Advanced Integrated Information Management System: A Flexible, Customized Decision Support Tool

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To assist in management of the volumes of facility and environmental information at federal installations, the Advanced Infrastructure Management Technologies (AIMTECH), a U.S. Department of Energy Technical Service Center, has developed and implemented the AIMTECH Advanced Integrated Information Management System (AIIMS). The AIMTECH AIIMS is a computer-based facility, installation, and environmental management tool that combines the power of relational databases and geographic information systems (GIS) to provide a user-friendly interface for organizing, storing, retrieving, and displaying environmental and facility data from a manager's desktop. Using a "point-and-click" and "drag-and-drop" approach for archiving, retrieving, and displaying information, AIIMS eliminates user skill requirements in complex database or computer-aided design (CAD)/GIS software. The AIMTECH AIIMS is a management tool, not an engineering software package.

Environmental, installation, and facility information can be accessed or added to the site through either a map interface or a data hierarchy interface, operating in the Windows 98, Windows NT, or Windows 2000 multi-tasking user environment, using Commercial-off-the-Shelf software products all integrated to provide a user-friendly management tool. AIIMS can display and archive virtually any electronic information including word processing documents, spreadsheets, schedules, photographs, sound, video clips, CAD drawings (regardless of format, e.g. .shp, .dwg, .dxf, etc.), and the output of modeling programs. AIIMS can link to multiple dissimilar databases, retrieve information in a specified reporting format, and can access information from remote resources (e.g., other desktop computers or from local or wide area networks). In addition, the AIMTECH approach has been to create a management tool that also uses a map to navigate a site and to retrieve information about a site or an environmental concern, or to add information to the site. The map interface provides a window to access information stored in the integrated database. Conceptually, this makes AIIMS a shell that overlays existing sources of information and brings them together into a well organized, easy-to-access, integrated format, making this information readily available from a manager's desktop computer.

The AIMTECH AIIMS takes advantage of Commercial-off-the-Self (COTS) software products merged to provide a user-friendly management tool. These COTS include: ESRI MapObjects, MS Access or SQL Server, VisualBasic, Crystal Reports, and the MS Office suite of office productivity tools. The resulting software is a very flexible package that can be customized to a user's specific needs. AIIMS development was federally funded and is completely non-proprietary. AIIMS users not only receive the customized software, but also the source code. As the diverse customer base increases and additional functionality is added to meet specific user needs, the entire user community benefits from the development. Our approach from the inception of AIIMS is: reuse and do not

reinvent. We also have developed AIIMS in a Microsoft environment that is familiar to installation, facility, and environmental managers in the federal sector. This reduces the learning curve for new users and permits AIIMS to operate as a stand-alone, networked, or World Wide Web-based application. The web-based approach eliminates hardware specificity, permits AIIMS to run on multiple dissimilar hardware configurations, and to include user password protected access restrictions (read only; read and write; or read, write, and edit). For stand-alone or networked applications, AIIMS operates on either the Windows 98, Windows NT, Windows 2000 operating systems. The NT. Windows 2000, and networked application also includes user password protected access restrictions (read only; read and write; or read, write, and edit).

The AIMTECH AIIMS has been implemented at eight installations. Though all of these systems are based on the core software development suite, each application was customized to the specific user's needs. Since the initial placement of AIIMS at the US Army Kwajalein Atoll Office of Environmental Compliance and the US Army Space and Strategic Defense Command Office of the Environment, AIIMS has been customized for the US Army Fort Campbell, Robins Air Force Base, Loring Air Force Base, the Air National Guard HQ Installation Restoration Program, the Fort Meade Environmental Management Office, and the Joint Program Office for Infrastructure Assurance at the Naval Surface Warfare Center Dahlgren Division. Though all of these AIIMS placements are based on the core software development suite, each application was customized to the specific user's needs. It is our approach to customize AIIMS to the client's way of doing business, not to force a change in business processes to fit the software.

- US Army Kwajalein Atoll – the most versatile of the AIIMS applications, this system encompasses installation restoration investigations and characterizations, in addition to compliance and permit tracking, facility issues, and cultural resource management. The Kwajalein AIIMS is linked by internet to the US Army Space and Strategic Defense Command, over 7,000 miles away and keeps the Command updated on environmental activities at Kwajalein. This system also contains an electronic archive of over 200 documents covering the range of environmental studies conducted at Kwajalein over the past 10 years.
- Loring Air Force Base – The AIIMS implemented at Loring is a stand-alone system used to track base closure activities. These include long-term ground water monitoring and the results of soils and sediments investigations. Similar to the Robins Air Force Base AIIMS, this application permits the manager to retrieve information about solvent plumes or soil contamination by highlighting and "clicking" on the area of interest. This application is used by the local regulators to quickly resolve questions and improve levels of communication.
- Fort Meade Environmental Management Office – This AIIMS implementation is a networked system that links 14 project managers. The application not only archives past work, but is used to monitor current project costs, UST and AST status, Air Permits, Hazardous Waste manifests, and Radon. The map function contains an aerial map that underlies the installation GIS maps.

- Joint Program Office for Infrastructure Assurance (JPO-IA) – This is a non-environmental application of AIIMS Technology. This application is networked with 70 users. This implementation acts as a window to over a dozen dissimilar databases used by JPO-IA analysts in the execution of the JPO-IA mission. These analytical tools are plug-ins to the AIIMS co0mmon interface. The analysis is strongly geospatially driven and interfaces with a 40GB geospatial data source. This application runs in both classified and unclassified environments

The examples of the user base for AIIMS demonstrates the varied application and flexibility of the AIIMS tool set AIMTECH has developed to provide customized applications to installation, facility, and environmental managers.

In summary, AIIMS is a manager's tool using interactive maps to obtain information about a site or to add information to a site, using existing site maps and data from a variety of electronic formats. AIIMS development was federally funded and the software is not proprietary. AIMTECH has developed a manager's tool by integrating several COTS and thus not "reinventing the wheel" in the design of AIIMS. The AIIMS application is a cost-effective approach to assisting facility, installation, and environmental managers in accessing and archiving information about their sites.