U.S. ARMY

MDMS UPDATE

~ METER DATA MANAGEMENT SYSTEM ~

US Army Corps of Engineers®

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FROM THE PROGRAM MANAGER

Welcome to our October - November 2023 issue of the *Meter Data Management System Update (MDMS),* designed to keep you informed on the growth and latest developments of the Meter Data Management System and the Army Metering Program.

Our first article below briefs the added year selection for historical fiscal years on four Energy Management reports. This enhancement will allow benchmarking against previous years.

Our next article on pages 2 and 3, describes the upcoming addition of the Audit Tool. An Energy Manager (EM) audits approximately 20% of their buildings every year. This tool will significantly impact the EM's life as each building can require 40 hours of work. To alleviate the significant burden on the EM, we are working to standardize that process in MDMS to eliminate redundant tasks and populate the audit forms where the data is available.

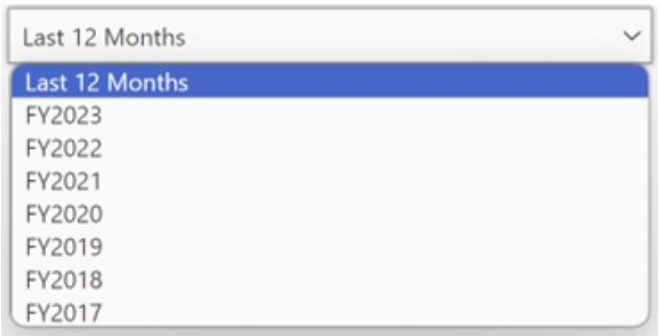
As always, our mission is to improve the MDMS experience for end users. Your input is valuable, and we welcome your feedback via the Army Meter Service Desk (AMSD) at: cehnc-army-meter-help@usace.army.mil

ADDED YEAR SELECTION IN SEVERAL REPORTS

The following MDMS reports, all found on the Benchmarking sub-menu on the Energy Management page, have been enhanced to allow users to select previous fiscal years for the reporting period:

- Base Load Comparison
- Cat Code Performance Metrics (Electric)
- Cat Code Performance Metrics (Gas/Water)
- Energy Project Identification Tool

The reporting period defaults to the last 12 months, but now there is a dropdown menu with the selection of historical fiscal years FY2017—FY2023. This enhancement will allow the Energy Manager or Resource Efficiency Manager to benchmark against previous years to see how they are progressing over time. The new pulldown menu is shown below.



UPCOMING AUDIT TOOL

The Army policy on audits required by Title 42 of the U.S. Code requires each installation to audit 75% of their energy use. That is accomplished over four years. That means an Energy Manager (EM) audits 20% of their buildings every year. This significantly impacts the EM's life as each building can require 40 hours of work. To alleviate the significant burden on the EM, we are working to standardize that process in MDMS to eliminate redundant tasks and populate the audit forms where the data is available.

First, we will establish the list of buildings with the highest energy users or square feet (sf). The EM can choose what method to populate the list. There are certain things required in a level-one audit. Those include information on the site, the building, and the usage. These can be input one time and then remain forever, eliminating that step in the future. Listing potential renewable energy measures will remain consistent each year, with only minor adjustments required.

The next phase, which identifies potential Energy Conservation Measures (ECMs), will draw on a lot of data and tools from MDMS. MDMS will list the usage and benchmarks and compare those to other facilities of the same category code and climate zone. The building can be ranked according to the potential savings against all the benchmarks, and the EM can choose the most applicable one. This will be a good initial look at the savings broken down by specific ECMs.

The following section breaks down the energy savings potential into categories. Five specific categories or systems will address the potential for savings by category and the possible remedies. Those five are:

- Excess baseload and non-duty hours load
- Plug load
- Lighting systems
- Air Conditioning (AC) systems
- Fan/pump systems

The first section covers energy that is wasted because it is on when it is not required to be on. That loading is broken into two groups. The first is constant loading. That covers fans or pumps that run constantly 24/7. The baseload % benchmark determines this factor as the baseload divided by the total usage of the building. We know that there is a minimum baseload, that is, the non-duty hours plug load. The plug load will be around 8% of the total energy consumption. Everything beyond that is a constant running system that should be scheduled off. We differentiate the variable loading separately by calculating the total non-duty % of energy. That load minus the plug and the energy usage required to maintain the temperature at the setback temperature in winter is the potential savings for the non-duty load. If you subtract the baseload potential savings from the non-duty hours' potential savings, you can determine what systems are operating and the time frame. That number includes the constant flow that can be subtracted out. So, you now have two values representing the constant and variable loading running during non-duty hours, which can be potentially saved. This section shows that 20-35% energy savings are possible if the schedules are used, or controls are installed to allow schedules.

The following section is the plug loads that run constantly. We give several options to reduce these loads. One of the best options is using power strips triggered by motion or loading to turn off during non-duty hours. Other measures can be utilized, such as software that turns off the computer systems when idle. PNNL found that one installation left the desktop systems on all night to receive updates for the software, which increased the usage appreciably for the plug load. Lighting systems are next, and two different tools determine them. The first is the Energy Project Identification Tool (EPIT), which provides a quick look at the ratios between systems. The second is a breakdown by the Scatter Plot Modeling Tool, which can provide watts per sf for the lights if data for that building can be effectively utilized by the tool. That allows the EM to determine if it is in the range for T8s and what savings will be generated if they replace them with LEDs.

Two different tools also evaluate AC systems. A quick look shows a portion of the savings based only on % of base load. This is traditionally low by 15% and 30% of actual savings, so we have a detailed scatter plot analysis to evaluate if the tool is effective for this building. That will give the EM much more detail as it will show the ratio of usage based on watts/sf or usage overall based on a kWh/sf/yr. It will also give an AC system efficiency, considering the combined efficiency of the chiller, fans, and coils. This is converted into a Seasonal Energy Efficiency Ratio (SEER). You can compare these against multiple years to see what may be changing. For example, the efficiency may be good, but the system usage is higher, indicating an override of the control schedule. Or that the efficiency has gotten so bad a replacement unit is warranted.

Fan/pump systems are the final system that is evaluated. MDMS can provide the evaluation in two phases. The first is based on the EPIT generated by the base load calculations. This will give a conservative estimate of the usage by the fan/pump systems and their impact on the actual usage cost by taking out the demand *(Continued on pg. 3)*

UPCOMING AUDIT TOOL (CONT. FROM PG. 2)

component of the bill where appropriate. This will be under the actual savings by 15 to 30%, but the scatter plot can validate that exact number if the data meets the criteria to generate a scatter plot. You will also be given the kWh/sf/yr in comparison with the last few years to determine if the system has deteriorated over time.

The Audit Tool then summarizes each of the potentially available ECMs. In some cases, it will give a range of ECMs so the EM can choose which is the most appropriate or if one requires a field check to validate a number. Once the EM completes the choices, the Audit Tool will provide a final report.

This Audit Tool does two things for the EM. First, it determines what buildings don't have any potential savings or will not meet an economic analysis for savings. This ultimately saves the time of the audit. The second is identifying potential candidates and breaking down what additional field checks are required to complete the audit. This should produce a time savings of 40 to 80% over traditional audits. What must be validated in the field is now focused, allowing the EM to use their time more effectively.