WELCOME TO *MDMS UPDATE*

By: Michael Ott, MDMS Project Manager, USACE—Huntsville Center

Welcome to the first edition of *MDMS Update.* This bi-monthly electronic newsletter will keep you informed about the Army's Meter Data Management System (MDMS).

As we all know, the Army has embarked on a campaign to save energy with the goal of reducing energy consumption 5 percent per year through 2030. This will save many tens of millions of dollars per year and move the Army toward achieving energy security.

To manage energy and water consumption, we must first measure it. The Army Metering Program (AMP) has installed thousands of advanced meters that report to a central data base accessible via the Army Knowledge Online (AKO) site, https://mdms.army.mil. This provides Energy Managers the capability to measure, track and analyze electricity, natural gas and water consumption down to the facility level. We are capturing data

from approximately 17,000 meters into the MDMS with the goal of expanding that number to 20,000 by end of 2015.

Many current MDMS users are aware of the challenges associated with meter data reliability. Interruptions in meter connectivity can frustrate useful analysis of energy consumption. At a minimum, the system should be able to distinguish between reliable and unreliable meter data and alert the user accordingly. This and other system improvements are being pursued by the new MDMS contractor, General Dynamics Information Technology (GDIT).

I invite you to not just read about our plans for MDMS, but also participate in this effort. Our mission is to make the Energy Managers' use of the MDMS productive and effective. It's a tool for action. Please give us your feedback and suggestions for improvements at: usarmy.coe-huntsville.cehnc.mbx.armymeterhelp@mail.mil

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IMPROVING METER DATA RELIABILITY

Reliable, trustworthy meter data is essential. Ensuring meter data reliability is the highest priority of the MDMS team. The focus is on the root causes as well as the detection, prevention and correction of the faulty meter data. Meters are usually very reliable. Far more common are network connection failures between the meter and the MDMS. Prolonged outages distort data, particularly the time stamping of the meter readings essential for correctly analyzing energy consumption and demand.

To assist the various Network Enterprise Centers (NEC) and other Command IT counterparts in restoring lost meter connections, the new MDMS contract will provide an expanded Army Meter Service Desk (AMSD) which will serve as a one stop resource for all metering issues including meter outages. *(see contact*

information on pg. 4). This resource can be used to obtain expert IT support from the equipment manufacturer and/or the meter network system integrator if needed. Instead of relying upon the Energy Manager to report meter outages, the MDMS contractor will monitor meter connectivity. For outages lasting more than 24 hours, GDIT will reach out to the appropriate NEC.

It must be noted that the best advanced metering networks owned and operated by private industry achieve about 90% reliability. However, these systems do not have the level of cybersecurity that the Army requires for its network. Software maintenance on network devices necessary for cybersecurity is the most common cause for meters losing connection from the MDMS. All parties including NETCOM and Signal Commands are aware of the problem and committed to avoiding this unintended consequence.

MDMS UPDATE

IMPROVING THE MDMS USER EXPERIENCE

In addition to the ongoing efforts to improve meter data reliability *(see article on pg. 1)*, software developers are looking at ways to make MDMS more convenient, responsive and capable. Concurrently, another group with Energy Manager experience is evaluating several commercial of the shelf software (COTS) alternatives for meter data analytics.

The two efforts are mutually supportive and closely coordinated. Should Army leadership decide to pursue acquisition of a COTS, it will likely take up to a year to obtain the cybersecurity certifications and perform other work required to transition the MDMS to the selected COTS. Due to the uncertainty of the decision and the subsequent time that would be required to implement a COTS solution, priority enhancements to the current MDMS software are proceeding. The first year's cost savings from a single incident of energy waste detection and correction is expected to more than off-set the cost of developing the software functionality that helped make it happen.

Priorities for functional enhancements were determined by the Army's Energy Manager community *(see pg. 3, "Survey Shows What MDMS Users Really Want")*. Priorities include expanding the types of reports that can be generated within the MDMS beyond simple bar graphs and providing more contextual information, e.g., detailed facility descriptions, identification of weekends and holidays within the time scale, adding outside air temperature readings to time of use (TOU) graphs, and identifying the number of buildings represented in a variety of energy consumption roll-ups (aggregated TOU), etc. Other to-do list items include expanding the ways metered buildings can be queried, e.g., tenant facilities occupied by a particular Command; faster report rendering; more effective navigation and drill-down capability from the meter status screen; and user capability to set facility consumption and/or peak demand limit alarms and notifications.

One of the upcoming enhanced functionalities the MDMS team is most excited about is the incorporation of Energy Use Intensity (EUI) targets. The goal is to provide a comparison of a building's actual energy performance against a benchmark or target energy performance for that facility type and climate zone location. The initial effort will be a prototype EUI application tool for five (5) recently constructed facility types: Unaccompanied Enlisted Personnel Housing,

Tactical Equipment Maintenance Facility, Company Operations Facility, Brigade Headquarters and Dining Facility.

EUI targets for each of the above facility types were developed by the Pacific Northwest National Laboratory and Army Corps of Engineers for six (6) different climate zones. These EUI targets are being incorporated into the MDMS. Each EUI target will be associated with the appropriate facilities that have meter data reporting to the MDMS, and which satisfy the criteria for valid comparison.

Feedback on the various prototype reports will be solicited prior to the expansion of this effort to include additional EUI targets for a much larger set of Army facility types. One mock-up EUI report for a fictitious building number 1188 is shown below. In this example, October's performance is especially out of line with the EUI target. What additional information would be useful? A plot of the average monthly outside air temperature, normal vs. actual? Maybe October's energy intensity is due to an operational reason. Once figured out, wouldn't it be helpful if the Energy Manager could "tag and save" a note to this graph that explains the reason? These "contextual information" enhancement suggestions have already been made by the Energy Manager community. Use the link on pg. 1 to send us your suggestions. A backlog of user requested improvements is an effective motivator for the MDMS Team.

BUILDING STRONG
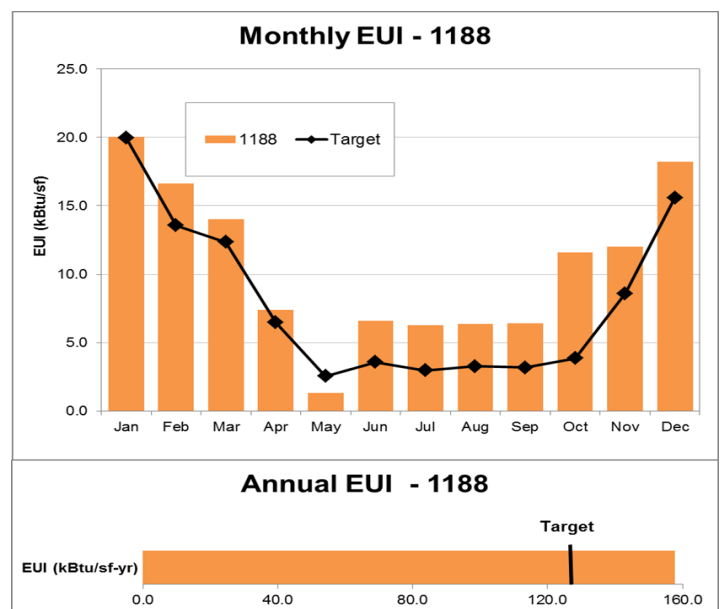
SURVEY SHOWS WHAT MDMS USERS REALLY WANT

The responses received from a survey sent to over 50 MDMS stakeholders in late 2014 revealed the priority functions/ features needed for an effective MDMS. The following table lists those priority functions/features and the average score received based on a 1—5 ranking system. For brevity sake, only those functions/features with an average ranking of 3.85 and higher are shown. Another survey will be solicited in third quarter of fiscal year 2016 after MDMS users have had opportunity to experience the new functionalities planned for release in the second quarter. The window for providing comments is always open. The new email address is usarmy.coe-huntsville.cehnc.mbx.armymeterhelp@mail.mil (We are working to shorten this email address). When requesting a new/expanded functionality, include an explanation of the purpose, i.e., how will it help achieve energy savings, or why it will enable the Energy Manager to be more productive? Help us make the business case for implementing your requests.

Function/Feature	Mean Score
Provide user the means to track and analyze multiple utilities on a single graph, e.g., natural gas (NG) and electricity that are consumed by a facility during the same time period.	4.54
Water meter applications, e.g., usage billings, water loss estimation and water use models/baselines.	4.54
Software navigation. Provide both file tree (hierarchy) and geographic site/building selection (mouse click) as means for navigating to data source locations from the home dashboard.	4.42
Establish logical groupings of facilities for comparing energy use intensity (EUI) based on functional use, climate zone, type of construction, facility age, etc. Whenever a user generates an EUI report for a facility, the historical average EUI for its group will also be shown.	4.15
Show outside air temperature concurrent with energy consumption and EUI graphic displays, i.e., show correlation of outside air temperature to energy use/intensity over time.	4.15
Provide means for meter data collection from utility providers, Utility Privatization (UP) companies; from meters installed as part of Energy Savings Performance Contracts (ESPC), and other meters installed on Army property, but owned by others.	4.15
Provide meter status (on-line/off-line) statistics with capability to generate a detailed report on all non-reporting meters to include the building, last reporting date/time, last reading, number of times and percent of time the meter was off-line in past 12 months, etc.	4.08
Provide a Help menu with keyword search for video tutorials on use of software for commonly performed tasks and applications.	4.08
Provide the user an option to use meter data normalized based upon any source of weather data.	4.08
Provide robust automated data quality testing and Value Editing and Estimating (VEE) capability.	4.00
Provide user selectable, rule based alarms to provide notifications when a building's energy demand or consumption exceeds certain measureable limits.	4.00
Provide the user the means to create for public display, a virtual meter for one or more facilities that shows the cost of the energy being consumed to heighten energy use awareness.	4.00
Provide a tagging mechanism for generated and saved graphs where the user can note significant events that impact energy use, e.g., completion date of ECMs/projects, the start of an energy awareness campaign, etc.	3.92
Allow user to establish energy consumption and EUI targets according to occupancy schedules, work shifts, workdays versus weekends/holidays, etc., and allow the user to set rules for when and how the system notifies the user whenever a facility exceeds one or more of its schedule related baselines.	3.85

IMPROVING METER DATA RELIABILITY

(CONT. FROM PG. 1)

Although the MDMS cannot prevent or restore a lost meter connection, it can be programmed to detect, notify, pass/fail meter data for reliability and inform the user accordingly. It can also offer Value Estimating and Editing (VEE) algorithms to fill-in short duration data gaps and/or smoothing of data spikes when sufficient historical (and reliable) data is available to confidently make these adjustments. Simulated data using VEE will be made distinguishable from real data.

The end goal for MDMS is to prevent the creation of any misinformation by ensuring that only reliable meter data are used to generate reports intended for consumption/demand analysis. MDMS users will still have the option to create reports with suspected faulty meter data, but the reports will include the appropriate disclaimer. All of these data quality assist functions are being developed, with roll-out to users expected within 3-4 months.

YOU CAN NOW ADD METERS TO THE MDMS

Not literally, but MDMS users can now add meters to the Army's total meter inventory. CALIBRE has recently released its last version of the MDMS software that includes a meter inventory module wherein a user can input information about meters and the metered assets not currently connected to the MDMS. This requirement stems from the FRAGO 2 to HQDA EXORD 028-12 Program Management of the Army Central Meter Program, specifically paragraph 3.C.2.U that calls for a complete inventory of all existing meters including those that currently do not electronically report to the MDMS.

The new MDMS module provides a snapshot of all meters counted in the inventory as compared to all meters in the inventory that are currently reporting to the MDMS. Meter counts are broken down by commodity and number of meters that are currently inventoried / reporting for the given commodity. The meter inventory will grow as MDMS inventory results are processed and validated. This provides the Army Metering Program Manager and the Army leadership the information needed to plan for the next phase of the

Army Metering Program as well as for sustainment of the existing metering infrastructure.

The MDMS User Manual (available by clicking the "Support" link within the MDMS website) explains how to generate the meter inventory reports for installations and organizations of interest. It also explains how to enter data for a new metered facility (or one that was missed by the survey to compile this inventory). All of the information entered by a user will be saved in the entry form. However, the MDMS will confirm that the user's entry of the Real Property Asset Unique ID (RPUID) has a match in the Army's Real Property Inventory (RPI) before it saves the record to the Meter Inventory screen along with other data fields auto-populated by download from the RPI data base.

MDMS SERVER RELOCATION & HELP DESK TRANSITION

Army policy requires that all enterprise level servers be located in Defense Information System Agency (DISA) approved locations. The relocation of the MDMS servers to the Defense Enterprise Computing Center (DISA-DECC) in Oklahoma City is on-going. Local NECs will soon begin redirecting the reporting of meter data to the new servers at DISA-DECC. The current MDMS servers will continue to operate in parallel with the new MDMS servers until the last meter is re-directed. MDMS logins will remain the same, and users should notice little or no change to system access and usability. No system downtime is expected as a consequence of the move.

Effective Sep 30, 2015, the MDMS Help Desk was transitioned to a new and expanded Army Meter Service Desk (AMSD) which now provides a single point-of-contact for all questions/issues related to MDMS and AMP-installed meters. Here is the new contact info:
Phone (0700-1700CT, Mon-Fri): 256-971-2141
Email (24/7): usarmy.coe-huntsville.cehnc.mbx.armymeterhelp@mail.mil