INITIAL

NAVY TRAINING SYSTEM PLAN

FOR THE

MORIAH PROGRAM

APRIL 1999

April 1999

MORIAH PROGRAM

EXECUTIVE SUMMARY

This Initial Navy Training System Plan for the Moriah Program was developed by the Naval Air Systems Command using the Training Planning Process Methodology. This document provides the manpower, personnel, and training concepts for the United States Navy (USN) and United States Marine Corps (USMC) needed to support and sustain the Moriah Program. These concepts will be further defined in updates to this document.

The Moriah Program is in the Concept Exploration/Program Definition and Risk Reduction phase of the Weapon System Acquisition Process (WSAP) awaiting a combined Milestone I/II approval. After Milestone I/II approval, the Moriah Program will go into the Engineering and Manufacturing Development phase of the WSAP.

The Moriah Program involves the integration of three emerging wind and meteorological systems into one program that will apply new sensors with processors and local area networks. This will present decision-makers a unified picture of the ever-changing atmospheric conditions around the ship or shore station. The three non-developmental items and/or commercial off-the-shelf systems being integrated are the New Digital Wind Measuring and Indicating System, the Shipboard Meteorological and Oceanographic Observing System Replacement, and the meteorological sensor portion of AEGIS Tactical Assessment Capability. Moriah components will replace the AN/UMQ-5 Wind Speed and Direction System installed at USN and USMC air stations and the Wind Measuring and Indicating System installed on ships.

An operator and maintenance workload analysis indicates there will be no increase in end-strength or change in force structure as a result of the Moriah Program. Existing fleet manpower is capable of absorbing all operator and maintenance tasks associated with Moriah equipment.

A training concept for Moriah components has not yet been selected. To aid in the decision making process, this document presents two possible training options. The first option involves creating a new maintenance Navy Enlisted Classification (with a corresponding new training course) for USN personnel and a new Military Occupational Specialty (with a new corresponding training course) for USMC personnel. The second option would involve the development of a Computer-Based Training module to be provided to activities receiving Moriah. When a Moriah training concept is decided upon, it will be added to the next iteration of this document.

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LIST OF ACRONYMS

AG	Aerographer's Mate
AIT	Alteration Installation Team
ASOS	Automated Surface Observing System
BIT	Built-In Test
CBT	Computer-Based Training
CINCLANTFLT	Commander In Chief, U.S. Atlantic Fleet
CINCPACFLT	Commander In Chief, U.S. Pacific Fleet
CNET	Chief of Naval Education and Training
CNO	Chief of Naval Operations
COTS	Commercial Off-The-Shelf
DSN	Defense Switched Network
EDM	Engineering Development Model
ET	Electronics Technician
FC	Fire Controlman
FMS	Foreign Military Sales
FTC	Fleet Training Center
FY	Fiscal Year
GOTS	Government Off-The-Shelf
HARDMAN	Hardware and Manpower
HSI	Human Systems Integration
ICAN	Integrated Communications and Advanced Networks
IOC	Input/Output Controller
MOS	Military Occupational Specialty
NA	Not Applicable
NAVAIRSYSCOM	Naval Air Systems Command
NAVPERSCOM	Navy Personnel Command
NAWCADLKE	Naval Air Warfare Center Aircraft Division-Lakehurst
NDI	Non-Developmental Item
NEC	Navy Enlisted Classification

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LIST OF ACRONYMS

NTSP	Navy Training System Plan
OJT	On-the-Job Training
OPNAV	Office of the Chief of Naval Operations
OPO	OPNAV Principal Official
PDA	Principal Development Activity
PDR	Program Design Review
PMA	Program Manager, Air
PMW	Program Manager, Warfare
PQS	Personnel Qualification Standards
QM	Quartermaster
SPAWAR	Space and Naval Warfare Systems Command
TBD	To Be Determined
TD	Training Devices
TTE	Technical Training Equipment
USMC	United States Marine Corps
USN	United States Navy
VRT	Voyage Repair Team
WMIS	Wind Measuring and Indicating System
WSAP	Weapon System Acquisition Process

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PREFACE

This Initial Navy Training System Plan (NTSP) is a product of the Training Planning Process Methodology, which is the Navy's replacement for the Hardware and Manpower (HARDMAN) Integration Program Methodology. Since the Moriah Program is still in the early stages of program development and acquisition, data for many NTSP elements is either incomplete or currently unavailable. Future updates to this Initial NTSP will provide more specific information as it becomes available.

PART I - TECHNICAL PROGRAM DATA

A. NOMENCLATURE-TITLE-PROGRAM

1. Nomenclature-Title-Acronym. Moriah Program

2. Program Element. 0604512N

B. SECURITY CLASSIFICATION

1. System Characteristics ..... Unclassified
2. Capabilities ..... Unclassified
3. Functions..... Unclassified

C. MANPOWER, PERSONNEL, AND TRAINING PRINCIPALS

OPNAV Principal Official (OPO) Program Sponsor ..... CNO (N096)

OPO Resource Sponsor ..... CNO (N096)

Functional Mission Sponsor ..... CNO (N096)

Developing Agency ..... NAVAIRSYSCOM (PMA251, PMW185)

Training Agency ..... CINCLANTFLT
CINCPACFLT
CNET

Training Support Agency ..... NAVAIRSYSCOM (PMA205)

Manpower and Personnel Mission Sponsor ..... CNO (N12)
NAVPERSCOM (NPC-4, NPC-404)

Director of Naval Training ..... CNO (N7)

D. SYSTEM DESCRIPTION

1. Operational Uses. Observing and anticipating changes in the weather is necessary for the safety of United States Navy (USN) and United States Marine Corps (USMC) aircraft, ships, and personnel. The advent of modern aircraft and weapon systems whose performance can be enhanced or degraded by weather and oceanographic conditions has dramatically increased the need to measure the environment. The Moriah Program will provide USN ships and USN and

USMC air stations with the capability to more accurately measure wind speed and direction, barometric pressure, air temperature, relative humidity, sea surface temperature, visibility, infrared extinction, incoming solar radiation (insolation), and cloud height.

2. Foreign Military Sales. For information on Foreign Military Sales (FMS), contact PMA251 or PMW185.

E. DEVELOPMENTAL TEST AND OPERATIONAL TEST. Over the past several years, the three emerging systems that make up Moriah have conducted individual demonstrations and validations of their systems and components in order to reduce risk to the Moriah Program. Engineering Development Models (EDM) of the Moriah will be installed in Fiscal Year (FY) 99 on a nuclear aircraft carrier and a guided missile destroyer for technical evaluation and operational assessment to support low rate initial production decisions for FY00 procurements. An operational evaluation of the two EDMs will then be conducted to support a full rate production decision for FY01 and subsequent procurements. As additional information becomes available, it will be incorporated in future updates to this Initial NTSP.

F. AIRCRAFT AND/OR EQUIPMENT/SYSTEM/SUBSYSTEM REPLACED. The AN/UMQ-5 Wind Speed and Direction System, installed at USN and USMC air stations is a different system than the Wind Measuring and Indicating System (WMIS) installed on ships. Like WMIS, it is old, obsolete, out of production, and difficult and expensive to maintain. The wind speed and direction subsystem of Moriah will fulfill the requirements to replace both the WMIS and the AN/UMQ-5 system. Using Moriah as the AN/UMQ-5 replacement will be advantageous in that it will allow all USN wind systems to be alike, saving maintenance, logistics, and procurement costs.

G. DESCRIPTION OF NEW DEVELOPMENT. For all ship classes, Moriah will provide continuous data for display and direct digital or analog input of ship systems. Moriah will provide continuous output of the parameters measured by the sensors and processed by the Moriah central processor if necessary, in standard units of measure as required by the end users (systems and people). These units of measure and the algorithms or formulas used to convert base output data will be identified in appropriate system specification documents. Moriah will use an open system architecture to reduce the integration effort of additional sensors.

Moriah will have the capability to select valid data and process that data to provide system performance parameters. Moriah will be capable of providing data for storage on multimedia mass storage devices. These interfaces, including system nomenclature, location on ship, required data format, and required sampling frequency to meet user-defined update rates will be iterated in a separate interface specification document.

Moriah will provide multiple display types with different levels of capability to include stand-alone continuous sensor information, aircraft launch and recovery decision aids, and control functions and maintenance diagnostics. Displays will be capable of displaying both digital and analog

graphics and will be usable both during daylight and during night-time reduced light conditions. Moriah will be capable of national television standard C output for ship's closed circuit television systems.

In addition to the above shipboard requirement, the sensor suite procured by the Moriah Program will also be used to fulfill shore-based requirements as a partial replacement or augmentation to the Automated Surface Observing System (ASOS) and as a replacement for the AN/UMQ-5 Wind Speed and Direction System. The ASOS was a joint program of the National Oceanographic and Atmospheric Agency, USN, Department of Transportation, and Federal Aviation Administration, with the National Weather Service as the lead procurement agency. ASOS is installed at USN and USMC air stations in the continental United States and abroad. Certain sensors may require updating by replacement in existing sites. Air stations that did not receive ASOS may have a current requirement that can be fulfilled by Moriah.

The wind speed and direction subsystem of Moriah will fulfill the requirements to replace the AN/UMQ-5, as well as augmentation for end-of-runway requirements submitted by the type commanders where installation costs are not prohibitive. Using Moriah as the AN/UMQ-5 replacement will be advantageous in that it will allow all USN wind systems to be alike, saving maintenance and procurement costs.

1. Functional Description. The Moriah system consists of five major components as subsystems: wind sensing, meteorological subsystem, data processing, data distribution, and data display. The system is designed to be modular so that it may accept various types of displays and sensing equipment as well as interface with existing or legacy ship systems and wind system components when required. The following paragraphs contain a brief description of each component or subsystem and its basic function.

a. Wind Sensing. The Moriah system has been designed to use new sensor technology while maintaining backward compatibility with existing WMIS detectors based on older synchro technology that have a long service history in the fleet. The Moriah system also has the ability to interface with new solid state wind sensors such as those based on sonic measurement technology. These types of sensors require little or no periodic maintenance and are capable of transmitting wind speed and direction data in a digital format (such as RS-422). The new wind sensors will be mounted in approximately the same locations as the existing detectors (port, starboard, and forward) so that no revalidation of aircraft launch and recovery envelopes will be required. Wind data (either synchro or digital) from all sensors will be routed to both Moriah processors.

b. Meteorological Subsystem. The meteorological subsystem is capable of acquiring a variety of meteorological parameters from numerous sensors mounted throughout the ship. Five of these parameters (air temperature, humidity, barometric pressure, insolation, and infrared sea surface temperature) are obtained.

c. Data Processing. The data processing component of Moriah acquires and processes all of the data critical to the launch and recovery tasks. Due to the safety of flight

nature of these functions, it is planned that the core Moriah processing function will be executed within two self-checking central processing units.

d. Data Distribution. The shipboard data distribution system that will be used to transmit Moriah information to various displays throughout the ship is the Integrated Communications and Advanced Networks (ICAN). It is planned that each Moriah processor will be connected to a separate ICAN Input-Output Controller (IOC) via Ethernet. However, only the processor designated as primary will be transmitting information to its respective IOC for distribution.

e. Data Display. All high-end displays will be connected to IOCs local to their particular location via Ethernet. Several high-end displays may be connected to one IOC if necessary. High-end displays will display information such as: true wind speed and direction, relative wind speed and direction, crosswind/headwind, ship's speed and course, launch and recovery bulletins, fox corpen data[1], limited meteorological data, etc. Low-end displays will also be connected to local IOCs or directly to the Moriah processors via an RS-422 digital serial interface. As with the high-end displays, several low-end displays may be connected to one IOC if necessary. Low-end displays will display either relative wind speed and direction or crosswind/headwind information.

2. Physical Description. Information on physical description is not available at this time. As information becomes available, it will be included in future updates to this Initial NTSP.

3. New Development Introduction. The Moriah Program equipment will be introduced as new production equipment based upon the Moriah operational and support concepts with heavy reliance on Non-Developmental Item (NDI), Commercial Off-The-Shelf (COTS), and Government Off-The-Shelf (GOTS) hardware, software, and firmware, repackaged for the shipboard operating environment.

4. Significant Interfaces. Moriah will be compatible and interoperable with shipboard and other U.S. services' systems, databases, and networks that share like information or data fields. A limited amount of software will be developed by Naval Air Warfare Center Aircraft Division-Lakehurst (NAWCADLKE), New Jersey to fully integrate the various NDI, COTS, GOTS hardware, software, and firmware into the Moriah Program, as well as providing diagnostic and Built-In Test (BIT) capabilities. This software will be provided to the production systems integration/manufacturing contractor as government-furnished information.

5. New Features, Configurations, or Material. Not Applicable (NA).

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1 Fox corpen data was previously calculated on a slide-rule. It is data used while landing an aircraft. It would recommend a ship's course to steer to get the correct wind speed and direction. In the Moriah system it will be calculated automatically and displayed. However, it is only a recommendation for perfect conditions.

H. CONCEPTS

1. Operational Concept. Moriah will be activated during all underway periods for 24 hours per day. Moriah will be fully mission capable in all weather conditions (tropical to arctic), heavy seas with wave heights up to 20 feet, and wind speeds up to 65 knots.

2. Maintenance Concept. Moriah will incorporate a self-contained diagnostic and BIT system, continuity or systems degradation alarms, redundant paths for continuous operations in a combat or damage control environment, and operator reconfiguration capability without impacting system operations.

a. Organizational. Organizational level maintenance will be performed by Navy Electronics Technicians (ET), and by Weather Observer personnel for the USMC. Organizational level maintenance will include self-contained diagnostic tests and BIT, and if the unit is not working properly, removal and replacement of the unit under test.

(1) Preventive Maintenance. Preventive maintenance will consist of periodic checks, filter replacement, and corrosion control.

(2) Corrective Maintenance. Corrective maintenance will consist of self-contained diagnostic tests and BIT as required, with removal and replacement of defective units as necessary.

b. Intermediate. No intermediate level maintenance will be required. All failed units will be returned to the vendor for repair.

c. Depot. Depot level maintenance will be provided by the vendor.

d. Interim Maintenance. Interim maintenance will be provided by the vendor.

e. Life-Cycle Maintenance Plan. There will be no mandatory overhaul period required for the Moriah systems.

3. Manning Concept. There will be no increase in end-strength or change in force structure as a result of the Moriah Program. Current fleet manpower is adequate to perform all tasking required by the Moriah Program.

a. Estimated Maintenance Man-Hour per Operating Hour. The basic architecture of the Moriah system is still undetermined. Consequently, it is too early to predict the estimated maintenance man-hours per operating hour. The requirement is for no maintenance action to exceed two hours. At this time, it appears that this is probable. Information listed below is from the Draft Moriah System/Segment Specification. This information will be updated with future updates to this Initial NTSP.

PARAMETER	THRESHOLD	OBJECTIVE
Operational Availability	0.969	0.981
Mean Time Between Operational Maintenance Failures	4,320 hours	7,000 hours
Mean Corrective Maintenance Time per Operational Mission Failure	2.0 hours	1.5 hours
Scheduled Maintenance	Less than 10 hours per quarter	

b. Proposed Utilization. The Moriah system will be activated during all underway periods for 24 hours per day. Moriah will be fully mission capable in all weather conditions (tropical to arctic), heavy seas with wave heights up to 20 feet, and wind speeds up to 65 knots. The Moriah system will also be operated at USN and USMC air stations.

c. Recommended Qualitative and Quantitative Manpower Requirements

(1) Aircrew. NA

(2) Enlisted. Manpower currently exists in appropriate quantities in both the USN and USMC. However, new qualifications (a new Navy Enlisted Classification (NEC) or Military Occupational Specialty (MOS) codes) may be required for Moriah system maintenance. This will be determined when the training concept is formalized. Two manpower options are:

(a) Option One. Create a new NEC for USN personnel in the ET rating and a new MOS for USMC Weather Observer and Weather Forecaster personnel to include the Moriah equipment maintenance. This is the least likely option as it would be the most costly and no more effective than the following option.

(b) Option Two. Assign operational and maintenance functions to existing USN and USMC personnel at the activities receiving the Moriah system. The existing USN ratings would be ET for maintenance; and Aerographer's Mate (AG), ET, Quartermaster (QM), and Fire Controlman (FC) for operators. MOS that are related would be MOS 6821 Weather Observer, and MOS 6842 Weather Forecaster.

4. Training Concept. Since the Moriah program is early in the procurement process, it is difficult to define the Moriah training concept. Consequently, two possible training options are presented at this time:

Option One. Qualitative manpower Option One suggests the creation of a new NEC for the ET rating and a new MOS for USMC personnel for Moriah equipment maintenance. The

training requirement for this option would involve developing a new training course for the new NEC and MOS.

Option Two. The contractor in conjunction with NAWCADLKE would create Computer-Based Training (CBT) that would be used on Navy ships and USN and USMC air stations as onboard training to hone the skills of personnel maintaining and operating the Moriah equipment. This is the most likely and most cost-effective scenario.

a. Initial Training. Alteration Installation Teams (AIT), Voyage Repair Teams (VRT), and shipyard personnel will provide initial operator training at the same time they are installing the particular Moriah system configuration.

(1) Operator. Operator training will be provided to AG, ET, QM, FC, USMC Weather Observer, and USMC Weather Forecaster personnel as required by each individual ship or activity.

(2) Maintenance. Initial Moriah maintenance training will be provided during installation and check out by the contractor. Initial training will include test and check of the Moriah system combined with BIT, cleaning, filter changing, corrosion control, and removal and replacement of the failed unit.

b. Follow-on Training

(1) Operator. There is no requirement for operator follow-on training. It is anticipated that minimal interfacing will be required by the operator and therefore no formal training will be required.

(2) Maintainer. Maintainer follow-on training requirements will vary according to the manpower options and training options selected.

Option One. A new USN training course would be required to support the new NEC proposed. The new course would be established at Fleet Training Center (FTC) Norfolk, Virginia, and FTC San Diego, California. This training would be required for ET personnel assigned to activities receiving Moriah systems. Additionally, a new training course would be required to support the new MOS proposed. The new training course would be established at Keesler Air Force Base, Biloxi, Mississippi. This training would be required for USMC personnel assigned to activities receiving Moriah systems.

Option Two. This option would employ contractor-developed CBT and would require no follow-on training.

c. Student Profiles

SKILL IDENTIFIER	PREREQUISITE SKILL AND KNOWLEDGE REQUIREMENTS
ET	° A-100-0138, Electronics Technician Core A School ° A-100-0140, Electronics Technician Strand A School
ET XXXX (New NEC)	° A-100-0138, Electronics Technician Core A School ° A-100-0140, Electronics Technician Strand A School
MOS 6821	° E3AQR1W031, Basic Weather
MOS 6842	° E3AQR1W031, Basic Weather ° E3AAR1W071, Meteorological and Oceanographer Analyst/Forecaster
MOS XXXX (New)	° E3AQR1W031, Basic Weather

d. Training Pipelines. Training pipeline requirements will be dependent upon which training option is selected. If Option One is selected, new pipelines and their corresponding courses for the new NEC and MOS will have to be developed. If Option Two is selected there will be no impact on training pipelines.

I. ONBOARD (IN-SERVICE) TRAINING

1. Proficiency or Other Training Organic to the New Development. It has not been determined exactly what kind of proficiency training will be required. It will be identified in future update to this Initial NTSP. On-the-Job Training (OJT) will be required to enhance the skills and knowledge of individuals. An OJT package will be delivered to each activity receiving the Moriah system at the time of delivery and installation.

2. Personnel Qualification Standards. If it is decided that Personnel Qualification Standards (PQS) will be required, they will be provided by the PQS Development Center. This information will be updated as information becomes available.

3. Other Onboard or In-Service Training Packages. OJT will be required. The application and adoption of advances in computer hardware and software technology have enabled CBT with its basic elements of computer-managed instruction, computer-aided instruction, and interactive courseware to be integrated into the training arena. Some mix of this training will be required for Moriah.

J. LOGISTICS

1. Manufacturer and Contract Numbers. The Moriah production systems integration and manufacturing contract will be competitively awarded and will be a firm fixed price contract for the various production lots. Using the systems performance specification, NAWCADLKE will award a contract to one production system contractor, who will integrate, manufacture, and deliver Moriah production systems to the Navy for shipboard installation.

Shipboard installation of the production system will not be included in the production contract and will be contracted separately for various sources, including AITs, VRTs, and shipyard personnel. Interface Control Documents that identify the Moriah configuration and data interfaces for each ship class will be used as the basis for all installations. As more specific information becomes available, it will be included in future updates to this Initial NTSP.

2. Program Documentation. Program documentation currently consists of Moriah Operational Requirements Document, Memorandum of Agreement for Moriah, Acquisition Strategy for Moriah, and the Minutes of the Moriah Pre-Program Design Review (PDR). As additional information becomes available, it will be included in future updates to this Initial NTSP.

3. Technical Data Plan. Technical documentation (Maintenance Instruction Manuals, Maintenance Requirements Cards, CBT, etc.) will be provided by the contractor upon system installation and checkout. As additional information becomes available, it will be included in future updates to this Initial NTSP.

4. Test Sets, Tools, and Test Equipment. Any test sets, tools, or test equipment that are required will be included in future updates to this Initial NTSP as information becomes available.

5. Repair Parts. The contractor will provide repair parts during all phases of the Weapon System Acquisition Process for the Moriah Program.

6. Human Systems Integration. A Human Systems Integration (HSI) program will be organized to achieve the effective integration of personnel factors into the design of the system. The HSI effort will include, but not necessarily be limited to, active participation in the following three major interrelated areas of system development: analysis, design and development, and test and evaluation.

K. SCHEDULES

1. Schedule of Events. OPNAV (Code N096) will fund the procurement of the meteorological and oceanographic portion of Moriah for all classes of ships (approximately 228 ships) and 35 USMC and USN air stations starting in FY00. Separate acquisition strategies will address N85, N86, and N88 procurement of the wind portion of Moriah for their respective ship classes (approximately 151 ships).

a. Installation and Delivery Schedules. To Be Determined (TBD)

b. Ready For Operational Use Schedule. All Moriah Program equipment will be ready for operational use upon installation and checkout by the contractor team.

c. Time Required to Install at Operational Sites. TBD

d. Foreign Military Sales and Other Source Delivery Schedule. For information on FMS, contact PMA251 or PMW185.

e. Training Device and Technical Training Equipment Delivery Schedule. If training Option One is selected, the development of new courses to support the new NEC and MOS will require Technical Training Equipment (TTE) and Training Devices (TD) for FTC Norfolk, Virginia; FTC San Diego, California; and Keesler Air Force Base, Biloxi, Mississippi. Delivery schedules and the exact equipment required would be determined at a later date. If training Option Two is selected there will be no requirement for TTE or TD.

L. GOVERNMENT FURNISHED EQUIPMENT AND CONTRACTOR FURNISHED EQUIPMENT TRAINING REQUIREMENTS. TBD

M. RELATED NTSPs AND OTHER APPLICABLE DOCUMENTS

DOCUMENT OR NTSP TITLE	DOCUMENT OR NTSP NUMBER	PDA CODE	STATUS
Minutes of the Moriah Program Pre-PDR	NA	PMA251	May 1998
Acquisition Strategy for Moriah	NA	N096	Approved
Operational Requirements Document	NA	N096	Draft Feb 1998
Memorandum Of Agreement For Moriah	NA	N096	Approved Feb 1998

APPENDIX A - POINTS OF CONTACT

NAME / FUNCTION / ACTIVITY, CODE / INTERNET EMAIL	TELEPHONE NUMBERS
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