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Using Web-Based Tools to Integrate Environmental Management

Gustavious Williams[1], Mandy Whorton,[2] and Karlene Leeper[3]

Abstract

The 611th Air Support Group (611 ASG), based at Elmendorf AFB in Anchorage, Alaska, is responsible for the operation and management of more than 40 remote sites that include forward operating locations, active airfields, short-range and long-range radar sites, and inactive or abandoned sites. These sites are widely dispersed across Alaska, including the Aleutian Islands, and represent the largest cumulative "base" in the Pacific Air Force Command (PACAF). Active sites are contractor operated. The 611 ASG oversees management at these facilities from a distance, which complicates data management and access.

The 611 ASG owns and is responsible for numerous historic structures of the World War II and Cold War eras as well as archaeological sites. To simplify its management of cultural resources, the 611 ASG has developed a Web-based system to store and provide access to information on the key characteristics of its cultural resources and to compile additional engineering data for the management of active facilities. This system helps personnel at the 611 ASG to oversee installation maintenance and meet the U.S. Air Force's regulatory requirements for cultural resources management at these facilities. It also provides information to the contractor personnel so that they do not initiate activities that may inadvertently damage historic resources. The ability of personnel to remotely access and update information in this system is essential to its successful operation.

The basic system consists of tabular and image data for all buildings at the installations under 611 ASG control. The focus is on cultural resource information obtained from data forms prepared for the Alaska State Historic Preservation Office (SHPO), but the system also includes other engineering data, such as scheduled maintenance and equipment components. Data can be entered into the system or reviewed in real-time over the World Wide Web. Input screens provide a number of pull-down menus and other features that reduce data entry errors. Reviewing and querying data can be easily accomplished using built-in reports.

Mission of the 611th Air Support Group, Alaska

The mission of the 611 ASG is to provide communication, engineering, logistics, environmental, financial, and program management support to maintain combat readiness for remote Alaska, the Eleventh Air Force, and the North American Aerospace Defense Command (NORAD). The 611 ASG, which is based at Elmendorf AFB in Anchorage, is responsible for the operation and management of more than 40 remote sites that include forward operating locations, active airfields, short-range and long-range radar sites, and inactive or abandoned sites. These sites are widely dispersed across Alaska, including the Aleutian Islands, and represent the largest cumulative "base" in the Pacific Air Force Command (PACAF). On-site management of the active installations has been outsourced to small crews of contractor personnel that perform such functions

[1] Argonne National Laboratory, EAD-900 9700 S Cass Ave, Argonne IL 60439; 630/252-4609; email: gpwilliams@anl.gov
[2] Argonne National Laboratory, 200 Union Blvd, Suite 530, Lakewood, CO 80228; 303/986-1140, ext 216; email: mwhorton@anl.gov
[3] 611 CES/CEVP, 10471 20th St, Suite 302, Elmendorf AFB, AK 99506-2270; 907/552-5057; email: karlene.leeper@elmendorf.af.mil

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as building and grounds maintenance, radar operation, meal preparation, land management, and all other activities associated with running a small installation. Program managers at the 611 ASG in Anchorage oversee and monitor contractor activities, as well as manage inactive installations, from a distance. Program manager responsibilities include auditing contractor activities, providing liaison support to Air Force managers at PACAF, and reporting progress in site cleanups and other activities.

Historic Resources at 611 ASG Installations

All of the 611 ASG installations are associated with the continental air defenses developed during the early phases of the Cold War. They provided the first line of defense against a potential Soviet bomber attack over the polar region. Radar stations provided early warning of bomber attack, and forward operating bases were established to launch fighter-interceptor aircraft to defend against Soviet bombers. As part of military downsizing resulting from the end of the Cold War, the scope of activities at these installations has been dramatically reduced; some are being closed altogether. A massive Department of Defense cleanup program, "Clean Sweep," has been initiated for demolition, landfilling, and removal of unnecessary equipment and buildings.

Because of their associations with important historical events and the unique design and engineering of individual facilities, many buildings on most 611 ASG installations are eligible for the *National Register of Historic Places* (NRHP) and require treatment as historic properties. The cleanup activities associated with Clean Sweep have the potential to dramatically affect historic properties. As a result, the 611 ASG has begun, in accordance with agreements with the Alaska SHPO, a process of systematic recordation of properties that will be demolished.

To monitor progress and provide additional documentation of its historic resources, including numerous historic structures of the World War II and Cold War eras, the 611 ASG developed a database to identify the key characteristics of its historic properties and to compile additional engineering data for the management of active facilities. The database allows personnel at the 611 ASG to oversee the maintenance of its installations and meet its regulatory requirements for cultural resources management. It also allows contractor personnel to input and update information and to access information on the historic nature of buildings at each installation. This process of centralizing cultural resource information and making it readily accessible significantly reduces the potential for inadvertent damage to historic properties during cleanup or general maintenance activities.

Web-Based Data Management

The web site that forms the basis of this system is a combination of a basic database consisting of tabular and image data for all buildings at the 611 ASG installations linked to traditional web pages for installation histories, photographs, and other information (Figure 1). The focus is on cultural resource information obtained from data forms prepared for the Alaska SHPO. The database includes information such as construction date; historic significance; and basic details such as building materials, alterations, or additions. The database also includes fields for other engineering data, such as scheduled maintenance and equipment components. The initial database was populated by transferring data from paper forms to the web site. Future

efforts could streamline this process, with users entering data directly into the database from laptop or desktop computers and generating reports to satisfy the needs of the Alaska SHPO. As more and more information sources become digitized, the Air Force may be able provide electronic data only, which could integrate with the SHPO's electronic databases currently under development. Engineering data will be field collected and entered directly into the database.

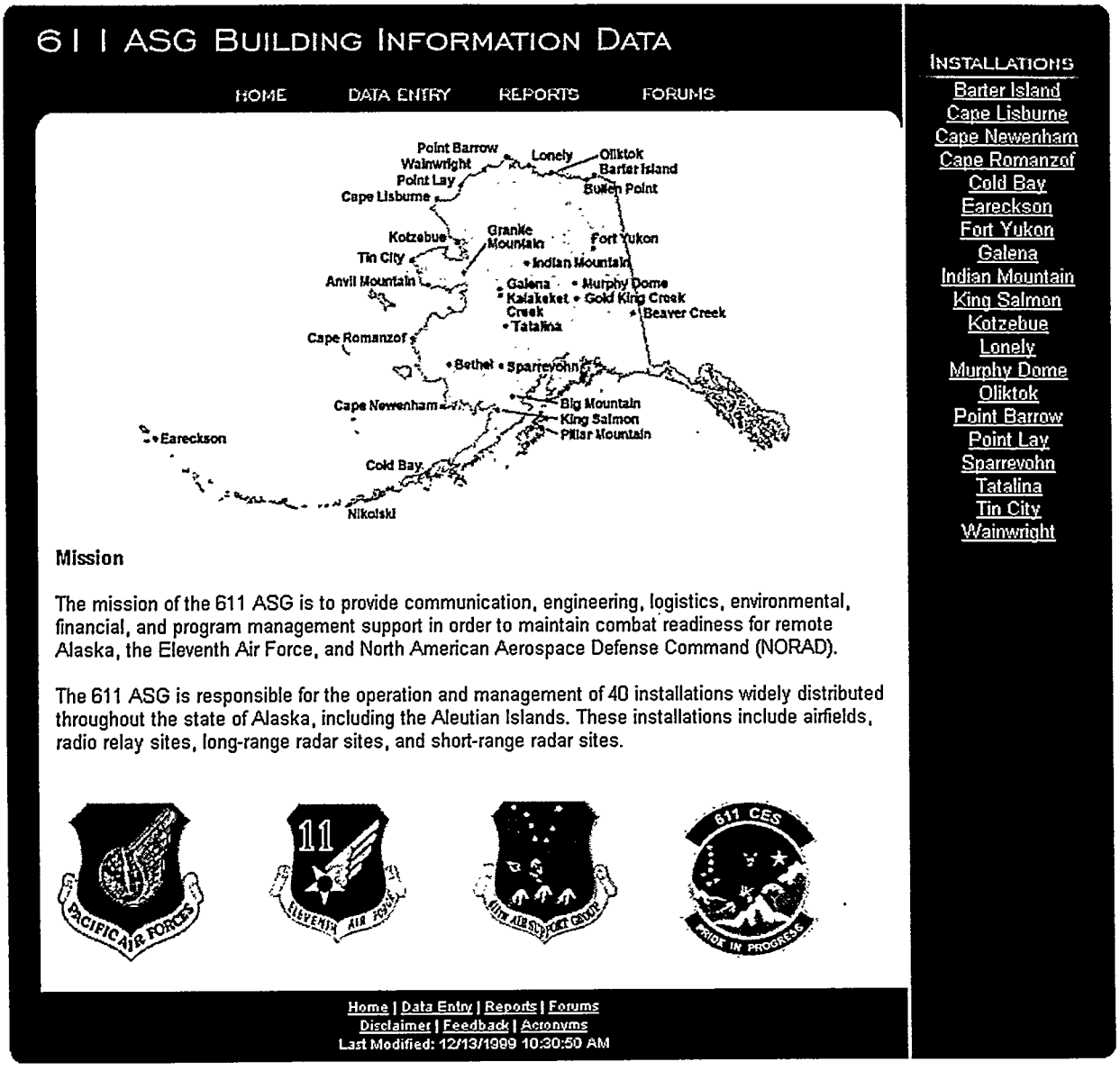

Figure 1: Main Home Page

Data can be entered and reviewed in real-time over the Web. Input screens provide a number of pull-down menus and other features that reduce data entry errors (Figure 2). Reviewing data is also easy; the report function (which will be expanded) allows the user to query particular parts of the database and to prepare a standardized report, including a picture of

the facility. Figure 3 shows a partial summary report for one of the installations. A detailed report displaying all data is also available.

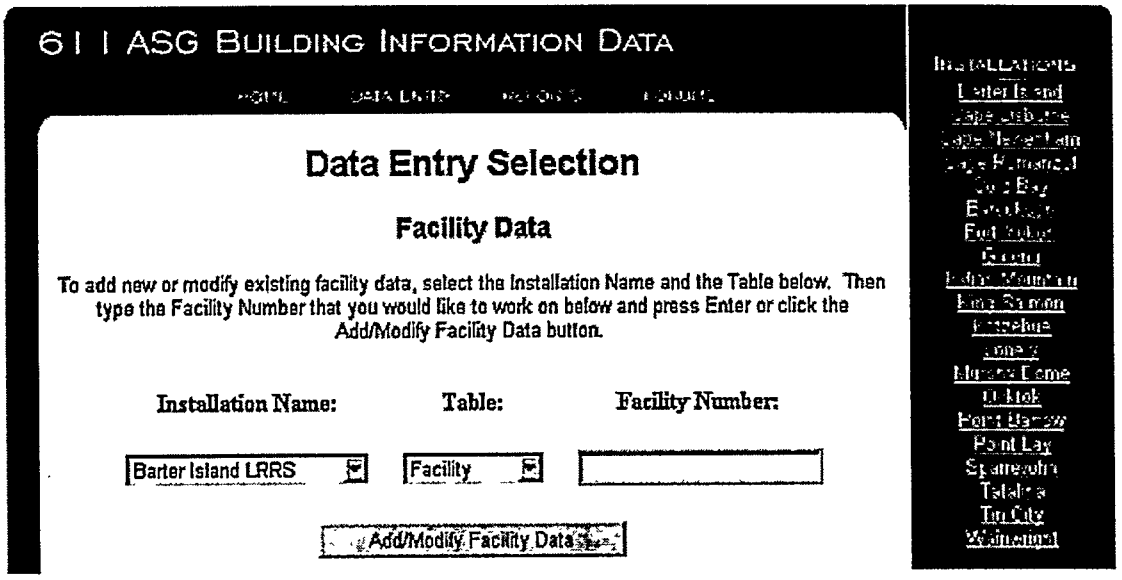

Figure 2 Data Entry Home Page

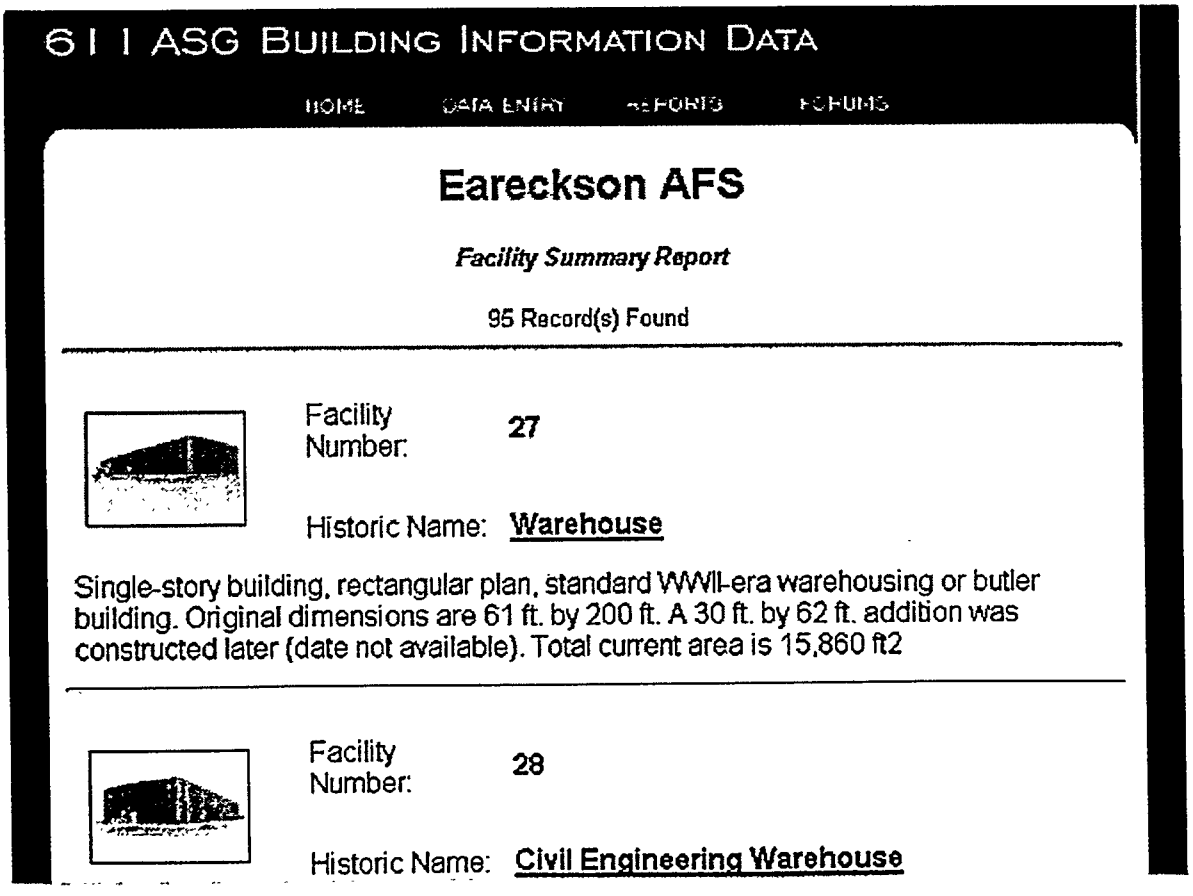

Figure 3 Summary Report for Output Data

The web site runs on standard computer equipment — a 333-Mhz Pentium II dual processor running Windows NT™ with Internet Information™ Server 4 as the web server. The database is a standard Microsoft Access™ database with a web application interface created in Cold Fusion Studio™. The Cold Fusion™ Server software resides on the web server to convert the Cold Fusion™ language into HTML for browsing over the Internet.

The site is extremely easy to maintain because it uses the Internet to perform data entry, including the uploading of pictures. Data and pictures are available to any user immediately after entry. Almost the entire web site, including the pull down and side menus, is stored in the Access™ database so that updating fields to add additional menu options or other information can be done in the database itself without additional web programming.

Any computer with an Internet connection and standard browser software (e.g., Netscape Navigator or Internet Explorer) can access the database, so contractor personnel and program managers access the same information. Information exchange is further encouraged and facilitated through the use of the web site's forum feature. This feature allows users to post and review questions about the web site itself, the resources included in the site, or other information or queries. The forum allows contractors from all of the sites, many of which are similar if not identical in configuration, to exchange best management practices or queries. Security measures could allow the 611 ASG to assign various levels of access to the database and to track database usage. For example, some users would only able to query the database, while others would be allowed update privileges.

Because of the utility of the system in managing cultural resources and limited engineering data, the 611 ASG plans to enhance the existing database to add more equipment/machinery data fields and to expand search and report capabilities. Other areas of potential expansion include (1) live links to other databases; (2) addition of clickable maps of facilities and archaeological sites; (3) expansion of existing content to include additional photos, imagery, or fields; (4) expansion of the database to cover additional installations, such as Elmendorf or Eilsen; and (5) addition of other types of data, such as real property, wetlands, monitoring, solid waste management units, or other Installation Restoration Program data.

Conclusion

The web-based tool developed by the 611 ASG for managing data on its scattered sites is an inexpensive way to help optimize environmental management. It runs on standard equipment and uses commonly available software. It is easy to update and provides an excellent means to disseminate critical information to all necessary personnel, regardless of their organizational or geographic locations.

As manpower and financial resources continue to be limited and as technology continues to advance, it will become more apparent that web-based data management tools will be essential in many management and oversight areas. This technology will continue to be used to develop integral management tools for the future.

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