



**US Army Corps
of Engineers.**
Construction Engineering
Research Laboratory

Fact Sheet

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HEATER ENGINEERED MANAGEMENT SYSTEM

The Problem

The Army operates and maintains some 2,600 miles of heat distribution systems (HDSs), many of which are over 30 years old, are in fair to poor condition, and are constructed from outdated designs and materials. The consequences of deteriorated and outdated HDSs include unreliability, high maintenance costs, high rates of leaks and failures, high energy losses, and safety hazards. In FY97, the Army spent \$25.6 million on the maintenance and repair of steam and hot water distribution systems. This is equivalent to over \$1,800 per thousand feet and is significantly higher than the cost to accomplish maintenance and repair of other utility distribution systems. In addition to the high maintenance costs, the Army loses between \$50 and \$100 million per year as a result of excessive heat losses from HDSs. For example, a single manhole filled with water can cost between \$50,000 and \$125,000 per year due to lost energy.

Heat distribution systems are often neglected until a failure occurs because they are “out of sight-out of mind” and are difficult to visually inspect and assess for system condition. In addition, it is difficult to quantify the impact of not performing maintenance.

The Technology

HEATER is an Engineered Management System (EMS) designed to perform comprehensive analysis and management of HDSs at Army installations. HEATER helps engineers design, operate, and maintain heating systems in an energy efficient and life-cycle cost-effective manner. HEATER is composed of several components. HEATER’s inventory databases include information describing the components that comprise the HDS, such as pipes, manholes, and steam traps. It includes procedures for inspecting the HDS and calculating a quantitative condition index on a scale of 0 to 100 (worst to best). HEATER’s condition prediction models forecast the system’s deterioration over time and indicate when maintenance and repair (M&R) will be needed. Based on all of this information, HEATER provides the user with multi-year M&R work plans that consider the life-cycle cost and functionality of the HDS.

To give the user a comprehensive analysis capability, HEATER is integrated with Washington State University’s HEATMAP program. HEATMAP calculates flows, pressures, temperatures, and heat losses at various points throughout the HDS, and can be used to calculate system operating cost for various scenarios.

HEATMAP also provides an AutoCAD map of the HDS. It can be used to design a new system, evaluate the performance of an existing system, evaluate the feasibility of expanding a system to handle new construction, and determine the cost of system energy losses.

HEATER is a module of the Utilities EMS Suite, which is an integrated set of EMSs for heat, gas, water, and sewer systems, as well as a set of shared utility analysis tools.

Benefits/Savings

HEATER will enable Army installation managers to make cost-effective, technically feasible decisions about the M&R of HDS. This will help reduce maintenance and operating costs, improve reliability, and enhance system safety. It will also help the Army meet energy conservation requirements of Executive Order 12902. Furthermore, HEATER will assist Army installations in modernizing or privatizing their HDS.

Status

HEATER was beta tested at Fort Jackson, SC in FY99. The beta test version included inventory, inspection, condition index, and condition prediction. An M&R planning module is being developed and will be completed during FY99, and closer integration with HeatMap is also under way. HEATER 1.0 is scheduled for release 4th quarter FY99.

Points of Contact

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