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OPNAV INSTRUCTION 5310.23

From: Chief of Naval Operations

Subj: NAVY PERSONNEL HUMAN SYSTEMS INTEGRATION (NAVPRINT)

Ref: (a) SECNAVINST 5000.2D
(b) Manual for the Operation of the Joint Capabilities Integration and Development System of 31 July 2009
(c) GAO Report Number 03-520S
(d) SECNAVINST 5223.2
(e) SECNAV Manual 5210.1 of November 2007

Encl: (1) Human Systems Integration in the Initial Capabilities Document and Analysis of Alternatives
(2) Human Systems Integration in the Capability Development Document/Capability Production Document
(3) Additional HSI Related Resources
(4) Acronym Glossary

1. Purpose. This instruction addresses the development of requirements for Human Systems Integration (HSI) within the Joint Capabilities Integration and Development System (JCIDS). Additionally, this instruction defines the process through which Deputy Chief of Naval Operation (Deputy CNO) (Manpower, Personnel, Training, and Education) (CNO (N1)) exercises Navy HSI governance authority.

2. Scope. This instruction applies to resource sponsors/requirements managers who draft capability documents containing Navy equities, and to organizations that provide inputs for capabilities documents containing Navy equities. These requirements apply to all acquisition programs, subject to reference (a).

3. Background

a. HSI is the application of systems engineering techniques to integrate the domains of manpower, personnel, training, human factors engineering, environmental safety and occupational

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health, habitability and personnel survivability into the materiel life-cycle. These domains collectively define how the human components of the system impact a system's capability or performance, (e.g., mission performance, safety, supportability, and cost). The HSI domains also identify how the system impacts the human aspects of the system, (e.g., the trade-offs, skill gaps and training requirements, workload and manning levels, and operator/maintainer characteristics such as body size and strength). The human components of the system include the whole range of system stakeholders, that is, the system, supporters, trainers, operators, and maintainers.

b. The Joint Chiefs of Staff, through reference (b), describe the documentation of a "capabilities based" approach to solving the validated gaps in execution of our national military strategy.

c. In a directed Congressional report, the Government Accountability Office (GAO), through reference (c), reported that the Navy's varied approach to applying HSI has occurred partly because Navy guidance allows program managers (PMs) considerable discretion in determining the extent to which they apply HSI principles in developing new systems. The GAO reported that in the absence of a clear requirement that HSI be a key feature of all future acquisition programs, efforts to optimize crew size will continue to vary due to the competing pressures placed on PMs. The GAO speculated that the Navy is likely to continue to miss opportunities to reduce personnel requirements for future ships.

d. The GAO report recommended the development and implementation of mandatory policies on HSI requirements, standards and milestones. Specifically, for each system the Navy plans to acquire, the Secretary of the Navy (SECNAV) should require that:

(1) HSI assessment is performed as concepts for the system are developed and alternate concepts are evaluated.

(2) HSI analyses, including trade-off studies of design alternatives, are to be used to establish an optimized crew size goal that will become a key performance parameter (KPP) in the program requirements document.

(3) HSI assessments are updated prior to all subsequent milestones.

e. The SECNAV, through reference (a), delegated CNO (N1) as the single governance authority for HSI policy.

4. HSI Policy

a. The implementation of HSI policy is critical to the Navy's ability to improve systems' performance and reduce total ownership costs (TOC). Implementation begins early in the acquisition process during the capabilities-based assessment (CBA) leading to an initial capabilities document (ICD), materiel development decision, and possibly to an analysis of alternatives (AoA). Program resource sponsors must ensure the analysis necessary to maximize the use of technology in reducing manpower, personnel, and training (MPT) requirements and TOC are included in this process. The enclosures provided are to assist resource sponsors/requirements managers in developing capabilities documents. The early-on requirements determination, resource estimates, and trade-off decisions shall be documented in the AoA.

b. HSI requirements and human performance are key considerations in affordability determinations. Shortfalls and alternative options shall be identified as early as possible in the capabilities development process.

c. The ICD identifies capability gaps in joint warfighting functions, as described in the applicable Family of Joint Future Concepts or Concept of Operations (CONOPS). When appropriate, HSI relevant attributes will be identified in the ICD, as described in enclosure (1).

d. The capabilities development document (CDD) and capabilities production document (CPD) identify capabilities required for the system to perform the mission CONOPS. Where applicable, the CDD/CPD will address HSI, as described in enclosure (2).

e. CNO (N1), in conjunction with the Naval Systems Commands (SYSCOMs) (e.g., Naval Sea Systems Command (NAVSEA), Naval Air

Systems Command (NAVAIR), Space and Naval Warfare Systems Command, and Naval Supply Systems Command), developed an HSI integrated architecture including two volumes of HSI guides, as well as a Web-enabled referential database for storing and developing HSI related requirements data, named Human Analysis Requirements Planning System (HARPS). These planning tools can be used to ensure detailed HSI requirements are translated into execution planning documents. HARPS has the ability to manipulate and display requirements data from program office acquisition programs reviews and technical authority certifications to be used for executive oversight as well as baseline comparison. Additional guidance can be found in enclosure (3). Acronyms can be found in enclosure (4).

5. HSI Governance

a. Per reference (a), and as delegated by CNO (N1), Director, Training and Education Division (OPNAV (N15)) serves as the Navy's HSI and human performance advocate, and the Navy's single governance authority for HSI policy.

b. Synchronization between Office of the Chief of Naval Operations (OPNAV) resource sponsors and SECNAV program offices is the key to successful planning and execution of HSI. CNO (N1) will endorse HSI requirements via the ForceNET Consolidated Compliance Checklist (FCCC).

6. Roles and Responsibilities

a. CNO (N1) shall:

(1) Provide resource sponsors with AoA planning data on cost of HSI based on similar scope studies performed on baseline comparison systems.

(2) Endorse HSI requirements in JCIDS documents via the FCCC.

(3) Program and budget funding for research, development, testing and evaluation (RDT&E), and science and technology (S&T) for MPT domains of HSI in coordination with the Office of Naval Research and Executive Future Navy Capability Technical Oversight Group.

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(4) Serve as the Navy's lead HSI advocate through the following roles and responsibilities:

(a) Represent Navy HSI service policy with Department of Defense (DoD), government agencies, and international programs.

(b) Develop HSI policy in coordination with HSI stakeholder organizations. Enclosure (3) provides instructions, standards, and guides for each domain.

(c) Develop MPT priorities and provide guidance to resource sponsors, program executive offices (PEOs), and PMs on processes.

(d) Conduct biennial review of Naval Post Graduate School HSI program for military personnel. Approve and resource education skill requirements (ESR), core skill requirements (CSR), curriculum, program of record, subspecialty ratings, and education and training quotas for OPNAV HSI education. Validate all HSI billets during zero-based review process using the ESR/CSR.

(5) Validate and program manpower requirements in new/modified manpower estimates for enterprise manpower affordability, excluding the programming of training requirements for new weapon system acquisition and engineering change(s) provided by the warfare sponsors.

(6) Validate program training requirements in Navy Training Systems Plans based on affordability, excluding training requirements for new weapon system acquisition and engineering change(s) provided by warfare sponsor.

(7) Assess HSI risk and recommend balanced solutions for Navy acquisition programs based on a risk assessment conducted by PMs.

b. Deputy CNO (Fleet Readiness and Logistics) (CNO (N4)), Deputy CNO (Information Dominance) (CNO (N2/N6)), Deputy CNO (Integration of Capabilities and Resources) (CNO (N8)), Special

Assistant for Safety Matters (OPNAV (N09F)), and Director of Test and Evaluation and Technology Requirements (OPNAV (N091)) (as specified below) shall:

(1) Ensure HSI requirements are adequately resourced.

(2) Ensure appropriate operational test and evaluation required to assess effectiveness and suitability of HSI attributes.

c. Resource sponsors, in collaboration with acquisition community stakeholders, will execute HSI processes, procedures, and requirements in accordance with references (a) and (b). Additionally, resource sponsors and acquisition community stakeholders will collaborate and coordinate to provide CNO (N1) concurrence review of trade off decisions affecting each domain at the appropriate gated review and address HSI as outlined in enclosures (1) and (2).

d. SYSCOMs will:

(1) Support PMs and CNO (N1) in the documentation of HSI technical requirements to ensure adequate resource sponsorship and technical authority assessment.

(2) Ensure the cost organization documents HSI cost elements in accordance with reference (d).

(3) Identify emerging HSI RDT&E and S&T requirements for submission to appropriate resource sponsors. Coordinate RDT&E and S&T requirements with Office of Naval Research and CNO (N1).

(4) Serve as OPNAV advisor for human factors engineering, safety, occupational health, personnel survivability, and habitability domains in capabilities documents.

(5) Provide periodic updates to resource sponsors, PEOs, PMs, on processes, standards, S&T, and RDT&E efforts.

7. Records Management. Records created as a result of this instruction, regardless of media and format, shall be managed in accordance with reference (e).

8. Administration. CNO (N1) has the authority, within the scope of this instruction to modify technical guidance to achieve the objectives of the instruction.



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HUMAN SYSTEMS INTEGRATION IN THE
INITIAL CAPABILITIES DEVELOPMENT DOCUMENT AND
ANALYSIS OF ALTERNATIVES

1. Purpose. References (a) and (b) provide guidance on the development of ICDs, CDDs, and CPDs. A Doctrine, Organization, Training, Materiel, Leadership, Personnel and Facilities (DOTMLPF) analysis that includes HSI considerations is part of this process.

a. Upon CNO (N8) approval, the CBA must account for both the current and projected manpower and personnel characteristics of the Navy. These analyses account for manned and unmanned systems, identify operational or environmental condition gaps between existing systems, and if necessary, develop a DOTMLPF change request that may impact the performance of the operators, maintainers, and support personnel of future platforms and systems.

b. The AoA results will help identify and define HSI requirements. Additionally, the AoA provides the general framework for the performance parameters of the CDD and CPD. HSI practitioner(s) who can develop human attributes during the AoA should be part of each Navy AoA Integrated Product Team. Where feasible, the AoA scope and tasking directive should identify these HSI practitioners. The AoA must provide information to guide the acquisition of future systems and platforms, as well as provide information to guide the development of future manpower and personnel characteristics.

2. Scope and Content of Analyses. CNO (N1) requires HSI data for new and modified systems acquisitions. To that end, the following guidance will be considered during development of the ICD and AoA.

3. HSI Content of the ICD. CNO (N1) will review each ICD for HSI considerations. DOTMLPF analyses that support an ICD should evaluate the following HSI considerations where applicable:

a. Address whether changes to MPT concepts or human factors engineering modifications to existing systems could enhance current system performance enough to meet the capability gap.

Enclosure (1)

b. Discuss potential approaches or required solutions for enabling capabilities in the areas of HSI, especially training, personnel management, distance support, and maintenance and logistics support.

c. Describe any current or projected operator, maintainer, support personnel major constraints, and roles necessary to enable the capability, especially any significant changes from current roles.

d. Describe desired outcomes for the proposed solution. Possible examples are: improved human performance, anticipated reduction in manpower requirements afloat or ashore, significant reduction in personnel training requirements, etc.

4. AoA. The AoA provides the foundation for KPPs, key system attributes (KSA), and other attributes in CDDs and CPDs; therefore it is vitally important that HSI considerations, where applicable, be evaluated during the AoA. This allows HSI considerations (e.g., manpower and systems training) and their associated costs, to be addressed when selecting the preferred alternative. CNO (N1) will participate in the AoA to ensure HSI equities are being considered. When applicable, the AoA should address HSI as discussed below:

a. Identify general roles and constraints in MPT (military, civilian, contractor, joint) concepts of operators, maintainers, and support personnel for each operational task, especially any roles, functional area metrics which vary significantly from current operations, will be included. Describe manpower end strength cost including operators, maintainers, and supervisors for afloat, ashore, and other staffing concepts. Identify training requirements and cost to maintain/refresh knowledge, skills, and abilities, and training or develop personnel attributes and training not currently available to the Navy.

b. Identify the conditions associated with the operational tasks that will include those related to HSI. Conditions relating to the current and projected manpower and personnel limitations or availability shall be included, along with environmental conditions (e.g., sea state, temperatures, and reduced visibility) that may impact performance of operators, maintainers, or support personnel.

c. HSI will be considered through the following activities:

(1) Identify the development, modification, or maintenance of training, training infrastructure, and shore support. Conduct affordability assessments that include estimates of the TOC of the training infrastructure, manpower, and the training associated with each approach. Identify the supportability required for training and other supporting infrastructure

(2) Identify technologies that are candidates for future maturation, including a high-level evaluation of the compatibility of those technologies with the skill sets of the projected user population.

(3) Identify the family of systems and system of systems approaches to include consideration for commonality of roles, tasks, and user interfaces across those systems. Common support equipment and systems should be evaluated with regard to efficiency, HSI, and safety characteristics.

(4) Identify high manpower drivers that optimize manpower and human performance in the emerging system solution by emphasizing challenging legacy system/spiral development increments.

(5) Identify requirements for safety, survivability, habitability, and environment considerations that can resolve the identified capability gap(s). Assess the expected design approach impact on human performance, with emphasis on human error potential/ mission impact and control of safety, health, environmental regulations, ergonomic/human engineering hazards and risks.

HUMAN SYSTEMS INTEGRATION IN THE CAPABILITY DEVELOPMENT
DOCUMENT/CAPABILITY PRODUCTION DOCUMENT

1. Purpose. References (a) and (b) contain instructions and guidance for developing and approving CDDs and CPDs. Where applicable, HSI considerations must be integrated into CDD/CPD system performance parameters and attributes to enhance mission performance of fielded systems.

a. Reference (b) requires that CDDs/CPDs include a description of DOTMLPF impacts and constraints. Discussion of each DOTMLPF impact and constraint must address the HSI domains (MPT, human factors engineering, safety and occupational health, personnel survivability, and habitability) that have a major impact on system effectiveness, suitability, and affordability.

b. Reference (a) requires that CNO determine accurate estimated manpower requirements for new and modified systems acquisitions. As a user representative, CNO (N1) shall help the resource sponsor identify, define, endorse, and prioritize mission requirements/ capabilities needs and program resource allocations to meet those requirements/needs through the Planning, Programming, Budgeting, and Execution System.

2. Definition of Terms. For the purpose of this document, the following terms are defined:

a. Cognitive workload - A measure of the mental and perceptual activities required to perform a task to a specific performance level. Cognitive workload can be thought of as the amount of resources demanded by the task or job.

b. Physical workload - The total physical activity (e.g., pulling buttons, activating, standing, lifting, etc.) required to perform a task.

c. Temporal workload - Mental demand relating to time pressure to perform a task. Temporal workload is a function of cognitive workload and physical workload in addition to all other time pressures (including any waiting time).

d. Workload - The amount of work assigned to or expected from a worker in a specified time period.

3. HSI Content of the CDD/CPD. HSI considerations shall be addressed, where applicable, in the CDD/CPD, with particular emphasis on sections 6, 14, and 15. Specific considerations may include:

a. Section 2 - Analysis Summary. Briefly summarize the results and impact of analyses to support HSI requirements, including top down requirements analyses, manning studies, human performance assessments, etc.

b. Section 3 - CONOPS Summary. Within the synopsis of the CONOPS, briefly include (as part of the enabling capabilities) the roles of operators, maintainers and support personnel, and preferred approaches to training, personnel management, human interaction with automation, maintenance, logistics support, and distance support.

c. Section 6 -System Capabilities Required for the Current Increment(s). The following information must be included, when appropriate:

(1) A summary statement that indicates all required capabilities will be met with the human as part of the system.

(2) CNO (N1) shall confirm that the guidance in reference (a) has been correctly followed in determining system training, manpower, survivability, force protection KPP applicability. This confirmation will be provided in or during Navy JCIDS review period as part of the HSI considerations for the FCCC.

(3) The description of any human-related attribute should help to ensure that the intent of the attribute is satisfied. For example, if a manpower KSA is appropriate, temporal workload or work-week requirements are necessary to ensure that a manpower KSA is met without overworking personnel. For CDD/CPDs that define a new or modernized ship, submarine, aircraft, unmanned system, or command, control, communications, computers, and intelligence systems, the shore support requirements/limitations must be specified to ensure that manpower goals are not met by simply moving personnel ashore. Additionally, there may be HSI constraints or other parameters that must be identified for attributes that are strictly HSI related.

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d. Section 12 - Assets Required to Achieve Initial Operational Capability (IOC)/Full Operational Capability (FOC). Describe the supporting capabilities in training infrastructure and shore support, including distance support required to achieve IOC (for the CDD) or FOC (for the CPD). Define the training and manpower asset quantities for these capabilities that are expected to be available (e.g., crew and maintainers at the O level must be trained; initial training and trainers will be required at specified locations by FOC).

e. Section 14 - Other DOTMLPF and Policy Considerations. In the CDD, summarize the DOTMLPF considerations that led to materiel and non-materiel solutions. In the CPD, identify changes to DOTMLPF to include all HSI domains associated with fielding the system. The following guidelines shall be applied to section 14 of the CDD/CPD where applicable.

(1) Provide a short description of HSI issues (in CDD and CPD) and fleet concerns regarding materiel solution implementation (in CPD). Include systems integration information concerning standardization and commonality of systems, equipment and components and their optimization for intra- and inter-platform, joint, and combined interoperability and human performance as appropriate.

(2) Provide top-level MPT guidance in the CDD that will guide the system developer to derive appropriate contractual MPT requirements during the engineering and manufacturing development (EMD) phase of acquisition. This guidance should be updated in the CPD to guide the system developer to update derived MPT requirements for the production and deployment (PD) phase. The following are examples of derived MPT requirements the system developer may be required to create during the EMD and/or PD phases.

(a) Identify the integrated training system requirements for individual, collective, joint, and fleet training support (e.g., Total Ship Training System for ships). Describe the required aptitudes, and/or physical characteristics of operators, maintainers, and support personnel.

(b) Describe in measurable and testable terms, when relevant, the missions, functions, or attributes used to optimize manpower, personnel readiness requirements (e.g.,

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improved technology or automation that will reduce human workload). Identify human factors engineering standards and metrics (e.g., accuracy, time, and fatigue) that improve human machine interfaces that are intuitive, interoperable, and have common and consistent protocols for system operation.

(c) Identify MPT TOC savings achieved through analysis of design human factors, workload, and associated KSAs, resources, and tools for all tasks allocated to humans required for the efficient operation, employment, and support of the system.

(d) Describe any safety and occupational health, and environmental compliance requirements that reduce the risk of fatalities, injury, illness, or disability and death of the operators, maintainers, and support personnel. These include minimizing personal detection or targeting, fratricide, or confinement within an attacked entity. Examples include egress from confined spaces, ejection seats, assisted breathing devices, etc.

(e) Describe habitability requirements, such as berthing and personal stowage, food service, medical, religious, security facilities, recreational and lounge spaces, ambient environment requirements (e.g., noise, lighting, heating, air conditioning, and ventilation, workspace layout, etc.).

f. Section 15 - Other System Attributes. Include a summary HSI statement: "Total system performance measures and requirements shall include the merged performance of hardware, software, and human performance (including operators, maintainers, and support personnel)." This statement will ensure that Navy mission essential task lists can be developed within assigned mission parameters. Where applicable, summarize capabilities-oriented performance-based HSI requirements that drive design, cost, and/or risk.

g. Section 16 - Program Affordability. Ensure that the costs of developing and sustaining the manpower and training required for the system and its supporting infrastructure (e.g., training, shore support) are incorporated into cost estimates. Describe the plans or process for trading off increased design or acquisition cost to reduce operations and support or TOC.

ADDITIONAL HSI RELATED SOURCES

WEB SITES

Navy

NAVSEA, HSI PORT: <http://hsiport.serco-na.com/>

NAVSEA Training Acquisition (SEATRACQ):
<https://seatraccq.navsea.navy.mil> (Training)

Distance Support: <http://www.AnchorDesk.navy.mil>

Training/Naval Education and Training Center:
<https://www.netc.navy.mil>

NAVAIR: <https://nserc.navy.mil/>

Standards: <http://assist.daps.dla.mil/quicksearch/>

HARPS: <https://harps.nmci.navy.mil>

Navy Knowledge Online: <https://www.nko.navy.mil/portal/home>

Other Services and Government

Department of Defense, Human Factors Engineering, Technical
Advisory Group: <http://www.hfetag.com/>

Army Human Systems Integration Directorate (MANPRINT):
<http://www.manprint.army.mil>

Air Force Human Effectiveness Directorate:
<http://www.wpafb.af.mil/afrl/he/>

Coast Guard Research and Development:
<http://www.uscg.mil/hq/cg9/rdc/>

National Aeronautics and Space Administration Human Systems
Integration Division Web site: <http://human-factors.arc.nasa.gov>

Federal Aviation Administration Human Factors Division Web
site: <http://www.hf.faa.gov/>

INSTRUCTIONS

SECNAVINST 4105.1B, Independent Logistics Assessment and Certification Requirements, 28 December 2008.

SECNAVINST 5100.10J, DON Policy for Safety, Mishap Prevention, Occupational Health and Fire Protection Programs, 26 October 2005.

OPNAVINST 1500.76A, Naval Training System Requirements, Acquisition, and Management, 10 October 2006.

OPNAVINST 3401.3A, Nuclear Survivability of Navy and Marine Corps Systems, 5 January 1989.

OPNAVINST 3541.1E, Surface Ship Survivability Training Requirements, 6 March 1995.

OPNAVINST 5090.1C, Environmental and Natural Resources Program Manual, 30 October 2007.

OPNAVINST 5100.23G, Navy Safety and Occupational Health Program Manual, 30 December 2005.

OPNAVINST 5100.24B, Navy System Safety Program Policy, 6 February 2007.

OPNAVINST 9070.1, Survivability Policy for Surface Ships of the U.S. Navy, 23 September 1988.

OPNAVINST 9640.1A, Shipboard Habitability Program, 3 September 1996.

NETCINST 1500.1, Human Systems Integration (HSI) and Acquisition, 4 March 2005.

STANDARDS/HANDBOOKS

MIL-STD-882D, Standard Practice for System Safety,
10 February 2000.

MIL-STD-1388-1A, Logistics Support Analysis, 11 April 1983.

MIL-STD-1472F, Human Factors Engineering, 23 August 1999.

MIL-HDBK-297, Introduction to Weapon Effects for Ships, 28
December 1987.

MIL-HDBK-502, Acquisition Logistics, 20 January 2005.

MIL-HDBK-759C, Human Engineering Design Guidelines, 31 July
1995.

MIL-HDBK-46855, Human Engineering Program Process and
Procedures, 17 May 1999.

ASTM F1166-07, Standard Practice for Human Engineering Design
for Marine Systems, Equipment and Facilities, 2007.

ASTM F1337-91, Standard Practice for Human Engineering Program
Requirements for Ships and Marine Systems, Equipment and
Facilities, 2006.

GUIDES

Defense Acquisition Guidebook, December 2008.

HSI Plan Preparation Guide, February 2006.

HSI Program Manager's Guide, Volume I, June 2006.

HSI Program Manager's Guide, Volume II, June 2006.

HSI Integrated Architecture (MPT), Volume III, May 2008.

NAVPERS 15839I, Navy Officer Manpower and Personnel
Classification - Volume I, Major Code Structures; Volume II, The
Officer Data Card, October 2008.

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NAVPERS 18068F, Navy Enlisted Manpower and Personnel Classifications and Occupational Standards - Volume I, Navy Enlisted Occupational Standards; Volume II, Navy Enlisted Classifications, October 2008.

System Safety - ESOH Management Evaluation Criteria for DoD Acquisition, January 2007.

Shipboard Habitability Design Criteria Manual, 1 December 1995.

Shipboard Habitability Design Practices Manual, 1 April 1994.

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ACRONYM GLOSSARY

AoA	Analysis of Alternatives
CBA	Capabilities-Based Assessment
CDD	Capability Development Document
CNO	Chief of Naval Operations
CONOPS	Concept of Operations
CPD	Capability Production Document
CSR	Core Skill Requirements
DoD	Department of Defense
DOTMLPF	Doctrine, Organization, Training, Materiel, Leadership, Personnel, Facilities
EMD	Engineering and Manufacturing Development
ESOH	Environment, Safety, and Occupational Health
ESR	Education Skill Requirements
FCCC	ForceNET Consolidated Compliance Checklist
FOC	Full Operational Capability
FoS	Family of Systems
GAO	Government Accountability Office
HARPS	Human Analysis and Requirements Planning System
HSI	Human Systems Integration
ICD	Initial Capabilities Document
IOC	Initial Operational Capability
JCIDS	Joint Capabilities Integration and Development System
KPP	Key Performance Parameter
KSA	Key System Attribute
MPT	Manpower, Personnel, and Training
NAVAIR	Naval Air Systems Command
NAVSEA	Naval Sea Systems Command
OPNAV	Office of the Chief of Naval Operations
OPNAVINST	Office of the Chief of Naval Operations Instruction
PEO	Program Executive Office
PD	Production and Deployment
PM	Program Manager
RDT&E	Research, Development, Testing and Evaluation
S&T	Science and Technology
SECNAV	Secretary of the Navy
SECNAVINST	Secretary of the Navy Instruction
SYSCOM	Systems Command
TOC	Total Ownership Costs