FROM THE PROGRAM MANAGER

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

Welcome to our February-March 2017 issue of the *MDMS Update*. Our planned implementation of the new database architecture for MDMS will begin in March. MDMS will continue operating in its current form until cut-over to the new architecture in the August–September time frame. Future improvements to the MDMS await the availability of this new architecture, as we have outgrown the current database structure.

While we take this short hiatus in the roll-out of MDMS improvements, please help us improve the quality and quantity of meter data reporting to the MDMS so that when the new database architecture is completed, more facilities can benefit from the enhanced capabilities.

All of the articles contained in the newsletter pertain to increasing meter data quantity and/or quality. Obtaining UP meter data is a priority as discussed in "Importing Utility Provider Meter Data." Note the article on the Army's goal to meter at least 60 percent of total energy use. This is not your typical unfunded mandate—money is being budgeted for this so it behooves to be pro-active.

Restoring connection to meters that have long been off-line represent the low hanging fruit for increasing the quantity of buildings reporting meter data to the MDMS (see article on page 4). The Army Metering Program has resources to troubleshoot and restore connection to off-line meters. However, Energy Managers need to scrub their list of non-reporting meters to confirm that those meters are still valid for reporting to MDMS.

Meter data quality was one of the topics of discussion during the late January training webinar. Please read the *January Training Webinar Report* on page 3 that re-caps the valuable insight provided during that training.

As always your input is valuable, and we welcome your feedback at: usarmy.coe-huntsville.cehnc.mbx.armymeterhelp@mail.mil

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IMPORTING UTILITY PROVIDER METER DATA

One of several recent improvements to MDMS is the increased capability to import meter data files from utility providers who have installed smart meters on Army facilities. Currently, MDMS is importing meter data from utility provider (UP) contractors serving Fort Myer, Fort Belvoir, Arlington National Cemetery, Fort Leonard Wood, Fort Benning and Picatinny Arsenal.

Although UP meter data is imported into the MDMS once a month (current as of the previous month), UP meter networks typically deliver a very high percentage of consistently reported 15-minute interval data. The number of buildings metered by UP contractors are also among the Army's highest. Ft. Benning has 94% of its building SF metered.

Importing data files collected from existing smart meters owned/maintained by UP contractors is the only practical alternative. Simultaneous electronic reporting by UP meters to the MDMS and the UP contractor's system would never be allowed. Data formatting differences among UP contractors complicate and can even preclude the transfer of the data into the MDMS. The MDMS Team developed a MDMS Standard Meter Data Format. The vast majority of the UP contractors that are now providing their meter data files have been cooperative in complying with this format guide. The document is available for download from the Army Meter Service Desk (AMSD) website. Simply click on the Tutorial icon on the MDMS homepage to access that site, https://army.deps.mil/NETCOM/EEDRS/SitePages/AMSD.aspx

The MDMS Team is available to assist any Army Energy Manager willing to explore the possibility of acquiring meter data from UP contractor(s), but we can only assist, not initiate. If you are currently receiving UP meter data via a spread sheet or means other than the MDMS, please notify the Army Meter Service Desk by clicking on the link, provided on the MDMS home page. You may not need the meter data imported into the MDMS, but the Army does and has mandated its capture wherever practical.

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MDMS UPDATE

METERING 60 PERCENT OF TOTAL ENERGY USE

That is the Army's goal. Simple enough, but how many buildings must be metered (and connected to MDMS) to achieve that goal? The Army leadership has a plan to answer that question. That plan may involve you and it starts this year. Five IMCOM installations (Forts Bliss, Bragg, Hood, Lee and Riley) and three TBD sites each for Army Reserve, Army National Guard, MEDCOM and AMC will be asked to prepare a list of buildings for additional metering funded by the Army Metering Program. It is up to each selected installation or site to determine how many and which additional buildings must be metered to achieve 60 percent of total energy use as compared to the Army Energy and Water Reporting System (AEWRS). The MDMS can help determine that answer.
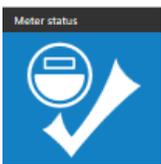
Within the Meter Status dashboard, the total metered square feet (SF) is shown for each installation and site. Total SF for each installation/site is obtainable from AEWRS. It is logical that the percent of total SF metered should approximate the total percent of energy metered. Below is a screen shot of the Meter Status Dashboard. Note the Metered SF column. If the metered SF for your installation or site is less than 60 percent of the total SF for your installation/site, you will likely need to increase the number of buildings to be metered accordingly.

Organization	All Meters	Electric Meters	Gas Meters	Water Meters	Metered Buildings	Metered SF
IMCOM	4045 of 7601 current	2820 of 5511 current	602 of 1235 current	623 of 855 current	4107	148436821
ATLANTIC REGION	2229 of 3592 current	1288 of 2269 current	326 of 542 current	615 of 781 current	1681	68052044
ABERDEEN PROVING GROUND	0 of 261 current	0 of 261 current	0 of 0 current	0 of 0 current	118	8781804
ADELPHI LABORATORY CENTER	123 of 123 current	106 of 106 current	3 of 3 current	14 of 14 current	14	1094259
CARLISLE BARRACKS	25 of 72 current	8 of 31 current	17 of 41 current	0 of 0 current	22	944017
FORT A P HILL	0 of 22 current	0 of 22 current	0 of 0 current	0 of 0 current	21	249507
FORT BRAGG	1174 of 1526 current	426 of 538 current	147 of 225 current	601 of 763 current	643	19063009

Using MDMS to directly measure the percent of energy metered is also a goal, but that will require improving meter network reliability and completion of version 2 (V2) of the MDMS (reference *From the Program Manager* regarding the new database architecture). V2 will be able to detect and quarantine unreliable meter data that distort aggregated (multiple building) usage reports. Previous MDMS Update newsletters have provided much discussion about unreliable meter data— inherent in all Advanced Metering Infrastructure (AMI) systems. Meter data provided by UP contractors for file transfer into MDMS sometimes contain faulty meter data. The utility industry and Public Utility Commissions that regulate that industry have adopted standards for validating and correcting faulty meter data for billing purposes. So will the Army for its purposes using MDMS V2.

Currently, faulty meter data overstates total usage within MDMS when extrapolating online network reporting to 100 percent. Erroneous usage spikes have a far greater over-reporting effect than the sum of all meters falsely reporting zero usage. Unreliable meter data is also unpredictable — some months will be better or worse than others. For these reasons, aggregated usage reports will not be made available until MDMS V2 has been implemented to detect and quarantine faulty meter data. In the interim, there is a valid way to model total energy usage as if all meters were reporting reliable data to the MDMS. The MDMS Team is providing the results of that modeling for total Megawatt Hours (MWH) reported to MDMS for entire Army to the Huntsville Center Corps of Engineers every month.

The details of the model used to estimate total energy metered are too lengthy to discuss here, but at the heart of the MDMS model is *median* Energy Use Intensity (EUI). Median is midpoint of a range of values. Its computation is unaffected by extremely low and high values within the data set. Faulty meter data is the likely cause of the building EUI outliers that the median EUI conveniently ignores. Multiplying the median building EUI by the total SF metered provides a reliable, albeit estimated, total energy metered value, e.g., MWH. Knowing your installation's median or average building EUI per AEWRS can be another tool for determining how many more buildings (and how many more SF) should be metered to achieve the Army's 60 percent goal. Contact us if we can be of help.

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JANUARY TRAINING WEBINAR REPORT

Over 100 participants joined the second MDMS Training Webinar on 26 January 2017. The training session kicked off by reviewing the priority functions of MDMS. These are to provide Energy Managers the capability to *prioritize* buildings for action, *validate* effectiveness of actions taken and *motivate* others to achieve energy savings. Currently, MDMS reports are focused on prioritization, i.e., listing worst first. Reports specifically designed for energy project validation and to motivate others are forthcoming.

The webinar explained the two methods utilized by MDMS to capture energy and water usage. It is important that MDMS users understand the mechanics of each method and which method is used to generate each report. The indicator will be the data quality metric included in every report. The data quality metric is either the percent of "meter reporting consistency" or the percent of "duration captured". The former is the percentage of interval meter data actually received by MDMS as compared to what was possible to receive had there been no network down-time during the period of interest. The latter is the percent of the report duration during which the meter network was available to capture the earliest and latest possible meter reading dates/times used to calculate the usage. Both metrics have application for judging the reliability and completeness of the meter data.

During the demonstration, the Meter Status Rollup report was used to point out the meter reporting consistency metric, as well as the capability to drill down to an installation's offline meters and export the report to Excel. See the article "Locating Non-Reporting and Unassigned Meters" on page 4 of this newsletter.

The Quick Reference Usage Report and the Energy Use Intensity (EUI) by Category Code reports include the "percent of duration" metric. In the future, MDMS users will be able to query and filter reports based upon a selected minimum percent reporting consistency and/or percent duration capture.

Demonstration of the EUI by Category Code report showed how to use the report for prioritizing buildings for action. This report is also useful for identifying buildings with faulty meter data. By clicking on a listed building's horizontal EUI bar, a vertical bar graph of that building's monthly EUI is generated. That report will reveal if the building had an erroneous usage spike during a particular month causing it to be unfairly listed as having one of the highest EUI. Another useful feature of this report is the median EUI that is also shown for the group. Buildings that show a normal monthly EUI profile but are outliers with respect to the median, could have meters that were calibrated incorrectly (wrong multiplier). The other possibility is the building is a poor performer and needs investigating.

Due to the large number of participants it was impractical to have verbal dialogue — use of a microphone was limited to the webinar trainer. Participants were invited to type their questions in the "Chat Room" provided by the Defense Collaboration Services website. Some of the Q&A highlights were as follows:

Q: How are meter roll-overs handled (when the meter counter rolls past all 9's to 0's again)?

A: Currently, the QRUR shows a building to be "Offline" if one or more of its meters for a commodity experiences a meter roll-over anytime during the month. This is done to prevent showing an erroneous usage amount that may or may not be obvious to a user. Automatic adjustment for meter rollovers is under development, complicated by the fact that there is no standard as to the number of digits each brand of meter has on its counter.

Q: The MDMS assumes that consumption is driven by climate, building size and use. This does not apply to Scranton AAP, which is an industrial installation. 85+ percent of the energy and water is consumed by manufacturing processes. SCAAP is installing meters on substations, which provide power to industrial processes — of which many are located in more than one building. How will this be accommodated within MDMS for analyzing SCAAP's energy use?

A: Your observation is correct. As MDMS is currently designed, it only has contextual information about, and functionalities relevant to, those facilities where energy consumption is primarily associated with human occupancy. A locally deployed UMCS that is designed according to how the SCAAP is metered is the better solution for your site specific needs. However, MDMS can capture and report statistics of interest to HQ AMC such as the effectiveness of the operating contractor's peak demand management efforts and the average energy consumption per unit of production. AMC will need to work with the Army Corps of Engineers to define the technical requirements for deployment within MDMS that can help AMC track and report operational energy consumption.

Q. Can you add the command level dropdowns to the QRUR? For example, I want to look at all of the Atlantic Region at once.

A. We will add that to our future improvement "to-do" list.

Q. Where is the data for a building's square footage pulled from as reported on the EUI?

A: The building's square footage is obtained from Army's Real Property Inventory (RPI) via the HQIIS portal and is updated every three months.

Future training webinars are planned for March, May, July and September. The March webinar will focus on Army National Guard sites. If you would like to participate but are not a registered MDMS user, log onto mdms.army.mil and click on the link, "MDMS Access Request (CAC Required)." Fill out the short form request. We will take care of the rest.

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LOCATING NON-REPORTING AND UNASSIGNED METERS

As of late-February 2017, there were a total of 49 sites that had 1202 meters offline for six months or longer. Of those, 30 sites had 467 meters offline for over a year. Some of the oldest offline meters date back to last reporting in July 2013. So, how does one determine which meters have been offline for how long? The Meter Status Dashboard, of course! Below are the steps for generating a list of non-reporting meters at your installation:

- Within MDMS, go to the Meter Status Dashboard (click on the tile icon).

- Drill down to the site you want from the Meter Status Rollup report and click on the hyperlinked name of the site.

- This will give you a list of meters at your site. At the top of the list will be those longest non-reporting meters. The meters are color-coded based on how long each has been off-line. Red is the priority — disregard the green.

- Select the "Export to Excel" option to extract the data from the Meter Status report into a spreadsheet that then can be utilized for follow-up actions.

If there is valid reason for a non-reporting meter to remain off-line from the MDMS, e.g., the building was demolished, please notify the AMSD by e-mail usarmy.coe-huntsville.cehnc.mbx.armymeterhelp@mail.mil so that we can correct our records within MDMS. We will preserve the old meter data for reference, but we don't want to continue reporting that building as being off-line and have it reflected in the Army's metric for meter network reliability.

Unassigned meters are associated with a site, but not to a particular building. This could be correct — the meter could be installed on a substation or something other than a building. However, in many instances an unassigned meter has a building name or number as part of its meter ID

string. For some reason, the information provided in the meter ID string could not be correlated to a real property record within the Army's Real Property Inventory. Examples provided below.

Building		Meter
Unassigned		CARS_BLDG_304
Unassigned		CARS_BLDG_1816
Unassigned		CARS_BLDG_1957
Unassigned		CARS_BLDG_2077
Building		**Meter**
Unassigned		REDS_BLDG_3313_METER_1
Unassigned		REDS_BLDG_3313_METER_2
Unassigned		REDS_BLDG_4528_METER_1

Suggest you coordinate with your Real Property Office to ascertain the Real Property Asset Unique Identifier (RPAUID) for those unassigned meters using the building clues provided in the meter ID string. The RPAUID is what MDMS requires to associate each meter with the correct facility data imported from the Army Real Property Inventory database.

To generate a spreadsheet of unassigned meters:

- Follow the previous instructions for Export to Excel and then sort the data in descending order on the "Building" column or select "Unassigned" as the filter value filter within the "Building" column.

- Add the appropriate RPAUID to unassigned meters

- Send the annotated spreadsheet to the AMSD.

US Army Meter Data Management System

The longest non-reporting meters are highlighted in red and appear at the top of the Meter Status drilldown report (if there are none that have never reported).

By double-clicking on the Building heading, any unassigned meters will appear at the top or near the top of the list.