiated at Milestone A

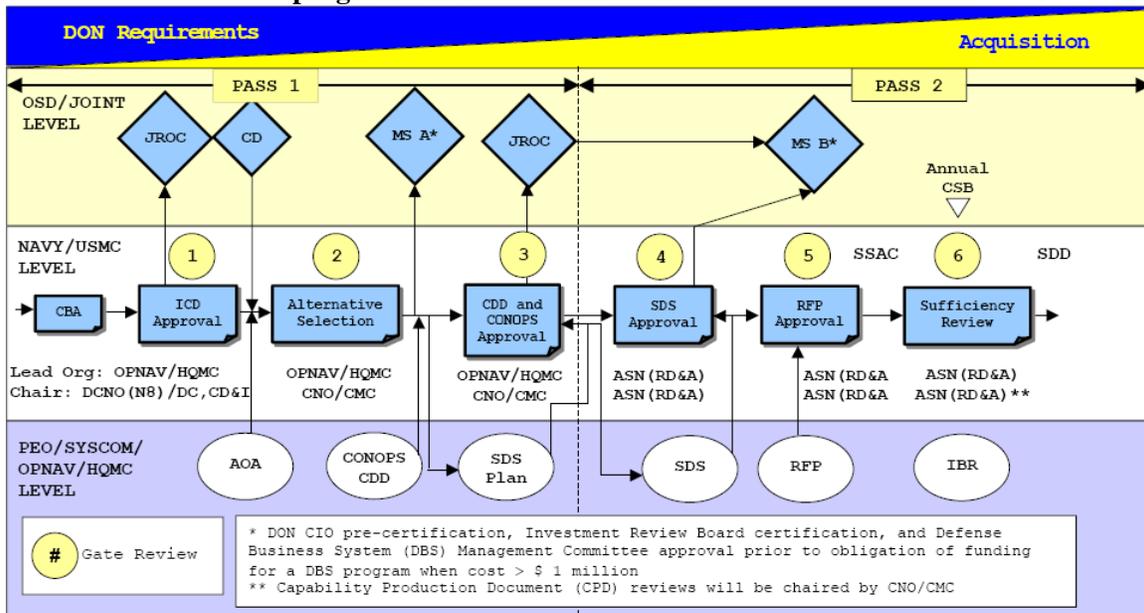


Figure 3-2 Integrated Defense Acquisition Process & SECNAV Gated Review Process for programs initiated at Milestone B

The identification of HSI requirements within JCIDS documents is critical to the Navy’s ability to provide the Sailor and/or Marine with integrated capabilities that fulfill fleet requirements. To accomplish this objective, Naval HSI leadership must properly identify, execute, and evaluate these requirements across the various Naval HSI organizations. The following sections will describe the execution and life-cycle process.

3.1 Naval HSI Life Cycle Process (Execution)

The SECNAVINST 5000.2D acquisition life-cycle framework begins with analysis to define the capability requirements satisfying an existing capability gap. DoDI 5000.02 provides a management system to execute life-cycle planning beginning with requirements generation (see Figure 3-3). Once the requirements are defined and approved, naval engineers, working with HSI domain representatives, develop feasible equipment designs and manufacturing processes. Alternative ideas are subjected to rigorous testing and analyses until a preferred system design is identified. Subsequent construction work is continually reviewed from technical and programmatic perspectives to ensure acceptable progress toward a mature system. Upon delivery to the Fleet, the system is certified for readiness for deployment. Moreover, during its operational life, naval systems are maintained and upgraded to ensure that their operational capabilities match the evolving war-fighting demands of the external environment.

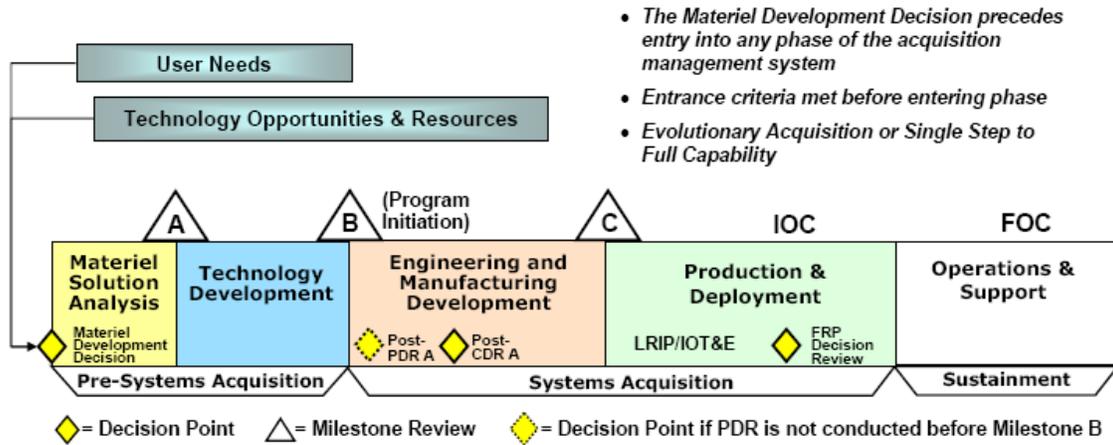


Figure 3-3 DoD 5000.02 Defense Acquisition Management System².

4.0 NAVAL HSI ACQUISITION PROCESS INTEGRATION (EXECUTION)

SECNAVINST 5000.2D requires PMs and Resource Sponsors to address HSI throughout all phases of the acquisition process. It requires the PM to initiate HSI effort at the earliest stages of

² DoD 5000.02 states that statutes applicable to the System Development & Demonstration phase shall be applicable to the Engineering Manufacturing & Design phase.

the acquisition process. Additionally, when modifying a system (e.g., a modernization or block upgrade), HSI domains must be considered to ensure that configuration changes do not create new or unforeseen human performance or supportability issues. Life cycle cost projections for capabilities and/or systems must include direct HSI costs (e.g., Manpower, Personnel, and Training Costs), and should discuss indirect costs (e.g., medical benefits resulting from safety and occupational health risks). PMs and HSI teams must base program planning on practical projections of future funding and manpower availability. Therefore, the HSI activities must collaborate intimately with PEOs, PMs, and their engineering teams during each phase of the acquisition process.

4.1 Naval HSI Acquisition Process Partnerships

The HSI Integrated Architecture was developed by a team of representatives from OPNAV N1, NAVSEA, NAVAIR, SPAWAR, Naval System Supply Command (NAVSUP), Naval Education and Training Command (NETC) and Commander Fleet Forces Command (CFFC). The team systematically analyzed HSI activities, their products, and information flows based on the Department of Defense Architectural Framework (DoDAF) model. All activities within this model have been arranged and numbered to correlate with the acquisition phases identified in CJCSI 3170.01 and DoDI 5000.02. For each activity in the acquisition framework, HSI activities and processes were aligned (see Appendix B). The HSI participation activities were divided into 6 discrete activities:

- A1 - Include Human Considerations in Capability Needs and Solution Definition
- A2 - Include Human Considerations in Concept Development and Refinement
- A3 - Participate in Technology Selection and Development
- A4 - Participate in System Development and Demonstration
- A5 - Participate in System Production and Deployment
- A6 - Participate in Operations and Support

4.2 Naval HSI Acquisition Process

The SYSCOM Chief Engineer (CHENG) is responsible for conducting technical reviews and assessments throughout the acquisition lifecycle. The integration of HSI domain requirements within the concept refinement, technology development, and system development & demonstration phases must be consistently addressed across all programs.

4.2.1 Development of DoDAF Human Views (HVs)

As part of JCIDS, DoD has mandated development of DoDAF-compliant architectures in support of the Net-Ready KPPs used in both requirements (e.g., ICD, CDD, & CDP) and acquisition documentation (e.g., Information Support Plans). With this requirement, DoD is recording information flow from various Naval platforms. The information flow is providing data to develop HVs with the intent of creating solutions for HSI objectives. These solutions address

integrating the different HSI domains with other engineering disciplines, managing the need for HSI activities, and performing trade-off analyses. By explicitly modeling the human elements that are being shaped in the process of capability design, HVs can be considered early and incorporated into the design and implementation of technology. This supports a change of focus from technology-centered functional requirements to capability-based requirements.

4.2.2 Coordination of organizations in JCIDS and early acquisition process

HSI activities require close coordination between OPNAV, SYSCOMs, ASN RD&A, Headquarters Marine Corps (HQMC), and the Fleet. Additionally, defined requirements and resources are needed to perform the requisite coordination, sequencing, and analyses.

4.2.3 Independent Technical Authority to monitor and evaluate all program reviews

The Navy's SETR process provides PMs with independent assessments of program readiness to enter the next technical phase. Naval HSI technical authority is reflected in the SYSCOMs across the HSI domains. In order to provide adequate assessments, detailed analyses must be performed to determine where there are issues with respect to human performance, workload, required skills, costs, safety, and operational readiness.

4.2.4 Integration into prototyping activities

DoDI 5000.02 highlights the critical role of prototyping prior to Milestone B. The human operators are complex systems; therefore, prototyping and testing of the proposed materiel solution must include the operators and maintainers as an integral part of that assessment. These warfighters must be trained, qualified, and certified to operate and maintain the system.

4.2.5 Integration into Developmental Test / Operational Test activities

Developmental Testing and Operational Testing (DT/OT) activities need direct HSI involvement to assist in the definition of appropriate metrics, design of the test events, and conduction of tests. To the degree that actual human performance parameters can be assessed in DT/OT, system performance and human error may be mitigated. Several of the acquisition SYSCOMs have established and are maturing Memoranda of Agreement (MOAs) with Commander Naval Operational Test and Evaluation Force (COMOPTEVFOR) to ensure that HSI requirements are fully incorporated into the DT/OT test plans (e.g., TEMP).

5.0 NAVAL HSI WORKFORCE DEVELOPMENT

Naval HSI leadership is committed to educating selected military officers, civilian professionals, and other engineers / PMs about HSI. Currently, HSI workforce development is focused on four areas: (a) Naval Postgraduate School Masters Program in HSI, (b) Naval Postgraduate School HSI Certificate Program, (c) the Defense Acquisition University (DAU) HSI Continuous Learning Module, and (d) SYSCOM executive level training.

NPS offers a Masters of Science in HSI. Additionally, NPS is developing an HSI distance learning certificate program which can later be transitioned into credits toward a Masters of Science in SE or HSI. These programs are widely supported by the joint services, and have the potential to yield a high return on investment for the military/civilian workforce. Efforts are underway to create an HSI specialty track for SE students who are Engineering Duty Officers attending NPS.

Naval HSI leadership is also focused on fulfilling a HSI educational requirement for top level training of PMs, Logisticians, and domain level experts. The high-level training will focus on articulating a baseline understanding of HSI, policies requiring its use, and methods to integrate HSI requirements into the design and development of new or modified naval systems. Executive level training exists at the SYSCOMS. NAVSEA is in the process of developing an introductory web-based course for PMs, systems engineers, and leadership via Navy Knowledge Online (<https://wwwa.nko.navy.mil>). Moreover, the Navy is working with the other military services to provide HSI course inputs to the DAU.

6.0 NAVAL HSI FY09 KEY TASKS

The tasks for Naval HSI in FY09 have been categorized in the following six areas: (1) organizational coordination, (2) workforce sustainment and improvement, (3) program assessments, (4) processes, methods, and measures, and (5) infrastructure and tools, and (6) policy.

Sections 6.1-6.6 describe some representative examples of currently planned tasks in HSI and related areas from organizations across the Naval service. For each task, the lead or participating organizations are identified along with the projected duration of the task. Short descriptions outlining the scope, planned benefits, and outputs are also provided.

6.1 Organizational Coordination

Effective HSI requires coordination across the various Naval organizations. Policy development, planning, and execution cannot be synchronized to meet long-term and near-term objectives without proper coordination. Table 6-1 outlines the various coordinating tasks for FY09.

Table 6-1 FY09 Organizational Coordination Tasks

| | |
|--|---|
| <p>Title: <i>Various Manpower, Personnel, Training, Future Naval Capability Research Projects</i></p> | <p>Organizational Performer/Lead: OPNAV-N1, N4, N6, N8, Marine Corps TECOM, USFF, ASN(RDA), and ONR Duration: Ongoing Scope: provide the ability to recruit and match Sailors and Marines to the right jobs at the right times, design affordable systems centered on the Warfighter, and equip Sailors and Marines with effective mission essential competencies.</p> |
|--|---|

| | |
|---|--|
| | <p>Output/Product/Benefit: develop and deliver quantifiable products (i.e., prototype systems, knowledge products, and technology improvements) in response to validated requirements for insertion into programs of record upon meeting exit criteria within five years.</p> |
| <p>Title: <i>Various Performance, Affordability, Reliability, Science and Technology Focus Area Projects</i></p> | <p>Organizational Performer/Lead: ONR Duration: Ongoing Scope: Sustain our Sailors and Marines at the peak of their effectiveness under all war fighting conditions. Enhance individual and team decision-making and combat effectiveness. Ensure the health and viability of our war fighters afloat and ashore. Output/Product/Benefit: science and technology products, e.g., improve personnel recruitment & selection and create effective performance-based measures of personnel readiness, integrate human performance considerations into system design, acquisition and operations, reduce training time and improve training impact</p> |
| <p>Title: <i>Various HSI Joint Working Group Coordination Meetings</i></p> | <p>Organizational Performer/Lead: OPNAV and SYSCOMs Duration: FY09-10 Scope: Maintain organizational coordination meetings and working groups (JHSIWG, etc). Joint working group and Executive steering group meetings conducted quarterly. Output/Product/Benefit: Coordinates joint roles and activities to support and implement HSI. Organizational Performer/Lead: SYSCOMs (SPAWAR working level lead for FY09) Duration: Ongoing Scope: Conduct periodic (monthly) meetings or telecons between SYSCOMs and OPNAV N151 to coordinate on common and critical issues. Prioritize allocation of resources across organizations and develop common products such as guides or templates for application across organizations. Output/Product/Benefit: Shared plans, resources, and products.</p> |

6.2 Workforce Sustainment and Improvement

HSI activities cannot be executed without a workforce that is properly equipped, trained, and educated. Multiple efforts are underway to deliver a Naval workforce with the range of skills necessary for implementing HSI. Table 6-2 outlines the workforce sustainment and improvement tasks for FY09.

Table 6-2 FY09 Workforce Sustainment and Improvement Tasks

| | |
|---|--|
| <p>Title: <i>Various Future Naval Capability Projects: Force</i></p> | <p>Organizational Performer/Lead: ONR Duration: Ongoing Scope: Web-based suite of tools that will serve as the simulation</p> |
|---|--|

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| <p><i>Utilization through Unit Readiness and Efficiency, Personnel Integration of Selection, Classification,</i></p> | <p>environment to assess the impact of alternative human resource allocation policies on individual, team, and unit efficiency and readiness. Output/Product/Benefit: 1) A simulation environment for MPTE HQ to test proposed policy changes, observe and measure their anticipated impact, and identify intended and unintended “ripple effect” consequences and 2) A prototype web-based suite of tools to serve as the fleet’s operational environment to optimally trade off FIT (Right Person in the Right Position at the Right Time) cost, and risk.</p> |
| <p>Title: <i>Various Human Systems Integration Symposiums, Committee, Working Groups</i></p> | <p>Organizational Performer/Lead: NAVSEA w/support from other Naval and Joint organizations Duration: Ongoing Scope: Organize conference (typically biannual) for American Society of Naval Engineers (ASNE) in the field of HSI, providing an opportunity for practitioners, managers, and leadership to exchange information on technical, management, and policy topics. Output/Product/Benefit: Forum for communication on HSI topics across the Navy, Services, and overall HSI community.</p> |
| <p>Title: <i>Naval Postgraduate School HSI Degree Program, HSI Certificate Program</i></p> | <p>Organizational Performer/Lead: N1, NPS, Duration: Ongoing Scope: HSI degree programs for civilian and military workforce at NPS. N1 conducts biennial review of program. SYSCOMs assist with curriculum development. Output/Product/Benefit: Graduate-level educated HSI practitioners</p> |
| <p>Title: <i>Naval Postgraduate School HSI Certificate Program</i></p> | <p>Organizational Performer/Lead: NPS, Duration: FY09 Scope: Complete development of curriculum for certificate program at NPS. Conduct review of course content against Core Skill Requirements as HSI Certificate program is developed. Output/Product/Benefit: Distance Learning HSI Certificate Program that will count toward Systems Engineering Masters Degree</p> |
| <p>Title: <i>Navy Ergonomics Program</i></p> | <p>Organizational Performer/Lead: Naval Safety Training Center Duration: Ongoing Scope: Technical training for safety and health professional engaged in ergonomics work/benefit: Professional training applied throughout navy work areas See http://safetycenter.navy.mil/training/coursedetail05-nsc.cfm?ID=Navy%20Ergonomics%20Program</p> |
| <p>Title: <i>HSI DAU Training</i></p> | <p>Organizational Performer/Lead: Joint HSI Working Group, OPNAV N1, SYSCOM Working Group Duration: FY09-10 Scope: Provide Naval HSI inputs to support the DAU HSI Continuous Learning Module and develop HSI inputs to existing career field training.</p> |

| | |
|--|---|
| | Output/Product/Benefit: On-line continuous learning module for all Defense Acquisition professionals |
| Title: <i>Technical Warrant Holder Pyramids</i> | Organizational Performer/Lead: Individual SYSCOMs Duration: Ongoing Scope: TA requires detailed analysis and oversight of evolving designs and system concepts. The workload associated with the large number of programs necessitates a technical pyramid of qualified personnel to provide adequate oversight. Output/Product/Benefit: Personnel resources available to support Technical Warrant activities |

6.3 Program Assessments

Independent evaluations and assessments are critical to the integrity of the JCIDS process. Table 6-3 provides the program assessment tasks for FY09.

Table 6-3 FY09 Program Assessment Tasks

| | |
|--|---|
| Title: <i>Technical Authority Program Assessments</i> | Organizational Performer/Lead: SYSCOMs Duration: Ongoing Scope: Provide independent HSI review and evaluation of acquisition programs in advance of engineering milestones such as technical reviews. Output/Product/Benefit: Awareness of HSI risks and risk mitigation opportunities for evaluated programs |
| Title: <i>Modernization Assessments (SHIPMAIN)</i> | Organizational Performer/Lead: NAVSEA Duration: Ongoing Scope: Incorporation of HSI assessment process for modernization into the Surface Ship and Carrier Entitled Process for Modernization Management and Operations Manual. Output/Product/Benefit: Reduction of costs incurred to correct HSI and training deficiencies introduced as the result of HSI assessments not being conducted on Ship Change Documents (SCDs) developed under the Navy Modernization Process. |
| Title: <i>Naval HSI Assessment Criteria</i> | Organizational Performer/Lead: SYSCOM Working Group Duration: FY09 Scope: Develop Draft Set of HSI assessment criteria associated with each Systems Engineering Technical Review point. Output/Product/Benefit: Naval HSI Common System Engineering Technical Review Checklist |

6.4 Process, Methods, and Measures

HSI processes, methods, and measures must be adhered to and keenly understood to best execute HSI at the tactical level. These areas are consistently funded as high priority activities by Naval leadership. Table 6-4 outlines the tasks associated with processes, methods, and measures for FY09.

Table 6-4 FY09 Process, Methods, and Measures Tasks

| | |
|--|---|
| <p>Title: <i>Various Capable Manpower Future Naval Capability: Game-Based Training, Sea Basing, Affordability, Maintainability, and Reliability Technology Focus Area Enabling Capabilities</i></p> | <p>Organizational Performer/Lead: ONR Duration: Ongoing Scope: Develop several game-based learning environments in critical Naval tasks, and systematically evaluate learning and performance in them. Output/Product/Benefit: (1) Improved tactical language proficiency and regional expertise, (2) Advanced capabilities for performance assessment, measurement, diagnosis, and remediation, (3) Reduced authoring time of game based scenario generation, and (4) Improved instructional effectiveness</p> |
| <p>Title: <i>Various Technical Standards Development, Engineering Guides, International coordination, and metrics</i></p> | <p>Organizational Performer/Lead: SYSCOMS Duration: FY09-FY11 Scope: Establish and update technical guidance associated with standards and best practices used to support HSI TA assessments, certifications, and recommendations. These include MIL-STD 1472, MIL-STD 2525 (funded by PEO IWS), ASTM 1337, NAVSEA 03-01 (Common Presentation Layer), Habitability Specifications and Shipboard Habitability Materials/Design Criteria and Practice (SHMDCP) manual. Output/Product/Benefit: Documentation provides clear guidance to system developers (in accordance with best practices) and supports validity of TA decisions.</p> |

6.5 Infrastructure and Tools

HSI practitioners must be equipped with the appropriate tools to design and analyze HSI. Naval acquisition programs are working to ensure the analytical tools being developed will address the unique requirements of each individual acquisition program. Table 6-5 describes the tasks associated with infrastructure and tools for FY09.

Table 6-5 FY09 Infrastructure and Tools Tasks

| | |
|---|--|
| <p>Title: <i>Various Capable Manpower Future Naval</i></p> | <p>Organizational Performer/Lead: ONR Duration: Ongoing Scope: Develop several game-based learning environments in critical</p> |
|---|--|

| | |
|---|---|
| <p><i>Capability Science and Technology Projects including: Affordability, maintainability, reliability, Sea Basing, Human Resources Data Bases, Tool improvements, Improved manpower Optimization Program,</i></p> | <p>Naval tasks, and systematically evaluate learning and performance in them. Output/Product/Benefit: (1) Improved tactical language proficiency and regional expertise, (2) Advanced capabilities for performance assessment, measurement, diagnosis, and remediation, (3) Reduced authoring time of game based scenario generation, and (4) Improved instructional effectiveness</p> |
| <p>Title: SYSCOMS Training Acquisition (SEATRACQ, CMAT, AVTRAQ) Website</p> | <p>Organizational Performer/Lead: SYSCOMS Duration: Ongoing Scope: Provide online resource for training acquisition info, tools and guidance and the SYSCOM Navy Training System Plan (NTSP) Virtual Library. Output/Product/Benefit: Automates NTSP formal Fleet review and comment process per OPNAVINST 1500.76A and provides one stop shopping for latest training guidance.</p> |

6.6 Policy

Establishment of HSI policy is the most effective means to facilitate coordination and collaboration across Naval organizations. Integration of HSI policy is necessary to ensure high level policies (e.g., SETR) remain sequenced and synchronized amongst the various stakeholders. Policy tasks are outlined in Table 6-6.

Table 6-6 FY09 Policy Tasks

| | |
|---|--|
| <p>Title: Capable Manpower Future Naval Capability: Various Exceptional Expertise for Submarine Command Team Decision Making, Unmanned Surface Vehicle Monitoring & Control Human Computer Interface for Amphibious Operations</p> | <p>Organizational Performer/Lead: ONR Duration: Ongoing Scope: to understand the principal attributes of submarine commanding officer and crew decision making processes. Output/Product/Benefit: (1) Principles of Information Flow Design to aid NAVSEA technology design, (2) Evaluate Structure of Tracking Party to determine whether the mix or qualifications should be changed, and (3) Improve Training Products to focus more on team training.</p> |
|---|--|

| | |
|--|--|
| Status: Funded | |
| Title: <i>Draft OPNAVINST 5310.23</i> | Organizational Performer/Lead: OPNAV N1 Duration: FY09 Scope: Navy Personnel Human Systems Integration (NAVPRINT) Output/Product/Benefit: Establishes HSI requirements in Naval JCIDS documents |
| Title: <i>Systems Engineering Technical Review (SETR) Implementation</i> | Organizational Performer/Lead: Naval SYSCOM Duration: FY08-FY09 Scope: Establish standard process for independent review of acquisition programs, allowing integration of HSI criteria and review authority into the review process for acquisition programs. Output/Product/Benefit: Uniform process for review and assessment of Naval programs |
| Title: <i>HSI policy and guidance updates, HSI Technical Authority criteria</i> | Organizational Performer/Lead: SYSCOM Working Group Duration: FY09-FY10 Scope: Work with DASN ACQ and RD&A CHENG to incorporate HSI inputs into Naval acquisition and engineering policy and guidance documents (Including Systems Engineering Plan, MIL-STD-882, etc) Output/Product/Benefit: Revise Systems Engineering and Acquisition Policy and Guidance |

7.0 NAVAL HSI RESOURCE REQUIREMENTS

Requirements for Human Systems Integration resources will be addressed in separate correspondence by the USD AT&L and USD P&R. These requirements include resources for integrated policy and guidance, infrastructure investment, and independent technical authority.

8.0 NAVAL HSI MATURITY METRICS

Establishment of HSI maturity metrics are required to address the strengths and weakness of HSI within the Naval service. The proposed maturity metrics closely mirror the aforementioned FY09 task categories, with the inclusion of program level implementation. For further description, see Sections 8.1-8.7.

8.1 Program-Level Implementation

In an OSD report to Congress entitled, *Human Systems Integration Activity in DoD Weapons Systems Programs: Part III (March, 2008)*, the E2-D Hawkeye and MH-60R/S were identified as HSI success stories. OSD concluded that HSI practices saved the Navy over \$2,000,000.00. Integrated Product Teams (IPTs) coordinated HSI practices through T/E, formal HSI assessments, and modeling and simulation techniques. Areas such as survivability, systems safety, and health hazards were determined to be the most improved areas. Currently, the DDG 1000, Littoral Combat Ship, GCCS-M, and CVN21 programs are using HSI practices to duplicate the success

earned in the aforementioned stories.

8.2 Organizational Coordination

Coordination in HSI policies and processes for individual organizations are steadily improving. OPNAV N15 is designated as the lead advocate for Naval HSI. FY09 will focus on formalizing the vertical and horizontal mechanisms for coordination and sequencing among organizations. The Navy's recent implementation of SECNAV 5000.2D is the driving force to define and implement the required coordination.

8.3 Workforce Sustainment

The resources to build and sustain the Navy's HSI military and civilian workforce are among the most mature of any critical area. The needs of multiple organizations are being closely aligned in this area; thus leading to greater opportunity and benefit. Additionally, the civilian academic community is becoming increasingly involved in providing the educational resources to develop and improve the knowledge, skills, and abilities (KSAs) required for HSI practitioners.

The remaining gaps concern defining HSI courses, creating opportunistic career paths, and establishing billets for HSI professionals. The billet structure for military, civilian, and contractor personnel should be balanced between requirements and execution of acquisition programs. Given the multiple academic organizations that are initiating HSI programs, there must be an assurance that course content is comparable and appropriate.

8.4 Program Assessments

Independent HSI assessments are vital to the integrity of the Navy's HSI program. The consistency and rigor of these assessments has been enhanced by the development of HSI evaluation criteria commonly tied to a program's technical reviews. This ensures both a periodic review of the HSI status of programs and an opportunity to provide critical HSI issues to the highest levels of a program's management structure. These processes are enhanced by the incorporation of HSI aspects into the ASN RD&A CHENG led SYSCOM SETR process.

8.5 Processes, Methods, and Measures

The DoDAF defined and documented the HSI domains of manpower, personnel, and training standard processes, methods, and measures for HSI within the Navy. KPPs and KSAs for Manpower and Systems Training are two primary measures for program progress. These two requirements were included to ensure system training is addressed in AOA/EOA analysis and subsequent phases; thus ensuring projected training requirements and associated costs are appropriately addressed across the program life cycle.

Specific guidance on assessment methods and evaluation measures are contained in the DoDI 5000.02, SECNAVINST 5000.2D, the System Performance Assessment Capability (HSPAC),

and a Best Practices Guide for Human Systems Engineering. At the SYSCOM level, HSI is supported through internal engineering policies.

8.6 Infrastructure and Tools

HSI infrastructure, including analysis and design tools, is necessary for effective implementation. Much of the organizational infrastructure is established and analytical tools (e.g., Integrated Manpower Personnel Integration human modeling software) have been developed and applied to acquisition programs. New tools need to be developed to transition war fighter concerns into capability development, design, and evaluation processes.

NAVAIR, NAVSEA, and SPAWAR have designated facilities to specifically conduct research and development on human performance issues, such as conditions of extreme temperatures, three-dimensional motion, command staff decision environments, and virtual decision making. This research parallels a 2007 Chief of Naval Operations (CNO) initiative concerning streamlining research efforts on existing and future Naval Capabilities. Additionally, a Defense Safety Oversight Council funded development of the Human Engineering and Ergonomics Analysis Process to provide life-cycle cost/benefit evaluation of technology introduction supporting improved HIS in design and facilitate improved interaction of HSI and ergonomics disciplines.

8.7 Policy

Given that effective HSI requires collaboration and tradeoffs between organizations, Naval HSI policy must explicitly articulate the responsibilities of individual organizations. Coordination across organizations in large part relies upon the effort and initiative of individual organizations. OPNAV Instruction 5310.23 NAVPRINT (OPNAVINST 5310.23) was developed through Congressional Plus-up funding and is proposed to improve coordination and sequencing across organizations while establishing policy for HSI JCIDS requirements and resources as it relates to the HSI domains in capabilities documents.

The Earned Value Management System (EVMS), Program Management Baseline (PMB), and the Integrated Baseline Review (IBR) are assessed throughout the acquisition process. Follow-on Gate Six reviews are conducted to endorse or approve the CPD, review program health prior to and post Milestone C, evaluate entrance criteria for Full-Rate Production Decision Review (FRP DR), and serve as forums for Configuration Steering Boards.

Additionally, HSI domains are evaluated as part of the Integrated Logistics Assessment (ILA). The ILA process provides the PM and Milestone Decision Authority (MDA) with a measure of Integrated Logistics Support (ILS) planning and implementation for many program elements including HSI. Additionally, assessments of logistics support programs prior to Initial Operational Capability and Full Operational Capability (IOC/FOC) by the PM and user

community ensure timely awareness of potential deficiencies requiring immediate and corrective action. Moreover, the assessment process provides an effective methodology for evaluating risk, life cycle cost, supportability, HSI, and support systems' performance from a total life cycle management perspective.

9.0 HSI RESEARCH AND DEVELOPMENT (HSI R&D)

HSI R&D is the foundation for injection into future acquisition programs. To build this foundation, Science and Technology (S&T) prior to Milestone A examines expected impacts of notional designs or design elements on Future Naval Capabilities (FNC). Notional designs involve new hardware and software technologies combined with models of human users who will operate and maintain the system. The need to assess both the expected performance and life cycle costs of such designs is recognized by ONR and addressed in requirements-driven research managed by both FNC and Discovery and Invention (D&I) programs. It is particularly important in the development of prototype solutions where HSI considerations are taken into account, early in the integrated Defense Acquisition Process, so that acquisition programs are given usable, trainable technology solutions that can be transitioned without significant, expensive, time-consuming re-work to our Sailors and Marines.

9.1 Future Naval Capability

The FNC portion of the S&T portfolio supports work to mature technology into requirements-driven, transition-oriented products that provide Enabling Capabilities (ECs) to fill identified capability gaps that cannot be resolved by current material or non-material solutions. As shown in Figure 9-1, the FNC process is composed ECs which develop and deliver quantifiable products (i.e., prototype systems, knowledge products, and technology improvements) in response to validated requirements for insertion into acquisition programs of record within five years, after meeting agreed-upon exit criteria. A Technical Oversight Group (TOG) consists of five senior flag officers (Chief of Naval Operations – Integration of Capabilities and Resources (CNO-N8), Marine Corps Combat Development Center, U.S. Fleet Forces Command, Office of Naval Research, and Principal Deputy for Assistant Secretary of the Navy Research, Development and Acquisition) who have financial & technical oversight of the FNC Program. The TOG provides recommendations on investment balance across the Naval Capabilities Pillars.

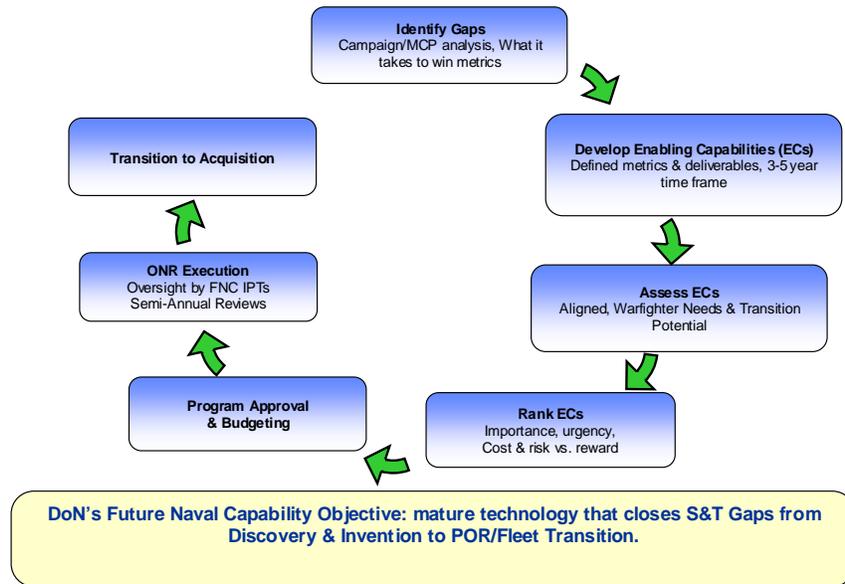


Figure 9-1 Future Naval Capabilities.

9.2 Enabling Capabilities

The ECs are currently aligned with four of the pillars of Naval Power 21 along with an additional group for crosscutting technology improvements (Naval Enterprise and Platform Enablers) for operations and maintenance cost savings. There are two remaining pillars focused on the war fighter – Capable Manpower and Force Health Protection. The Capable Manpower pillar is a set of capability-development products focused on human performance aspects of the Navy and Marine Corps. Capable Manpower supports research to further HSI, particularly in the areas of HFE and MPT. Force Health Protection pillar provides Sailors and Marines with the best possible protection from operational threats and will reduce morbidity and mortality throughout the battle space when casualties do occur.

The D&I program begins in the acquisition life-cycle before formal requirements are determined and the number of candidate design elements and notional system designs are quite large. To identify the most promising projects, ONR is working to provide the S&T community with test beds, Synthetic Environments for Assessment (SEA) that allow researchers flexibly to measure the impact of new technologies in terms of human performance and mission effectiveness. The SEAs provide a means of experimentally examining the trade space involving technologies

associated with the domains of HSI using a calibrated instrument that can be shared between laboratories and the SE communities (see Figure 9-1).

The SEAs will support HSI with SE practices through the use of mission-based, flexible metrics by:

- Allowing the rapid construction and evaluation of parameterized models of new capabilities to be compared against one another prior to milestone B in accordance with instruction 5000.2.
- Providing robust interfaces between simulations and human performance modeling technologies, allowing for low-cost live, virtual and constructive simulations;
- Facilitating flexible experimentation with reduced-manning concepts;
- Insulating S&T partners from many of the technical details of simulation implementation through the provision of meta-modeling and other interface facilities (These technologies should encourage greater participation by the S&T community in Naval M&S, potentially increasing the variety of capabilities and platform designs to be analyzed);
- Standardizing M&S results along dimensions of relevance for the Navy, USMC, and other services; and
- Allowing performance and cost benefits to be determined prior to implementation.

Appendices

A. ACRONYMS

| | |
|-------------|--|
| ABS | American Bureau of Shipping |
| ACAT | Acquisition Category |
| AoA | Analysis of Alternatives |
| ASN RD&A | Assistant Secretary of the Navy for Research, Development, and Acquisition |
| ASNE | American Society of Naval Engineers |
| ASR | Annual Sufficiency Review |
| ASTM | American Society for Testing and Materials |
| CDD | Capabilities Development Document |
| CFFC | Commander, Fleet Forces Command |
| CHENG | Chief Engineer |
| CJCSI | Chairman Joint Chiefs of Staff Instruction |
| CNO | Chief of Naval Operations |
| CNR | Chief of Naval Research |
| COMOPTEVFOR | Commander, Operational Test and Evaluation Force |
| CONOPS | Concept of Operations |
| CPD | Capabilities Production Document |

| | |
|---------|---|
| CPL | Common Presentation Layer |
| DACG | DoN Acquisition and Capabilities Guidebook |
| DAU | Defense Acquisition University |
| DT | Developmental Test |
| DoD | Department of Defense |
| DoDAF | DoD Acquisition Framework |
| DON | Department of the Navy |
| DOTMLPF | Doctrine, Organization, Training, Materiel, Leadership, Personnel, Facilities |
| DRPM | Direct Reporting Program Manager |
| EMAC | Early Manpower Assessment Capability |
| EO | Executive Order |
| ESOH | Environmental Safety and Occupational Health |
| EVMS | Earned Value Management System |
| FFB | Fleet Feedback |
| FOC | Full Operational Capability |
| FRP DR | Full-Rate Production Decision Review |
| FY | Fiscal Year |
| HFE | Human Factors Engineering |
| HPAT | Human Performance Assessment Tool |

| | |
|--------------|---|
| HSI | Human Systems Integration |
| HSI PORT | Human Systems Integration Program Online Review Tool |
| HSIP | HSI Plan |
| HSIWG | HSI Working Group |
| HSP AC | Human Systems Performance Assessment Capability |
| IBR | Integrated Baseline Review |
| ICD | Initial Capabilities Document |
| ILA | Integrated Logistics Assessment |
| ILS | Integrated Logistics Support |
| IMOP | Improved Manpower Optimization Program |
| IOC | Initial Operational Capability |
| IPT | Integrated Product Team |
| IV&V | Independent Validation and Verification |
| JCIDS | Joint Capabilities Integration and Development System |
| JHSIWG | Joint HSI Working Group |
| MARCORSYSCOM | Marine Corps System Command |
| MDA | Milestone Decision Authority |
| MDD | Materiel Development Decision |
| MOA | Memorandum of Agreement |

| | |
|----------|--|
| MPT | Manpower, Personnel, and Training |
| MPT&E | Manpower, Personnel, Training, and Education |
| MS | Masters of Science |
| NAVAIR | Naval Air Systems Command |
| NAVFAC | Naval Facilities Command |
| NAVMAC | Naval Manpower Analysis Center |
| NAVPRINT | Navy Personnel Human Systems Integration |
| NAVSEA | Naval Sea Systems Command |
| NAVSUP | Naval Supply Systems Command |
| NCB | Naval Capabilities Board |
| NCCA | Naval Center for Cost Analysis |
| NEPA | National Environmental Protection Act |
| NETC | Naval Education and Training Command |
| NPS | Naval Postgraduate School |
| NRL | Naval Research Laboratory |
| NTSP | Navy Training System Plan |
| ONR | Office of Naval Research |
| OT | Operational Test |
| OT&E | Operational Test and Evaluation |

| | |
|----------|---|
| PEO | Program Executive Office |
| PEO IWS | Program Executive Office Integrated Warfare Systems |
| PM | Program Manager |
| PMB | Program Management Baseline |
| PR | Program Review |
| R3B | Resource and Requirements Review Board |
| RDA | Research, Development, and Acquisition |
| RDT&E | Research, Development, Testing, and Evaluation |
| RFP | Request for Proposal |
| SALT | Spatial Analysis Link Tool |
| SCD | Ship Change Document |
| SDS | System Development Specification |
| SE | Systems Engineering |
| SEATRACQ | NAVSEA Training Acquisition |
| SEMP | Systems Engineering Management Plan |
| SEP | Systems Engineering Plan |
| SETR | Systems Engineering Technical Review |
| SHMDCP | Shipboard Habitability Materials/Design Criteria and Practice |
| SOS | System of Systems |

| | |
|---------|-------------------------------------|
| SOW | Statement of Work |
| SSB | Stakeholder Steering Board |
| SYSCOM | Systems Command |
| TA | Technical Authority |
| TDRA | Top-Down Requirements Analysis |
| TEMP | Test and Evaluation Management Plan |
| TWH | Technical Warrant Holder |
| vSYSCOM | Virtual Systems Command |

B. NAVAL HSI ACTIVITIES WITHIN THE DODI 5000.02 ACQUISITION LIFE CYCLE.

| Requirements | Responsibility | Execution | Applicable Statute | Handbook / Guide | Gate 1 | Gate 2 | Gate 3 | Gate 4 | Gate 5 | Gate 6 |
|----------------------------------|-------------------|--------------------------------|--|--|--|---|----------------------|--|---|--|
| HSI - All Domains | N1 MPTE | PEO / PMO | 3170.01F, CJCSM 3170.01C, OPNAVINST 5310.23 | Defense Acquisition Guidebook, HHS Program Manager's Guide Vol. 1-3 | AMA, TAD, HSP | ICD, A/OA, HSP, MS A | TDS, SEP, MS B, JTA1 | ODD, TRA, TEMP, AS, CARD-like document, JTA2, JTA3 | CPD, HSP Analysis, SEP, TEMP, TRA, SFR, PDR, CDR, DRR | TEMP, SEP, IER, Operational Readiness Assessment |
| | | | | | | | | | | |
| Manpower | N12 | PMO, NAVMAC | OPNAVINST 1000.18K, SECNAVINST 4105.1A | MIL-HDBK-502, NAVPERS 158391 Vol. 1-2, NAVPERS 18068F Vol. 1-2 | HSP | Initial NTSP, Systems Training KPP reqmt., T&E Strategy | PSMD, CSPP | JTA 2 & 3 Data, Characteristics and Task KSAs | MIR | SMD |
| | | | | | | | | | | |
| Personnel | N13 | NPC, SYSCOM, NAVMAC, PMO | OPNAVINST 1500.76A, SECNAVINST 4105.1A | MIL-HDBK-502 | HSI Plan, Target Audience Description, Analysis of Material Alternatives, Job Task Analysis, Manpower and Personnel Characteristics, Operational and Environmental Conditions, | TRPPM Advisory Board, validate Systems Training KPP, Training Transition Coordination for RFT Date, | | | | |
| Training | RS, PMO, N12 | PMO, SYSCOM, Enterprise, NETC | OPNAVINST 4105.1A | MIL-HDBK-502 | | | | | | |
| Human Factors Engineering | ASIN(RD8A) CHSENG | PMO, SYSCOM | | MIL-STD 1472F, MIL-STD 1388.1A, MIL-HDBK-759C, MIL-HDBK-46855, ASTM F1168, ASTM F1337-91 | Performance Parameters, Roles of Operators and Maintainers for each task, Capability Caps, Key Attributes of the Capabilities, Human Performance, Personnel Inventory, Manpower Costs for Lifecycle, DOTMLPF analysis, Front End Analysis, TRPPM | KPPs, System Design Specs | HM Design's, KPPs | | | |
| | | | | | | | | | | |
| Safety / Environmental | OPNAV 09F | Navy Safety Center, Enterprise | SECNAVINST 5100.10J, OPNAVINST 5100.24B, OPNAVINST 5090.1C | MIL-STD 882D, MIL-HDBK-297, ESOH Mgmt. Evaluation Criteria for DOD Acquisition | | PESH, Environmental Solutions, Safety Solutions, Hazard List | | | | |
| Occupational Health | BUMED | | OPNAVINST 5100.23G, SECNAVINST 5100.10J, NETONINST 5100.1 | | | PESH, Hazard List | | | | PESH |
| Survivability | Enterprise | SYSCOM, PMO | OPNAVINST 9071.1, OPNAVINST 3541.1E, OPNAVINST 3401.3A | | | Survivability Solutions | | | | |
| Habitability | NEHC - N4 | SYSCOM, PMO | OPNAVINST 9640.1A | Shipboard Habitability Design Criteria Manual | | Habitability Solutions | | | | DT/OT |

