NAVAIR

ENVIRONMENTAL PROGRAM

The Environmental Systems Allocation (ESA) Model

Helping Programs Appreciate the Environmental Impacts of Their Operations

The Environmental Systems Allocation (ESA) model is a database tool that manages environmental, safety, and health (ESH) information and data from organizational (O), intermediate (I), and depot (D) level naval aviation maintenance operations. The Lead Maintenance Technology Center for the Environment (LMTCE) Working Integrated Product Team (WIPT) developed the ESA model to provide Program Managers (PM) with information on the environmental impact of their platforms. The ESA model provides summaries of hazardous material (HM) usage and hazardous waste (HW) generation information that can be presented from a variety of perspectives. ESH information can be presented by platform or activity, and allocated down to O, I, or D level maintenance operations and work centers/shops. (For example, the ESA database tool can be queried to determine how many pounds of a given corrosion inhibitor are consumed at all the 12C Corrosion Control Shops at P-3 Orion squadrons Navy-wide. The ESA database can also determine how much alodine all VAQ (electronic attack) squadrons consume, including O, I, and D level maintenance.)

Since the establishment of the ESA database in 2000, the tool has been incrementally expanded and enhanced. The ESA database tool has most recently incorporated Program Manager Air (PMA) summaries (for all platforms managed by a given PMA) and Program Executive Office (PEO) summaries (for platforms of all PMAs under a given PEO). The ESA database tool is regularly updated, with new versions released on CD at six-month intervals to various users throughout the Naval Air Systems Command (NAVAIR) and elsewhere. The information is ultimately used to determine the ESH impacts and costs associated with Fleet aviation maintenance processes. PMs can utilize ESA analyses to modify their platform designs and/or the industrial processes and HM they use to maintain their aircraft.

NAVAIR ENVIRONMENTAL PROGRAM

The Environmental Systems Allocation (ESA) Model

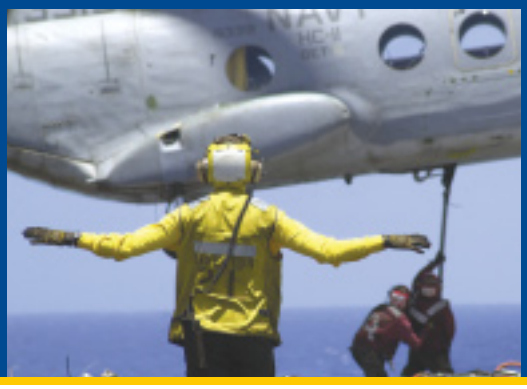
Why is ESA Needed?

In concert with NAVAIR's goals "to reduce the cost of doing business, to continuously introduce best business practices and remove barriers to getting our job done with greater efficiency, and to improve our ability to make rapid decisions in support of emerging Fleet requirements," ESA is the tool to make it happen.

1. ESA can help PMs understand the impact their platforms are having on the environment. The PMs cannot make informed pollution prevention (P2) changes unless they understand the environmental impacts of their platforms.
2. ESA can help PMs identify P2 opportunities. PMs have the ultimate responsibility for their platforms and are the appropriate authorities to direct the necessary process changes to achieve P2 at the source.
3. ESA can leverage available information. The ESA program takes advantage of the extensive P2 information that has already been collected at each Navy installation on a fence line basis.
4. ESA can distribute information about environmental impacts to the right program. ESA can allocate the existing P2 information to platforms, and provide the PMs with this platform-specific information. This feature can be used to build program-specific Hazardous Materials Authorization Use Lists (HMAUL).
5. ESA can help assess the probable impacts of proposed legislation. The ESA model can offer insight into how proposed or future regulations will impact a platform by quantifying associated HM usage and HW generation. PMs can leverage this information to plan for and mitigate the costs of maintaining compliance.

   For example, ESA data was surveyed to determine the successful reduction of methylene chloride (MeCl) usage across all O, I, and D level maintenance activities, as well as identifying the processes where MeCl is still being used. ESA data was also recently surveyed to determine the pervasiveness of solvent usage and processes across the O, I and D level maintenance activities to assist the Joint Solvents Substitution Working Group on where to focus their project efforts in finding alternatives.

ESA
Environmental Systems Allocation



ESA Methodology

The ESA model is constructed through a multi-step process that includes:

1. Collection of central data (including maintenance data from the Naval Aviation Logistics Data Analysis (NALDA) database, aircraft data from the Aircraft Program Data File (APDF), information from Hazardous Waste Annual Reports (HWAR), fence line data from P2 plans, Federal Logistics (FEDLOG) data, and Hazardous Material Information Resource System (HMIRS) data),
2. Collection of field data (including data collection through field visits to various activity Aircraft Intermediate Maintenance Divisions (AIMD)/Marine Air and Logistic Squadrons (MALS), other squadrons, and Depots),
3. Evaluation and analysis of field data (including the allocation of environmental impacts to individual weapon systems), and
4. Preparation of platform- or activity-specific reports.

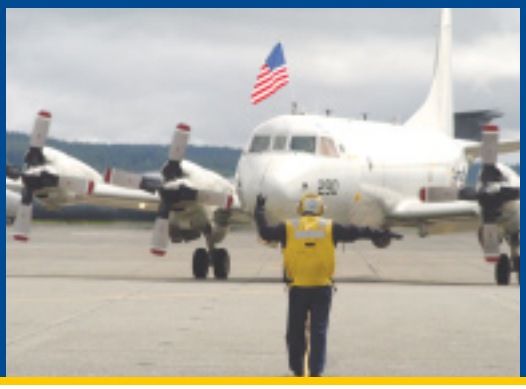
Primary Sources of ESA Data

The ESA model contains four primary sets of information:

1. Hazardous and non-hazardous material use data,
2. Waste generation data (including water, solid waste, HW, and recycled waste),
3. Compliance/regulatory data included in Material Safety Data Sheets (MSDS) and other sources, and
4. Cost data (including costs of materials management and waste disposal).

The ESA model uses maintenance workload information from the NALDA database maintained by the NAVAIR Logistics Competency (AIR-3.0), as well as fence line environmental data collected directly from the Fleet. The NALDA database contains information regarding maintenance operations, such as identification of work centers, type of maintenance performed, and the amount of man-hours spent on maintenance operations.

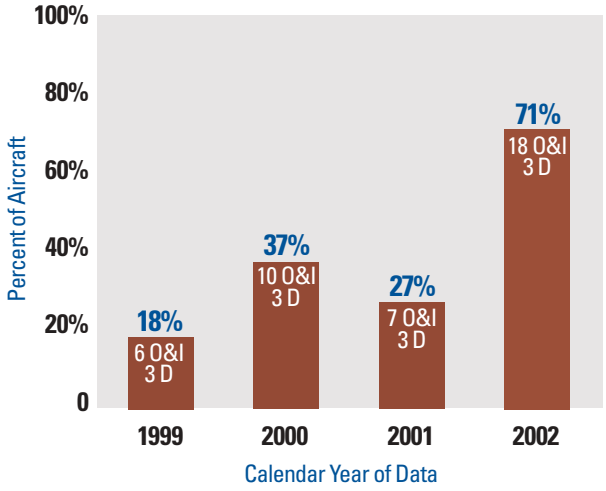
For information pertaining to HM and HW, the ESA model relies on data from field activity P2 plans, targeted field data collection efforts, and activity HM and HW centers that use material and/or waste tracking control systems, such as the Hazardous Substance Management System (HSMS) or the Hazardous Inventory Control System (HICS). These tracking systems often form the foundation for the Consolidated HM Reutilization and Inventory Management Program (CHRIMP) required at Navy installations, or the Marine Corps equivalent, the HM Consolidation Program (HCP). For information regarding material properties, constituents, and costs, the ESA model uses data collected from MSDSs, FEDLOG, and HMIRS.



Extent of ESA Data

The ESA model has been progressively successful in capturing and allocating HM usage and HW generation for a growing percentage of Navy and Marine Corps aircraft since establishment of the ESA database, as illustrated in the following chart. Percentage of aircraft with associated HM usage and HW generation data has risen from 18 percent (from six O & I level and three D level activities) for CY99 data to 71 percent (from eighteen O & I level and 3 D level activities) for CY02 data. Moreover, approximately 13 percent of the total aircraft are contractor-maintained, and NALDA maintenance data and HM usage and HW generation data is often difficult to obtain or allocate (i.e., exclusion of contactor-maintained aircraft would yield higher percentages than those shown in chart below).

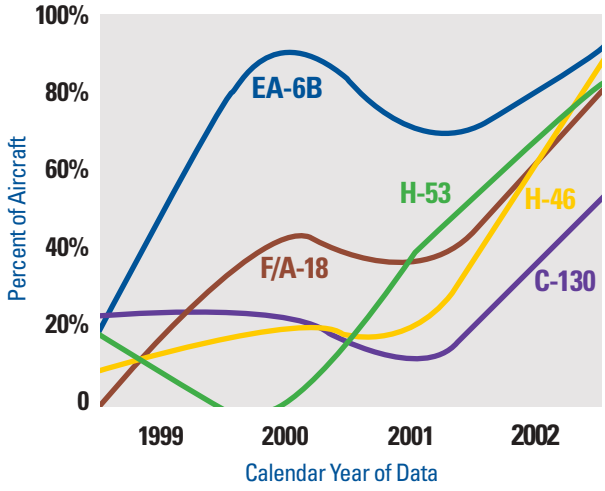
ESA DATA COLLECTION RATE
1999 - 2002
Percentage of Combined Navy and Marine Corps Aircraft



Range of ESA Data Range

ESA collects HM usage and HW generation data on over thirty aircraft platforms in use throughout the Navy and Marine Corps, including fighters, trainers, cargo planes, helicopters, and patrol and reconnaissance aircraft. [Data are not actively collected on several platforms (primarily cargo planes and trainers) that are predominantly based overseas or are being decommissioned/ phased out.] The following chart illustrates how data capture of HM usage and HW generation has increased for several example platforms since inception of the ESA database.

EXAMPLES OF PLATFORMS TRACKED
1999 - 2002
Percentage of Five Aircraft Types Captured in the ESA Tool



What ESA Does

The ESA model analyzes the data to determine the environmental impacts by linking the impact to the platform, activity, work center/shop, and material and/or material ingredient. By using workload information from NALDA, the ESA model can allocate HM and HW to similar work centers that do not have data. This allocation factor is a defining attribute of the ESA database tool. This feature will alleviate the problem of requiring comprehensive data calls, resulting in an expedient, more cost effective database program and analysis tool. To date, this tool has been used in a variety of applications to help support ESH evaluations for numerous programs.

The following is a short list of some of the uses of the ESA program:

- To support Programmatic Environmental Safety and Health Evaluations (PESHE),
- To generate Hazardous Materials Management Plans (HMMP),
- To understand HM and HW impacts on aviations maintenance operations,
- To allocate material usage and waste generation to O, I, and D levels,
- To support cost/benefit analyses for environmental technology research and development programs,
- To complement and supply data for various NAVAIR programs and databases (e.g., to determine where P2 efforts and funding can best be focused),
- To assess the probable impacts of proposed regulation (e.g., Federal Register), and
- To help identify and target high material usage products and high generation waste streams.

Reach of ESA Data

Installations involved in the ESA model include nearly thirty Naval Air Stations (NAS), Naval Stations (NAVSTA), Naval Aviation Depots (NADEP), Marine Corps Air Stations (MCAS), and Marine Corps Bases (MCB) throughout the United States.

ESA Future Plans & Summary

Development of a tool that can link civilian worker and sailor stressor exposure data, such as safety costs and workplace and health monitoring costs, to platforms and work centers through utilization of the ESA model is being explored. Development of such a data tool would further enhance the PMs understanding of the true life-cycle costs associated with the platforms they manage.

In summary, the ESA model is invaluable for determining the environmental impact of O, I, and D level Naval Aviation maintenance operations. The ESA model can be used to identify and quantify HM usage and HW generation for individual platforms, activities, or work centers. This information can then be used to identify P2 opportunities.

For more information about the NAVAIR environmental program, visit www.enviro-navair.navy.mil.

NAVAIR

www.enviro-navair.navy.mil

CONTACTS

Eric Friedl
Naval Facilities Engineering Service Center (NFESC)
Port Hueneme, CA
805-982-3688
eric.friedl@navy.mil

Tom Cowherd
Lead Maintenance Technology Center for the Environment (LMTCE)
Naval Air Depot
Jacksonville, FL
904-317-2037
cowherdtr@navair.navy.mil