APPENDIX I - MARITIME WARFARE MISSION AREAS

The Maritime Warfare Mission Area appendix has been broken down into three annexes: P-3C, SH-60B, and MH-53E.

- Annex A P-3C Mission Areas within Maritime Warfare
- Annex B SH-60B Mission Areas within Maritime Warfare
- Annex C MH-53E Mission Areas within Maritime Warfare

ANNEX A - P-3C MISSION AREAS WITHIN MARITIME WARFARE

The Maritime Warfare Mission Elements addressed for the P-3C aircraft in this appendix include:

a. USW (Under Sea Warfare)
b. SUW (Surface Warfare)
c. Mine Warfare (MIW)
d. Strike Coordination and Reconnaissance (SCAR)

The following sections discuss the current mission planning process, deficiencies and limitations, and concepts for a new or modified approach for these mission elements.

The primary focus of maritime warfare is control of the seas. To that end, the weapons platforms charged with maintaining that control must operate in a variety of environments to ensure supremacy under the sea, on the sea, and above it. The P-3C has proven an ideal platform for the Maritime Sector Commander (MSC) to exercise that control.

For this Concept of Operations (CONOPS), and specifically Maritime Warfare, we will consider maritime patrol aircraft, specifically the P-3. In developing this CONOPS, it is important to understand several important issues concerning P-3 operations. Historically designed to operate in a maritime environment, the P-3 has undergone a significant equipment upgrade (Anti-Surface Warfare Improvement Program (AIP)) which has radically changed its operating environment. These equipment upgrades have led to fundamental changes in the P-3's employment to now include SCAR. This appendix will address how aviation mission planning within the P-3 community is currently being conducted.

In the development of the JMPS architecture, this appendix will examine how the current mission planning process supports the following objectives of the JMPS.

- Connectivity with command, control, communications, computer and intelligence (C4I) networks
- Collaborative and distributive mission planning
- How compliant the current mission planning architecture (hardware, software, connectivity, etc.) is to the Defense Information Infrastructure Common Operating Environment (DII COE)
- Creation of a standardized Maritime Warfare Mission Planning Guide for the Maritime Patrol Platform (P-3)

In addition, this appendix will examine the current sources of mission planning support infrastructure/information used by maritime patrol aircraft to prepare for and support the mission areas listed above. This will allow the mission planning program offices to identify areas of commonality among the data producers, as well as identifying mission planning applications that are common to a variety of aircraft.

In follow-on chapters, we will use this format to identify deficiencies in the current mission planning process/system, and identify improvements needed.

In defining the maritime warfare mission planning process for the P-3, one needs to understand the role of the Global Command and Control – Maritime (GCCS-M) network and the Tactical

Support Center (TSC) infrastructure that currently provides mission planning support to the P-3. That is covered under the support concept within this section of the appendix.

I-A.1.0 DESCRIPTION OF CURRENT SYSTEM/SITUATION

I-A.1.1 OPERATIONAL MISSION PLANNING

During operational planning operations, the P-3 squadron is assigned to, and under the operational control of, an MSC (e.g., CTF-84 (Atlantic), CTF-67 (Mediterranean), CTF-72 (Pacific), etc.). P-3 operations are planned and coordinated through the TSC, a dedicated Maritime Sector Commander's Command and Control site, manned almost exclusively by P-3 experienced flight crew members.

While under the operational/tactical control (OPCON/TACON) of the MSC, the squadron operations officer will hold daily coordination meetings with the TSC operations officer to review upcoming tasking and determine the availability of Maritime Patrol Aircraft (MPA) to conduct the tasking. While the TSC will provide the actual mission specifics (Operational Area (OPAREA), target, communications plan, environmental support package, recommended tactics, etc.), the flight crew, a crew of 12 officers and sensor operators, is actually responsible for preparing the aircraft (ordnance load, aircraft preflight, sensor preparation, etc.) for the specific mission.

For the P-3, mission planning is a highly complex, but coordinated effort. As in all naval aircraft, the aircraft commander is responsible for flight safety, while the mission commander is responsible for the overall success of the mission. Each crew member, however, is responsible for various portions of the mission. The tactical coordinator (TACCO) is responsible for coordinating the efforts of the entire flight crew into a well-orchestrated team. This includes coordinating the efforts of the flight crew (e.g., ensuring the aircraft is properly positioned to collected the specified information), the acoustic and non-acoustic sensor operators (e.g., ensuring the crew has optimized its sensors for collecting the required information), and any ancillary support personnel (e.g., inflight technician and the aviation ordnanceman).

A typical mission will begin with a tactical briefing for the aircrew at the TSC three hours prior to take-off. Concurrently, maintenance personnel are preparing the aircraft for the mission (fueling, loading ordnance, etc.) The TSC tactical briefing will cover every aspect of the mission, including objectives, flight safety, supporting forces, communications plan, Emissions Control (EMCON) plan, etc. After the tactical briefing, the TSC will break up the aircrew and provide a more detailed briefing tailored to specific sensor or threat considerations. At the conclusion of the briefings, the TSC provides the flight crew with a mission support package containing digital or magnetic media containing threat parameters, chart data, mission data recorders, postflight reporting and analysis reports.

Each P-3 aircraft records all aspects of the mission on digital tape for mission replay and analysis. Feedback is provided to the squadron on each flight for training and readiness purposes.

I-A.1.1.1 Tasking

Maritime Patrol Aircraft (P-3C) are tasked through two processes:

- For normal maritime operations, tasking will be coordinated between the TSC and the squadron based on available aircraft and flight hours. Actual tasking will be via a Naval Tasking Message ("green" tasking request) to the squadron requesting a P-3 for a particular mission.
- For Joint/Combined operations, the Air Tasking Order (ATO) is the primary source for tasking. This tasking will be reflected on the squadron flight schedule. Prior to the formal receipt of the ATO, informal liaison with the Joint Forces Air Component Commander (JFACC) staff generally provides advance warning of impending flight operations and allow the flight crews more time for mission planning.

I-A.1.1.2 Research & Study

Research addresses the need for an aircrew to have common data and analysis regarding targets, threats, assets, and environment. Much of the planning support for P-3 operations is provided by the TSC. By coordinating all of the information in one central location, the TSC provides "one-stop shopping" for mission planning information.

The TSC has the capability to exchange information with intelligence support systems, electronic intelligence cueing systems, environmental support systems, the Integrated Undersea Surveillance System (IUSS), non-strategic nuclear forces, and joint tactical C4I systems, and to exchange intelligence information with tactical forces and key shore/afloat commanders. TSC information exchange is accomplished through the Defense Information Systems Network (DISN), Naval Command and Control System (NCCS) Network, Link 11, Office-in-Tactical Command Information Exchange System (OTCIXS), and other data relay, point-to-point, air-to-ground and ship-to-shore communications media. When conducting remote operates, the P-3 will use the Mobile Operations Command Center (MOCC) as a communications relay. The MOCC information exchange is accomplished through Tactical Digital Information Exchange Systems (TADIXS), Link-11, OTCIXS, Battle Group Information Exchange System (BGIXS), Common User Information Digital Exchange System (CUDIXs) and other data relay, point-to-point, air-to-ground and ship-to-shore communications media.

P-3 aircrews focus on the following:

- Development of a Communications/Data Link Plan - Plain/Secure Voice, Link-11, SATCOM (TDMA/non-TDMA/voice/imagery), Multi-mission Advanced Tactical Terminal (MATT) Filters
- Environmental Information -
  - USW - Submarine detection ranges based on ocean temperatures, ocean currents, ambient noise, etc. SUW - Atmospherics, cloud cover, temperature inversions, Electro-Optical Tactical Decision Aid (EOTDA) etc.
  - Reconnaissance - Visibility, Emission Indices, sun angle, terrain masking, etc.
- Combat Identification - Positive identification (ID) of all players
- Electronic Support (ES) Information Integration

- Battle Space Management (air space and water space restrictions/standoffs, threats, etc.)
- Rules of Engagement (ROE)
- Crew coordination/Crew tasking

When P-3 aircrews are operating out of remote locations, without TSC or MOCC on-site support, the P-3 communications suite permits secure connectivity to the TSC for most planning information. All P-3 TACCOs routinely carry P-3 Tactical Aids (TACAIDS), pertinent TACMANs, squadron Standard Operating Procedures (SOPs) and rely on individual aircrew mission commander's experience as primary sources of mission planning information while at remote sites.

I-A.1.1.3 Concept Development (Initial Planning)

Initial planning is dynamic and interactive. Upon notification of tasking (generally a secure telephone call to the TSC or squadron), the TSC and squadron operations teams will form to develop an initial answer to the standard questions: *who, what, when, where,* and *how.* The brainstorming process involves a multitude of activities, such as:

- Determining the mission objective
- Determining the number of sorties required to accomplish the task
- Examining historical environmental data
- Examining the terrain if conducting reconnaissance overland
- Determining the optimum sensor mix an ordnance load
- Determining the best approach and timing for the mission(s)

Once there is agreement on the assets required and the number of flight hours available for the operation, the TSC will generate a naval tasking message to the squadron formally requesting the aircraft and flight crews for the specific mission(s).

I-A.1.1.4 Concept of Operations Briefing (Optional)

The TSC/Squadron planning team will provide the TSC Director and Squadron Commanding Officer with a concise Concept of Operations briefing on the conduct of the operation. Actual mission briefings will be prepared by the individual TSC Watch Officer briefing the specific mission. In the event of a major operation, the TSC will assign an action officer to oversee the overall planning and execution of the missions. The majority of TSC Watch Officers are experienced P-3 mission commanders.

In terms of specific mission elements, the following scenarios are the general rule:

I-A.1.1.4.1 Undersea Warfare

For Undersea Warfare prosecutions, the TSC and Patrol Squadron Operations Officers will review the operational traffic on a specific target(s) generated by the adjacent Maritime Sector Commander's TSC and its resident maritime patrol squadron(s). After reviewing the target and ROEs, they will develop an initial plan of attack which will be briefed to the squadron commanding officer for his approval. Once the commanding officer approves the initial

prosecution plan, the squadron and TSC operations officers will develop a detailed plan of action against the target within the prescribed ROEs.

I-A.1.1.4.2 Surface Warfare

For Surface Warfare actions, the MSC will coordinate with the JTF commander to determine the assets available for a surface warfare strike. If this mission has been assigned to a maritime patrol squadron in advance of a surface action group (SAG), the MSC will task the task group commander in their sector (generally the patrol squadron commanding officer) to carry out a strike plan against the designated enemy SAG. Here again, the squadron and TSC operations officers will develop a strike plan that may use a sortie of maritime patrol aircraft to engage the SAG. Once the commanding officer approves the initial strike plan, the squadron and TSC operations officers will develop a detailed plan of action against the enemy SAG within the prescribed ROEs.

I-A.1.1.4.3 Mine Warfare

Mine Warfare operations can be designated as offensive or defensive. Depending on the scenario, maritime patrol aircraft may be called up to conduct either operation. The MSC will task the task group commander in their sector (generally the patrol squadron commanding officer) to carry out a mine warfare operation in support of a specific Operational Plan (OPLAN) or Contingency Operation. Here again, the squadron and TSC operations officers will develop a mine warfare strike that may use a sortie of maritime patrol aircraft to mine a specific location. Once the commanding officer approves the initial plan, the squadron and TSC operations officers will develop a detailed plan of action to deliver the mines within the prescribed ROEs.

I-A.1.1.4.4 Strike Coordination and Reconnaissance

Maritime patrol aircraft have now assumed an additional mission of Strike Coordination and Reconnaissance. The MSC will task the task group commander in his sector (generally the patrol squadron commanding officer) to carry out a SCAR operation in support of a specific OPLAN or Contingency Operation. The squadron and TSC operations officers will develop a plan in coordination with the Joint Task Force (JTF) commander to support the designated SCAR mission. Once the commanding officer approves the initial plan, the squadron and TSC operations officers will develop a detailed plan of action in support of the SCAR mission.

I-A.1.1.5 Detailed Element Planning

There is no current P-3 mission planning guide with standard mission planning procedures. As mentioned previously, the actual mission support materials (environmental support package, sensor threat parameters digital load, digital map loads (dual 9 Gigabyte drives), target threat information, etc.) are provided by the TSC. Specific procedures for inflight tactical processes (e.g., Tactical Crew Checklist and setting flight/battle conditions) are discussed in the NATOPS Manual. The maritime patrol community does rely on Naval Warfare Publication (NWP) Maritime Patrol Tactics manuals for specific mission areas (USW sonobuoy patterns, mine warfare planning, etc.), but there are no community standard mission planning guides on sequential steps for each of the following procedures (i.e., “I’m on the flight schedule for an USW mission tomorrow; what do I (Tactical Coordinator (TACCO), Pilot, Senior Sensor Operator) do

first?). Most aircrews rely on squadron SOPs, individual checklists handed down over the years, or make up their own based on individual experiences.

There are currently no capabilities permitting real-time collaborative and distributive planning between P-3 aircraft beyond that permitted by secure voice/data circuits. Aircraft can exchange a common tactical picture with the TSC or other similarly equipped aircraft via secure data link (Link 11) or OTCIXS if AIP-equipped.

I-A.1.1.6 Detailed Administrative Planning

There is no current P-3 mission planning guide with standard mission planning procedures for detailed administrative planning. A detailed administrative guide will list all aircrew members and their specific responsibilities, for example:

1. Mission Commander
    - Check Ordnance Load
    - Review Return to Force Procedures
    - Review ROE
2. Pilot
    - Review weather
    - EMCON Procedures

I-A.1.1.7 Validated Aggregate Planning

In general, there is no procedure for P-3 aggregate planning. Once the mission has been briefed, the individual aircrew is responsible for executing the mission. In the event of a multiple plane evolution, such as an offensive mine warfare mission, the aircraft mission commanders will assemble with the squadron commanding officer and TSC briefing team to ensure there are no unresolved questions.

For individual sorties, once the detailed planning is complete, the P-3 mission commander will review the mission plan with the aircrew to ensure everyone understands their individual responsibility. Any last minute updates can be passed to the P-3 via secure circuits. Depending on EMCON conditions, the TSC can maintain real-time connectivity with the P-3, via Link 11 or secure SATCOM (if wide band channel available).

I-A.1.1.8 Create Aircraft Data Load

The P-3C requires data loads from a number of sources. Mission sensor data magnetic and digital loads (mapping data & mission data) are prepared at the TSC and loaded by the specific sensor operators (acoustic, non-acoustic, electro-optical (EO)). The Navigator/Communicator prepares and loads all cryptographic materials. Any future program must be loaded to the P-3C through the RD-450 and in the case of AIP, via removable aircraft hard drives. AIP hard drives are loaded at the TSC with digital charts, overlays, radio configurations, MATT filters, target imagery (EO,

Synthetic Aperture Radar (SAR), Inverse SAR (ISAR), Maverick Infrared Detection System (IRDS)).

I-A.1.1.9 Rehearse Mission

Deployed P-3 aircrews have no access to mission simulators for mission rehearsal. There are no current plans to install TOPSCENE systems for mission rehearsal in the TSCs.

I-A.1.1.10 Aircrew Briefing

As discussed above, the TSC provides aircrew briefings for operational P-3 missions. These missions, depending on the sensitivity of the mission, are generally attended by the entire flight crew. For sensitive operations, TSC briefings will be limited to the officer flight crew and senior sensor operators.

During training operations in the local flight area, the pilot will brief local flight procedures, while the TACCO will brief tactics and aircrew coordination procedures.

There is always an aircraft safety and Naval Air Training and Operating Procedures Standardization (NATOPS) briefing prior to takeoff.

I-A.1.1.11 Execute

Mission execution can be tracked at the TSC via data link or secure (high frequency (HF)/ultra-high frequency (UHF)) SATCOM. Aircrews load mission data collection media (magnetic tapes or digital recorders) on all operational missions. P-3s are capable of transmitting real time E/O information via UHF LOS and near real time still imagery via DAMA SATCOM.

I-A.1.1.12 Postflight Debriefing

At the conclusion of operational missions, the tactical flight crew is debriefed at the TSC. The TSC is capable of replays all aspects of the mission and conducts initial analysis and dissemination of collected sensor information. All information of interest is reported to the operational chain of command via a formatted naval postflight reporting message. Examples of information reported are:

- High interest land targets
- Surface & sub-surface combatants
- Merchant Shipping
- Environmental

I-A.1.2 USER OR INVOLVED PERSONNEL

In the P-3 mission planning process, the aircrew will interact with the following people:

- TSC personnel with web links to intelligence, weather, National Imagery and Mapping Agency (NIMA), etc., via SIPRNET connectivity

- METOC personnel (at flight ops, but can be accessed via TSC web connections

The TSC personnel will interact with a host of mission support personnel via the GCCS-M (ashore) connectivity. The TSC has the capability to exchange information with intelligence support systems, electronic intelligence cueing systems, environmental support systems, the IUSS, non-strategic nuclear forces, and joint tactical C4I systems, and to exchange intelligence information with tactical forces and key shore/afloat commanders.

I-A.1.3 SECURITY

All P-3 aircrew are cleared to at least Secret with the Officers cleared to the Top Secret level.

I-A.1.4 SUPPORT CONCEPT

The maritime patrol community is supported by the TSC Program. The TSC Program consists of fixed site TSC and mobile components MOCC. Fixed site TSCs are located at P-3 and S-3 home-ported locations, and at principle P-3 deployment sites. TSC Mobile Variants (TMVs) MOCCs are deployable units capable of providing a rapid-reaction tactical C4I and sensor analysis capability, as required, which can be positioned using fleet assets (e.g., P-3 or C-130), at forward operating sites not supported by fixed-site TSCs.

The Tactical Support Center is an ashore node of GCCS-M which provides a component of the Tactical Command Center (TCC) pillar of the Copernicus “Forward” architecture described in the CNO document, “Copernicus...Forward: C4I for the 21st Century.” As such, the TSC has C4I capabilities which provide the Naval Component Commander (NCC) and the MSC-ashore with the capability to plan, direct and control tactical operations of forces under their OPCON and TACON, in support of Naval Expeditionary Forces (NEFs) and other assigned units within his respective littoral and open ocean area of responsibility (AOR). The MSC is normally a task group commander who reports to the maritime area surveillance task force commander (CTFs 12, 67, 72 or 84) under the immediate operational control of the fleet commander-in-chief (FLTCINC) or numbered fleet commander (NFC), depending upon the theater of operations. The MSC supports NEFs and other assigned units in their respective littoral and open ocean area of responsibility operating in his AOR as tasked by the FLTCINC or NFC. Those operations include , but are not limited to the following.

- All facets of expeditionary warfare
- Maritime and Littoral (seaward and land) and surveillance
- Surface warfare
- Over-the-horizon detection, classification and targeting (OTH/DCT)
- Mine Warfare
- Command and Control Warfare (C2W)
- Counter Drug Operations (CD)
- Under Sea Warfare
- Power Projection

- Convoy Escort
- Search and Rescue (SAR)
- Sensitive Special Operations (SPECOPS)
- Strike Warfare (STKW)
- Mission Warfare Readiness Training

As an integral part of the Expeditionary Force Package, the TSC must be compatible and interoperable with the C4I systems supporting the unified, subordinate unified and JTF commanders, FLTCINCs/NFCs; maritime area surveillance task force commanders; key NEF commanders afloat (e.g. battle group (BG), SAG, amphibious task force (ATF) and convoy); other service components and tactical commanders, and key allied/North Atlantic Treaty Organization (NATO) commanders. Forces and assets which may be assigned to the OPCON/TACON of the NCC or MSC include US and Allied expeditionary aircraft, surface combatants and surveillance units, submarines, unmanned aerial and subsurface vehicles, and selected SPECOPS units.

Joint Maritime Command and Information System (JMCIS) TSC and TMV systems include: TSC, MOCC, Mobile Ashore Support Terminal (MAST), and the Mobile Integrated Command Facility (MICF).

I-A.1.5 TRAINING COMMAND/FLEET REPLACEMENT SQUADRON MISSION PLANNING

Prior to assignment to a P-3 squadron, each individual aircrew goes through a six month fleet replacement squadron (FRS) syllabus that introduces him to the aircraft and its systems. If the aircrew has had prior experience in P-3s, this syllabus may be shortened. Although there are sections in the syllabus for tactics and employment of the aircraft on the designated mission areas, the primary focus is on aircraft systems and crew safety procedures.

General mission planning is addressed in the syllabus, but more as an introductory course. Students are taken to a TSC and introduced to the mission planning support infrastructure in place for P-3 operations.

Upon arriving at the squadron, each aircrew, depending on their flight designator (pilot/Naval Flight Officer (NFO)) or Navy Enlisted Classification (NEC) for enlisted aircrew, undergoes a rigorous qualification process involving ground training, simulator flights, exercise flights, systems boards, tactics boards, and formal designation in aircraft type. Within the course of this training, aircrew are integrated into Combat Aircrews that must pass through a series of training exercises that test crew knowledge and flight coordination in executing all mission areas. Those flight crews/individuals unable to meet Patrol Wing mission standards/ qualifications are removed from flight status. Once designated, aircrews must go through a yearly qualification process as an integral crew.

I-A.2.0 DEFICIENCIES AND LIMITATIONS OF CURRENT SYSTEM

I-A.2.1 JUSTIFICATION FOR CHANGE

A review of the current operating procedures associated with MPA operations reveals a system that has relied heavily for its mission planning support on an existing command and control infrastructure (TSC) that has served it well. A review of MPA/TSC operations over the years will reveal a symbiotic relationship that may be called upon to support a wide variety of mission areas in the course of normal operations. These may range from a USW prosecution, a surface surveillance operation, a NATO exercise, or a series of E/O reconnaissance flights supporting joint/combined operations. What is key in all of this is an increasing emphasis on joint operations.

The Maritime Patrol Aviation Vision 2010 is very clear in its vision of the MPA community as an expeditionary force capable of being a force multiplier in a wide spectrum of Joint Mission Areas. The end of the Cold War and the decrease in Russian submarine deployments forced a shift in emphasis for MPA squadrons. The changing international scene called for forces that could quickly respond and provide a United States (US) presence. The P-3C, with its supporting infrastructure, represents a self-contained, self-sustaining force capable of command, control, and communications with Battle Groups, Amphibious Ready Groups, Theater and Fleet commanders via a network of communications links.

With the emergence of qualitative improvements in information management (IM), along with DoD directives that mandate migration to architectures that optimize these new IM technologies, and the focus on joint operations, we need to examine how we conduct combat operations to ensure we can take full advantage of these new technologies in our operations.

I-A.2.1.1 Imposed New Requirements

I-A.2.1.1.1 Connectivity to C4I Nodes

Current military doctrine describes a strict hierarchy for command and control of military forces. The following figure best illustrates that structure as it currently exists for MPA forces.

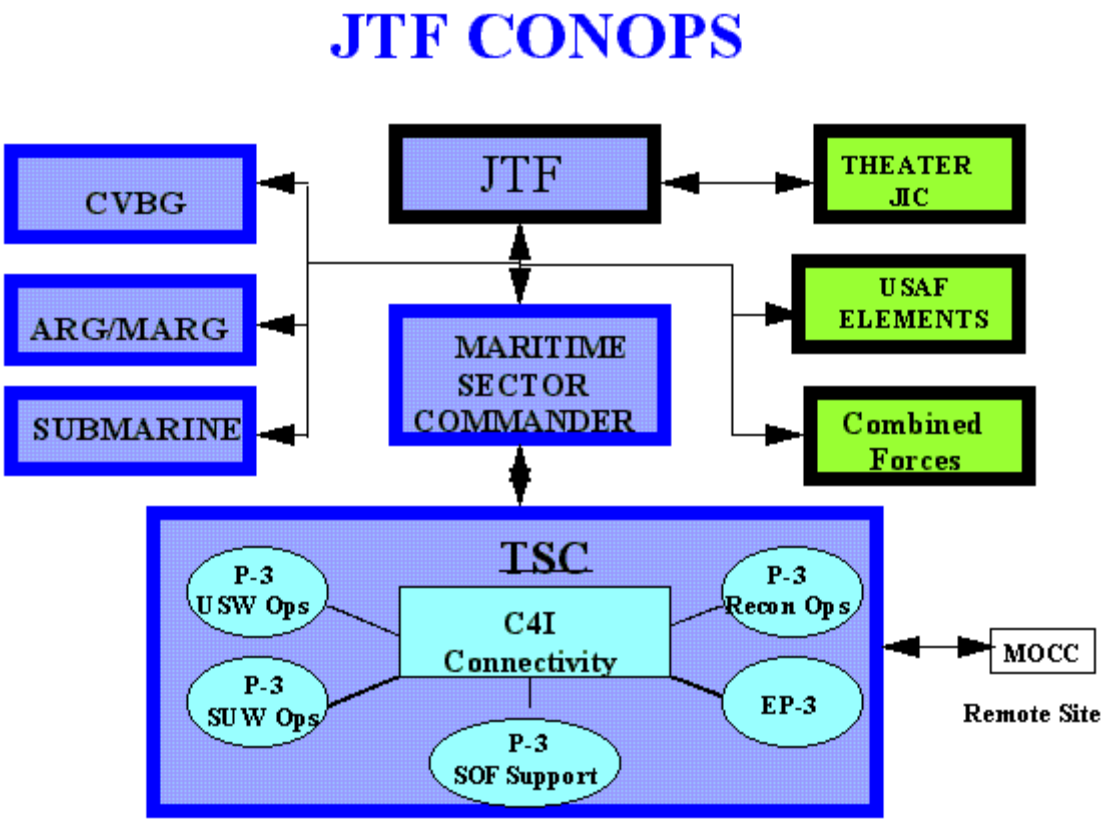

Figure I-1. Typical Hierarchical Command Structure.

Lessons Learned from Operation Desert Storm were replete with criticism over the lack of adequate connectivity between the services resulting in ATOs being transported by aircraft throughout the theater of operations.

I-A.2.1.1.2 Collaborative and Distributive Planning

A review of the current MPA planning process shows that the MPA is heavily dependent on the TSC infrastructure for command and control. This will not change, nor should it. The TSC has been specifically designed and manned to support the MPA missions. That relationship has been the backbone of the MPA success story throughout the Cold War. With the current emphasis on joint and combined operations, the ability to conduct collaborative and distributive planning has taken on a new urgency.

With the focus on joint operations, it becomes critical for MPA forces to operate in forward areas at a moment's notice without on-site Command and Control (C2) support. The P-3Cs need the ability to electronically conduct collaborative and distributive mission planning sessions and pass operational information between joint players across chains of command.

A-I.2.1.1.3 Compliance with DoD Doctrinal and Information Management Requirements

Current directives (Joint Vision 2010, DII COE Mandate, IT-21, etc.) are mandating compliance with doctrinal and information management requirements meant to assist the warfighter. To the

average P-3C aircrew, this has no meaning since much of the P-3C planning is done by function-specific software and hardware at the TSC. P-3 hardware and software are also function-specific for maritime combat operations. P-3C aircrews currently do not use TAMPS for mission planning.

A-I.2.1.1.4 Standardized Maritime Patrol Aviation Mission Planning Guide

There is no P-3C community standard MPA mission planning guide specifically addressing a P-3C mission planning process for the major P-3C mission areas. P-3C aircrews rely on a squadron SOP (if it exists), and TSC mission planning support for planning major operations.

I-A.2.2 DEFICIENCIES AND LIMITATIONS OF CURRENT SYSTEM

There are a number of deficiencies and limitations within the current system. These deficiencies and limitations do not prevent the execution of P-3C missions, however, the mission planning process, from tasking through postflight debrief and analysis, does need major revision if the P-3C community hopes to capitalize on information management techniques and technologies.

I-A.2.2.1 Tasking

Tasking mission planners is a time consuming process that requires information to be passed through several layers of command, analyzed and distributed. By the time it reaches key mission planners, valuable planning time is lost. If questions arise about mission tasking, available mission planning time decreases as clarification requests are routed back up the chain of command.

I-A.2.2.2 Research and Study (including information request)

P-3C mission planners require a large amount of information for mission planning in the four major mission areas. This includes command organization, the communications plan (call signs, frequencies, data link, etc.), the EMCON plan, weapons release policies, weather information, intelligence information, weather, ROEs, etc. As a result, P-3C mission planners must request outside support to assist in mission planning.

The TSC currently provides the P-3C aircrew with the necessary information required for the successful execution of the tasked mission. The TSC relies on its capabilities as a GCCS-M node to connect to a vast array of information. TSCs are currently implementing web site technology to access a variety of information needed to support P-3C operations. As the maritime patrol aircraft begin to enter into warfare areas that have been traditionally the domain of strike aircraft, there will need to be a re-evaluation of the current manning structure to include personnel from other warfare communities.

I-A.2.2.3 Concept Development (Initial Planning)

P-3C operations personnel conduct extensive liaison with the TSC to ensure all aspects of an operation are thoroughly researched before actual flight operations begin. By the nature of its functionality, i.e., the Maritime Sector Commander's command and control node, the TSC is optimized to support Maritime Warfare operations in its sector. The TSC conducts extensive

liaison with all commands within its area of responsibility, both joint and combined, to ensure it has all the necessary information to support combat operations.

Unless the TSC and squadron are co-located, there is still the need to physically gather the mission planning team, consisting of TSC and squadron aircrew, together. There is a requirement for a collaborative and distributive planning capability that would allow the aircrews/mission planners to discuss any item of the specific mission being planned or to get an update without having to go to the TSC, especially after the initial aircrew briefing.

I-A.2.2.4 Concept of Ops Brief (Optional)

Prior to the start of a major operation, P-3C and TSC operations planners will research the mission objectives and brief the local task group commander (generally the squadron commanding officer) and the aircrew mission commanders on the operation. A collaborative and distributive planning capability would be desirable if the aircrews are dispersed in support of combat operations.

I-A.2.2.5 Detailed Element Planning

I-A.2.2.5.1 P-3C Mission Elements

The following identifies current mission planning deficiencies for P-3C Mission Planning. The deficiencies can be grouped into several categories that identify the basic problems with current automated mission planning systems and with the P-3C mission planning process.

I-A.2.2.5.1.1 Current Automated Planning System

P-3C aircrews do not currently use an automated mission planning system. The current Tactical Automated Mission Planning System (TAMPS) does not have a P-3C mission planning module (MPM) for P-3C planning support.

Current planning process relies on the aircrews to manually input mission information into the aircraft avionics systems.

I-A.2.2.5.1.2 P-3C Mission Planning Process

There is no P-3C community standard mission planning guide for any of the P-3C mission areas.

Lack of a “standard P-3C mission planning process” leads to human error (missing a critical step in a non-standard process).

Mission Planners use numerous, non-standard mission planning checklists to aid in mission planning.

I-A.2.2.5.1.3 Collaborative and Distributive Mission Planning

Current planning process does not support the capability to conduct effective and timely concurrent planning with agencies outside of the immediate vicinity.

I-A.2.2.5.1.4 Tasking

Current P-3C tasking is electronically received and tied into other mission planning agencies (D-I.2.2.5.1.4-1). ATO tasking is received by the supporting TSC and passed to the P-3C squadron via secure phone.

I-A.2.2.5.1.5 Mapping, Charting, Geodesy & Imagery (MCG&I)

P-3C aircrews have access to hardcopy MCG&I products within the squadron navigation office. The aircrew also receives a digital hard drive from the TSC containing MCG&I information of the mission OPAREA. Unfortunately, this mapping information is not available to the flight crew (pilot) via a digital display in the cockpit.

I-A.2.2.5.1.6 Aircraft Performance

Determining aircraft performance for all P-3C aircraft is done manually without the aid of an approved automated system that could quickly calculates those items required by NATOPS (e.g. Weight and Balance, Take Off and Landing Data (TOLD), etc.) or those items essential for mission planning (e.g. fuel consumption, best range, speed, etc.).

Valuable mission planning time is spent calculating and re-calculating vital information in order to eliminate errors that might impact flight safety.

I-A.2.2.5.1.7 Route Planning

P-3C mission planners conduct mission route planning manually. The approach to route planning is dependent upon the mission at hand and the time available for planning. A typical mission is generally done by hand, using existing maps and charts, and manually determined information such as distances, time, fuel consumption, etc. Once route planning is complete, aircrews must manually transcribe this information on to a map or chart, and manually enter information into an aircraft Navigation/GPS system.

I-A.2.2.5.1.8 Communications

Communications planning for P-3C missions requires detailed coordination and planning between mission planners and external agencies in regards to frequency availability, security and procedures. Once the coordination, planning, and deconfliction has been completed however, this information is manually inputted into aircraft communications systems. This procedure is timely and prone to error as aircrew rush to enter data prior to launch.

I-A.2.2.5.1.9 Defensive Electronic Countermeasures (DECM)

Current defensive countermeasure planning requires detailed coordination between mission route planners, intelligence agencies, and maintenance. Mission planners determine the type of defensive countermeasures required for the mission after an analysis of enemy threat systems. Planners rely on publications (e.g. MCM 3-1) to provide information on the best countermeasures to employ.

Based upon on the information available on the threat, the route, countermeasure availability, ROEs, etc., mission planners coordinate with maintenance for modifications to the ordnance load. Aircrew are then required to manually input the appropriate programming sequence into the aircraft countermeasure systems.

I-A.2.2.5.1.10 Load Planning

Aircrew are required to manually input aircraft load information (e.g. personnel, cargo, fuel, sonobouys, weapons, etc.) into the aircraft's computers.

I-A.2.2.5.1.11 Mission Products

Mission planners create a variety of flight products (e.g., charts, maps, execution checklists, communication cards, routes cards, etc.,) from a variety of sources. The TSC helps the P-3C aircrew by printing many of the mission support products or preparing the digital load devices. Although the process is automated for the majority of the products, the process for generating many of these products is very labor-intensive.

I-A.2.2.5.1.12 Briefing

The TSC generally provides the overwhelming majority of the products used to support the P-3C missions.

I-A.2.2.6 Detailed Administrative Planning

Detailed administrative planning is handled by the P-3C mission commander. As stated previously, there is no standard P-3C checklist specifically tailored to a mission area and all the administrative requirements associated with crew preparation. Experience is a large factor in determining what will comprise a specific checklist.

Detailed administrative planning becomes an even greater issue for P-3C remote detachment operations. Squadrons rely on SOPs since there is no community standard checklist that addresses remote site operations.

I-A.2.2.6.1 Validate Aggregate Plan (Coordination/Deconfliction)

The TSC coordinates and deconflicts mission planning within its maritime sector. All missions tasked within the sector are automatically plotted and displayed for all subsequent aircrews operating in that sector of operations. Aircrews are provided with routes, communications plans, etc. to ensure deconfliction. No noted deficiencies in this area.

I-A.2.2.6.2 Create Aircraft Data Loads

The TSC prepares a variety of data loads for the P-3C aircrews. These data loads are primarily to support sensor avionics and mission data recording. There is an emergent capability among the ASUW AIP aircraft to digitally display charts in the aircraft. The TSC prepares data loads (9 Gigabytes) for those aircraft. AIP aircraft have removable hard drives which are preloaded at the TSC with digital charts, overlays, radio configurations, MATT filters, target imagery (EO, SAR, ISAR, Maverick IRDS). The TSC has the capability to record and replay a P-3C mission for postflight analysis.

I-A.2.2.6.3 Rehearse Mission

Until recently, most P-3 missions were conducted over the open ocean, and thus, there was no perceived requirement for a mission rehearsal capability. With the emerging prominence of the overland reconnaissance (E/O) mission, there is now a renewed interest in a mission rehearsal capability that provides the flight crew with a perspective for aircraft placement that optimizes

electro-optic sensor performance. There are no plans at this time to install a mission rehearsal capability in the TSC.

I-A.2.2.6.4 Aircrew Brief

The TSC/MOCC tactical aircrew briefing captures the majority of shortfalls addressed within the TACAIR community. The TSC watch team provides the P-3C aircrew with a "full spectrum" view of operations within the AOR. The TSC/MOCC is specifically designed to provide the P-3C aircrew with prompt access to all the information needed to complete its mission. It provides the aircrew with mission support documentation, as well as sensor data loads optimized for the targets of interest.

Deficiencies in this area center on aircrew support while at remote sites without MOCC support. There is an outstanding requirement for COTS that provides a collaborative and distributive planning capability for the maritime patrol aircraft based at a remote site.

I-A.2.2.6.5 Execute Mission

Mission planning typically ceases upon mission execution. Mission execution is recorded by onboard recorders or can be tracked via secure data link or secure voice communication with the TSC. The TSC can provide updates or changes to the mission plan inflight via a wide variety of secure communications links.

I-A.2.2.6.6 Postflight Debrief

TSC postflight debriefs are extremely thorough and follow a standard P-3C postflight analysis reporting format that covers every aspect of the tactical mission. Aircrews are graded on mission performance and feedback is provided to the squadron. The TSC has mission replay capability and, depending on the mission, can provide a minute-by-minute replay of the mission from takeoff to landing. The TSC provides the MSC with a postflight report on every operational mission within six hours of its landing.

I-A.2.2.6.7 Post Flight Data Analysis

The TSC conducts postflight analysis of each operationally tasked flight. The TSC team collects, analyzes, and disseminates sensor data and reports that information to interested technical, intelligence and operational agencies.

Squadron-related information (maintenance and operations) is submitted in accordance with squadron SOPs.

I-A.2.2.7 Description of Needed Changes

The description of needed changes will be addressed in light of the overall requirements stated at the beginning of Section I-A.3. Because of their ability to operate at remote sites, P-3C aircrews are particularly sensitive to issues of command, control and communications. Without adequately addressing these fundamental issues in the mission planning process, there is no command, control or communications within which our forces can operate.

I-A.2.2.7.1 Connectivity to C4I Nodes

The current hierarchical system of passing tasking information to P-3C aircrews is adequate, but vulnerable. Given the time-critical nature of much of P-3 tasking, and its greater emphasis on joint operations, it is imperative that all segments of the mission plan be passed concurrently to begin preparation of the battle plan. There are COTS tools that are specifically designed to permit a collaborative and distributive planning capability.

The conferencing capability would permit the JTF commander to immediately communicate his (or the National Command Authorities (NCAs)) intentions and objectives. Mid-level command elements can provide the details of the plan (targets, ROE, communications plans, etc.). By incorporating these distributive capabilities, the units actually implementing the plan understand the information required to carry the plan out, and the data producing elements (weather, intelligence, NIMA, etc.) can tailor their products to support the plan, unlike the current situation where the information is filtered until the executing units have little idea of the ultimate objectives.

I-A.2.2.7.2 Collaborative and Distributive Planning

The TSC infrastructure provides the P-3 aircrews the connectivity to pass operational information between sectors, however the data exchange rate is limited. A collaborative planning capability that allows access to critical mission planning information via the SIPRNET and using web page technology is critical to improving the overall mission planning process. The following figures illustrate that proposed capability.

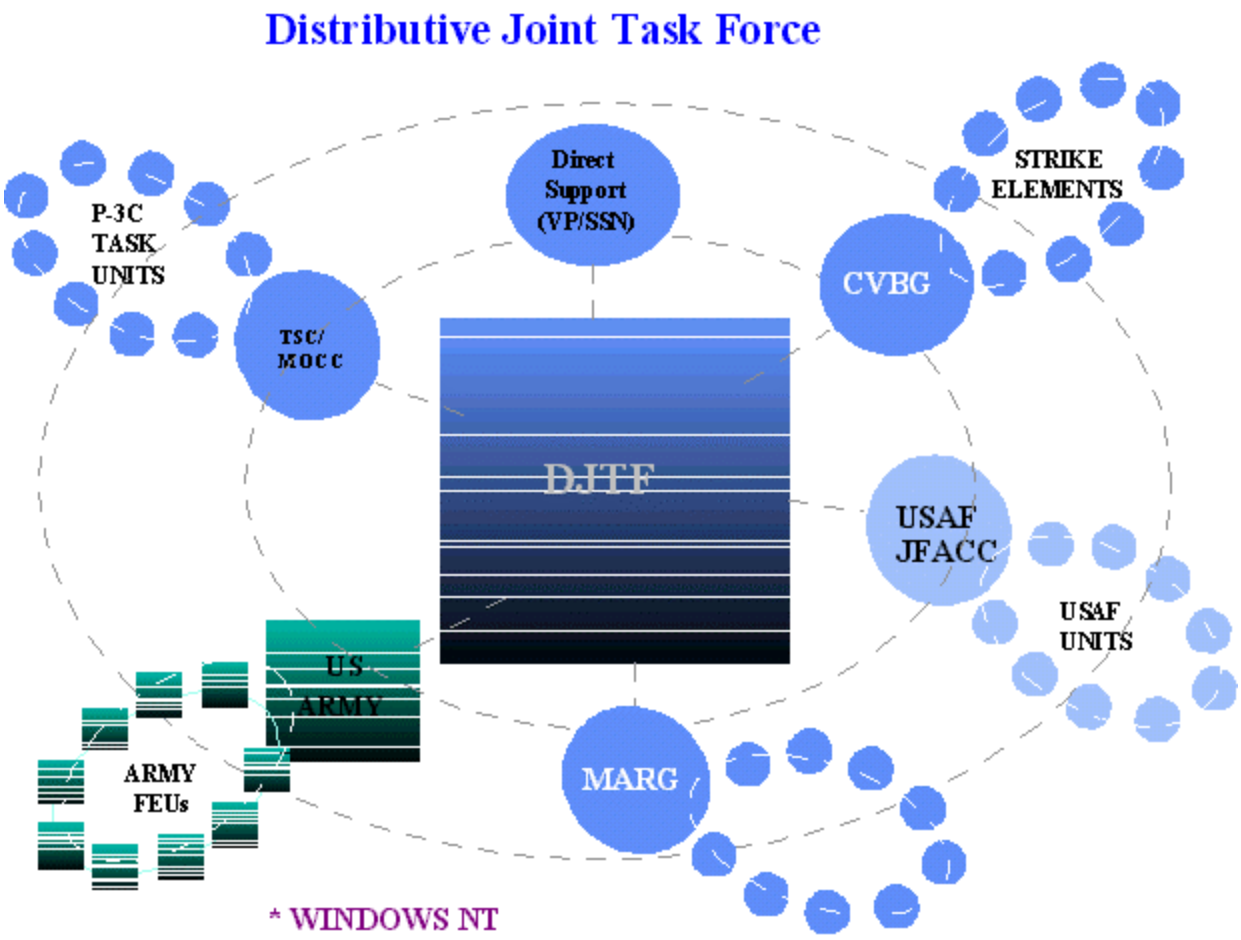

Figure I-2. Distributive Joint Task Force.

The following figure illustrates a collaborative planning capability in which planning involving a number of P-3C aircrews could collaborate with a carrier strike group in planning a multi-plane offensive mining sortie.

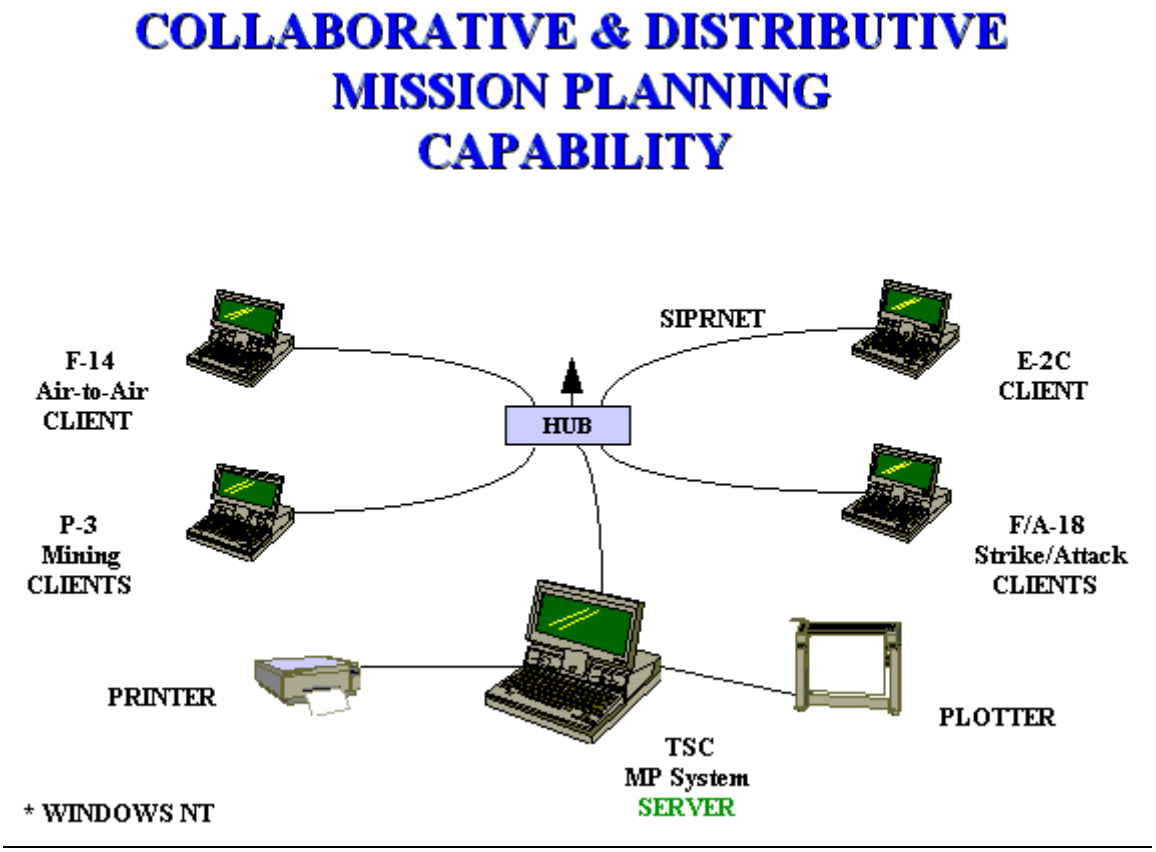

Figure I-3. Collaborative & Distributive Mission Planning.

The following figure illustrates an emergent TSC capability being introduced to improve the information management process used to meet the P-3C mission planning process. By centralizing the common data elements into web sites with specific information responsibility, we cut down on the current "search for the key player," we designate a responsible agent for the necessary information (weather, intelligence, etc.), and we provide an infrastructure for managing mission planning information that can be accessed by other warfighters operating within the TSC AOR.

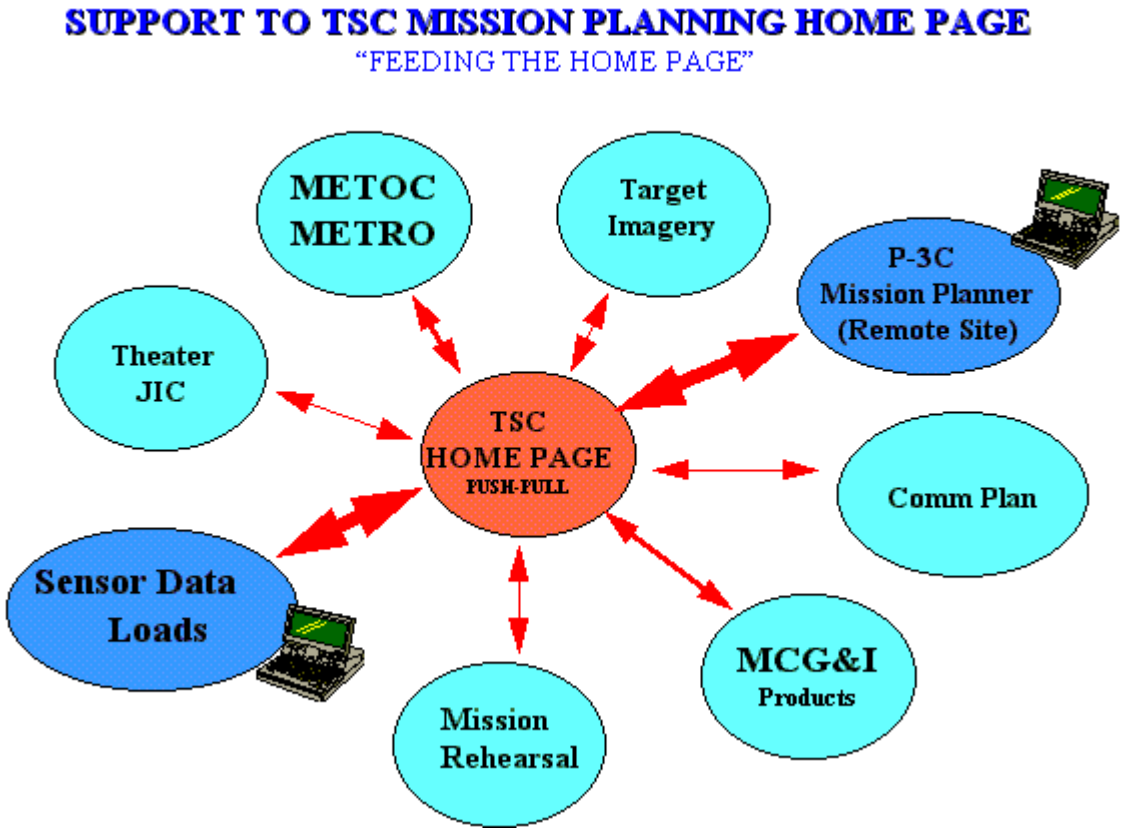

Figure I-4. TSC Mission Planning Home Page.

I-A.2.2.7.3 Compliance to DII COE

Much of the software currently used on P-3C aircraft is function specific. Current P-3C communications capacity, data transfer, storage, display, and imagery transfer capabilities are falling behind the demand. The P-3 community needs additional warfighting support capabilities such as real time data exchange with Joint Forces, and timely receipt of ATO. The ATO is currently received via SIPRNET.

I-A.2.2.7.4 Standardized P-3C Mission Planning Guide

There is no standardized mission planning process for any of the mission areas identified for the P-3C aircraft. There are squadron checklists and SOPs that address P-3C mission planning concerns, but there are no community standards for P-3C mission planning. Members of the P-3C community recognize that the community must agree on a standard process for mission planning if they are to take full advantage of the information management tools in the commercial market.

I-A.2.3 PRIORITIES AMONG THE CHANGES

Changes to the mission planning process must come from the user community. The architecture in which that process will operate has been defined in DII COE directives. We will need better connectivity to C4I nodes, and collaborative and distributive planning capabilities. The current

planning process (TSC/VP) is adequate but vulnerable, and does not address remote site planning support without MOCC support.

The P-3C community needs to have an organic capability to conduct collaborative and distributive mission planning in light of the emphasis on joint and combined operations. The development of a standardized P-3C mission planning guide is a first step in defining mission planning requirements that can feed into a common development architecture using DII COE compliant standards (e.g., WINDOWS NT) to develop a truly automated mission planning system for the P-3C community.

I-A.2.3.1 Changes Considered but not Included

A recommendation to review the current P-3C planning process and the sources of information feeding that process was not included.

I-A.2.4 ASSUMPTIONS AND CONSTRAINTS

Development of a standardized P-3C mission planning guide.

I-A.3.0 CONCEPT FOR A NEW OR MODIFIED SYSTEM

I-A.3.1 BACKGROUND, OBJECTIVES, AND SCOPE

The Joint Mission Planning System (JMPS) is a cooperative effort between Navy and Air Force to develop a mission planning architecture that will permit interoperability between warfighting forces down to the unit level.

A new or modified system will need to meet the stated objective identified within this JMPS document. Those objectives center on the following:

- Connectivity to C4I nodes
- Compliant with DII COE directives
- Provide a collaborative and Distributive Planning Capability
- Reflects the needs of the user community

This section will provide the near-term vision for mission planning (2001-2005) from the planner's perspective.

I-A.3.2 OPERATIONAL POLICIES AND CONSTRAINTS

The new system must conform to the requirements and policies discussed in Section I-A.1 and I-A.2.1.1 above.

I-A.3.3 DESCRIPTION OF THE NEW OR MODIFIED SYSTEM

The Maritime Patrol community will continue to rely on the TSC infrastructure to provide the majority of its mission planning support. The JMPS architecture will, however, provide the P-3 aircrew with the capability to plan maritime warfare missions by accessing TSC mission planning support from remote sites more effectively, and permit more effective interaction with naval battle

group and joint warfare operations. The maritime patrol community will do this by taking effective advantage of information technology advancements that will permit the community to incorporate its community-specific mission planning process onto a laptop and tie into the TSC's mission planning data bases via satellite communication (SATCOM). This same JMPS architecture will permit the maritime patrol assets to tie into the Battle Group's Naval Strike Warfare Planning Center information network for incorporation into the Strike Leader's external assets that can be called upon for strike support.

I-A.3.3.1 Tasking

Maritime Patrol Aircraft (P-3) will continue to be tasked via a Navy tasking message ("green" tasking messages) and via an ATO received through normal Navy communications channels. Using the JMPS architecture, MPA will be able to join a distributive network and receive tasking via a secure conferencing capability within its JMPS laptop.

I-A.3.3.2 Research and Study

As mentioned in the previous section, much of the information required to prepare the MPA aircrew for a specific mission is prepared at the adjacent TSC. This arrangement is preferred by the MPA community. It becomes a problem when the P-3 is located at a remote site without access to the TSC infrastructure, such as a MOCC. The JMPS architecture will permit the MPA aircrew to access critical mission planning information via SATCOM ties to their laptop JMPS workstation which will have the capability to tie into the extensive MPA communications suite.

I-A.3.3.2.1 Rules of Engagement

The MPA aircrew will be given the ROEs when they brief at the adjacent TSC. When working in joint or combined operations, this information will be relayed to the MPA aircrew by the TSC, either at the aircrew briefing, or updated via a variety of communications links. While at remote sites, the MPA aircrew will access the TSC via secure links and access the TSC Web Site with links to a variety of mission planning information, including the updated ROEs.

I-A.3.3.2.2 Meteorology

MPA aircrew currently get meteorologic information/products from the TSC during the aircrew briefing. This will not change in the foreseeable future. Of greater importance will be the remote site access to the on-station information needed for proper sensor employment. Here again, the JMPS architecture will permit the MPA aircrew to access the TSC Web Site with links to a variety of mission planning information, including meteorologic information.

I-A.3.3.2.3 Asset Availability

The MPA squadrons provide the Maritime Sector Commander, via the TSC, with a daily naval message depicting the status of aircrew/aircraft operational readiness. The MPA squadron operations department is responsible for providing this information. While at a remote site, the JMPS architecture will permit the remotely based MPA aircrew to pass this information to the TSC and MPA squadron.

I-A.3.3.2.4 Target Study

MPA currently get their target information from the TSC. This situation will not change in the foreseeable future. The JMPS architecture will permit the TSC to download target information to the aircrew's JMPS laptop so that this information is readily available while the crew is on-station or deployed to a remote site. While deployed to a remote site, the JMPS architecture will permit the MPA aircrew to access the TSC Web Site, via secure likes, and download current information on the specific target(s) of interest.

I-A.3.3.2.5 Target Analysis Tools/Sources

The TSC currently provides the MPA aircrew with target analysis information. Using specialized equipment, the TSC is able to focus specific expertise on a target, be it a submarine, a surface action group, or an overland reconnaissance target. This information is provided during the MPA aircrew briefing, or can be posted on the TSC Web Site for access from remote sites via secure links. The JMPS architecture will provide the MPA aircrew with the collaborative and distributive software necessary to link with this web site.

I-A.3.3.2.6 Friendly Situation/Disposition

The TSC provides the MPA aircrew with the very latest information on the friendly situation in the maritime sector. That information is graphically displayed to the MPA aircrew when they are briefed at the TSC. When at a remote site, the JMPS architecture will provide the MPA aircrew with the collaborative and distributive software necessary to link with this web site.

I-A.3.3.2.7 Enemy Order of Battle/Threat Situation

The TSC provides the MPA aircrew with the very latest information on the enemy situation in the maritime sector. That information is graphically displayed to the MPA aircrew when they are briefed at the TSC. When at a remote site, the JMPS architecture will provide the MPA aircrew with the collaborative and distributive software necessary to link with this web site.

I-A.3.3.2.8 Threat Analysis Tools/Sources

The TSC maintains the personnel infrastructure, analysis hardware, and information links to support MPA operations. When at a remote site, the JMPS architecture will provide the MPA aircrew with the collaborative and distributive software necessary to link with the TSC to access threat analysis tools and mission planning data sources.

I-A.3.3.3 Concept Development (Initial Planning)

As discussed in a previous section, initial planning is dynamic and interactive between the TSC and MPA squadron operations personnel. During the initial planning stage, the JMPS architecture will permit the TSC to conduct collaborative and distributive planning sessions with the MPA squadron's operations officer to determine the specific course of action that will be undertaken. The JMPS architecture will provide the TSC and squadron operations officer with the collaborative and distributive tools to present a variety of options to the squadron commanding officer, who is generally the task group commander. The results of this initial planning session(s) will be posted on the TSC's impending tasking board as a "heads up" to remotely based MPA aircrews.

I-A.3.3.3.1 Mission Planning and Coordination Tools

The TSC will coordinate any actions with the MPA squadron commanding officer and operations officer. The agreed upon course of action will be passed to the MSC for their concurrence. The JMPS architecture will permit the TSC, squadron commanding officer, and the MSC to interact with JMPS-supplied conferencing tools in determining the best course of action to undertake against the enemy force. This information will be turned into tasking which will be posted on the TSC Tasking Status Web Site for access by MPA aircrew.

I-A.3.3.3.2 Strike/Mission Planning Team Composition

The Mission Planning Team will consist of TSC operations personnel, the TSC Watch Team, the MPA squadron operations officer, and the MPA TACCO/Mission Commanders participating in the tasked operation. When at a remote site, the JMPS architecture will permit the MPA TACCO to coordinate his tactics with the TSC.

I-A.3.3.3.3 Concept Plan Development Process

The development of a plan is contingent on a number of factors:

- Objective: What are the objectives of this plan and how do they fit in the overall strategic battle plan
- Asset Availability: What are the assets available to accomplish the plan's goals & objectives
- Logistics: Without a clear-cut idea of the length of this operation, assets required, sustainability, etc., we may discover that the squadron does not have the resources to make a significant impact on the overall objectives of this plan

The JMPS architecture will provide the mission planners with the tools necessary to clearly define the parameters that must be met to successfully undertake an operation. The mission planning process will avail itself of the collaborative and distributive tools within the JMPS architecture to permit "brainstorming" sessions between the TSC and mission planners. The JMPS architecture is optimized to permit in-depth interaction between all members of the mission planning process.

I-A.3.3.4 Concept of Ops Brief (Optional)

As previously discussed, the TSC/Squadron planning team will provide the TSC Director and Squadron Commanding Officer with a concise Concept of Operations briefing on the conduct of the operation. The JMPS architecture will obviate the requirement for all the players to be present at one site for the briefing. Using collaborative and distributive software, the JMPS architecture will permit this briefing to take place in an electronic conferencing mode.

I-A.3.3.5 Detailed Element Planning

Detailed element planning for maritime warfare missions will focus on the following mission areas:

- Under Sea Warfare
- Surface Warfare

- Mine Warfare (Offensive & Defensive)
- Strike Coordination and Reconnaissance

I-A.3.3.5.1 Maritime Warfare Mission Elements

The MPA squadron relies quite heavily on the TSC for mission planning support in all mission element areas. The TSC maintains a cadre of maritime patrol experienced aviators that form the core of all maritime patrol mission planning evolutions. Depending on the level of the conflict, the TSC may have to disperse its assets with the MPA squadron to remote sites. The JMPS architecture will permit the mission planning teams and MPA flight crews to coordinate mission planning and flight coordination. Making use of collaborative and distributive software, as well as the maritime patrol aircraft's extensive communications suite, the TSC/MPA aircrew combination will coordinate tactics and flight planning to meet specific mission planning and execution requirements.

I-A.3.3.6 Detailed Administrative Planning

The JMPS architecture will contain maritime patrol community standards for detailed administrative planning. That standard will contain mission planning and execution guidelines for all Maritime Patrol mission areas, including procedures for interaction with battle group forces.

I-A.3.3.7 Validate Aggregate Plan (Coordination/Deconfliction)

The TSC will brief all flight crews on coordination and deconfliction procedures for the various missions undertaken by MPA. The TSC will also post an aggregate plan on the TSC Web Site for access by all MPA flight crews preparing for combat operations.

I-A.3.3.8 Create Aircraft Data Loads and Flight Aids

The TSC will continue to support the creation of aircraft data loads and flight aids.

I-A.3.3.9 Rehearse Mission

Maritime Patrol aircrews will access simulation software, via the JMPS architecture, to rehearse their specific mission elements.

I-A.3.3.10 Aircrew Brief

The TSC will continue to provide the MPA aircrew with their specific mission briefing. When at a remote site, the JMPS architecture will provide the MPA aircrew with the collaborative and distributive software necessary to link with the TSC for aircrew mission briefings.

I-A.3.3.11 Execute Mission

The MPA aircrew will execute its mission as briefed. The JMPS laptop will contain a variety of on-station sensor support applications.

I-A.3.3.12 Post Flight Debrief

The TSC will continue to conduct post flight debrief and analysis of P-3 mission data.

I-A.3.3.13 Post Flight Data Analysis

The JMPS architecture will permit the maritime patrol squadron stabilization board to access this post flight material for aircrew readiness evaluation.

I-A.3.4 USERS/AFFECTED PERSONNEL

Key personnel in the maritime warfare mission planning process include:

- TSC personnel with web links to intelligence, weather, NIMA, etc., via the SIPRNET
- METOC personnel accessed via a SIPRNET connectivity
- MPA aircrew

ANNEX B - SH-60B MISSION AREAS WITHIN MARITIME WARFARE

The SH-60B has developed into one of the most versatile and widely used platforms in the Navy inventory. The helicopter is utilized as the air component of the Light Airborne Multi-Purpose System (LAMPS) and deploys primarily aboard Perry class frigates (FFGs), Spruance class destroyers (DDs) and Ticonderoga class cruisers (CGs), however it is versatile enough that it has successfully deployed aboard numerous other platforms. It is also planned to be a key mission system aboard future flights of the Arleigh Burke class destroyer and is envisioned to be aboard most of the Navy's concept ships. The LAMPS community is unique in that it utilizes the detachment concept. A 10-12 plane squadron must be prepared to deploy as many as ten one or two plane detachments while maintaining normal operations at the "home guard" squadron. Another unique aspect of LAMPS is that it functions as an extension of the host-ship's weapons system and relies on a cohesive relationship with the ship's combat team to effectively plan and complete its assigned missions.

The Sea Control Mission Elements addressed for the SH-60B aircraft in this appendix include:

- Under Sea Warfare (USW)
- Surface Warfare(SUW)
- Search and Rescue (SAR)
- Medical Evacuation (MEDEVAC)
- Vertical Replenishment (VERTREP)
- Naval Surface Fire Support (NSFS)
- Communications Relay (COMREL)

The platform has also been used in other roles, including Strike Coordination and Reconnaissance (SCAR), Maritime Interception Operations (MIO), Mine search and destruction support, and Special Forces support.

The warfare mission of the SH-60B is conducted in a wide variety of environments and usually involves the execution of numerous mission elements conducted either simultaneously or consecutively. This appendix will address how the SH-60B conducts mission planning while deployed. The following sections discuss the current mission planning process, deficiencies and limitations, and concepts for a new or modified approach for this process.

I-B.1.0 DESCRIPTION OF CURRENT SYSTEM/SITUATION

I-B.1.1 OPERATIONAL MISSION PLANNING

I-B.1.1.1 Tasking

While deployed, advanced notice tasking comes from numerous sources such as the Air Tasking Order (ATO), Sea Component Commander Daily Intentions Message (SCC DIM), and the host ship's mission requirements, but a majority of LAMPS tasking evolve from emergent requirements while airborne. Some emergent tasking LAMPS is likely to encounter are MIO,

SAR and logistics support. Because of this short notice tasking, a deployed LAMPS detachment normally remains at Alert-60 for the duration of its in theater operations.

I-B.1.1.2 Research and Study

LAMPS crews have the luxury of working in a defined operating area and traditionally thoroughly familiarize themselves with all likely operating areas before In-Chop. They derive the required information from intelligence sources available to ship's Combat Information Center (CIC) and through a face-to-face turnover with the detachment that they replaced in theater.

This embedded knowledge allows the LAMPS detachment to respond rapidly to emergent tasking. Some of the things closely studied by LAMPS crews before their arrival to the operating environment are geography (charts), Rules of Engagement (ROE), position of threats based on recent intelligence, type and number of threats and recent threat activity, and the CVs operating procedures guideline. On a daily or weekly basis throughout the detachment's deployment, CV intentions and operating cycles are reviewed, and when a new CV arrives in theater LAMPS pilots study its Operating procedures.

I-B.1.1.3 Planning the Mission

Flight crew assembles in CIC with ship's specialists (ship Anti-submarine Warfare (ASW)/ASST Tactical Controller (ASTAC), Remote Radar Operator (REMRO), Tactical Action Officer (TAO), Commanding Officer (CO), Operations Officer (OPSO), Electronic Support Measures Operator (ESMO) and others as needed) depending on what type of mission is scheduled. This group discusses ordnance required, possible tactics, and support required for successful completion. Discussion for an ASW mission includes close analysis of bottom topography charts (depth, type of bottom surface, up-slope or down-slope), locations of known wrecks and pinnacles, Sonar Insitu Mode Assessment System (SIMAS) analysis and other sensor limitations. The ASTAC makes off-ship arrangements such as alerting the carrier of a launch and lily pad reservations. Flight crew (pilot, ATO and sensor operator) conduct flight crew brief and aircraft preflight. Immediately prior to launch, ATO returns to combat for a mission brief with the ship's CO, TAO, ASTAC and other required persons to determine the optimal use prescribed tactics from the TACMAN. En-route to the datum (for an ASW mission), the ATO determines the most effective use of sonobuoys and manually inserts the pattern into the aircraft's navigation system.

I-B.1.1.4 Detailed Administrative Planning

Crew rest and crew day are monitored by Detachment Operations Officer who ensures OPNAV 3710 limits are not exceeded by the daily flight schedule. Ordnance load requirements are provided to the maintenance team so that they can accomplish required release and control checks and stores loads which can take up to two hours.

I-B.1.1.5 Create Aircraft Data Load

The ASTAC creates the data load and transmits the tactical data picture to the aircraft via data link hardwire. The tactical data can be updated as needed in flight via the Hawklink. The tactical data includes vital navigation data such as the host ship's course and speed, initial Grid Reference

Point (GRP) to synchronize both the ship and aircraft navigation picture, Electronic Support Module (ESM) library, friendly and non-friendly surface contacts, fly to points (points that the aircraft will be directed toward), reference marks on items of interest and Contact of Interest tracks.

I-B.1.1.6 In-flight Execution

The ship's ASTAC and TAO monitor the entire mission through the data link and have the ability to monitor and control airborne sensors and correlate or cross fix them to sensors on the host ship. For flights that involve controlling aircraft from other ships or land-based assets, the LAMPS crew is required to conduct an in-flight brief over secure radio.

I-B.1.1.7 Post-flight Debriefing

At the conclusion of the flight the ATO, ASTAC and Sensor Operator (SENSO) will debrief in CIC.

I-B.2.0 DEFICIENCIES AND LIMITATIONS OF CURRENT SYSTEM

I-B.2.1 JUSTIFICATION FOR CHANGE

While the LAMPS mission has proven overwhelmingly successful since its development and continues to evolve into new arenas, there are significant shortfalls that need to be addressed and overcome for it to reach its potential. The SH-60B's diversity, capability, and limited manning have made it increasingly challenging for flight crews to be fully prepared for any possible mission contingency. LAMPS ability to rapidly adjust to changes in tasking have made it commonplace for a crew to launch on one mission and to be re-assigned in flight to accomplish a mission from a different mission area. Any improvement to the methods utilized to plan these short-notice missions will not only improve their effectiveness but should also significantly enhance their safe execution.

I-B.2.1.1 Tasking

Routing the ATO/SCC DIM to surface combatants is a timely process. Typically the ATO is received a couple of hours into the calendar day for which it was prepared. Occasionally, events are missed because they are scheduled early in the calendar day. LAMPS tasking is often assigned by non-LAMPS personnel who do not understand LAMPS limitations requiring liaison with CV personnel to clarify intentions which further delays the launch. Real-time coordination with CV mission planners would dramatically improve LAMPS ability to meet the ATO/SCC DIM.

I-B.2.1.2 Research and Study

ASTACS presently depend on Joint Operational Tactical System (JOTS) and Link11 information for current Battle Group position updates, and may provide flight-crews with information that is several hours old. Crews rely on this outdated information and hope that their Tactical Control and Navigation (TACAN) system is able to locate platforms that have moved from their JOTS

reported position. Current Battle Group positions and real-time intelligence updates would decrease the amount of time required to plan LAMPS missions, while the execution of those missions would be improved by crews able to plan routes based on current positions.

Inclusion of a TACMAN in the database would allow the ASTAC the ability to overlay patterns and tactical ingress and egress procedures and uplink them to the aircraft via the data link. This would make the charts and tactics more accurate and increase mission effectiveness.

I-B.2.1.3 Planning the Mission

Determining and plotting the most effective sonobuoy strategy is both mentally challenging and labor intensive. The process of determining sonobuoy patterns based on geography, environmentals, possible target type, and mission goal could be automated which would significantly reduce the time to plan a USW prosecution. This would give detachment maintenance personnel more time to prepare the aircraft for the mission. The automatic plotting of recommended sonobuoy patterns around datum (allowing for aircraft heading to datum, sonobuoy channels, Minimum Detection Range, and likely threat axis) would significantly decrease the ATO's workload en-route to the prosecution and would allow more time for "swap" reports, radar monitoring, and co-pilot duties.

A real-time ability to brief with flight originating from other ships for SCAR, SAR, and Logistics missions would both enhance the mission effectiveness and increase the safety margin of those events.

I-B.2.1.4 Detailed Administrative Planning

Tracking crew rest, crew day and OPNAV 3710 flight time limits is a very time consuming and error prone process. The automation of this process would save countless hours of tedious record keeping.

I-B.2.1.5 Creating Aircraft Data Load

The hardwire (a cable that plugs into the side of the aircraft) between the ship and helicopter is often corrupted preventing the transfer of information. A method of transferring the data via JMPS would enable the flight crew to launch with updated information in their system and not force them to manually input it after take-off. It would also ensure that both the ship and the helicopter have identical GRP guaranteeing that both navigation systems are aligned and helping LINK synchronization.

I-B.2.1.6 In-flight Execution

LAMPS detachments currently depend on burdensome charts for navigation throughout operating areas. A moving kneeboard map with the capability to input Battle Group positions and current Stand-Off ranges and points of interest would greatly simplify in theater navigation. For USW prosecution, the map could overlay underwater charts and input known pinnacles, wrecks and anomalies, significantly improving LAMPS ability to prosecute submerged targets of interest.

I-B.2.1.7 Post-flight Debrief

There is no ability to replay missions and tired flight crews rarely have the energy to recapitulate a seven-hour flight. Valuable data is lost during the change in watch, as the ASTAC is replaced and the oncoming ASTAC has no recall capability to his system. If the watch changed shortly before the return of the aircraft, no debrief is possible with the Ship's CIC.

I-B.3.0 CONCEPT FOR A NEW OR MODIFIED SYSTEM

The LAMPS community depends on a close relationship with its host ship, whose personnel and resources contribute directly to the utilization of the embarked SH-60B. It is imperative that the Joint Mission Planning System (JMPS) architecture encompasses JMPS use by the host ship's ASTAC who directly controls its embarked platforms.

I-B.3.1 TASKING

LAMPS will continue to be tasked by the ATO and host ship but envisions continued emergent tasking that make up almost half of its embarked operations. A typical LAMPS mission will encompass a variety of the Seahawk's capabilities, so JMPS will need to be able to prepare for a multi-mission event. LAMPS might launch, for example, on an alert from home-ship's tail on an USW mission, which might turn into a Surveillance Mission and finish as a VERTREP mission. The ability of JMPS to interface directly with mission tasking agencies aboard the CV will expedite mission assignments and eliminate the ambiguities that affect mission execution.

I-B.3.2 RESEARCH AND STUDY

Because LAMPS crews typically move between mission areas on short notice and often while in flight, they launch prepared for any possible further tasking. Their research and study is accomplished before arriving in theater. JMPS will include TACMAN information, theater ROE, standoff ranges and other crucial area specific information so that crews can use that information during exercises and training flights in preparation for arrival in the Operating Area. As the LAMPS crew is often assigned short notice tasking while in flight, the ability to research the JMPS database from the airborne asset would contribute to the crew's ability to successfully complete the assigned mission.

I-B.3.3 PLANNING THE MISSION

The LAMPS mission will be planned by the host ship's combat team, often with little input or assistance from embarked flight crews. These non-aviator users are crucial to the successful interface of LAMPS with its host ship and are typically senior enlisted in the Operations Specialist (OS) rate. These ASTACs will be able to plan a complete LAMPS mission that covers numerous mission areas and includes environmental and acoustic information. Every LAMPS ship will produce identical mission brief sheets that will significantly reduce the training time required to make a cohesive LAMPS/ship team.

I-B.3.4 DETAILED ADMINISTRATIVE PLANNING

JMPS will enable Detachment Operations Officers to closely monitor OPNAV 3710 flight time limits and track crew rest/crew day limitations.

I-B.3.5 CREATE AIRCRAFT DATA LOAD

It is imperative to the success of the LAMPS mission that the ship and aircraft software reflect identical tactical pictures. Currently this task is accomplished through the data-link hardware, but JMPS will allow a back-up method through a disc downloaded in Combat and uploaded into the aircraft.

I-B.3.6 IN FLIGHT EXECUTION

JMPS will enable flight crews to monitor their flight on a Global Positioning System (GPS) interfaced "moving map" kneeboard that will include bottom topography representation and note anomalies that affect USW prosecutions (wrecks, pinnacles, trenches, surface type, etc.). The moving map will also indicate current Operations Order (OPORDER) standoff ranges. The ASTAC will have the ability to upload tactical flight recommendations provided by JMPS including fly-to points, sonobuoy patterns (based on geographical and acoustic data interpretation) and recommended sonobuoy load-outs. JMPS will also allow the flight crew to access updated intelligence and current ship positions.

A plan devised by the ASTAC/TAO should be designed in such a way that it can be up-linked to the aircraft via the existing Hawklink. This would allow the ship to accept tasking from an outside agency such as the Battle Group (BG) Commander, formulate a plan including Ingress/Egress routes, obstacles, environmental conditions, threat intelligence, targeting information, coordination issues (call signs, frequencies, Identification Friend or Foe (IFF), etc), etc, and then link it up to an airborne LAMPS aircraft.

I-B.3.7 POST FLIGHT DEBRIEF

Following mission completion, the entire LAMPS team will be able to replay the mission allowing comprehensive analysis and critique. This is particularly important in the LAMPS community as a non-aviator controls the aircraft and the typical LAMPS mission requires numerous modifications and adjustments after the brief. A thorough debrief by the Mission Commander to the ship's ASTAC and TAO discussing how their decisions affected the aircraft and what options might have been taken that would have increased mission effectiveness will be possible. This will improve their ability to make educated decisions during future missions and allow training for off-duty watch standers. The ability to store a mission on disc will provide a valuable training tool to future detachments and will provide a medium for analysis for future tactical development.

ANNEX C - MH-53E MISSION AREAS WITHIN MARITIME WARFARE

I-C.1.0 DESCRIPTION OF CURRENT SYSTEM OR SITUATION

Mine Countermeasures includes all offensive and defensive countermeasures for countering a mine threat, including the prevention of enemy mine-laying. Any action taken to counter the effectiveness of, and/or reduce the probability of damage from, underwater mines.

Commander in Charge Atlantic Fleet (CINCLANTFLT) has operational control and administrative control of Commander Mine Warfare Command (COMINEWARCOM). Under COMINEWARCOM, Commander Countermeasures Squadron (COMCMRON) One, Two and Three plans and executes MCM exercises and operations as directed. Primary operational focuses are:

- COMCMRON One – Pacific theater
- COMCMRON Two – Atlantic and Mediterranean theater
- COMCMRON Three – Southwest Asian theater/Persian Gulf

The Mine Countermeasures Warfare Mission Elements addressed for the MH-53E aircraft in this appendix include:

- Mine Hunting
- Mechanical Mine Sweeping
- Acoustic Mine Sweeping
- Magnetic Mine Sweeping

The following sections discuss the current mission planning process, deficiencies and limitations, and concepts for a new or modified approach for these mission elements.

Mine hunting locates individual mines allowing for countermeasures to be taken to avoid, remove, render harmless, or destroy each mine. The five stages of mine hunting are detection, classification, localization, identification, and disposal/removal.

Mechanical minesweeping physically removes the mine from the minefield or physically interrupts its functioning.

Magnetic minesweeping produces a magnetic signature that satisfies the mine sensor's magnetic settings, thereby detonating it at a safe distance.

Acoustic minesweeping produces an acoustic signature that satisfies the mine sensor's acoustic settings, thereby detonating it at a safe distance.

I-C.1.1 OPERATIONAL MISSION PLANNING

I-C.1.1.1 Tasking

Tasking is generated by the MCMRON via a MW-125 (Mine Countermeasures tasking message) and sent to the squadron. The tasking contains the mission area, types of mines that intelligence

indicates are in the area and dictates a desired percent clearance and confidence level. At times the MCMRON will also dictate equipment to be used based on mines, and mission element (i.e. Mine Hunting, Mechanical Mine Sweeping, Acoustic Mine Sweeping or Magnetic Mine Sweeping).

I-C.1.1.2 Research

When a squadron receives tasking, the squadron's operations department will begin fuel planning and Operating Area (OPAREA) research. Fuel planning is accomplished manually based on the Naval Aviation Training and Operating Procedures Standardization (NATOPS) manual. The focus of research in the OPAREA centers on:

- Intelligence on the type of mines suspected of being in the area
- Environmental Information:
  - Weather (to include sea state) – provided by local duty weather forecaster
  - Water depth, temperature and turbidity provided by Naval Oceanographic Office (NAVOCEANO)
  - Bottom contour and composition
  - Tides, currents, salinity and marine Concept

Mission planning is accomplished with Joint Maritime Command Information System (JMCIS) MEDAL. The tactics officer plans the missions and pass them to the individual aircrews. Multiple missions are planned to clear an area and the overall plan is briefed to the squadron. The pilots are also given an individual mission brief before each mission.

I-C.1.1.2.1 Information Required for Mission Planning Using MEDAL

- Intelligence information from MCMRON
- The type equipment being used for hunting or sweeping
- The percentage of clearance desired
- Aircraft speed (a function of the MCM equipment being used)
- Mine detection probability calculations form Naval Weapons Publication (NWP) MCM manual
- A value - width of sweep
- B value - probability of mine detection
- NAVOCEANO bottom contour and composition

I-C.1.1.2.2 Outputs from MEDAL

- Track numbering/spacing/time to clear
- Flashcards that load on the aircraft

The Tactics officer is also responsible for aircraft separation, which is accomplished by assigning tracks in different areas. Deconfliction with other assets (i.e. ships and Explosive Ordnance Disposal (EOD) units) is also accomplished manually.

At the conclusion of the flight, the aircrew returns the flash cards and inserts them into the MEDAL system. Although MEDAL does not have a true replay capability, it does provide an indication of mission accomplishment.

I-C.2.0 JUSTIFICATION FOR AND NATURE OF CHANGES

I-C.2.1 JUSTIFICATION FOR CHANGE

There is no capability for conducting collaborative and distributive planning with other naval units in a joint or combined operation. Current MCM planning is very labor intensive and does not provide accurate MCM flight support products.

I-C.2.1.1 Deficiencies and Limitations of Current System

I-C.2.1.1.1 Tasking

- Tasking will continue through the parent squadron

I-C.2.1.1.2 Research

- Digital Charts
- The digital charts available today do not have sufficient fidelity
- There are different chart projections (i.e. North Atlantic Treaty Organization (NATO) versus United States (US))
- Flight crew does not have the capability to print out digital charts

I-C.2.1.1.3 Concept

- Current Global Positioning System (GPS) tools must be more reliable (probability of detection)
- Flight crews need power sheets for dual engine operations
- Flight crews require an automated tool to facilitate flight and fuel planning
- Flight crews require an automated mission planning tool that calculates the MCM stream point (dependant on direction of wind and type of gear being streamed)

I-C.3.0 CONCEPT FOR A NEW OR MODIFIED SYSTEM

Today MEDAL does an adequate job of track planning for Mine Countermeasures Warfare. Flight/aircraft planning is manually calculated with minimal to no automated planning assistance. The future system needs to automate aircraft track/fuel planning and integrate the results with the MEDAL system. Areas of integration include:

- Flight deconfliction

- MEDAL track aircraft assignment optimization (optimized for fuel and or time)

Visual aids for mission planning (MEDAL is also a data oriented system)