DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
WASHINGTON, DC 20362-5101

IN REPLY REFER TO

NAVSEAINST 4790.1A
Ser 90Rc/21
13 Feb 85

NAVSEA INSTRUCTION 4790.1A

From: Commander, Naval Sea Systems Command
To: All Offices Reporting Directly to COMNAVSEA

Subj: EXPANDED SHIP WORK BREAKDOWN STRUCTURE (ESWBS) FOR SHIPS, SHIP SYSTEMS AND COMBAT SYSTEMS

Ref: (a) Expanded Ship Work Breakdown Structure for all Ships, Ship Systems and Combat Systems (S9040-AA-IDX-010/SWBS 5D) Vol. 1
(b) Users Guide for the Expanded Ship Work Breakdown Structure for all Ships, Ship Systems and Combat Systems (S9040-AA-IDX-020/SWBS 5D) Vol. 2
(c) Ship Work Breakdown Structure for Nuclear Propulsion (NSTM 0900-LP-039-9020)
(d) Fleet Modernization Program (FMP) Management and Operations Manual (NAVSEA SL720-AA-MAN-010)

Encl: (1) Definitions
(2) Impact of the Five Character ESWBS on AILSIN
(3) Logistic Configuration Data Base Establishment
(4) Application of ESWBS to Life Cycle for Integration of Advance Planning and Drawings with Logistics

1. Purpose. Establish policy and issue procedures to (1) provide a method to integrate design with logistics through standard coding of the work breakdown structure for ships, ship systems and combat systems; (2) require the use of references (a) and (b) as the source documents for assigning this standard coding; (3) require the use of this standardized coding for all new design/new construction and alteration/modernization configuration identification and change reporting; (4) define new construction and alteration data requirements to support the Planning Yard concept after turnover of ships to the Ship Logistic Manager (SLM).

2. Scope. This Instruction applies to all new designs and new construction programs for ships, ship systems and combat systems, and to life cycle configuration identification and logistic support management procedures for existing ships.

3. Cancellation. NAVSEAINST 4790.1; NSTM 0900-LP-068-6010, Ship Work Authorization Boundaries (SWAB) for Surface Ships of March 1981.

4. Exclusions.

a. Nuclear Propulsion. The Deputy Commander for Nuclear Propulsion, SEA 08, is responsible for all technical matters pertaining to nuclear propulsion for U.S. naval

ships. Work boundary definitions involving the nuclear propulsion plant will continue to use reference (c). Consult SEA 08 in all matters relating the ESWBS concept to the nuclear propulsion plant and associated nuclear support facilities.

b. Fleet Ballistic Missile Weapons Systems (FBMWS). NAVMAT Instructions 5430.37B and 5430.45E designate the Director, Strategic Systems Project (DIRSSP) as being responsible for all technical matters related to FBMWS and Strategic Weapon System (SWS). Consult the DIRSSP in all matters relating to the ESWBS concept and the FBMWS or SWS.

5. Background.

a. The rapidly expanding requirements for logistic and configuration data and the lack of integrated planning and coordination mechanisms have resulted in the independent development and maintenance of generic configuration baselines; e.g., the design baseline (ship's drawings), the supply/configuration baseline (Weapons System File (WSF) and Coordinated Shipboard Allowance List (COSAL)), and the maintenance baseline (Class Maintenance Plan, Planned Maintenance System, etc.). This lack of data integration handicaps shipboard personnel and other users in locating and updating configuration and technical documentation and in identifying and obtaining complete, accurate and adequate support for the ship's equipment. Integration of the ship's drawings and functional block diagrams with the configuration baseline and logistic support products depends upon the establishment of a common reference point. The ESWBS concept provides this common reference point and associates functionally related data from the preliminary design phase, through construction, and throughout the life cycle of the item.

b. Reference (a) includes the data provided by the Ship Work Breakdown Structure (SWBS) Manual and the Ship Work Authorization Boundary (SWAB) Manual, maintains the existing three digit SWBS numbering system and expands the SWBS indenturing concept to a five digit ESWBS number. Enclosure (1) provides definitions of specific terms. Enclosure (2) discusses the interface between the ESWBS and the Automated Integrated Language System Identification Number (AILSIN). Reference (b) describes the use of this structured indenturing process to expand the ESWBS to a Functional Group Code (FGC) with a maximum of ten digits. The ESWBS/FGC indenturing concept provides the structure, the discipline and the basic technique required for the development and the application of a Navy standard methodology for configuration identification and change reporting, and the establishment of a standard functional nomenclature for ship systems. The ESWBS fosters the integration required to resolve Fleet and user problems associated with logistic support documentation and with the updating of the ship's configuration records.

6. Policy.

a. Expanded Ship Work Breakdown Structure (ESWBS)

(1) Existing Fleet and New Construction (Except Submarines). ESWBS will be the primary interface number used for all configuration identification and configuration change control and reporting systems.

(2) Ship Systems and Combat Systems. Maintenance Plans for new systems will reflect, and associated functional block diagrams will assign the ESWBS number and incorporate the ESWBS indenturing concepts described in references (a) and (b).

b. Functional Group Code (FGC)

(1) Ship Construction Programs Using New Designs. The FGC indenturing process, outlined in reference (b), will be used on all new designs.

(2) Ship Construction Programs Using Existing Designs. Use of the FGC indenturing system in all new construction is encouraged, but not required for construction of ships using existing designs.

(3) Backfit to Operational Fleet. The assignment of FGCs to operational ships is not required, but may be desirable for certain newer, high value ships and ship classes. FGC development for any existing ship class will be determined by the economics and anticipated long term benefits. To avoid duplication and possible conflicts, ships or ship classes converted to FGC will discontinue use of any other assigned hierarchical code.

c. Life Cycle Support

(1) All future new construction programs, which are not continuations of existing shipbuilding programs (i.e., "new starts"), will invoke the data elements listed in enclosure (3) and the procedures provided in reference (b). Enclosure (3) provides initial guidance which will be expanded and incorporated into a Technical Specification for Ship Component and Logistic Support Information.

(2) Data and alteration/modernization development for all existing ships will implement the provisions of enclosure (4). Enclosure (4) is provided as initial guidance pending issuance of a Technical Specification for Selected Record Updates.

7. Action

a. Ship Design and Engineering Directorate, SEA 05, is responsible for ship integration and ship systems, and will:

(1) Update and maintain the General Specifications for Ships of the U.S. Navy and the Naval Surface Ship Design Manual (T9070-AA-MAN-030(c)) to incorporate the ESWBS/FGC concepts.

(2) Incorporate the provisions of this Instruction into new ship designs.

(3) Update and maintain ESWBS system boundaries and generic functional nomenclature for cognizant systems.

(4) Provide policy direction for the Planning Yard's implementation and audit of ESWBS/FGC concepts including the Planning Yard Component Configuration activity responsibilities for the maintenance of data on the WSF. For structured ships, this direction will include responsibility for updating of the ship's functional configuration description provided by the Ship Unique Systems Boundary Definition Manual described in reference (b).

(5) Recommend changes to NAVSEAINST 4441.3 for processing the Summary List of Component and Equipage Changes (SLCC/SLEC) including requirements for updating the Logistic Configuration data received from the new construction shipyard.

(6) Incorporate provisions of this Instruction into reference (d), including update of Chapter 8, to require recording of the ESWBS number into the Drawing Schedule used during availabilities and the subsequent transfer of this data to the Ship's Drawing Index, as discussed in enclosure (4).

(7) Develop and maintain functional block diagrams and Maintenance Plans for new ship systems and ensure that ESWBS and functional nomenclature are assigned; update existing functional block diagrams and Maintenance Plans, including assignment of ESWBS and functional nomenclature, as changes occur to existing systems.

(8) In conjunction with SEA 90, provide guidance to NAVSUP to develop the necessary software changes to report the data in the Ship Configuration and Logistic Support Index based on the data in the WSF Download.

(9) Use enclosure (4) as guidance for integrating advance planning and drawings with logistics, pending revision of reference (d) and issue of a Technical Specification for Ship Selected Record Drawings Updates.

(10) Incorporate requirements of enclosure (4) into the Technical Specification for Class Improvement Plans.

(11) Coordinate the development of the Technical Specifications discussed above with SEA 90.

b. Weapons and Combat Systems Directorate, SEA 06, is responsible for the technical direction of combat systems, and will:

(1) Update and maintain the ESWBS system boundaries and generic functional nomenclature for cognizant systems.

(2) Develop and maintain functional block diagrams and Maintenance Plans for new ship systems and ensure that ESWBS and functional nomenclature are assigned; update existing functional block diagrams and Maintenance Plans, including assignment of ESWBS and functional nomenclature, as changes occur to existing systems.

c. Industrial and Facility Management Directorate, SEA 07, will:

(1) Approve changes to the ESWBS system groupings used only for industrial availability planning and execution requirements. The 800 and 900 ESWBS Groups will be modified in concert with the platform directors to incorporate the Class Estimating Standards (CES) concept expressed in submarine industrial availability work packages, in order to ensure continued estimate/cost comparability in the future, as well as consistency with surface ship and submarine general overhaul specifications.

(2) Working with SEA 05, take action necessary to ensure that any non-compliance with the provisions of this Instruction and references (a) and (b) is corrected.

d. Platform Directorates.

(1) Ship Acquisition Programs will:

(a) Incorporate the provisions of this Instruction into acquisition contracts for ships to a new design.

(b) Encourage the use of the FGC indenturing system in new ship construction programs using existing ship designs; coordinate implementation with SEA 05 and SEA 90.

(c) Pending issue of the Technical Specification for Ship Component and Logistic Support Information, invoke the provisions of enclosure (3) in new start, new construction programs by requiring the use of the Fitting Out Management Information System (FOMIS) Plus Addendum to the FOMIS Requirement Statement (FRS).

(d) For new start, new construction shipbuilding contracts, integrate the ship system and the combat system functional block diagrams and maintenance plans into ship documentation using the ESWBS number as the primary interface.

(2) Ship Logistic Managers will:

(a) Implement the provisions of this Instruction for the life cycle management of the ships under their cognizance.

(b) Update and maintain the General Specifications for surface ship and submarine overhauls to incorporate the ESWBS/FGC concepts.

(c) Select ship classes and provide funding for FGC assignment or major AILSIN reassignment based on anticipated costs and benefits; coordinate implementation with SEA 05 and SEA 90.

e. Acquisition and Logistics Directorate, SEA 90, will:

(1) Maintain and periodically update references (a) and (b), including the evolving CES requirements, and ensure that the cognizant technical codes concur with changes which impact ship systems.

(2) Ensure that the proposed NAVSEA LSA Handbook reflects and implements the processes described in reference (b).

(3) Include the standard FOMIS Plus Addendum to the FRS and make the required FOMIS software changes to enable the development, accumulation and transfer of Planning Yard Component Configuration (PYCC) data as described in enclosure (3), pending issue of the Technical Specification for Ship Component and Logistic Support Information.

(4) Convert SWAB-based AILSIN to ESWBS-based AILSIN as discussed in enclosure (2).

(5) Update NAVSEA Instruction 4441.3 to modify the Summary List of Component and Equipage Changes (SLCC/SLEC) preparation procedures to include the requirement for ESWBS/FGC identification of configuration worthy items.

(6) Revise NAVSEA Instruction 4130.12 to incorporate the requirements of this Instruction for acquisition and life cycle management.

(7) Issue NAVSEA Instruction 4441.X on Mission Criticality Code (MCC) assignments.

(8) Monitor all implementation actions defined in this Instruction and report progress to SEA 09.

J. H. WEBBER
Vice Commander

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DEFINITIONS

1. Ship Work Breakdown Structure (SWBS). A three digit functional indenturing system which has been in use for new designs since 1973.

2. Ship System Index (SSI). A three digit numbering system, based on the Bureau of Ships Consolidated Index (BSCI), used in place of SWBS for existing classes of submarines.

3. Ship Work Authorization Boundary (SWAB). A four digit functional indenturing system which develops boundaries to support the maintenance and repair needs of the industrial availabilities of operational ships.

4. Ship Work List Item Number (SWLIN). A five digit number which is a further breakdown of SWAB.

5. Expanded Ship Work Breakdown Structure (ESWBS). A five digit functional indenturing system, based on the original three digit SWBS and expanded by two, single digit indenture levels to incorporate the functions of the SWAB.

6. Functional Group Code (FGC). A maximum ten digit number which consists of the ESWBS (first five digits) and up to five additional levels of indenture represented by single alphanumeric characters, used for accumulation, correlation and integration of all data baselines.

7. Automated Integrated Language System Identification Number (AILSIN). A twelve digit hierarchical, functional indenturing number used for configuration validation requirements and maintenance support needs.

8. Functionally Significant Item (FSI). Any item contained on the ship which performs a function and is significant to the performance of the system. An FSI can be a system, subsystem, equipment, or component, or a summary level of two or more FSIs.

9. Functional Nomenclature. The common name or nomenclature which identifies an item as a functional part of the system or equipment it supports. This nomenclature should be similar to that found in technical manuals and design drawings, and should be in fleet common terminology which will be quickly recognized and understood by shipboard and industrial users. The term "Functional Nomenclature" is synonymous with "Functional Description" (DEN T057).

10. Functional Block Diagram. A diagrammatic representation of FSI functional relationships arranged in a hierarchical Top-Down Breakdown (TDBD).

11. Hierarchical Top-Down Breakdown (TDBD). A structured, FSI arrangement which displays the relationship of an FSI to its parent and subassemblies.

12. Functional Configuration Baseline Index (FCBI). A hierarchical TDBD listing of the FSIs on the ship. The FCBI is arranged by the FGC and associates the FSI Functional Nomenclature, the official Functional Nomenclature Abbreviation, the Mission Criticality Code and the Quantity to a unique FGC.

DEFINITIONS (Cont)

13. Maintenance Plan. The maintenance related portion of the approved Logistic Support Analysis Record. This is an equipment level plan versus the Class Maintenance Plan which is at the ship level.

14. Logistic Configuration Baseline. The accumulation of design, logistic and configuration data, constructed from the ship's maintenance plans and integrated through the FCBI.

15. Structured Ship. A ship with its Functional and Logistic Configuration Baselines developed through the FGC indenturing process.

16. Class Standard ESWBS Manual. A manual created by tailoring the ESWBS Manual. This tailored manual identifies and defines the ship class system and equipment configuration, establishes the boundaries and system descriptions for the ship class, and provides guidance for the life cycle maintenance of the SBD Manual.

17. Ship System Definition and Index (SSDI). Functional block diagrams specified in MIL-STD-24534A Reliability Centered Maintenance (RCM) for the Planned Maintenance System (PMS).

18. Ship Unique System Boundary Definition (SBD) Manual. A disciplined collation of the Ship FCBI which lists all of the FSIs on the ship, and the SSDI diagrams which graphically represent the narrative system descriptions contained in the Class Standard ESWBS Manual as they apply to a specific hull.

IMPACT OF THE FIVE CHARACTER ESWBS ON AILSIN

1. Introduction. The Ship Equipment Configuration Accounting System (SECAS) program requires the assignment of 12 digit Automated Integrated Language System Identification Numbers (AILSIN). The first five digits of the AILSIN number are generally derived from the SWAB and the Configuration Reporting Level (CRL) to form the Ship Work List Identification Number (SWLIN), the second five digits are AILSIN unique, and the final two digits are taken from the Component Dictionary Code (CDC), found in the SECAS Program Manual, Volume 8.

2. Impact of ESWBS with AILSIN.

a. The ESWBS provides the capability to integrate design and engineering with the logistic configuration baselines for existing ships. The ESWBS will be used in developing and improving assignment of AILSIN for existing ships and ship systems. Reference (b) addresses the data interface for life cycle logistic configuration management and provides a coordinated, incremental approach to the improvement and the maintenance of new construction and active ships data.

b. In most cases, the five digit ESWBS relates closely to the first five SWAB/CRL characters of AILSIN. Consequently, the modification of the current AILSIN numbers to the ESWBS-based AILSIN numbers is essentially a straightforward one-for-one replacement process. For those AILSIN numbers, as redefined by ESWBS, which do not have a direct one-for-one replacement, some engineering effort will be required to assure proper assignment. Although most AILSIN-unique characters and the CDC are not expected to change as a result of the conversion from SWAB/CRL to ESWBS, existing AILSIN programs will be used to validate the consistency of AILSIN assignments.

c. The modified AILSIN (i.e., with ESWBS incorporated) will be applied to current Configuration Status Accounting (CSA) records on the WSF.

3. Exceptions to Generalized Use of ESWBS for AILSIN Assignment

a. Submarines. Existing classes of submarines use the Ship System Index (SSI) indenturing system which was also used to develop AILSINs for submarines. An SSI-to-ESWBS cross-reference will be provided to simplify shipyard interface tasks during submarine maintenance availabilities and to facilitate transition from the SSI to the FGC for the new design Fast Attack submarine (SSN 21).

b. FFG 7 Class. The FFG 7 Class AILSINs use a four digit, SWAB-based Ship System Definition and Index (SSDI) numbering system. Since the SSDI is a functionally oriented, hierarchical system, modification to current AILSIN assignments or other technical documentation is only required where old SWABs have been eliminated or redefined.

c. Aircraft Carriers. Although the CV/CVN Classes use Bureau of Ships Consolidated Index (BSCI) numbers for construction purposes, they were assigned AILSIN based on surface ship SWAB/CRL. These ships will be updated in accordance with paragraph 2b.

LOGISTIC CONFIGURATION DATA BASE ESTABLISHMENT

1. Introduction. This Enclosure provides a brief description of the data elements, data flows, method of transmission and uses of data which will be collected during the shipbuilding process. The purpose of this effort is to provide a single-source of information which will be used to initiate the primary life cycle management data bases for new classes of ships. The system expands existing Fitting Out Management Information System (FOMIS) programs to incorporate the collection and transmission requirements and provides a cost effective mechanism which can be used by existing new construction programs as well as by new ship design programs.

2. Background

a. Many of the recent command initiatives (e.g., SNAP installations, Planning Yard Component Configuration (PYCC) responsibilities, etc.) require establishment of integrated logistic configuration data to improve the ability of ships and industrial activities to maintain fleet readiness. Efforts to develop the logistic data and associate the data with the system that it supports are less than successful, as users must locate and apply data from multiple files, which originate from different data sources, are maintained by different mechanisms, and are updated on different cycles. Much of the difficulty can be attributed to past data development practices which have regarded components as generic items (e.g., pumps, valves, etc.) rather than as functional components of systems (e.g., pump for a dishwashing unit). Under the Functional Group Code indenturing concept, logistic configuration information is collected and associated with its parent functional component or system.

b. Historically, significant efforts have been made to collect key data (i.e., design/drawing, configuration, provisioning, maintenance, etc.) during the shipbuilding process. These efforts suffered from the lack of a positive integration mechanism which spanned the requirements of each data developer or user, and from the inability to transition that data when the shipbuilding program was completed. Five major obstacles have precluded effective and economic use of new construction data:

- o No recognized vehicles for transmitting the data
- o No agreement on what data elements were needed
- o No consistency in the quality or content of the data
- o No repository for collection of the data
- o No sponsor for maintenance of the data

3. FOMIS Plus. To correct those deficiencies and assure consistency across the spectrum of data requirements and files, traditional FOMIS input is being modified by a FOMIS Addendum which clarifies data requirements for life cycle management and simplifies data collection and transmission. FOMIS Plus has the following features:

a. An accepted set of data elements required for life cycle management of the ship class. Attachment A to this enclosure provides the data elements which are not currently resident on the WSF, but which are required by the Planning Yard to manage the Logistic Configuration of a new class of ships. These data elements represent a composite of the minimum data required for the Weapon Systems File Download (WSFD), SNAP, and PYCC File. The Ship Acquisition Project Manager, shipbuilder, Ship Logistic Manager, ship, In-Service Engineering Agent, or Planning Yard may require development, collection and maintenance of additional data. FOMIS Plus is

designed to provide the flexibility to accept these extra data elements if required for other data bases.

b. A methodology which associates and integrates logistic, configuration and design data. FGC links key design, configuration and logistic elements through a structured, cohesive process and disciplined application of the ESWBS. Each Functionally Significant Item (FSI) is assigned a unique FGC, and each unique FGC requires a separate FOMIS Access Record. Thus, each FSI in each unique application (i.e., quantity of one, if desired) will be uniquely identified in the WSF through the FOMIS input.

c. A single data file which initiates all other data files ensuring data consistency and integration. The shipbuilder has internal and contract data requirements in addition to the normal requirements for FOMIS and provisioning. To avoid unnecessary costs, the shipbuilder will simply expand his FOMIS File and submissions to include the additional logistic data which cannot currently be accepted by the WSF, but is required for the WSFD, plus the additional data required for PYCC Management plus SNAP requirements. This file may also contain any number of additional data elements which are required, either by the shipbuilder or others, for the construction process. However, any data maintained in this file must accept the discipline of the FGC process; that is, it must relate to the FGC.

d. A uniform method of passing the data to the associated data files. The shipbuilder's standard FOMIS input to the WSF will establish the Level A (ship configuration) record. The same input from the shipbuilder's FOMIS Plus File will provide the single data source to initiate the Weapon Systems File Download (logistic support and life cycle management data elements), SNAP (logistic configuration baseline linked by the FGC), and the PYCC File. A hull-by-hull extract from the FOMIS Plus File at Mechanicsburg will be provided to the PYCC as ships are turned over to the Planning Yard for management. One additional advantage is that extracts of the shipbuilder's FOMIS Plus file, with extraneous (e.g., construction use only) data removed, can be provided to the Planning Yard on an "as required" or periodic basis to suit specific SHAPM/Planning Yard interface and turnover requirements.

e. An initiation procedure that will not require data translation, reformating, conversion, or modification. The transfer process has been developed to minimize or eliminate the need to modify, convert, translate, or reformat the data. The PYCC data on the WSFD will be initiated from the FOMIS Plus information. Individual planning yards will then be free to use the WSFD as the PYCC File, or to initiate a PYCC File on separate PYCC computer hardware. FOMIS Plus ensures that all participants use the same data from the same original source without the manipulation and conversion that often leads to confusion, distortion, or corruption of the data.

3. FOMIS Plus Application to Existing New Construction Contracts. Although these procedures have been designed for use in new ship design programs, they are equally adaptable to any existing new construction program which uses FOMIS. An Addendum to the FOMIS Requirements Statement which incorporates the additional data formats is available and can generally be adapted for use without significant problems.

WSF DATA ELEMENT NUMBERS (DEN) FOR LOGISTIC CONFIGURATION DATA BASE AND FILE ESTABLISHMENT

WSF DENS	DATA ELEMENT - SHORT DESCRIPTION
A002	Unit Identification Code
C008	Mission Essentiality Code
C035	Federal Supply Code For Manufacturers
D008	Allowance Parts List/Component Item Designator/Reparable Item Code
D008	Alteration APL/CID/RIC Number
D008D	Equipment Identification Code
D009	Parent RIC
D011	Quantity
D032	Equipment Serial Number
D032D	Parent APL Serial Number
D036B	Ship Type, Hull Number
D036D	Name applied to end use weapon
D037	Data Originator/Validation Code
E010A	Service Application Code
E012	Allowance Equipage List Column Number
E033	Action Code
E052	Location (DK/FRM/CMPMNT)
E093	Valve Mark/Electric Symbol Number
E097	Type Commander
E127	Work Center Responsible For Compartment
E128	Work Center Responsible
E177	Sub Category Code/Test Equipment
E222	Installation Status Code
E223	Validation Source Action Code
E223	Alteration Status (Second digit only)

WSF DENS	DATA ELEMENT - SHORT DESCRIPTION
E224	Type, Model, Series Designator
E225	Type of Equipment ID Number
E226	Category Code/Test Equipment
E239	Next Higher Assembly/Remarks
E243	Selected Equipment Indicator
E317	Alteration Type
E319	Alteration Identification Number
E346	Reason Not Validated
E351	Planning Yard
E352	Status Code
E359	Class (Hull Number of Ship considered Class Standard)
T017B	Technical Confirmation Activity
T057	Equipment Functional Description
T058	Element/System Designator
T059	Logistic Support Document Serial Number
T059A	Logistic Support Document Type
T059B	Logistic Support Document Serial Number
T059C	Logistic Support Document Date
T059D	Logistic Support Document Note Code
T060	Configuration Reporting Activity
T060A	Configuration Reporters Initials
T060B	Configuration Reporting Date
T063	Hierarchical Structure Code
T063A	Hierarchical Structure Code Indicator

APPLICATION OF ESWBS TO LIFE CYCLE FOR INTEGRATION OF

ADVANCE PLANNING AND DRAWINGS WITH LOGISTICS

1. Background. The CNM, NAVSUP and NAVSEA are continuing to pursue ways to establish and facilitate design and engineering interfaces with configuration data in order to improve configuration control and logistic support.

a. Two primary areas of impact which require an ESWBS interface are:

(1) Shipboard Non-Tactical Automated Data Processing (SNAP) Computer Installation and File Initialization. The CNM has directed that the ship's SNAP configuration file be indexed by the five digit ESWBS. Within a five digit ESWBS grouping, equipment and components are separated by Work Center, and then further separated by functional nomenclature to a quantity of one. This breakdown allows the ship's force to locate an item in the ship configuration file.

(2) Weapon Systems File (WSF) Modifications. To support the SNAP configuration file initialization and maintenance, NAVSUP is making two key modifications to the WSF, the Navy's central configuration file. First, functional nomenclature is being added as a data element, in addition to the existing commodity nomenclature. Secondly, configuration worthy items which are above and below the Allowance Parts List (APL) level will be accepted. Both of these changes are keyed to the ESWBS concept.

b. In order to effectively implement these actions and satisfy CNM desires for Ship Maintenance Improvements, design must reassume its former leadership role in logistics configuration identification and definition. The Functional Group Code (FGC) process restores the design leadership for structured ships. A corresponding leadership role can now be established for the existing fleet by having design (1) establish the necessary system boundaries; (2) determine which items are configuration worthy; (3) indicate the ESWBS/FGC number, as applicable, next to the piece mark number description of these items on the drawing; (4) assign functional nomenclature and abbreviation down to a quantity of one per application or use of each configuration worthy item; (5) assign Mission Criticality Coding for these items in accordance with NAVSEA Instruction 4441.X to be issued by SEA 905; and (6) communicate this information to other users through the interface provided by the ESWBS/FGC number.

2. Life Cycle Ship Class Management and Integration. Long range ship class management requires early integration efforts to ensure continuity of modernization and alteration planning. The evolving process to integrate the planning and control of configuration changes will involve three specific sets of actions.

a. The proposed Technical Specification for the preparation of Class Improvement Plans (CIP) must be modified to reflect alteration improvement planning to the five digit (ESWBS) level.

b. The Technical Specification 9090-600 for the preparation of Basic Alteration of Class Drawings (BACD) and SHIPALT Installation Drawings (SID) must be updated to reflect the requirement for annotating the five digit ESWBS number to the Functionally Significant Items (FSI) listed on the BACD/SID List of Material. Reference (b) explains the FSI selection process.

c. The Technical Specification for updating Ship Selected Record Drawings (SSRD), which is currently under development, requires incorporation of the procedures outlined in paragraph 4(a) of this enclosure.

3. Ship Alteration Planning and Execution. While the complete transition to ESWBS-oriented information on the WSF will occur over time, a significant number of configuration changes (SHIPALTs) which will impact the transitioned WSF are already in preparation. It is imperative that the design functions of modernization planning and alteration preparation relate to ESWBS. This process is already established in existing requirements and those requirements must be updated to highlight the necessity for reflecting, respecting and annotating the boundaries effected to the five digit ESWBS level.

4. Advance Planning for Industrial Availabilities. The General Specifications for overhauls of surface ships and of submarines must be updated to reflect the required changes associated with ESWBS/FGC. In addition, the Fleet Modernization Program (FMP) Management and Operations Manual will be updated to require use of the five digit ESWBS during Advance Planning, incorporation of the ESWBS on the Drawing Schedule, and update of the Ship Drawing Index by ESWBS to reflect each boundary affected by a change. The following guidance is provided for two critical steps in the integration process:

a. Ship Selected Record Update. For ships with Planning Yards, the number of SSR Drawings (SSRD) will be increased by issuance of Volume 2 of the FMP Maintenance and Operations Manual, and the SSRD update process will begin during advance planning.

(1) Through the use of the ESWBS and the Functional Nomenclature, each item which is configuration worthy, can be defined to a functional quantity of one. This can be accomplished through the expansion of the equipment/component information listed (e.g., List of Material, Symbol List, etc.) for changes on the SSRD to include annotation of the Functional Nomenclature and Functional Abbreviation. It is critical that this information flows into the update of the engineering diagrammatics and that this same information is used to develop and facilitate the updates of logistic and operational documentation (e.g., COSAL, Engineering Operational Sequencing System, CMP Staging Diagrams, RCM SSDIs, Combat System Tactical Operations Manuals, Damage Control (DC) Books, DC Diagrams, Ship Information Book diagrams, etc.) which are required to be kept current, in addition to the configuration file of the on-board SNAP computer.

(2) Where elimination, modification or replacement of an item will cause a change to the above documentation, that item is defined as configuration worthy. Configuration worthy items are indicated by annotating the applicable ESWBS number next to the piece mark description on the drawing. This annotation advises individuals developing lists of material and the Allowance Branch that the item needs to be recorded on the WSF. This flow provides a direct linkage from SHIPALT planning and design to the engineering drawings and the logistic products which must support the changes implemented by the SHIPALT.

(3) The controlling document for this process will be the SSRD. The Authorization Letter reflects the authorized changes (SHIPALTs) from which the Planning Yard generates pre-overhaul updates of the SSRDs. Other configuration changes (OPNAV 4790/CKs) made to the ship during the operational cycle were

reported to the Weapon Systems File (WSF) by the Planning Yard. By combining the Planning Yard's unique knowledge of both the authorized engineering changes and the reported configuration changes, the quality of Ship Checks and validations by advising the auditor of all probable differences, and the quality of input to the Start of Overhaul COSAL will be significantly enhanced.

(4) In order to maintain the concept of SSRDs, the revisions made upon receipt of the Authorization Letter must be verified prior to completion of the availability.

(5) These procedures maximize the gains to be realized from the concepts of the expanded Ship's Selected Record Drawings, the Planning Yard and the ESWBS integration process, while significantly enhancing the quality of input of data to the WSF.

b. Ship's Drawing Index (SDI). A significant continuing problem in SHIPALT development is the traditional practice of modifying systems within multiple ESWBS boundaries and incorporating these changes in a single set of drawings which reference only the prime system being modified (e.g., changes to ventilation, piping, electrical and other systems are included in the change drawings for the basic system, such as electric boiler). This process destroys the design baseline and mandates extensive ship-checks in order to perform other alterations.

(1) NAVSEANOTE 4700 of 30 April 1984 provides the Integrated Logistic Support requirements (Chapter 8) of the revised reference (d), and indicates that the Ship's Drawing Index (SDI) is a Ship Selected Record (SSR). To avoid the costly and time-consuming development and update of multiple drawings, while meeting the requirements for maintaining the SDI as an SSR, the following procedures will be used:

- For each alteration, the Drawing Schedule will be annotated with the ESWBS of all systems affected by the modification or alteration.
- No additional drawings will be prepared, but the drawing process will retain and update, as necessary, the ESWBS of systems, in addition to the primary system, which are affected by the change.
- The SDI will be prepared to reflect an entry for each ESWBS boundary affected during the availability (i.e., if five ESWBS boundaries were affected by a single drawing, the SDI would show five ESWBS entries with a reference to the same drawing number).

(2) As the SDI will be produced by using an ESWBS top down breakdown format, the above procedures will provide basic SDI information on the fact that particular systems have changed. Each ESWBS will list the number and title of the drawing which defines the complete ESWBS grouping in its most detailed form. Drawing numbers and titles must be related, at a minimum, to the five digit ESWBS level, where logistic support is involved.

5. Drawings for Structured Ships. The present method of using the three digit SWBS for numbering NAVSEA Drawings and Title Blocks in accordance with DoD STD 100 will not be changed to incorporate the ESWBS or the FGC. However, the structured ship construction process mandates a link between the design drawings and their associated logistic products. It is imperative that advance planning comply with the system boundaries defined by the ESWBS Manual or by the further indentured FGC

boundary structure. Each system boundary interface will be indicated on the drawing by noting the five digit ESWBS. Drawing titles should be consistent with functional system or equipment nomenclature defined by the ESWBS Manual or the functional nomenclature developed during the FGC assignment process.