**Headquarters, United States Marine Corps**

**Marine Corps Installations Command (MCICOM)**

**Facilities Directorate, (GF-1)**

**Utilities Demand Reduction of Ten Percent by FY2020**



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# Purpose and Background

This documentation provides direction for the United States Marine Corps (USMC) to reduce Installation utilities execution (the net cost of purchasing and operating utilities) from FY15 through FY20. The MCICOM Installations Energy Strategy, published in 2013, outlined key strategies required to improve USMC mission readiness. Those strategies include the implementation of prudent management practices; supporting and achieving mandates; conserving energy, and reducing utilities costs. The intent of this guidance is to provide a uniform approach in the reduction of utilities costs through the reduction of execution. This will be achieved by decreasing consumption and pursuing more economical practices in the utilization of USMC utility resources.

Currently, the provision of utilities consumes 19% of all BOS (Base Operating Support) non-labor execution. This percentage is destined to increase due to rising costs of utilities, growing installation footprints, and the cumulative demands on the use of installation facilities for the support of day to day activities. Actions to decrease this percentage must be taken now to free up funds needed to support other BOS Programs. Reducing BOS utilities requirements will allow comptrollers to take real time actions to shore up programs that may be underfunded with funds originally budgeted for the Utilities Program.

This “Utilities Demand Reduction Guidance” sets a target for the Marine Corps and for each installation. By the end of FY20, utility execution will be at least 10% lower than estimates using a FY13 baseline. To achieve this goal, installations must reduce their utility execution by 0.88% each year from FY15 through FY20. Savings of $86 Million could be achieved by a ten percent reduction in utility execution. This reduction can be achieved by decreasing the use of utilities through individual and unit actions, as well as efficiencies achieved by energy projects yet to be done. Individual and Unit actions described in this guidance include the pursuit of more economical utilities contracts, strategic utilization of Industrial Control Systems, and the demolition or shuttering of excess buildings with a focus on utility savings.

Lastly, at the end of each quarter, each installation will be requested to provide a “Quarterly Utilities Execution Reductions Report”, outlining milestones in achieving the utilities execution reduction goal. This report will provide the means to track progress towards our ten percent execution saving goal, and provide a means to adjust goals based upon real time increases or decreases in utility rates, unforeseen weather patterns, or other unexpected utilities costs.

# Roles and Responsibilities

The following sections define roles and responsibilities performed by HQMC, Regional Commands, Installation Commanders, and Installation Energy and Utility Managers.

## Headquarters U.S. Marine Corps (HQMC)

Headquarters Marine Corps, the Assistant Deputy Commandant, Installations and Logistics (Facilities)/Commander, Marine Corps Installation Command (MCICOM), is responsible for formulating program policy and providing technical and programmatic guidance while facilitating decision making to CMC and his staff. Additionally, MCICOM coordinates utilities activities between the Installations, Regions, and CMC or higher headquarters.

## Regional Commands

MCICOM is organized into four regional authorities: MCIEAST, MCIWEST, MCIPACIFIC, and MCI NATIONAL CAPITAL REGION. Each of these regions shall ensure their subordinate Installations conform to utility execution reduction procedures as outlined in this guide and as defined in existing policy. The Region will provide coordination between Installations and MCICOM to distinguish roles and responsibilities and resolve issues as needed. Regional commands shall provide the minimum support essential to the mission, operations, and ancillary function of assigned units, tenant organizations, and personnel in accordance with applicable policy and agreements.

## Training and Education Command (TECOM)

TECOM has ownership of four Installations in the Marine Corps: Marine Corps Recruiting Depot (MCRD) San Diego, MCRD Parris Island, Marine Corps Air Ground Combat Center (MCAGCC) Twenty-nine Palms, and Mountain Warfare Training Center (MWTC) Bridgeport. For the purposes of this guidance, these Installations are considered to be supported by the MCI Regional Commands and should comply with the guidance set forth in this document and where appropriate report through the MCI Regional Command structure. TECOM shall provide the minimum support essential to the mission, operations, and ancillary function of assigned units, tenant organizations, and personnel in accordance with applicable policy and agreements.

## Installation Commanders

Installation Commanders will ensure that goals established and set forth from Regions and MCICOM are reached, and that all reporting requirements set forth in this guidance are fully met. Installation Commanders shall ensure coordination with the Region and MCICOM as required. Additionally, Installation Commanders will ensure proper redistribution of utilities dollars to other installation programs resulting from savings achieved from this guidance. Any significant deficiencies in goals set forth in this guidance should be reported to MCICOM through the chain of command.

# Description of Utilities Execution Reduction Actions

## Ethos

The USMC Installation Energy Strategy describes Energy Ethos as a “shared vision that the efficient use of energy resources is a critical component of mission readiness”. Currently, operating budgets face increasing pressure from budget reduction mandates while rising utilities costs threaten to take larger portions of installations’ BOS (Base Operating Support) budget. An Energy Ethos requiring diligent management of all our utilities will help us to meet increasing budget reduction mandates, especially for larger programs like Utilities where we have opportunities to reduce execution. .

An effective Energy Ethos will drive down utilities execution by; planning installation functions and operational decisions with consideration for saving utilities costs, involving supported command and tenant units in the team effort of saving utility resources, and raising end-user awareness in the value of driving down utilities costs. Specifically, the education of Marines on the efficient use of utilities such as Electricity, Water, and Natural Gas can be a principal means of driving down utilities execution. By establishing an Ethos that puts the responsibility in the hands of every Marine and Civilian Marine, we can make significant strides in our utilities execution reduction goals. Assuming this responsibility means educating and setting expectations at our installations for every Marine and Civilian Marine to make every effort to reduce their utilities consumption through the following methods and more:

* Turn off lights when not in use.
* Reduce Water consumption
* Expect room temperatures to be slightly warmer in the summer months and cooler in the winter months.
* Ensure that devices that use energy when in standby mode (energy “vampires”) are unplugged or have power strips switched off when not in use. These items include: phone chargers, TV’s, computers and related equipment left on overnight, microwaves, stereos, DVD players.
* Notify Energy Managers if a schedule can be tightened on HVAC and lighting systems.
* Hold each other accountable for excess utility consumption or waste.
* Actively pursue new and innovative ways to reduce utilities consumption.

## Utilities Contract Renegotiations

Electricity is the largest consumed utility, and the most costly. In 2013, the USMC spent about $105M on electricity alone. Without mitigation, the amount that we spend on electricity is due to increase with rates rising throughout the country. These increases are largely a result of rising costs for the fuel used by generators to produce electricity. In fact, fossil fuel costs have increased over 150 percent since 1999. Fuel costs are rising due to global demand for fossil fuels, the impact of supply interruptions from the hurricanes in 2005, and insufficient domestic production. The push for cleaner, more reliable and efficient power plants drive prices higher as well. To help reduce electricity costs, Installations should ensure that they are getting the best possible electricity rate.

Other utility rates should be reviewed as well. In 2013 the USMC spent approximately the following on utilities contracts: Natural Gas $14M, Fuels including fuel oil $14M , Coal $9M, Water purchases $6M, Sewage Contracts $6M, Propane $3M. Additionally, we can expect utilities like water and sewage to increase in cost as fuel and electricity rates increase.

To mitigate rising utility execution, installation Energy and Utilities Managers should review all utility service contracts to ensure that they are getting the best rate possible. Contracts should utilize the best market rate possible to achieve saving needed to reach our ten percent savings goal.

Installations should contact their NAVFAC FEC (Facilities Engineering Command) and UEM (Utilities and Energy Management) to receive assistance in renegotiating utility contracts for better rates. Appendix A provides a list of UEM and Utilities Acquisition Points of Contact for NAVFAC**.**

## Industrial Control Systems

Proper utilization of Industrial Control Systems could be one of the biggest contributors to achieving our utilities saving goals. Industrial Control System (ICS) is the overarching term that encompasses automated controls and monitoring systems for utilities, and their efficient use within facilities.

ICS includes the following systems:

* + Utility Control Systems (UCS), also called Supervisory Control and Data Acquisition (SCADA) systems (and other terms), are used for monitoring, controlling and/or regulating utility systems in real time, and measuring, collecting and analyzing energy usage. These systems are integrated into individual utility plants and are in most cases a component of individual utility facilities. Advanced Metering Infrastructure (AMI) is considered part of the UCS.
  + Building Control Systems (BCS), also called Direct Digital Control (DDC) systems (and other terms), are used for monitoring, controlling and/or regulating building systems in real time. These components are integrated into building systems such as HVAC, irrigation and lighting, and are also in most cases components of individual facility buildings.
* Energy Management Control Systems (EMCS are considered part of BCS).

System efficiencies can be achieved with SCADA through the automated reduction of equipment run time during off-peak hours, tighter scheduling, and the reduction of the production of utilities to minimum levels required to support installation operational requirements.

AMI systems can be an important tool in achieving our utilities execution reduction goal. Supported organizations should be held accountable for excess utility consumption, and required to meet installation set goals of consumption reduction. AMI allows us to track utility consumption, and hold supported organizations accountable for helping us to reach our reduction goals. AMI could also be effective in the support of the Energy Ethos, educating commands on their utilities consumption, and then setting goals for reduced utility consumption. Installations should also use AMI systems to verify that utility contract bills are accurate. Finally, when feasible, installations should use AMI systems to ensure that reimbursable tenants are accurately charged for increased utility consumption, and pay for what they use instead of paying rates based upon estimates for building size or square footage occupied.

Building Control Systems are an important tool in minimizing utility consumption. Set-points can be adjusted where possible to reduce the energy used by heating and air conditioning systems both seasonally and for demand reduction. Cooling set-points should be increased in areas where humidity control is not an issue, and for winter operations, set-points can be lowered to reduce heating system loads. “Rolling” setbacks can be put into effect to manage demand during peak demand periods. Schedules for exhaust fans, water heaters, and lighting should be narrowed to minimalize operating times. And times utilized for occupancy sensors should be reduced where possible. Building occupants should be encouraged to take notice when BCS systems are not adequately minimizing utilities use, and notify Energy managers of adjustments needed.

For advanced strategies for ICS, please see the Guidance for Industrial Control System Based Energy Management Strategies to be released by MCICOM in 2014. This guidance will provide advanced level strategies for the optimization of ICS to reduce energy.

## Consolidation of Excess facilities

A standard office building will cost about $2 per square foot per year in utilities consumption, thus retaining obsolete or unneeded facilities can lead to added unnecessary utilities fiscal costs. Consolidation of personnel to new more efficient buildings is a key element in reducing the execution of utilities. While it is understood that with the current fiscal climate, demolition funding may be limited, installations should consider shuttering or mothballing unused or unneeded buildings to reduce unneeded demand on overall installation utilities consumption. Priority for demolition or shuttering should be given to buildings with the highest potential for utilities execution savings.

## Facilities operation and maintenance

As we continue to build and retrofit high performing facilities and utilities infrastructure through the FSRM, MILCON, and EIP programs, we must ensure that they perform at peak efficiency throughout their entire lifecycle.

Operation and sustainment at minimum levels for facilities designed to save energy and utilities is no longer acceptable as a standard practice. Installation Commanding Officers must take steps to identify industry best practices and training competencies required to provide our facility management professionals with the tools required to keep our facilities operating at peak performance. Furthermore, resource requirements for these actions must be identified and presented to the appropriate program managers who will advocate for installations at the Installations PEB or DC M&RA for appropriate resourcing decisions.

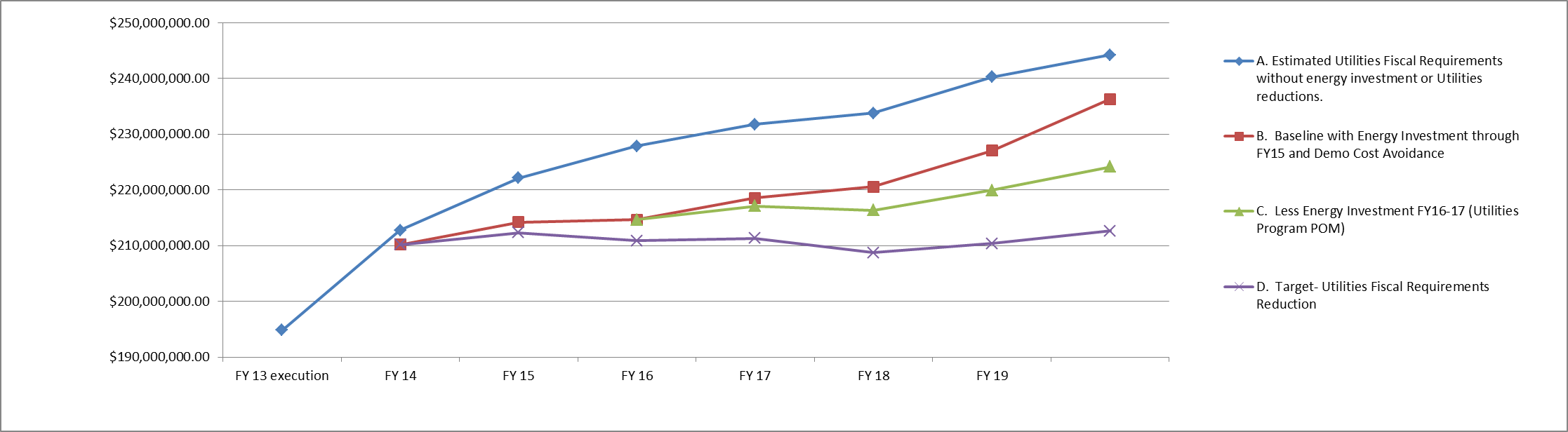
For new and retrofitted facilities and utilities infrastructure, design and construction requirements shall include provisions for commissioning, O&M manuals, and training personnel on peak efficiency operation.

Separately, the MCICOM GF is developing the required competencies and certifications required for this effort under the Facilities Community of Interest led by Deputy MCICOM. This will include personnel responsible for facilities planning, Energy Management, Maintenance Control (PM management and project development), facilities design and the facilities maintenance work force. The facilities maintenance workforce will focus on HVAC, HVAC and lighting controls, building envelope. MCICOM GF is also developing the competencies and certification requirements for operating and sustaining Heating Plants, Potable Water Treatment Plants and distribution systems and Waste Water Treatment Plants and collection systems.

# Utilities Execution Reduction Concept of Operations

## Established Baseline for reduction

To achieve a 10% reduction in FY 19 from current estimates, a baseline must be established.



**10%**

Figure 1 (Graph showing baseline and target for Utilities Execution Reduction)

* + Trend line “A” (in blue) shows what USMC non-labor utilities execution could be with inflation, no energy investment savings, and no reduction in utilities consumption or execution avoidance. It is estimated that utilities execution could exceed $240 Million by 2020.
  + Trend line “B” (in red) is established using energy investments funded FY13 and before, MILCON energy investments for FY14, Estimated EIP projects for FY14, general inflation, demolition, construction, and known rate adjustments. This baseline will be used to determine the amount required to save 10% by FY20.
  + Trend line “C” (in green) shows utilities execution reduction baseline adjusted for energy projects funds programmed for FY14-FY17. All Execution reductions beyond energy investment program savings will be achieved below this baseline. Additionally, this baseline represents the POM amount for Utilities for FY16 and out.
  + Trend line “D” (in purple) shows utilities reduction target for FY 14 through FY20. This target is established using programmed energy project money and a standard reduction of .88% per installation, per year, below possible savings from energy projects.
  + The 10% reduction that is outlined in above figure is established in the overall reduction required to meet saving acquired from all energy projects, and a standard .88% reduction per year in utilities execution. The final Target estimation of $212M is established by determining the cumulative effect of reducing utilities .88% per year, and the cumulative effect of energy project savings from FY15 through FY20.

## Estimated reduced baselines for each installation

As described in Section 3.1, installations should reduce utilities requirements by approximately .88% per year between FY 15 and FY20. Figure 2 through 4 is an estimate of each Installation’s reduced requirements from FY14 to FY20 based upon FY13 executions. This estimate considers inflation rates, energy investment projects, construction, demolition, and the standard reduction required by each installation.

For FY 15 and 16 (Figure 2), each installation’s requirement prior to reduction is obtained using Energy Investment Projects that are executed in FY 12 and 13 as well as inflation rates. The baseline for each installation is established as “FY ## Baseline” column.



Figure 2 (Installation targets for utilities execution savings for FY 15 and FY 16)

For FY 17 through FY20(Fig 3 and 4), each installation is assumed to take an equal share of Energy Investment Program savings, as well as the standard .88% reduction. The result of standardized reductions is a decrease of 10% for the total requirement of non-labor utility execution in FY 20.



Figure 3 (Installation targets for Utilities Execution Savings for FY 17 and FY 18)



Figure 4 (Installation targets for Utilities Execution Savings for FY 19 and FY 20)



Figure 5 (Utilities Execution Reduction and Energy Investment estimates)

## Quarterly utility execution savings report and resetting of baseline

Each Quarter, installations will be requested to provide an update to MCICOM GF showing progress towards savings goal, and what programs within the installation will receive saved funds. Utility execution savings will be tracked and compared to goals outlined in Figures 1 through 5. Goals will be adjusted yearly based upon results from the annual Utilities Data Call. Additionally, unforeseen increased utilities execution will be taken into consideration when analyzing yearly data call and quarterly reports. Baselines will be reset as needed quarterly, and after completion of the annual Utilities Data Call. Examples of unexpected increases could be: unforeseen rate increases, extremely cold winters or hot summers, increases to installation personnel and utilities consumption, one time operation purchases that are unexpected i.e. purchase of large amount of chemicals or media required to continue utilities production. Each report will be tasked via MCATS, and due dates will be established accordingly. Please see Figure 6 for a completed example of the quarterly utility execution reduction report.



Figure 6

# APPENDIX A: NAVFAC Points of Contact

