FY09 Department of Defense

Human Systems Integration Management Plan

Version 1.0

Office of the Deputy Under Secretary of Defense
(Acquisition and Technology)
and
Office of the Deputy Under Secretary of Defense
(Science and Technology)
Director of Biological Systems

FY09 Department of Defense Human Systems Integration Management Plan

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1.0 INTRODUCTION

1.1 Purpose

The purpose of this document is to provide a comprehensive management plan for Human Systems Integration (HSI) for the Department of Defense (DoD).

1.2 Background

Congress and the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics (OUSD(AT&L)) see the potential for HSI in its ability to enhance overall system effectiveness and lower life cycle ownership costs. A recent report to Congress [Ref: DoD HSI Coverage and ROI Report, 2008] documents many examples where Services have successfully implemented HSI on programs and have realized significant returns on investment (ROIs). However, in general, the DoD has not been successful at implementing HSI as a normal method of doing business even though strong acquisition policy and guidance is in place. As a result, Congress has taken a more forceful position in directing OSD to manage HSI and develop a comprehensive plan for funding and implementing HSI throughout the DoD. For complete details on the Congressional language, refer to Appendix B in this document.

This Congressional language prompted OUSD(AT&L), on April 3, 2008, to issue a memorandum [Young, 2008] (Refer to Appendix C) that stated:

> "The Deputy Under Secretary of Defense for Acquisition and Technology (DUSD(A&T)) is hereby designated as the senior official responsible for the coordination and management of HSI activities throughout the DoD acquisition programs. The Deputy Under Secretary of Defense for Science and Technology (DUSD(S&T)), Director of Biological Systems, is designated co-lead for S&T related matters."

And hence, this memorandum has prompted the establishment of an HSI Management Plan that establishes OSD formal responsibility and accountability for the management of HSI within the DoD.

1.3 Objective

The objective of this plan is to establish formal responsibility, authority, and accountability for Human Systems Integration within the DoD.

This plan encompasses the HSI organizational structure, roles, responsibilities, processes, tasks, metrics, and enabling resources, and formalizes both horizontal and vertical communications between Office of the Secretary of Defense (OSD)

and the Services and agencies. The planning process will be a living process that responds to needs and improved methods of doing business. As a minimum, the HSI management plans will be reviewed and updated on a yearly basis. This plan is not intended to become a tool for micromanagement but a mechanism for good leaders to make the right decisions. Through collaboration and effective coordination, the Department will effectively leverage HSI knowledge and best practices across the agencies, which will result in accelerating the maturity of HSI implementation within the DoD.

The DoD HSI Management Plan structure is shown in Figure 1-1. The OSD HSI Management Plan provides the DoD overarching plan and the respective Services plans, represented as annexes, provide the detailed plans. Combined they reflect the HSI Management approach within the DoD.

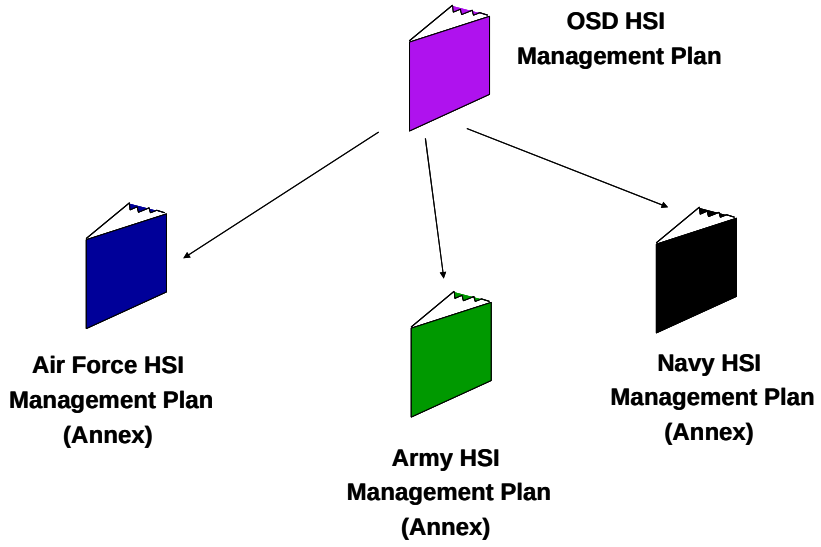


Figure 1-1 DoD HSI Plan Structure

1.4 Scope

The scope of this plan covers HSI management for OSD, the Joint HSI Steering Committee, and the Joint HSI Working Group (JHSIGW). It establishes relationships between the OSD HSI Management Plan and the Services HSI Management Plans.

1.5 Overview of Human Systems Integration

The human and ever increasingly complex defense systems are inextricably linked. Systems, composed of hardware and software, enable the ability of

humans to perform tasks that successfully project combat power in difficult and lethal environments. High levels of human effectiveness are typically required for a system to achieve its desired effectiveness. The synergistic interaction between the human and the system is key to total system effectiveness. Therefore, to realize the full and intended potential that complex systems offer, the Department must apply continuous and rigorous approaches to human-systems integration to ensure that the human capabilities are addressed throughout every aspect of the system life development cycle.

The DoD has embraced Human Systems Integration as a systemic approach. The concept of HSI embraces the total human involvement with the system throughout its life cycle. Furthermore, DoDI 5000.02 Enclosure (8) states that:

> [The goal of HSI is] "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, maintain, and support the system."

In summary, this means that the human in acquisition programs is given equal treatment to hardware and software.

1.5.1 The Elements of HSI

HSI consists of eight elements representing the key aspects and disciplines that address the human involvement (users, maintainers, trainers, system owners) with the system throughout its life cycle. These elements must be synergistically applied in the context of the system, or material solution, under development. DoDI 5000.02 Enclosure (8) stipulates the following:

- "Human Factors Engineering. The PM shall take steps (e.g., contract deliverables and Government/contractor IPT teams) to ensure ergonomics, human factors engineering, and cognitive engineering is employed during systems engineering over the life of the program to provide for effective human-machine interfaces and to meet HSI requirements. Where practicable and cost effective, system designs shall minimize or eliminate system characteristics that require excessive cognitive, physical, or sensory skills; entail extensive training or workload-intensive tasks; result in mission-critical errors; or produce safety or health hazards.

- Personnel. The PM shall work with the personnel community to define the human performance characteristics of the user population based on the system description, projected characteristics of target occupational specialties, and recruitment and retention trends. To the extent possible, systems shall not require *special cognitive*, physical, or sensory skills beyond that found in the specified user population. For those programs that have skill requirements that exceed the knowledge, skills, and abilities of current military occupational specialties, or that require additional skill

indicators or hard-to-fill military occupational specialties, the PM shall consult with personnel communities to identify readiness, personnel tempo, and funding issues that impact program execution.

- Habitability. The PM shall work with habitability representatives to establish requirements for the physical environment (e.g., adequate space and temperature control) and, if appropriate, requirements for personnel services (e.g., medical and mess) and living conditions (e.g., berthing and personal hygiene) for conditions that have a direct impact on meeting or sustaining system performance or that have such an adverse impact on quality of life and morale that recruitment or retention is degraded.

- Manpower. In advance of contracting for operational support services, the PM shall work with the manpower community to determine the most efficient and cost-effective mix of DoD manpower and contract support. The mix of military, DoD civilian, and contract support necessary to operate, maintain, and support (to include providing training) the system shall be determined based on the Manpower Mix Criteria and reported in the Manpower Estimate. Economic analyses used to support workforce mix decisions shall use costing tools that account for fully loaded costs–i.e., all variable and fixed costs, compensation and non-compensation costs, current and deferred benefits, cash and in-kind benefits. Once the Manpower Estimate is approved by the DoD Component manpower authority, it shall serve as the authoritative source for reporting manpower in other program documentation.

- Training. The PM shall work with the training community to develop options for individual, collective, and joint training for operators, maintainers and support personnel, and, where appropriate, base training decisions on training effectiveness evaluations. The PM shall address the major elements of training, and place special emphasis on options that enhance user capabilities, maintain skill proficiencies, and reduce individual and collective training costs. The PM shall develop training system plans to maximize the use of new learning techniques, simulation technology, embedded training and distributed learning (DoD Instruction 1322.26 (Reference (be))), and instrumentation systems that provide “anytime, anyplace” training and reduce the demand on the training establishment. Where possible, the PM shall maximize the use of simulation-supported embedded training, and the training systems shall fully support and mirror the interoperability of the operational system (DoD Directive 1322.18 (Reference (bf))).

- Safety and Occupational Health. The PM shall ensure that appropriate HSI and ESOH efforts are integrated across disciplines and into systems engineering to determine system design characteristics that can minimize the risks of acute or chronic illness, disability, or death or injury to operators and maintainers; and enhance job performance and productivity of the personnel who operate, maintain, or support the system.

- Survivability. For systems with missions that might require exposure to combat threats, the PM shall address personnel survivability issues including protection against fratricide, detection, and instantaneous, cumulative, and residual nuclear, biological, and chemical effects; personnel survivability against asymmetric threats; the integrity of the crew compartment; and provisions for rapid egress

when the system is severely damaged or destroyed. The PM shall address special equipment or gear needed to sustain crew operations in the operational environment, including the suitability of equipment intended to enhance personnel survivability against asymmetric threats."

1.5.2 Role of Systems Engineering and HSI

Many of the defense acquisitions systems today are too complex for a single discipline to define, design, integrate, test and deploy. The successful development of complex systems requires a team of program managers, systems engineers, and specialty engineers that spans the knowledge domains and competencies applied synergistically in all aspects of the system development life cycle. The role of the systems engineer is to orchestrate the involvement of the specialty engineering disciplines to achieve the best possible solution that meets the need. Human Systems Integration is one of those specialty engineering disciplines. HSI is complex in itself, whereby the eight elements (Human Factors Engineering, Personnel, Habitability, Manpower, Training, Safety, Occupational Health, and Survivability) are combined synergistically to address all aspects of the human involvement with the system. To achieve total system effectiveness, HSI must be an integral consideration that balances the interactions between humans, hardware, and software. For further information regarding systems engineering and HSI policy and guidance, refer to DoDI 5000.02, Enclosures 12 and 8, and the Defense Acquisition Guidebook (DAG), Chapter 4 and 6 respectively.

1.5.3 Role of Science and Technology and HSI

While systems engineering is concerned with the effective integration of HSI requirements for a given system, Science and Technology (S&T) is concerned with the Human Systems technology area that enables the human component in the system to be fully accommodated and effective. Innovative technologies that enhance human capabilities must find their way into system solutions early in the acquisition life cycle. Likewise, human science considerations are fundamental to understanding the limits of human capabilities under varying environmental conditions. For example, human performance models can be developed to aid systems engineers in appropriately characterizing human involvement as the system design is stressed under different operationally-relevant conditions that stress the human component. The Human Systems S&T technology area is a key complement to systems engineering when defining, developing, verifying, and validating systems.

Technological superiority is a principal characteristic of the U.S. military advantage. The objective of the DoD Science and Technology (S&T) program is

to develop options for decisive military capabilities based on superior technology. The Office of the Director of Defense Research and Engineering (DDR&E) is responsible for the direction, overall quality, and content of the DoD S&T program; it develops strategies and supporting plans to exploit and develop technology to respond to the needs of the Services and to maintain U.S. technological superiority. DDR&E ensures that DoD technology investments are focused on the highest payoff areas and that related efforts by the Services and defense agencies are complementary. The key "defense technology area" supporting HSI is "human systems".

The Human Systems technology area provides technologies and methods to ensure that the military's most critical resource—its people—are properly selected, trained, and equipped to perform as effectively and as safely as possible. Cost reduction through more efficient use of personnel and equipment is a key secondary goal. The Human Systems technology area has at least four domains that support HSI goals; they include: information display and performance enhancement; design integration and supportability; warrior protection and sustainment; and, personnel performance and training. The domains have some of the following characteristics:

- Information display and performance enhancement technologies support data visualization and situational understanding, aural and visual interface, immersive interface, intelligent aiding and decision support, decision-centered staff process control, supervisory control and teleoperation, and physical aiding.

- Design integration and supportability advances the state of the art in human system design tools, performance requirements estimation, performance metrics, human-system integration, logistics readiness, and sustainment logistics.

- Warrior protection and sustainment technologies provides full-spectrum personal protection; troop sustainment, including rations and field feeding equipment; aircraft escape/crash safety, survival, and rescue; advanced airdrop (both personnel and cargo); and dismounted, mounted, and aircrew warrior systems integration, including warfighter systems analysis.

- Personnel performance and training technologies advance force management and modeling tools, selection and classification approaches, human resource development, simulation-based training, training strategies, and training efficiency.

A key to force lethality, survivability, and unit efficiency is the effective use of human resources. People are the most critical and the most costly component of the military systems. Personnel and related costs have been shown to exceed $70 billion annually, with an additional $20–$30 billion spent on training (ref. 2007 Defense Technology Area Plan, page 39). The Human Systems defense technology area directly contributes to all Joint Staff future warfighting capabilities by optimizing the use of the DoD's most vital resource—its people.

The Human Systems area also addresses the human in an integrated and systematic way; it treats the military system as an integrated "platform" across the breadth of ships, planes, and land vehicles, but having an added focus on human cognition. The Human Systems technology area employs a multidisciplinary approach to the human role in combat operations. Its collective capability to draw on the physical, biological, biomedical, and behavioral sciences plus the engineering discipline is the essential science component of HSI.

Through vigorous application of Human Systems technologies to current and future weapons systems, operational gains can be achieved. These gains include the following: significant reductions (approximately 25 percent) in physical, perceptual, and cognitive workload, which could, in turn, reduce the average crew and command staff size by up to 33 percent; 20 percent or more reduction in the weight of personal equipment; 30 percent weight reduction in improved ballistic protection; doubling of critical decision making accuracy and reliability; 80 percent reduction in fatalities and injuries from aircrew escape; and 50 percent reduction in total life-cycle costs (ref. 2007 Defense Technology Area Plan, page 39).

To maintain technological superiority—a principal characteristic of the U.S. military advantage—the DoD Human Systems area will continue to invent, develop, and harness technology to optimize the practice of HSI.

1.6 Document Revision History

The OSD HSI Management Plan is a living plan. As conditions change and lessons are learned, this plan will be updated and coordinated within OSD. The document revision history will be maintained for the life of this plan.

Table 1-1 Document Revision History

Version	Date	Description	Status
1.0	13 February 2009	Original	Current

1.7 References

Table 1-2 References

Title	Doc. No.	Version	Date
[Young, 2008], OUSD(AT&L) Memorandum for Secretaries of Military Departments Designation of Senor Official to Coordinate and Manage Human Systems Integration (HSI) Activities Throughout the Acquisition Programs of the Department of Defense (DoD)	N/A	N/A	3 April 2008
Duncan Hunter National Defense Authorization Act For Fiscal Year 2009	Report 110-652	N/A	2008
[H5159, HSI SEC 231], Congressional Record – House, SEC 231, Responsibility for Human Systems Integration Activities	H5159		16 May 2007
Defense Acquisition Program Support (DAPS) Methodology	N/A	V 2.0	2008
[5000.02], Department of Defense Instruction	5000.02	N/A	8 December 2008
[DAG], Defense Acquisition Guide			20 December 2004
[JHSIWG Charter, 2007], Charter, Joint Human Systems Integration Working Group		Draft	2007
[DoD HSI Coverage and ROI Report, 2008], Human Systems Integration in DoD Weapons Acquisition Programs: Part III, Program Coverage and Return on Investment	N/A	N/A	March, 2008
2007 Defense Area Technology Plan	N/A	N/A	2007

Note: The listed references can be accessed via https://acc.dau/mil/hsimgmt

2.0 HSI ORGANIZATION ROLES AND RESPONSIBILITIES

2.1 OSD HSI Management Organization Overview

The OSD HSI organization structure is shown below in Figure 2-1. Based on the direction contained in the OUSD(AT&L) memo [Young, 2008], HSI management responsibility in AT&L is a shared responsibility between the Office of the Under Secretary of Defense for Acquisition and Technology (ODUSD(A&T)) for managing execution of HSI in all acquisition programs, and the Director of Biological Systems for Science and Technology-related matters and their relationship to acquisition programs. These AT&L organizations must also work with the Office of the Under Secretary of Defense for Personnel and Readiness (OUSD(P&R)), which has statutory responsibility for HSI policy and guidance.

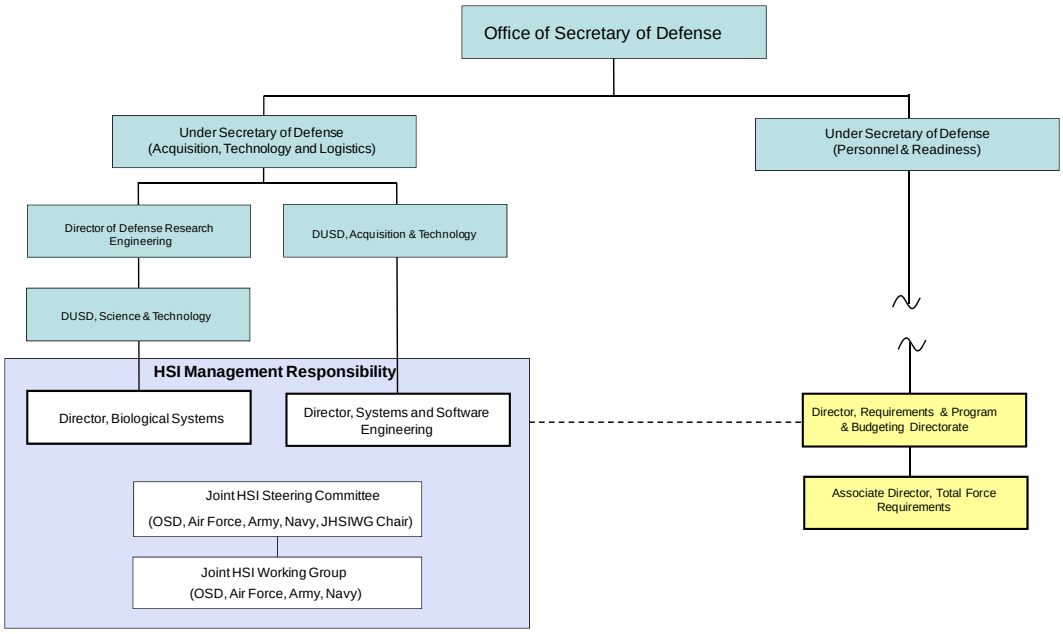


Figure 2-1 OSD HSI Management Organization

Figure 2-2 further defines the relationships and functional responsibilities between OSD, Joint HSI Steering Committee (JHSISC), Joint HSI Working Group (JHSIWG), and Service reporting relationships. One of the objectives of this HSI Management Plan is to formalize vertical and horizontal communications between all HSI organizations. To achieve this, the JHSISC serves as the coordination and communication body between OSD and the Services. The JHSISC is co-chaired by ODUSD(A&T and S&T), with participation from each of the Services HSI senior representatives, OUSD(P&R) and the JHSIWG Chair.

The JHSISC provides the platform to share knowledge and issues and assess the status of achieving joint and organization-specific goals. The JHSIWG is an organization that supports the JHSISC and serves as the joint technical coordination body for all DoD HSI-related matters.

Section 2.2 of this document further describes the respective roles, responsibilities, and relationships within the scope of this plan.

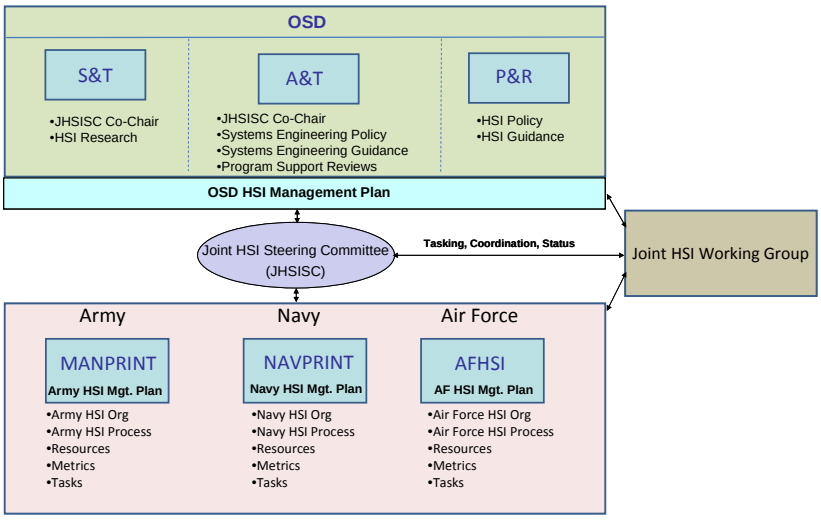


Figure 2-2 OSD Management Plan Relationships

2.2 HSI Description of Organization Roles and Responsibilities

To achieve both horizontal and vertical communications and integration among OSD and the Services, the following OSD organization roles and responsibilities are defined:

2.2.1 Deputy Under Secretary of Defense for Acquisition and Technology

- Responsible to DUSD(A&T) for the management of HSI on acquisition programs within the DoD in a co-leadership role with DUSD(S&T) (Biological Systems).
- DUSD(A&T) has delegated this responsibility to the Director of Systems and Software Engineering (D, SSE).

2.2.2 Director, Systems and Software Engineering (D, SSE)

- Co-chairs the Joint HSI Steering Committee.
- Calls Joint HSI Steering Committee meetings based on need, not to exceed a biannual basis.

- Coordinates with OUSD(P&R), systems engineering acquisition policy and guidance and ensures alignment with HSI policy and guidance.

- As necessary, co-develops Department of Defense Instructions or Directives with the Director, Biological Systems, in coordination with OUSD(P&R) and others, specific to human systems integration activities [H5159, HSI, SEC 231], [Young, 2008].

- In coordination with the Director, (S&T) Biological Systems, identifies and recommends, as appropriate, Department resource requirements for human systems integration [H5159, HSI, SEC 231], [Young, 2008].

- In coordination with the Director, (S&T) Biological Systems, supervises the planning, management, and coordination of HSI activities [H5159, HSI, SEC 231], [Young, 2008].

- Reviews Services and agencies HSI Management Plans and assesses progress against plans.

- Coordinates inter-OSD HSI-related initiatives that strengthen HSI integration within DoD acquisition.

- Plans Program Support Reviews (PSRs) in accordance with DoDI 5000.02 paragraph 9 (f), and reports HSI findings to the JHSISC.

- In coordination with the Director, (S&T) Biological Systems, review and approve changes to the HSI Management Plan.

- In coordination with the Director, (S&T) Biological Systems, review the JHSIWG Action Plan.

- Develops the HSI Management Plan in coordination with DUSD (Biological Systems) and Services HSI leads.

- Directs the JHSIWG in accordance with the JHSIWG charter.

- Reports to the DUSD(A&T), in coordination with Director, (S&T) Biological Systems, on HSI status and progress against plans.

2.2.3 Director, (S&T) Biological Systems

- Responsible to OUSD(AT&L) for the management of HSI on DoD acquisition programs, as related to Science and Technology.

- Co-Chairs the Joint HSI Steering Committee.

- As necessary, co-develops Department of Defense Instructions or Directives with D, SSE in coordination with OUSD (P&R) and others, specific to human systems integration DoD acquisition activities [H5159, HSI, SEC 231], [Young, 2008].

- In coordination with Director, Systems and Software Engineering, identifies and recommends, as appropriate, Department resource requirements for human systems integration [H5159, HSI, SEC 231], [Young, 2008].

- In coordination with Director, Systems and Software Engineering, supervises the planning, management, and coordination of HSI activities [H5159, HSI, SEC 231], [Young, 2008].

- In coordination with the Director, Systems and Software Engineering, reviews and approves changes to the HSI Management Plan.

- In coordination with the Director, Systems and Software Engineering, reviews and approves the JHSIWG Action Plan.

- Contributes to the Joint HSI Steering Committee on S&T-related tasks and progress against plans.

- Coordinates Science and Technology input to the HSI Steering Committee from Services.

- Chairs the Human Factors Engineering Technical Advisory Group (HFE-TAG) as an external Science and Technology advisory group.

- Reports to the DUSD(A&T), in coordination with Director, Systems and Software Engineering, on HSI status and progress against plans.

2.2.4 OUSD Personnel and Readiness

- Participates in the Joint HSI Steering Committee.

- Develops and maintains HSI policy and guidance and ensures alignment with systems engineering policy and guidance.

- Participates and contributes to the Joint HSI Working Group.

2.3 Committees and Working Groups

2.3.1 Joint HSI Steering Committee

- The Joint HSI Steering Committee is to provide a forum for executive-level collaboration on HSI activities regarding the management of HSI throughout DoD acquisition programs.

- The Joint HSI Steering Committee shall be co-chaired by the Director, Systems and Software Engineering, and the Director, Biological Systems. The co-chairs shall:

- Develop the meeting agenda.

- Call meetings on as needed basis, but not to exceed a biannual basis.

- Review HSI planning accomplishments and progress against plans.
- Direct or consult with the JHSIWG on key task areas that needed addressing.

The Joint HSI Steering Committee shall consist of:

- D, SSE: Co-Chair
- Director, Biological Systems: Co-Chair.
- Senior executive from OUSD(P&R).
- Army MANPRINT senior representative.
- Navy HSI senior representative.
- Air Force Air Force HSI senior representative.
- JHSIWG Chair.

2.1.1 2.3.2 Joint HSI Working Group

The JHSIWG was established in 2005 to bring together the Services with the objective of sharing knowledge and expertise and to address cross-cutting HSI issues in a joint collaborative manor. The JHSIWG serves as an integral part of the HSI management structure, represents expertise from all DoD organizations (OSD, Air Force, Navy, and Army), and is an excellent collaborative entity to enable integration in the DoD. The JHSIWG will:

- Adhere to the JHSIWG Charter [JHSIWG Charter, 2007] (as currently defined). If there is conflict between this plan and the charter, the issue should be raised and resolved at the JHSISC.
- JHSIWG Chair attend JHSISC meetings and provide advice as needed.
- Submit a JHSIWG Action Plan that delineates all JHFY09 JHSIWG tasks and resources, 60 days after the approval of the OSD HSI Management Plan. The JHSIWG Action Plan shall address, at a minimum, the tasks identified in Appendix A.
- Report progress against the approved JHSIWG Action Plan to the JHSISC.
- Suggest tasks based on needs and issues to be addressed to the JHSISC and amend the JHSIWG Action Plan accordingly.

3.0 LIFE CYCLE PROCESSES AND HSI

The objective of Human Systems Integration is to appropriately integrate the human into the system design to optimize total system effectiveness. To accomplish this, all aspects of human interaction with the system must be understood to the highest degree possible to optimize the system and human capabilities. For each program or system, different emphasis is placed on the human interaction depending on the type of system and its mission and environment. To accomplish the complex task of integrating the human into the system development process, OSD has adapted ISO 15288 and associated 16 technical management and technical processes for engineering systems. These processes provide the overarching process definition that incorporates all technical and management tasks for defining, designing, implementing, integrating, verifying, and validating a system. These 16 processes are described in detail within the systems engineering section of DAG Chapter 4. Figure 3-1 shows the respective 16 processes, and Figure 3-2 provides a notional flow of effort related to the technical processes over the system development life cycle. Figure 3-2 illustrates that the processes are continuous, and it is implied that they interact with one another to accomplish the objective of engineering a system.

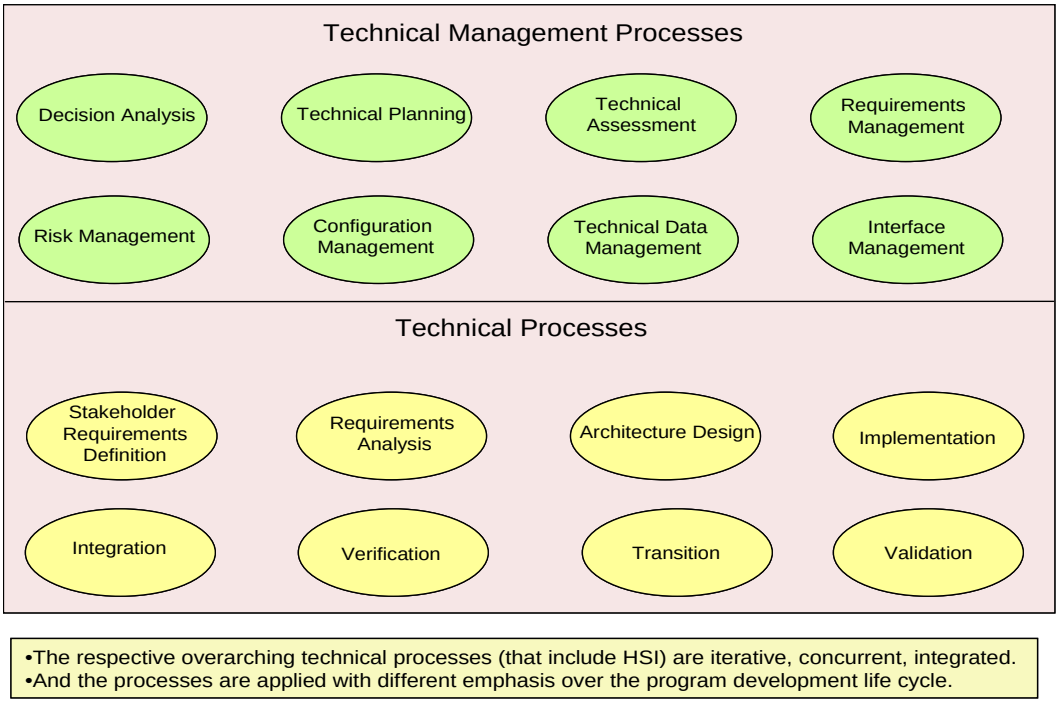
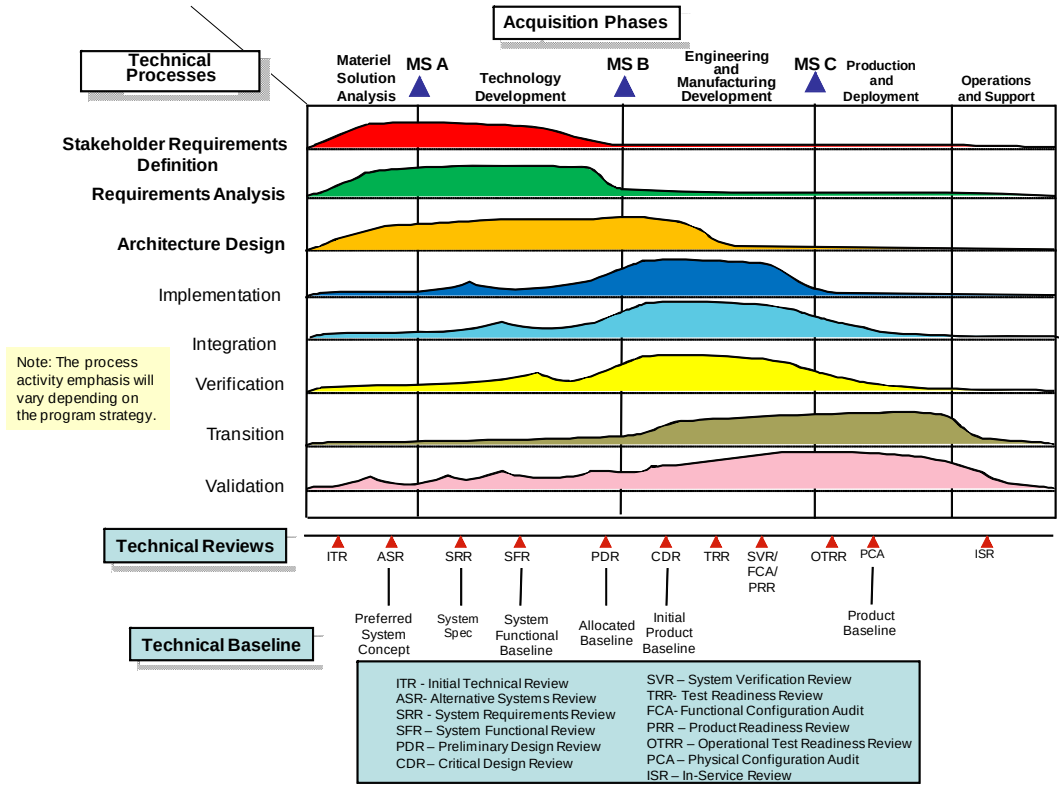


Figure 3-1 Life Cycle Processes for Engineering Systems



Source: DAG Chapter 4

Figure 3-2 Notional View of Technical Life Cycle Process on a Program

HSI activities reside within the context of these 16 life cycle processes for engineering a system. DAG Chapter 4 incorporates HSI as a design consideration, where a design consideration is one facet of the overall development effort that must be balanced against other design considerations and with the overall system function, performance, and constraint requirements. The key to success of HSI is to effectively integrate and balance HSI requirements along with all the design considerations to achieve the best possible design. The intent of these 16 life cycle processes is to accommodate all system requirements.

For detailed guidance on HSI and its role within the 16 life cycle processes, refer to DAG Chapter 6, which defines specifically the activities performed within the HSI domain.

4.0 OSD HSI ACQUISITION MANAGEMENT SYSTEM INTEGRATION

Section 3 of this document established the life cycle processes for engineering a system with references to DAG Chapter 4 for Systems Engineering and DAG Chapter 6 for HSI. In the acquisition of systems, DoDI 5000.02 establishes acquisition policy that defines the statutory and regulatory requirements for all DoD system acquisitions. While HSI should be considered when any technology decisions are being made, policy requires that it must be explicitly addressed in key acquisition documents that specifically call for HSI. These documents are multifaceted in that they span technology, economics, threats, manpower, and the effectiveness of the system. The documents listed in Table 3 are an extract from DoDI 5000.02 Enclosure (4), which contains both statutory and regulatory acquisition documents that either specifically call out HSI or indicate that HSI should be a key consideration within a given document. The DAG provides supporting guidance on how to develop the information that these key acquisition documents require. Table 3 is evidence of how HSI has been integrated into the acquisition management system, which is further implemented and refined within the respective Services and agencies.

Table 4-1 Statutory and Regulatory Requirements That Include HSI Applicable to MDAPs and MAI Acquisition Programs

Key Acquisition Document	S/R*	When required	HSI Involvement
Analysis of Alternatives (AoA)	S	ACAT 1 and regulatory for all others. Program initiation for Ships and MS A/B/C (Updated as necessary)	Calls for manpower impacts and trade space alternatives
Initial Capabilities Document (ICD)	R	Materiel Development Decision MS A MS B MS C (if Program Initiation)	CJCSI3170.1 JCIDS policy calls for HSI to be addressed in the capabilities definition process.
Capabilities Definition Document (CDD)	R	Program Initiation for Ships MS B	CJCSI3170.1 JCIDS policy calls for HSI to be addressed in the capabilities definition process.

Key Acquisition Document	S/R*	When required	HSI Involvement
Acquisition Strategy	R	Program Initiation for Ships MS B MS C Full-Rate Production DR (or Full Deployment DR)	Specifically calls for a technical and management approach at meeting HSI requirements.
Manpower Estimate	S	Program Initiation for Ships MS B MS C Full-Rate Production DR	One of the eight elements of HSI and informs the MDA.
Technology Development Strategy (TDS)	S (ACT I) R (ACT II and below)	MS A	The role of HSI should influence the competitive prototyping strategy to validate and refine requirements and guide systems engineering planning efforts.
Systems Engineering Plan (SEP)	R	MS A MS B MS C	Policy requires HSI to be included in systems engineering technical planning.
Test and Evaluation Master Plan (TEMP)	R	MS B MS C (update, if necessary) Full-Rate Production DR (or Full Deployment DR)	Used to verify that HSI requirements are implemented satisfactorily.

*Note: S –Statutory, R- Regulatory

4.1 OSD HSI Human Capital Development

OSD needs to enhance its in-house HSI capabilities through competency development, knowledge management, education, training, and possible hiring of expertise. Human Capital Initiative (HCI) is a key vehicle that will enable HSI executive leadership to strengthen HSI capabilities and will be a key task undertaken within the scope of this plan.

4.2 OSD HSI FY09 Key Tasks and Schedule

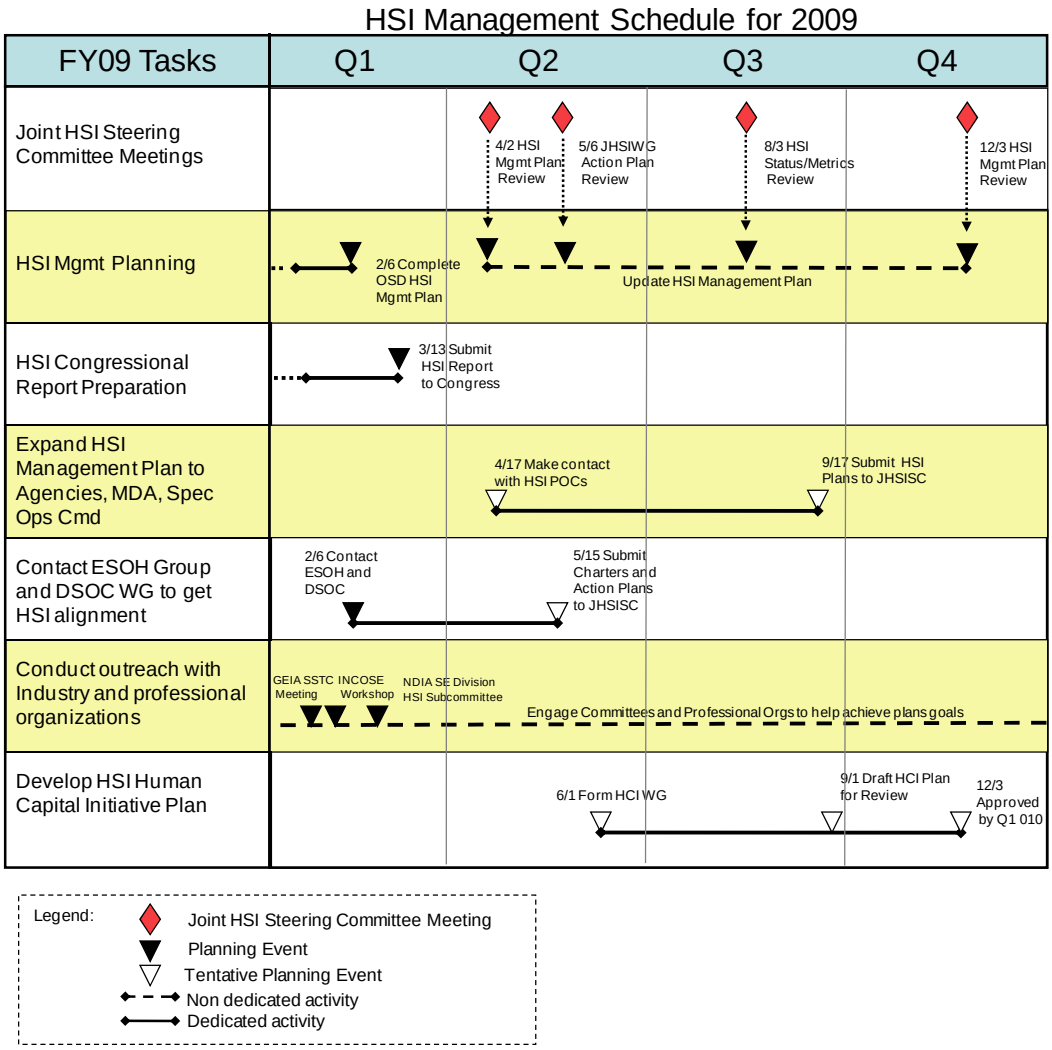
4.1.1 4.2.1 HSI FY09 Tasks

The following tasks are to be performed within OSD to fulfill the goals and intent of this plan:

- Expand Joint HSI Steering Committee involvement beyond the Services to include:
  - Assistant Secretary of Defense (ASD) Networks and Information and Integration.
  - Under Secretary of Defense (USD) Intelligence Agencies
  - Missile Defense Agency.
  - Special Operations Command.
- OUSD(AT&L) will contact current organizations and working groups that fall under the HSI domain and gain alignment in charters and tasking:
  - Environment, Safety, Occupational Health (ESOH).
  - Defense Safety Oversight Council (DSOC).
- D, SSE will forge relationships with industry associations and professional societies to strengthen DoD Systems Engineering and HSI capabilities: The following associations and professional societies have been identified:
  - National Defense Industrial Association (NDIA): Establish HSI Subcommittee within Systems Engineering Division.
  - Government Electronics Industrial Association (GEIA): Establish relationship and address HSI standards needs.
  - International Council on Systems Engineering (INCOSE).
- Develop a Human Capital Initiative plan for HSI for OSD.

4.1.2 OSD FY09 Schedule

Figure 6-1 defines the schedule for OSD HSI FY09 key tasks described in Section 6.1 The accomplishment and status of these tasks will be communicated to the communicated to the JHSISC. The Services and agencies will also communicate



their task status and progress against plans.

Figure 4-1 OSD HSI FY09 Management Schedule

5.0 OSD HSI RESOURCE REQUIREMENTS

One Full-Time Equivalent (FTE) Systems Engineer with HSI background: This systems engineer will support Director, Systems and Software Engineering and Director, (S&T) Biological Systems in the execution of this plan.

6.0 OSD HSI MATURITY AND EFFECTIVENESS METRICS

The purpose of the HSI metrics is to determine the state of HSI maturity and effectiveness going forward. The goal is to have one set of HSI metrics that the Department can use to report the maturity and effectiveness of HSI on programs. Currently these metrics have not been defined. A task has been identified to develop such metrics, which will be part of the JHSIWG Action Plan.

7.0 OSD HSI ASSESSMENT PROCESS

OSD performs Program Support Reviews (PSRs) to inform the Milestone Decision Authority (MDA) prior to major milestone reviews on ACAT ID and ACAT IAM programs. For a description of acquisition program designation and decision authority, refer to DoDI 5000.02 Table 1.

PSRs are directed by the D, SSE to support the Overarching Integrated Product Teams (OIPT), or by OUSD(AT&L) when requested by the program manager (PM) [Ref: 5000.02]. Each PSR is staffed by OSD and conducts the PSR in accordance with the Defense Acquisition Program Support (DAPS) Methodology. This DAPS methodology contains detailed questions that cover the full scope of current policy and guidance, which includes HSI, and the selected programs are evaluated against the DAPS. Both positive and negative findings are collected and captured in the Systemic Analysis Database (SADB) from which post-analysis is conducted to determine system, including HSI, root causes of problems.

Furthermore, OSD reviews all Systems Engineering Plans (SEPs) and Test and Evaluation Plans (TEMPs) for compliance with the policy. The SEP will provide insight for technical planning, which is required by policy to include HSI. The TEMP should contain insight on the involvement of the human aspect of the system and its role in total system effectiveness. SEP and TEMP findings are documented and also serve as a source of information for the JHSISC.

8.0 DOD HSI INFORMATION WEB PORTAL

To facilitate knowledge sharing and information exchange across the DoD HSI community, a Defense Acquisition University (DAU) Acquisition Community Connect (ACC) Web portal, as shown in Figure 10-1, has been established that posts all DoD HSI management-relevant information. As an overview, this site contains HSI Management Plans for the OSD, Services, and agencies, and the JHSISC and JHSIWG meeting artifacts. This site is currently restricted to members of the DoD HSI community. For access to this Web portal, please contact Stuart Booth at stuart.booth.ctr@osd.mil. The site location is https://acc.dau.mil/hsimgmt.

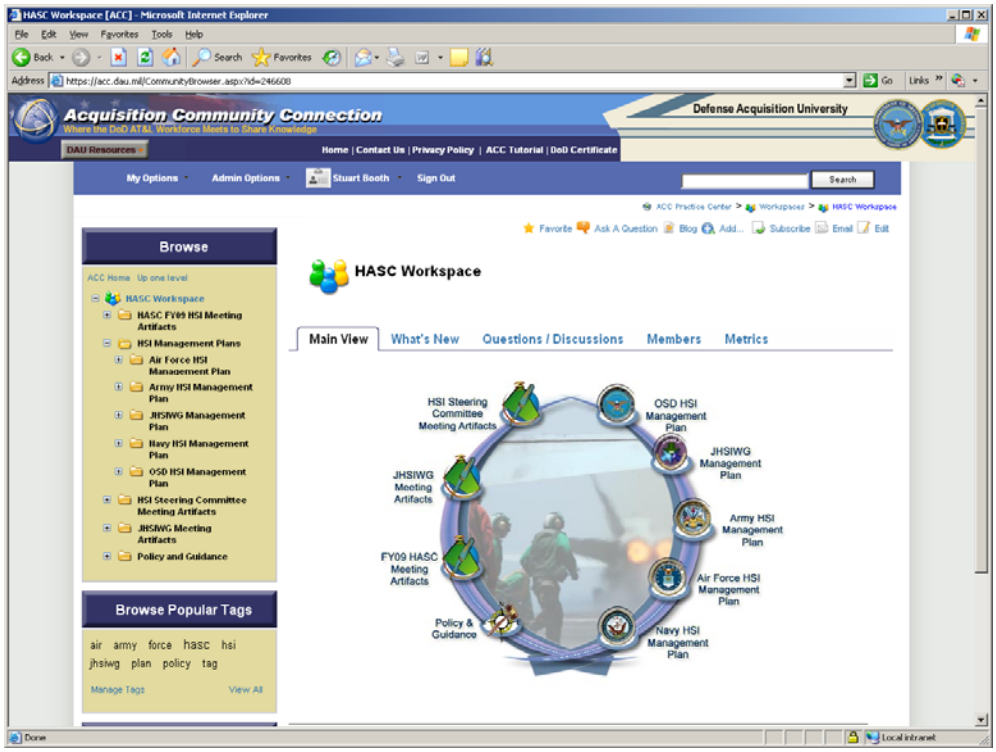


Figure 8-1 HSI Management Web Portal

9.0 SERVICES AND AGENCIES SUPPORTING HSI PLANS

The supporting Services and agencies supporting plans are posted on the DAU ACC Web site. See Section 8 for Web site location.

APPENDIX A: DOD HSI TASK AREAS

The following table delineates the key task areas deemed important by the JHSISC to enhance HSI maturity and effectiveness on programs.

Table A-1 DoD HSI Task Areas

Task Area	Recommendation(s)	Comment(s)
Process and Planning	Continue Systems Engineering as the integrating process for HSI within the Acquisition Process. Note: There was no issue with respect to this recommendation; however, it needs to be reinforced when considering the solutions to other recommendations.	There is a broad consensus that proposed DoDI 5000.02 policies and Defense Acquisition Guidebook (DAG) guidance is sufficient to support the implementation of HSI.
Terminology and Definitions	Develop a joint definition for Human Systems Integration.	A common definition of HSI within the DoD does not exist. A common definition will facilitate common understanding and articulation of HSI.
Education and Training	Develop an education and training plan to strengthen education and training for all roles that involve HSI (e.g., program managers, systems engineers, test engineers, HSI professionals). The plan should identify the appropriate set of competencies and learning methods required by the respective program roles to effectively define and execute HSI within an overall program plan.	There is a shortage of HSI-trained professionals from all related disciplines who can effectively define and implement HSI.
HSI Staffing	Consider the establishment of dedicated HSI professionals on programs similar to the other established roles such as systems engineering and program management.	Due to the breadth and depth of the HSI discipline, there is a strong viewpoint that dedicated HSI professionals are needed to effectively establish the HSI competency on programs.
HSI Maturity and Effectiveness Metrics	Develop metrics to quantify HSI maturity on programs.	Developing meaningful metrics will aid in evaluating HSI maturity on programs.
Knowledge Management	Define and implement an HSI knowledge management plan that will enable the sharing of knowledge capital across the DoD and government agencies.	There is a need to share knowledge and best practices and collaborate across the DoD on HSI. This will enable the fluency of HSI practices across the DoD and

Task Area	Recommendation(s)	Comment(s)
		government agencies.
Acquisition Guidance/Policy for HSI Contracting	Strengthen contract language to enable effective contractor implementation of HSI.	Establish strong contract language to enforce contractor implementation of HSI.
Requirements	1. Consider HSI requirements at the key performance parameter/key system attribute (KPP/KSA) level that affect overall system performance and enable early trade-studies such as the Analysis of Alternatives (AoA). 2. Provide guidance for addressing HSI in the JCIDS process.	Drive HSI requirements into the process starting at the Joint Capabilities Integration and Development System (JCIDS) level.
Tools and Technology	Define a tool and technology support plan that considers the following: 1. Consider working with ISO Standard for Exchange of Product model data (STEP 10303) Product Life Cycle Management community to establish the appropriate data model for data exchange between HSI, requirements management, system engineering, and architecture tools. 2. Consider the addition of Human Views as part of the overall compliment of Department of Defense Architecture Framework (DoDAF) views. 3. Define a streamlined tool or set of tools that enables HSI on programs and can be leveraged across the DoD (e.g., IMPRINT). 4. Provide training and support for tools on programs.	Tools are an enabler of HSI methods and processes. Some tools are in the form of checklists and procedures. Others are software based, which apply modeling and simulation.
Communications	Develop a communications plan to heighten the awareness of HSI within the DoD. For example, consider documenting success stories and case studies that promote the value of HSI.	Heightening the awareness and value of HSI is a key challenge on programs.
Standards	Develop a strategy that will strengthen standards support for HSI.	Strong standards support for HSI currently does not exist. A strong HSI standard will facilitate common methods and practices in applying HSI within the DoD and industry.

APPENDIX B: NDAA 2009 CONGRESSIONAL LANGUAGE

Reference: Duncan Hunter National Defense Authorization Act for Fiscal Year 2009, Report 110-652.

The National Defense Authorization Act for Fiscal Year 2008 (Public Law 110-181) contains a provision requiring the Department of Defense (DOD) to establish a single office to coordinate the planning, management, and expectation of human systems integration (HSI) activities throughout all DOD acquisition programs. The provision also requires the Department to identify and recommend resource requirements for all HSI activities.

The committee continues to support HSI as an affordability initiative for reducing overall life cycle costs of weapon systems and improving training regimes of military personnel. As noted in the committee report (H. Rept. 106-616) accompanying the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001, significant savings in defense systems ownership costs are possible with wisely targeted science and technology investments. The committee views HSI as an integral part of this approach, continues to support these affordability efforts, and urges the Department to commit further to HSI activities.

The committee directs the Under Secretary of Defense for Acquisition, Technology and Logistics to develop a comprehensive plan for funding and implementing HSI through all phases of science, research, and acquisition. This plan shall include the development of policy, requirements, and recommendations on methods for incorporating HSI concerns throughout all phases of systems acquisition. The committee also expects the plan to include a specific method for determining and tracking the implementation of HSI activities to ensure adherence with stated Department goals and policy objectives. The committee directs the Under Secretary of Defense for Acquisition, Technology and Logistics to submit the report by March 15, 2009 to the congressional defense committees.

APPENDIX C: OUSD(AT&L) HSI MEMORANDUM

ACQUISITION, TECHNOLOGY AND LOGISTICS

THE UNDER SECRETARY OF DEFENSE

3010 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010

April 03, 2008

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
UNDER SECRETARIES OF DEFENSE
ASSISTANT SECRETARIES OF DEFENSE
GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE
DIRECTOR, OPERATIONAL TEST AND EVALUATION
INSPECTOR GENERAL OF THE DEPARTMENT OF DEFENSE
ASSISTANTS TO THE SECRETARY OF DEFENSE
DIRECTOR, ADMINISTRATION AND MANAGEMENT
DIRECTOR, PROGRAM ANALYSIS AND EVALUATION
DIRECTOR, NET ASSESSMENT
DIRECTORS OF THE DEFENSE AGENCIES
DIRECTORS OF THE DOD FIELD ACTIVITIES

SUBJECT: Designation of Senior Official to Coordinate and Manage Human Systems Integration (HSI) Activities Throughout the Acquisition Programs of the Department of Defense (DoD)

Section 231 of the National Defense Authorization Act for FY 2008 requires the designation of a senior official to carry out the Secretary of Defense responsibility, acting through the Under Secretary of Defense for Acquisition, Technology and Logistics, to coordinate and manage HSI activities throughout the DoD acquisition programs.

The Deputy Under Secretary of Defense for Acquisition and Technology (DUSD(A&T)) is hereby designated as the senior official responsible for the coordination and management of HSI activities throughout the DoD acquisition programs. The Deputy Under Secretary of Defense for Science and Technology (DUSD(S&T)), Director of Biological Systems, is designated as the co-lead for S&T related matters. The DUSD(A&T) and DUSD(S&T), Director, Biological Systems, are jointly responsible for: coordinating the planning, management, and execution of HSI activities; and identifying and recommending, as appropriate, resource requirements for HSI activities.

In this capacity, these officials will work in close collaboration with the Under Secretary of Defense for Personnel and Readiness, who maintains statutory responsibility as the DoD focal point for manpower, personnel and training policy, including HSI policy.

John J. Young, Jr.

ACRONYMS

A&T	Acquisition and Technology
ACAT	Acquisition Category
ACC	Acquisition Community Connection
AoA	Analysis of Alternatives
ASD	Assistant Secretary of Defense
CDD	Capabilities Definition Document
DAB	Defense Acquisition Board
DAG	Defense Acquisition Guidebook
DAPS	Defense Acquisition Program Support Methodology
DDR&E	Director of Defense Research and Engineering
DoD	Department of Defense
DoDAF	Department of Defense Architecture Framework
DUSD	Deputy Under Secretary of Defense
DSOC	Defense Safety Oversight Committee
ESOH	Environment, Safety, and Occupational Health
FTE	Full-Time Equivalent
GEIA	Government Electronics and Information Technology Association
JCIDS	Joint Capabilities Integration and Development System
JHSISC	Joint Human Systems Integration Steering Committee
JHSIWG	Joint Human Systems Integration Working Group
HCI	Human Capital Initiative
HFE-TAG	Human Factors Engineering Technical Advisory Group
HSI	Human Systems Integration
ICD	Initial Capabilities Document
INCOSE	International Council on Systems Engineering
ISO	International Organization for Standardization
KPP	Key Performance Parameter

KSA	Key System Attribute
MS	Milestone
MAIS	Major Automated Information System
MDA	Milestone Decision Authority
MDAP	Major Defense Acquisition Program
NDIA	National Defense Industrial Association
OSD	Office of the Secretary of Defense
OUSD(AT&L)	Office of the Under Secretary of Defense for Acquisition, Technology
OIPT	Overarching Integrated Product Teams
OT&E	Operational Test and Evaluation
P&R	Personnel and Readiness
PM	Program Manager
PSR	Program Support Review
ROI	Return on Investment
SADB	Systemic Analysis Data Base
SEP	Systems Engineering Plan
SSE	Systems and Software Engineering
SSE/AS	Systems and Software Engineering/Assessment and Support
TDS	Technology Development Strategy
TES	Test and Evaluation Strategy
TEMP	Test and Evaluation Master Plan
S&T	Science and Technology
USD	Under Secretary of Defense