

# **Explosive Safety Seminar**

**Orlando, FL**

**18-20 August 1998**

## **Munition Items Disposition Action System**

# **MIDAS Program**

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## **INTRODUCTION**

The MIDAS Program was established in 1992 to identify alternatives to open burning and open detonation, and to provide a systematic approach to the disposition of unwanted ammunition items. Over four hundred thousand tons of excess, obsolete, or unserviceable dissimilar munitions, ranging from small caliber cartridges to complex cluster bomb units, await disposal. Characterization of ammunition components and constituents is essential to support the four MIDAS Program thrust areas: demil execution, resource recovery and recycling (R3), research and development technology application, and environmental permitting. Centrally located MIDAS data is available to Government, Industry, and Academia; as a management tool to respond to these thrust areas.

## **DEVELOPMENT**

The MIDAS Program is managed at the U.S. Army Defense Ammunition Center (DAC), located on Savanna Army Depot Activity in northwestern Illinois. Argonne National Laboratory develops the data base programming. Thirteen DOD ammunition plants, depots, and engineering centers assist the MIDAS Team in ammunition and waste stream characterization. This business efficiency utilizes their unique munitions and engineering expertise.

## **RESEARCH**

Munitions characterization includes research of technical data packages, engineering drawings, specifications, standards, and other sources; to determine all components and constituents of a munition. Inert and explosive materials are identified by name, specification, weight, and composition. This information is entered into relational data bases that link the components and constituents in a hierarchical listing. Characterization is the key in determining the best candidates for open burning, open detonation, incineration, resource recovery and recycling, or new technology development. The knowledge of recyclable ingredients will also enhance the marketability of recovered materials.

## **FEATURES**

Information on munitions characterization data, disposition alternatives, and demil R&D technology is available on the MIDAS web site. Users may determine drawing number, material, specification, and weight information for munitions, components, parts and PEP materials. User-friendly menus and searches allow selection of items by NSN, DODIC, part number, nomenclature, or MIDAS Family. Reports, diagrams and RRD inventory stocks may be viewed or printed from the web site. An enormous amount of information may be accessed in minutes versus hours, without the need to store volumes of data. Standard Reports are tailored to specific needs, MIDAS enables users to quickly extract comprehensive information in various formats, e.g., complete detailed structure, PEP materials, packaging, or RCRA-regulated materials.

## **ENVIRONMENTAL SUPPORT**

MIDAS data has been used for notice of deficiency (NOD) responses, OB/OD permit applications, State air emission permits, environmental impact statements, incineration trial test burn permit applications, and legal defense. In the future MIDAS will play a vital role in permit applications, EPCRA/TRI chemical reporting, and waste stream characterization. Examples of MIDAS environmental support follow:

**Policy.** A member of the MIDAS Team has continuously supported the OEESC, Munitions Rule Development, and Munitions Rule Implementation Council meetings. The blend of munitions experience, chemistry and environmental background, and the support of the MIDAS Team infuse realism into environmental policy development.

**Waste Stream Characterization.** Permitting of ammunition peculiar equipment (APE) 1236, Deactivation Furnace, is very critical as open detonation and burning becomes more restricted. Through the MIDAS Program, the Ammunition Equipment Directorate at Tooele Army Depot has developed a waste characterization and prediction program called "Merlin". In order to speed up the permitting process Merlin imports munitions component descriptions from MIDAS and uses comprehensive chemical and thermodynamic calculations to predict combustion products, chemical elements, metal parts, and ash products resulting from munitions incineration. Merlin generates documentation for the APE 1236 Trial Test Burn EPA Permit submission, and will allow the user to vary operational parameters such as: furnace temperature, residence time, and feed rates. The program can be modified for any waste process, but is currently programmed only for incineration.

**Emission's Characterization.** The MIDAS program is being considered to warehouse empirical emissions test data from the Dugway Proving Ground Bang Box, Nevada Test Site X-Tunnel, and other detonation chambers.

**Toxic Release Inventory.** MIDAS has been recognized as the source of data for munition's characterization and constituent data. MIDAS + Emissions + Modeling are the three building blocks needed for the development of reporting requirements for the Emergency Planning and Community Right to Know Act (EPCRA), TRI reporting.

## **DISPOSITION ALTERNATIVES**

Options for demilitarization, disposal, resource recovery, and recycling have been assembled into a feature called Disposition Alternatives. Flow diagrams of current and proposed options for safe demil or disposition of 27 MIDAS families of munitions and explosives are displayed in a point-and-click (windows) environment. Examples of specific topics include environmental rules impacting on demil and disposal, explosive and personnel safety requirements, Penta treated wood alternatives, and data bases of DMWRs, and DoD installation capabilities. "Emerging Technologies" features a database of more than eighty disassembly, removal, recovery/reuse, waste stream

treatment, and/or destructive R&D technologies, with descriptions, MIDAS families affected, and POCs.

## **WEIGHT ESTIMATION**

To overcome missing part or surface coating weights in technical data packages, a standard system for estimating weights was incorporated into MIDAS. Mathematical representations for 32 shapes are used to estimate explosives (pressed into a confined area), metal platings, paint finishes, and metal brazes. Given dimensions from the engineering drawing, and densities from specifications, the system instantly calculates the volume and weight of the material. The standard weight estimation system has been very useful in MIDAS research and may have further applications in safety, R&D, production, or environmental calculations.

## **TECHNICAL ASSISTANCE**

Examples of MIDAS support include use of MIDAS reports in demil contract solicitations offered by the Industrial Operations Command (IOC). Industry has been highly complimentary of the MIDAS data used to estimate and plan R3 proposals. Installations routinely use the information for demil, disposal, maintenance, and recycling planning. Stockpile analyses by MIDAS Family have been the central core of two Joint Service Demil Studies for Congress, and have become the standard in the current IOC Conventional Demilitarization (CAD) Plan.

## **IMPLEMENTATION PLAN**

The implementation plan for the MIDAS Program included a BULLETIN BOARD, established in March 1995. An INTERACTIVE MIDAS Program is networked to the MIDAS Team at 14 locations. Over 500 copies of the introductory CD-ROM version of MIDAS were distributed since May 1996. The MIDAS Web Site was launched in May 1997 (<http://www.dac.army.mil>). The use of several formats gives MIDAS a wider application. To Access MIDAS Databases you will need to register at the web site. Submit your registration with your choice of user ID and password. A feedback feature allows you to tell us how we are doing, ask a question, or recommend improvements. No formal training is required, however help menus are available to assist you.

## **CONCLUSION**

The MIDAS Program provides a wide variety of information to make better disposition decisions on the RRD stockpile. Business efficiencies were designed to utilize existing expertise, to unify research and data collection, and to standardize the outputs of munitions disposal information. The MIDAS Team is confident that the products of MIDAS will actively support demil planning, execution, resource recovery and recycling, technology development, and environmental permitting. More importantly, MIDAS tools focus efforts to more effective use of demil, R&D, and environmental dollars.

To obtain more information on accessing MIDAS data, contact our web master, Ms. Lisa Anderson, phone 815/273-8365, E-mail: [andersonl@dac-emh1.army.mil](mailto:andersonl@dac-emh1.army.mil).