



UNITED STATES MARINE CORPS
MARINE CORPS BASE
QUANTICO, VIRGINIA 22134-5001

IN REPLY REFER TO:
MCBO 4100.1B
B 04
11 Apr 11

MARINE CORPS BASE ORDER 4100.1B

From: Commander
To: Distribution List

Subj: ENERGY AND WATER MANAGEMENT PROGRAM

Ref: (a) Energy Policy Act of 2005
(b) Executive Order 13423 of 2007
(c) Energy Independence and Security Policy Act of 2007
(d) Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding of 2006
(e) National Defense and Authorization Act 2007
(f) Executive Order 13514 of 2009
(g) DoDI 4170.11
(h) OMB Policy Letter 92-4
(i) OPNAVINST 4100.5D
(j) SECNAVINST 4100.9A
(k) MCO P11000.9C W/ CH 1-4
(l) Ten By'10 Facilities Energy & Water Management Campaign Plan
(m) ASHRAE/IESNA Standard 90.1-2010
(n) Department of Energy, Energy Efficiency and Renewable Energy, Federal Energy Management Program, Energy Projects
(o) ASHRAE, Standard 189.1-2009
(p) NAVFAC, Engineering & Construction Bulletin, Navy Shore Energy Building Standard, Policy

Encl: (1) Federal Energy and Water Mandates and Goals
(2) Energy and Water Management Program - The "B-A-S-E" Plan
(3) Energy Conservation Board (ECB)
(4) Energy Conservation Officer (ECO) Program
(5) Activity and Tenant Command Tasks
(6) Energy and Water Management Guidelines
(7) Life-Cycle Costing (LCC) Tools
(8) References

1. Purpose

a. Reissues MCBO 4100.1A to reflect requirements specified in references (a) through (l) regarding energy and water consumption reduction mandates and goals.

b. Establishes guidance, assigns responsibilities, and prescribes procedures for the operation, management, and enhancement of Marine Corps Base, Quantico's (MCBQ) Energy and Water Management Program for all MCBQ Activities and tenant commands.

2. Cancellation. MCBO 4100.1A.

3. Summary of Revision. This Revision contains a substantial number of changes and should be completely reviewed.

4. Situation

a. Dependence on Energy and Water

(1) Energy and Water Use & Vulnerability Summary

(a) Commercial utilities provide the majority of the energy and water to the installation via electric transmission and distribution lines, natural gas pipelines, and water pipelines. Fuels such as diesel and propane are trucked onto the installation.

(b) The installation's dependence on utilities from "outside the fence" presents operational and security challenges because any disruption to the supply can disrupt training, day-to-day operations and missions.

(c) Loss of energy or water supply to MCBQ negatively impacts day-to-day operations through lost man-hours and delayed or cancelled training.

(d) Reducing energy and water consumption through conservation, efficiency, onsite energy generation and water reuse projects will reduce the demand for energy and water from commercial utilities.

(2) Potential Utility Disruptions. The supply of energy and water to MCBQ could be impacted by the following:

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(a) Natural Disasters. Natural disasters such as hurricanes, flooding, tornados, and earthquakes can damage critical utility (electric, water, & gas) infrastructure, resulting in short-term or long-term utility outages at the local, regional, or even national level.

(b) Aging and Overstressed Electric Infrastructure. The existing transmission and distribution systems (both outside and inside the fence) are aging, making the infrastructure vulnerable to power outages on both Mainside and the westend side of MCBQ. Furthermore, consumer demand for power has increased more rapidly than the transmission infrastructure has expanded, stressing the electric grid and reducing its reliability.

(c) Terrorism and Cyber Attacks. The electric grid, gas pipelines, and water systems are targets for deliberate terrorist and cyber attacks. Attacks could take down a primary utility supply infrastructure, creating short-term or long-term outages.

(d) Backup Power Supply. Activities and tenant commands rely primarily on diesel generators for backup power. MCBQ maintains a short-term backup supply of diesel onsite and relies on the availability of resupply of diesel for long-term outages. Therefore, if there is a long-term disruption to the diesel fuel supply, day-to-day operations would be impacted severely. Furthermore, aging and under-maintained generators are prone to malfunction. These malfunctions could create additional power issues.

(3) Most Likely Failure. A short-term electric power failure is the most common type of failure on the installation; however, a long-term disruption is likely due to the age and condition of the electric power infrastructure. Long-term outages could have severe effects on training, day-to-day operations, and missions due to MCBQ's high demand for electricity and reliance on the commercial electric grid as a primary source for power.

b. Friendly Forces

(1) Higher's Mission & Intent. Since 2005 Federal and Local agencies have established multiple sustainability mandates and goals to reduce energy and water consumption with the intent of reducing the nation's reliance on foreign fuel sources and non-renewable resources, improving energy security, enhancing

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environmental stewardship, and reducing greenhouse gas emissions (see references (a) through (l)). Enclosure (1) summarizes these mandates by subject.

(2) Adjacent Units. DoD installations throughout the country are applying energy and water management programs to meet mandates, reduce their dependence on the electric grid, and ensure mission sustainment via implementation of a more reliable energy and water infrastructure. For specific information about other base initiatives, see enclosure (8), reference (n).

(3) Supporting. Utility companies (i.e., electric, gas, and water suppliers) provide support in the form of personnel, information, rebates, and MCBQ's incentives to enhance the reliability of its energy and water supply via infrastructure upgrades, conservation and efficiency projects.

c. Attachments. Energy and water auditors, A/E design firms, building and maintenance contractors, and goods suppliers provide services that help MCBQ reduce energy and water consumption through studies, systems design, construction, maintenance of buildings and the purchase of energy and water efficient goods.

5. Mission. Beginning March 2011, MCBQ activities and tenant commands will implement and maintain the MCBQ Energy and Water Management Program in order to reduce consumption, increase the reliability and security of MCBQ's energy and water infrastructure, and meet Federal energy and water mandates.

6. Execution

a. Commander's Intent

(1) Purpose. The purpose of this Order is to reduce energy and water consumption aboard MCBQ to emphasize a commitment to the efficient use of energy and water in order to:

(a) ensure MCBQ does its part to meet the energy and water reduction mandates and goals established by the President, Congress, and the Department of Defense in accordance with references (a) - (l).

(b) reduce MCBQ's dependence on utilities from outside sources and increase the reliability of the utility infrastructure to help ensure sustainment of MCBQ operational functions.

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(c) reduce MCBQ utility costs.

(2) Method. MCBQ must reduce energy and water consumption. One critical vulnerability of energy inefficiency is a lack of MVBQ activities and tenants commands' commitment to the Energy and Water Management Program. To create a command climate committed to the efficient use of energy and water, the following four initiatives, referred to as the "B-A-S-E" Plan will be implemented (see enclosure (2) for additional information about each initiative):

(a) B - Benchmark Building Performance. This initiative focuses on installing meters, collecting meter readings, analyzing utility consumption data, conducting energy audits and identifying energy projects. This effort is led by the Energy Manager, Public Works Department, Facilities Division. Information gathered will be used to create an energy and water baseline and measure the success of energy conservation efforts. By 2013, building-level energy and water consumption reports will begin being distributed to each activity and tenant command on a quarterly basis to increase activity and tenant command awareness about consumption habits.

(b) A - Activities and Tenant Command Commitment. All activities and tenant commands will engage in the energy program through the Energy Conservation Board (ECB) and/or the Energy Conservation Officer (ECO) Program. The ECB is a board chaired by the Commander, MCBQ and comprised of leaders from activities and tenant commands that meet semi-annually to receive messages regarding energy and water program policies and initiatives. These top-level board members will distribute energy and water information provided by the Commander, MCBQ to their personnel. The ECO Program consists of facility managers and other identified individuals from each activity and tenant command that will monitor energy and water consumption at their facility and serve as a single point of contact for energy and water conservation matters within their building or organization. See enclosures (3) and (4) for specific information about the ECB and ECO Programs, respectively.

(c) S - Sustainable Facilities. This initiative engages individuals in the G-5, Facilities Division. It aims to improve the energy and water performance of MCBQ by making sustainability a core requirement in the planning, design, engineering, construction, operation and maintenance of MCBQ infrastructure.

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(d) E - Energy Awareness Campaign. This campaign focuses on reducing energy and water consumption by making the population aboard MCBQ aware of their energy consumption and educating them through articles, posters, and events that they can control consumption and costs at home and at work.

(3) End State. Reduce energy and water consumption as described in Enclosure (1) by creating a command committed to the efficiency use of energy and water.

b. Concept of the Operations. Consumption will be reduced by implementing the "B-A-S-E" Plan. Enclosure (2) provides detailed information about the "B-A-S-E" Plan. Once these four initiatives are underway, a more detailed energy plan/sustainability plan will be developed.

c. Tasks

(1) MCBQ activities and tenant commands shall comply with this Order to the maximum extent possible and have specific, assigned tasks to execute in order to ensure this installation meets the mission of this Order (see enclosure (5)).

(2) All MCBQ activities and tenant commands shall become familiar with and implement the Energy and Water Management Guidelines provided in enclosure (6). These guidelines will be used to develop, on a quarterly basis, policy letters specifying required actions that all MCBQ activities and tenant commands must take to reduce energy and water consumption.

(3) Occupants of facilities aboard MCBQ and tenant commands shall actively participate in the Energy and Water Management Program by turning off unnecessary lights, maintaining the heating and cooling temperature settings at the recommended levels, turning off water fixtures when not in use, and reporting all energy and water inefficiencies to the ECO for their respective organizations.

7. Administration and Logistics

a. Directives issued by this MCBQ are published and distributed electronically. Electronic version of this MCBQ directive is found at <http://www.quantico.usmc.mil/directives.aspx>.

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b. Questions and comments regarding this instruction should be addressed to the MCBQ Energy Manager's Office at (703) 432-2590.

8. Command and Signal

a. Command. This Order affects all phases of operations, including administration, planning, programming, budgeting, operations, maintenance, training and material acquisition that affect the supply, reliability, and consumption of facility energy and water aboard MCBQ.

b. Signal. This Order is effective upon signature.

/s/

D. J. CHOIKE

DISTRIBUTION: A

FEDERAL ENERGY AND WATER MANDATES AND GOALS

The goals and mandates identified below summarize the Federal, DoD, DoN, and Marine Corps requirements. See each of the references in enclosure (8) for the comprehensive requirements.

Also, note that some categories, such as "Water Reduction", have multiple goals and mandates that are specified through multiple executive orders, laws, and regulations. The regulations below are listed in the order of oldest to most recent.

1. Energy Reduction. Reduce energy consumption by three percent based on the FY2003 baseline for a 30% reduction by FY2015 (Energy Independence & Security Policy Act (EISA) 2007).
2. Water Reduction. Reduce water consumption two percent per year based on the FY2007 baseline for a 16% reduction by FY2015 (Executive Order (EO) 13423, DoDI 4170.11).
 - a. Reduce potable water consumption intensity two percent annually through FY2020 to achieve a 26% reduction by the end of FY2020 with a FY2007 baseline (EO 13514).
 - b. Reduce industrial, landscaping, and agricultural water consumption two percent per year to achieve a 20% reduction by the end of FY2020 with a FY2010 baseline (EO 13514).
3. Petroleum Reduction. Reduce petroleum consumption in agency fleets of 20 or more two percent annually through FY2015 relative to a FY2005 baseline (EO 13423).
 - a. Reduce petroleum consumption 20% by 2015 compared to a FY2015 baseline. Purchase vehicles with low greenhouse gas emissions. CAFE = 35 MPG by 2020. Increase alternative fuel use 10% per year compared to a FY2005 baseline (EISA 2007).
 - b. Reduce petroleum consumption in agency fleets of 20 or more two percent annually through FY2020 relative to a FY2005 baseline (EO 13514).
4. Renewable Energy Production. Purchase or generate and use renewable electricity. Produce three percent of electrical consumption with renewable energy in FY2007-FY2012; seven and a half percent by FY2013, and 25% by FY2025 (EPAct 2005, National Defense and Authorization Act (NDAA) 2010: 10 U.S.C. § 2911). Measure: Total renewable electricity consumption/ (Total electrical consumption).
 - a. Federal agencies can double count renewable energy if the energy is produced and used on-site, on Federal land, or on Native American land (EPAct 2005).

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b. At least half of renewable energy used by the Federal Government must come from new renewable sources (in service after January 1, 1999). Non-electric renewable resources (e.g., solar water heating) can be used to meet this requirement, but all of the EPAct 2005 goal must be met with renewable electricity (EO 13423).

c. 30% of the hot water demand in major renovations and new Federal buildings must be met with solar hot water equipment if Life-Cycle Costing (LCC)-effective (EISA 2007).

5. Reduce Fossil Fuel Consumption. New facilities and major renovations constructed after FY2010 will need to consume less fossil fuel than comparable facilities consumed in FY2003 by the following amounts:

- a. 55% less fossil fuel consumption after FY2010
- b. 65% less fossil fuel consumption after FY2015
- c. 80% less fossil fuel consumption after FY2020
- d. 90% less fossil fuel consumption after FY2025
- e. 100% less fossil fuel consumption after FY2030. (EISA 2007)

6. Metering. Meter all appropriate electrical consuming facilities by 1 October 2012, when LCC-effective (EPAct 2005).

a. Agencies must identify and meter all "covered facilities" that constitute at least 75% of the agency's facility energy use (EISA 2007).

b. No later than 1 October 2016 facilities shall have natural gas and steam meters (EISA 2007).

c. Electricity, natural gas, water and steam should be monitored by 2012. If not installed, installations should aim to install meters on 15 percent of facilities that are not in compliance each year (DoDI 4170.11).

7. Energy and Water Audits. Perform energy and water efficiency audits of all facilities; Audit 25% of facilities comprising of 75% of energy consumption per year (EISA 2007).

8. Sustainable Design. 15% of the existing Federal buildings for each agency and leases above 5,000 gross square feet must meet the Guiding Principles for Sustainable Existing Buildings by the end of fiscal year 2015 (EO 13423). Measure: Number of facilities meeting the criteria/total number of facilities.

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9. Leadership in Energy and Environmental Design (LEED). Ensure that all major M1/R1 and MILCON projects have requirements to meet LEED Silver or better criteria (DoDI 4170.11).
10. Purchasing. Purchase and install only Energy Star ® and Federal Energy Management Program recommended products. When acquiring electronics, at least 95% use Electronic Product Environmental Assessment Tool. Minimize standby energy use in purchases of energy consuming equipment (EISA 2007).
11. Pollution Prevention and Waste Reduction. Divert 50% of non-hazardous solid waste by the end of FY2013. Reduce printing paper use and uncoated printing and writing paper containing at least 30% post-consumer fiber. Decrease the amount of compostable and organic material going into the waste stream. Minimize waste and pollutants through source reduction (EO 13514).
12. Economic Payback. Complete all energy and water conservation measures with an economic payback of 10 years or less. See enclosure (7) for resources regarding LCC Analysis (EPAct 2005, EISA 2007, DoDI 4170.11).
13. Maintenance. Improve equipment and utility distribution system efficiency and reliability by performing cost effective scheduled preventive maintenance. Ensure that conservation conscious maintenance is performed with efficient replacement components.
14. Training. Ensure that personnel that design, install, operate and maintain energy and water consuming systems are properly trained.

ENERGY AND WATER MANAGEMENT PROGRAM - THE "B-A-S-E" PLAN

Marine Corps Base, Quantico (MCBQ) is committed to reducing its energy and water consumption. To guide this effort, the "B-A-S-E" Plan was developed.

The objective of the "B-A-S-E" Plan is to create an installation committed to the efficient use of energy and water resources. Base-wide commitment is essential because every Marine, Sailor, civilian employee, contractor, family member and visitor at MCBQ consumes energy and water. By engaging everyone in the energy program, we can invoke cultural change in not only the way we use energy and water in our buildings but also in the way installation planners; engineers; and facility personnel design, build, operate and maintain our buildings.

The "B-A-S-E" Plan has the following four initiatives:

Benchmark Building Performance
Activities and Tenant Command Commitment
Sustainable Facilities
Energy Awareness Campaign

These four initiatives are discussed in the following sections.

Benchmark Building Performance

This initiative focuses on installing meters, collecting meter readings, analyzing utility consumption data, conducting energy audits and identifying energy projects. This effort is led by the Energy Manager, Public Works Department, Facilities Division. Information gathered will be used to create an energy and water baseline and measure the success of energy efforts. By 2013, building-level energy and water consumption reports will begin being distributed to each activity and tenant command on a quarterly basis to increase activity and tenant awareness about consumption habits.

Targets

- Install electric meters that monitor at least 75% of electricity consumption on the installation by the end of FY2012.

- Install natural gas, steam (at The Basic School only), and water meters at facilities that constitute 75% of the energy and water consumption by FY2015. Aim to install 55% of these meters

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by the end of FY2012 and install 15% of facilities that are not in compliance each year thereafter.

- Perform energy and water efficiency audits of all facilities; audit twenty-five of facilities comprising 75% of energy consumption per year.

Implementation Plan

Meter MCBQ's Energy and Water Consumption

- Install meters on buildings/infrastructure that consume energy and water.

- Collect and analyze meter data via automated and/or manual data collection techniques and benchmark building performance utilizing Energy Star Portfolio Manager or other benchmarking energy programs.

- Generate baseline energy performance utilizing at least one year's worth of meter data from buildings.

Audit buildings, exterior lighting and other infrastructure

- Conduct energy and water audits on installation infrastructure and create energy models to identify energy performance inefficiencies. Conduct energy audits on facilities with meters, high energy loads and/or known major inefficiencies first.

- Utilize the results from the audits to plan and prioritize projects (see initiative Sustainable Facilities).

- Share building energy and water consumption and cost information with activities and tenant commands so that the data can help incentivize organizations to be more aware of their consumption habits (see initiatives Activities and Tenant Command Commitment and Energy Awareness Campaign).

Activities and Tenant Command Commitment

Activities and Tenant Commands aboard MCBQ consume energy and water. Therefore, it is essential that Energy and Water Management Program engages all personnel, from the leaders and decision makers to the people who spend their days working in MCBQ facilities. To facilitate command commitment, an Energy Conservation Board (ECB) and a Energy Conservation Officer (ECO) Program will be implemented and sustained, as described below.

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The ECB is an information panel chaired by the Base Commander and staffed by leaders, decision makers and supervisors of activity and tenant commands from MCBQ. The organization will meet semi-annually to receive updates about the MCBQ's energy and water program. Additional information about ECB duties is provided in enclosure (3).

The ECO Program focuses on improving the way our existing buildings work by requiring activities and tenant commands to identify ECOs for each building within their organization. The ECO will monitor energy and water consumption at their facility and serve as a single point of contact for energy and water conservation matters within their building or organization. Additional information about ECO duties is provided in enclosure (4).

Targets

- Implement and maintain an active ECB and ECO Program to facilitate the planning, coordination and implementation of energy and water efficiency projects aboard MCBQ.
- The ECB meet semi-annually to ensure activities and tenant commands are aware of the Energy and Water Management Program and its current policies and projects.
- ECOs submit annual energy and water reports to the Energy Manager regarding the performance of the building(s) within their organization.
- Energy Manager use the ECO reports and other information provided by ECOs to develop energy/water projects for MCBQ (see initiative Sustainable Facilities).
- Hold ECO meetings at a minimum per quarter.
- Conduct ECO training annually.

Implementation Plan

- Implement the ECB
- Identify ECB members for each of the Activities and Tenant Commands listed in enclosure (3).
- Work with the Commander, MCBQ to the chair of the ECB, to

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identify the date/time for the first ECB meeting. Develop an agenda to ensure ECB members gain a solid understanding of MCBO 4100.1B.

- Utilize the ECB as a means to distribute information about energy and water policies and programs underway to activities and tenant commands.

- The board meets semi-annually.

- Enclosure (3) provides additional information about the ECB personnel and tasks.

ECO Program.

- All ECB and other designated personnel are responsible for identifying one or more ECOs to be a point of contact for helping the installation meet the requirements of MCBO 4100.1B and comply with Federal regulations.

- The ECOs shall be trained to identify inefficiencies in building operations. ECOs are expected to report inefficiencies and improvement suggestions to the Energy Manager for consideration and analysis within the Public Works Branch.

- Enclosure (4) provides additional information about the ECO Program and ECO duties.

- The form found in enclosure (4) shall be used by each organization's commander/supervisor to appoint an ECO for their building or organization.

Sustain ECB and ECO Programs:

- MCBQ's Energy Manager is responsible for maintaining the ECB and ECO Programs on the installation.

- The Energy Manager will work with the Commander, MCBQ to set up and plan the semi-annual ECB meetings to provide updates regarding the energy and water program to activities and tenant commands. This information should be distributed by the leadership to commands throughout the installation.

- The Energy Manager will set up quarterly meetings for all ECOs. Meetings will be for training, information distribution and program updates.

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- Dialogue between the Energy Manager and the ECOs must remain open at all times to ensure all energy and water issues at facilities are addressed on an ongoing basis.

- The ECOs shall identify and report potential energy/water projects to the Energy Manager on an ongoing basis. The Energy Manager will evaluate these projects and prioritize projects with input from the G-5 and Commander, MCBQ. Projects will be routed into the "Sustainable Facilities" pipeline as seen fit.

Sustainable Facilities

This initiative aims to improve the energy and water performance of the MCBQ by making sustainability a core requirement in the planning, design, engineering, construction, operation and maintenance of base infrastructure. The initiative will accomplish this by developing training, requirements, standard operating procedures, and scopes of work that emphasize the importance of sustainability. The program requires the Energy Manager to utilize information garnered from the ECB, ECOs, and the Benchmarking Building Performance initiative to develop and seek funding for energy projects, implement energy projects and ensure sustainment of those energy projects over the long-term.

Targets

- Implement energy retrofit and new construction projects to reduce energy consumption by 3% per year from the FY2003 baseline.

- Implement water retrofit and new construction projects to reduce water consumption by two percent per year from the FY2003 baseline.

- Integrate renewable energy projects into retrofit and new construction projects to reduce dependence on energy from outside the fence by point five percent per year.

- Require and document that all major M2/R2 and Military Construction projects meet Leadership in Energy and Environmental Design Silver or better criteria.

- Retrofit 15% of the existing buildings (area greater than 5,000 gross square feet) to meet the Guiding Principles for Sustainable Existing Buildings by the end of FY2015.

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Implementation Plan

Train and Distribute Information to Key Planning, Design, Engineering, Construction, Contracting and Facilities Personnel.

- To ensure all projects incorporate energy and water conservation principles, hold energy/water training classes and/or distribute best practices information to personnel involved in base infrastructure projects.

Develop Scopes of Work that Integrate Sustainable Design Principles:

- Develop scopes of work that integrate sustainable design, construction, operations and maintenance practices for existing and new construction infrastructure projects.

- All personnel including area/unit commanders and tenants are responsible for implementing, within their authority and capability, the design, construction, operation and maintenance principles identified in MCBO 4100.1B, references (d), (m), (o), and (p) and enclosure (6) into any existing or new building(s) when applicable.

- Sustainable design principles shall be implemented when life-cycle cost (LCC) effective. Tools to be used in performing LCC analysis are listed in enclosure (7).

Plan Projects

- Utilize knowledge gained about existing building inefficiencies and new construction issues to develop energy and water conservation projects for the base.

- The Energy Manager will plan projects by developing a 1391 and LCC analysis for each planned project and submitting it for review by the Public Works Branch. Approved projects will be submitted to headquarters for funding.

Seek Funding

- Funding is sought for the projects identified above using either MILCON funding, Energy Conservation Investment Program, Utility Energy Service Contracts, Energy Service Performance Contracts, Power Purchase Agreements, Enhanced Use leases, and/or other funding mechanisms.

ENCLOSURE (2)

Optimize Project Sustainability and LCC Effectiveness.

- All personnel including area and unit commanders and tenants are responsible for implementing, within their authority and capability, the design, construction, operation, and maintenance principles identified in references (d), (m), (o), and (p) and enclosure (6) into any existing or new building(s) when applicable. These policies shall be implemented when LCC effective.

Project Implementation and Sustainment.

- Conduct reviews and inspections during the planning, design, contracting, construction, commissioning, continuous commissioning to ensure energy and water efficient designs, products, and operating procedures are implemented at each stage of every project.

Energy Awareness Campaign

This campaign will focus on reducing energy and water consumption by making the base population aware of their energy consumption and showing the base population that they have the ability to control consumption and costs.

Targets

- Conduct an annual energy awareness survey. The target is to have 25%, 50%, and 75% of surveyed individuals aware of MCBQ's Energy and Water Management Program by FY2012, FY2013, and FY2014, respectively.
- Publish energy/water awareness articles in the Quantico Sentry on at least a monthly basis.
- Distribute energy awareness material throughout MCBQ on a quarterly basis.
- Participate in and host at least two events each year relating to energy and water conservation.

Implementation Plan

Develop the Energy Awareness Campaign

- The installation Energy Manager develops and implements an Energy Awareness Campaign with the goal of having all MCBQ

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personnel aware of and involved in the base's energy and water conservation efforts.

- The Energy Awareness Campaign reaches out to MCBQ personnel and occupants via multiple outlets including but not limited to news articles, energy awareness materials, posters, and expositions (Earth Day/Energy Awareness Week).

- The Public Affairs Office, Marine Corps Community Services, and Public Private Venture Housing Branch are actively involved in ensuring installation personnel and occupants are aware of the program and are participating in energy awareness activities.

Maintain and Improve Energy Awareness Campaign

- Enhance program through the deployment of an energy web page and development of additional participation in energy outreach programs.

- Conduct an Energy Awareness Survey on an annual basis.

In summary, these four initiatives will create an organizational structure that is committed to the efficient use of energy and water. All activities and tenant commands aboard MCBQ will benefit from this Program because it will reduce energy consumption and thus reduce utility costs. Furthermore, reductions in consumption will improve the reliability and security of MCBQ's energy and water infrastructure. On a national level, these efforts will reduce the nation's reliance on foreign fuel sources and non-renewable resources, improve national energy security, enhance environmental stewardship and reduce greenhouse gas emissions.

ENCLOSURE (2)

ENERGY CONSERVATION BOARD (ECB)

1. Purpose and Objective. The ECB is an information panel chaired by the Commander, MCBQ and staffed by leaders, decision makers and supervisors of activities and tenant commands from Marine Corps Base, Quantico (MCBQ). The organization will meet semi-annually to receive updates about the MCBQ Energy and Water Management Program.

2. Chairman. The Commander, MCBQ is the ECB Chairman. The Chief of Staff may serve as the alternate ECB Chairman.

3. Membership. ECB membership at MCBQ shall consist of representatives from the following activities and tenant commands:

a. MCBQ Activities

- (1) G-3 Operations Division
- (2) G-4 Logistics Division
- (3) G-5 Facilities Division
- (4) G-6 Communications Electronics Division
- (5) Headquarters and Service Battalion
- (6) Marine Corps Community Services
- (7) Public Affairs Office

b. Tenant Commands

- (1) Marine Corps Combat Development Command
- (2) Manpower & Reserve Affairs
- (3) Training and Education Command
- (4) Marine Corps Systems Command
- (5) Marine Corps Embassy Security Group
- (6) Marine Corps Air Facility, Quantico
- (7) Defense Commissary Agency

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(8) Joint Non Lethal Weapons Directorate

(9) Marine Corps Information Operations Center

(10) Marine Corps Intelligence Activity

(11) Marine Corps Operational Test and Evaluation Activity

4. Duties. The duties of the ECB include:

a. Meet semi-annually and at the call of the ECB Chairman to receive informational updates about the Energy and Water Management Program.

b. Inform activities and tenant command personnel about energy and water policies and programs. Ensure the Energy and Water Management Program requirements are being followed.

c. Provide feedback on successes and challenges of the existing energy and water programs.

d. Each ECB member will specify one or more Energy Conservation Officers (ECO) for all facilities within their activity or tenant command to serve as the point of contact for energy and water issues within the organization's building(s) (see enclosure (4)).

e. Ensure ECOs are actively participating in the ECO Program and are submitting the required information to the MCBQ Energy Manager on time.

ENCLOSURE (3)

ENERGY CONSERVATION OFFICER (ECO) PROGRAM

All activities and tenant commands at Marine Corps Base, Quantico (MCBQ) must assign an ECO to monitor energy and water consumption at the facility that it occupies. The ECO will assist the Energy Manager, Public Works Branch, Facilities Division in coordinating the Base Energy and Water Management Program within the ECO's organization.

For MCBQ activities and tenant commands that occupy large buildings or multiple buildings, more than one ECO should be specified to ensure ECO duties are followed. The ECO will serve as a single point of contact for energy and water conservation matters (i.e., projects, issues, costs) within their organizations.

ECO tasks include the following:

1. Identify an ECO to the MCBQ Energy Manager by sending a copy of the Energy Conservation Officer Notice Form (found at the end of this enclosure) to the Energy Manager.
2. Each ECO should introduce himself/herself to building occupants within the building(s) assigned. ECO contact information should be provided to all building occupants. Suggest that all building occupants send energy and water comments to the ECO. The ECO shall compile and summarize these comments to provide to the Energy Manager in the quarterly report (described below).
3. Post energy awareness material and information throughout the facility to increase energy and water conservation awareness amongst building occupants.
4. Communicate installation energy goals and objectives to the people within each building(s). Assist in educating personnel within the organization to conserve energy and water resources. Increase energy awareness about energy and water usage and costs within the organization.
5. Receive training and instruction from the Energy Manager in the execution of these duties.
6. Read, understand and follow the Building Energy Monitors Guide published by the Navy/Marine Corps energy program. This guide will be provided to each ECO by the Energy Manager.

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7. To the maximum extent possible, follow all guidance and requirements provided by the Energy Manager regarding the operation and maintenance of energy and water systems within facilities.
8. Ensure that purchasing agents within the building(s) purchase energy and water efficient equipment (Federal Energy Management Program rated/ENERGY STAR certified).
9. Periodically inspect organization facilities to ensure that the energy and water conservation objectives of this Order are followed.
10. Provide the Energy Manager with information requested about the energy and water consuming equipment within the building(s).
11. Assist the Energy Manager in developing energy and water conservation and efficiency projects within the building(s).
12. Ensure that maintenance requirements impacting energy and water consumption are resolved. Generate work orders for low cost maintenance measures. Email energy and water efficiency project suggestions to the Energy Manager.
13. Submit quarterly update reports to the Energy Manager. The Energy Manager will provide this reporting form.
14. Attend quarterly meetings with other ECOs and the Energy Manager to discuss existing and proposed projects, challenges and successes.
15. Upon departure from MCBQ, work with your organization's ECB representative and other personnel in the office to identify a new ECO. Submit the new ECO's information to the Energy Manager.

ENCLOSURE (4)

ENERGY CONSERVATION OFFICER (ECO) NOTICE FORM

From: **(ECB Member, Commanding Officer, Officer in Charge, or
Department Head)**

To: **(Energy Conservation Officer Designee)**

Subj: ENERGY CONSERVATION OFFICER AT (COMMAND/ACTIVITY/DEPART.)

Ref: (a) MCBO 4100.1B

1. **(Name of ECO, Title)** represents **(Activity/Tenant Command)** as the Energy Conservation Officer. The ECO's responsibilities include monitoring energy and water consumption in the areas occupied by **(activity/tenant command)**. The ECO will conduct the tasks identified in enclosure (4) of MCBO 4100.1B.

2. To ensure mission sustainment and compliance with Federal energy and water mandates, energy and water reduction measures will be continuously sought within the organization. Your participation is required and is greatly appreciated.

ECO Contact Information:

Name: _____

Email: _____

Phone: _____

(ECB Member, Signature of
Commanding Officer, Officer in
Charge, or Department Head)

Copy To:

Energy Manager
Public Works Branch, Facilities Division
Marine Corps Base, Quantico
2004 Barnett Avenue
Quantico, VA 22154
E: stefanie.kivelin@usmc.mil
P: 703-432-2590
F: 703-432-0509

ENCLOSURE (4)

ACTIVITIES AND TENANT COMMAND TASKS

1. Tasks

a. G-3, Operations Division. Participate in the Energy Awareness Program. Assist the Energy Manager, Public Works Branch, Facilities Division, in the preparation of awareness posters, brochures, and materials as required.

b. G-4, Logistics Division

(1) Food Services Branch. Coordinate with the Energy Manager to optimize the efficiency of energy and water consumption within the mess halls aboard Marine Corps Base, Quantico (MCBQ).

(2) Transportation Branch

(a) Track and report vehicle energy consumption. Provide a monthly vehicle report that includes the number of vehicles in operation by energy type, energy consumption by energy type, and miles driven by energy type to the Energy Manager, Public Works Branch, Facilities Division.

(b) Track and report deliveries to the fuel farm and deliveries or sales to all tanks on base by fuel type. Report date delivered and quantity delivered. Indicate the type of system (generator, boiler, fueling station, etc.) that the fuel was delivered to. Provide a monthly delivery report to the Energy Manager, Public Works Branch, Facilities Division, for the DUERS report required by MCO P11000.9C, reference (k), paragraph 2202.

(c) Develop policies and projects to ensure that energy and water conservation are factors in the operations, maintenance and washing of motor vehicles.

(d) Coordinate vehicle conservation programs and the introduction of nonpetroleum fueled vehicles to MCBQ with Headquarters Marine Corps (HQMC) and the Energy Manager, Public Works Branch, Facilities Division. Government vehicle petroleum consumption is to be reduced by two percent annually through the end of 2015 and increase fleet vehicle alternative fuel use by 10% annually. Prudent usage of vehicles is essential to reducing our dependence on foreign-supplied oil.

ENCLOSURE (5)

c. G-5, Facilities Division

(1) Public Works Branch, Public Works Officer

(a) Ensure that the project specifications of all projects constructed at MCBQ reflect the energy and water objectives and standards of this order, including its references and enclosures. References (d), (m), (o), and (p) contain additional guidance in selecting energy and water conservation alternatives.

(b) Evaluate the consolidation of functions at MCBQ with an eye towards reducing the number of buildings that require utility services. Ensure that unoccupied (abandoned) buildings have their utilities secured.

(c) Submit all construction projects at MCBQ that have any effect on utilities consumption and costs to the Energy Manager, Public Works Branch, Facilities Division for review.

(2) Public Works Branch, Energy Manager

(a) Under the guidance and direction of higher authority, manage the Energy and Water Management Program. Provide support to MCBQ activities and tenant commands to help them accomplish the policy and goals of this order through a coordinated conservation program.

(b) Develop, implement, and maintain an active Energy Awareness Program. Write articles regarding energy awareness and energy/water projects ongoing aboard MCBQ. Develop an agenda and coordinate events for Earth Day, the annual Department of the Navy Energy Awareness Week, and other activities on MCBQ and in the community.

(c) In coordination with HQMC, and MCBQ area commanders and tenants.

1. Develop energy and water conservation studies and projects.

2. Solicit funding from HQMC and other sources.

3. Provide project documentation to the Head, Public Works Branch, Facilities Division or other contracting authority for implementation.

ENCLOSURE (5)

4. Review all projects provided by Public Works Branch and other divisions and tenants to determine the effect on MCBQ energy and water consumption and costs.

(d) Ensure that applicable energy and water conservation objectives and efficiency standards of this Order, and its references and enclosures, are a factor in the design, construction, maintenance, repair and replacement of facilities and equipment at MCBQ. The design of new Federal buildings and the application of energy and water conservation measures to existing Federal buildings shall be made using lowest Life-Cycle Costing (LCC) methods.

(e) Provide periodic updates to this Order and its enclosures as well as input on other policies, regulations and instructions.

(f) Track MCBQ energy and water consumption and costs. Send Defense Utility and Energy Reporting System (DUERS) energy, water and square footage data to the Naval Facilities Engineering Support Center each quarter.

(g) Update enclosure (6) Energy and Water Management Guidelines annually.

(h) Develop and publish quarterly policy letters specifying required actions that all MCBQ activities and tenant commands must take to reduce energy and water consumption. Utilize the policy guidelines found in enclosure (6) as a basis for developing and implementing the policy letters.

(i) Manage the MCBQ Energy and Water Reduction Program by:

1. Working with utility providers to obtain their assistance in reducing energy and water consumption and costs aboard MCBQ through demand shedding and peak shaving strategies as well as other energy programs.

2. Implement and sustaining the Energy Conservation Board (ECB) and the Energy Conservation Officer (ECO) Program as discussed in enclosure (3) and enclosure (4).

3. Maintaining a list of ECOs and instructing new monitors in their duties.

ENCLOSURE (5)

(3) Public Works Branch, Commodities Group

(a) Track and report heating-oil, propane and other fuel delivery not collected by the transportation branch. Provide a monthly delivery report to the Energy Manager, Public Works Branch, Facilities Division, for the DUERS report required by MCO P11000.9C, reference (k), paragraph 2202.

(b) Track and report water and sewer production and consumption. Provide a monthly report to the Energy Manager, Public Works Branch, Facilities Division, for the DUERS report required by MCO P11000.9C, reference (k), paragraph 2202.

(4) Facilities Division, Utilities Financial Manager

(a) Coordinate rate setting and billing for tenants aboard MCBQ with the Energy Manager and Water/Sewer Commodity Manager.

(b) Submit monthly energy, water and utility cost reports to the Energy Manager for all utilities/accounts, including but not limited to electric, natural gas, propane, heating oil, diesel, water, and sewage. This information will be used for energy benchmarking.

(c) Submit a quarterly report to the Energy Manager identifying all tenants. For each tenant, specify whether the electric, gas, propane and water consumption was calculated or monitored (using meters). Also include a summary of utility consumption and costs for each tenant organized on a per month basis.

(5) Facilities Division, Family Housing. Work with installation Energy Manager to coordinate the development and distribution of energy awareness material to occupants of Public Private Ventures housing on a quarterly basis.

d. Marine Corps Community Services

(1) Participate in the Energy Awareness Program.

(2) Work with the Energy Manager to coordinate energy awareness activities in conjunction with Marine Corps Community Service (MCCS) events.

(3) Coordinate the distribution of energy awareness material at MCCA facilities and events.

e. Public Affairs Officer. Participate in Energy Awareness Program by coordinating with the Energy Manager to publish energy and water conservation awareness articles in the Quantico Sentry on a regular basis. Advertise energy awareness events and activities.

f. Tenant Commands (Defense Commissary Agency).

(1) Coordinate energy and water efficiency projects with the Energy Manager, Public Works Branch.

(2) Coordinate the distribution of energy awareness material with the Energy Manager.

(3) Keep energy awareness material distributed throughout the commissary at all times to increase the visibility of the Energy Awareness Program aboard MCBQ.

g. Energy Conservation Board Personnel. As discussed in enclosure (3), all identified ECB personnel must attend meetings as directed.

h. Energy Conservation Officer (ECO) Personnel. Each activity and tenant command must have one or more ECOs that are actively involved in the ECO Program (see enclosure (4)).

i. Personnel involved in Planning, Purchasing and Contracting.

(1) Energy efficient products and services should be procured when life cycle cost (LCC) effective. To encourage this, follow Federal Energy Management Program recommendations and Energy Star requirements that can be found at:
http://www1.eere.energy.gov/femp/technologies/procuring_eeproducts.html

(2) Ensure LCC Analysis is executed within a 10 year economic payback period:

(a) As discussed in the references, the design of new Federal buildings, and the application of energy and water conservation measures to existing Federal buildings, shall be made using LCC methods vice the lowest initial cost.

ENCLOSURE (5)

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(b) Contact the Energy Manager, Public Works Branch, Facilities Division for current utility rates to use in LCC analyses.

(c) Electric costs must differentiate between demand and consumption and accurately reflect the actual cost of electricity to MCBQ. See enclosure (7) for a list of LCC tools to be used in performing LCC analyses.

(d) To achieve mandates, all energy and water conservation projects with an economic payback of 10 years or less must be incorporated into all new building and renovation projects when the energy/water project is within the project scope.

ENCLOSURE (5)

ENERGY AND WATER MANAGEMENT GUIDELINES

These guidelines are provided as recommended measures to take to reduce energy and water consumption on the installation. These guidelines will be updated annually.

Note that the Energy Manager will be developing and publishing quarterly policy letters specifying required actions that all Marine Corps Base, Quantico (MCBQ) activities and tenant commands must take to reduce energy and water consumption. As found appropriate, the Energy Manager may translate the guidelines found below into policy to be reviewed, approved and signed by the Commander, MCBQ.

Building Envelope

- Insulation must be added to new facilities whenever cost effective to do so.
- New windows must be added whenever cost effective to do so.
- Cool roofs or other reflective materials must be incorporated into any new roof whenever cost effective.
- Immediately report building envelope leaks to the Energy Conservation Officer (ECO) or Energy Manager.

Exterior Lighting

- Exterior lighting shall only be used from dusk until dawn, unless there are extenuating circumstances due to poor visibility due to cloud cover and/or snow. All other exceptions must receive a waiver.
- Replace all inoperable lamps or fixtures with energy efficient lamps and/or fixtures.
- Turn off lighting for exterior signage during daylight hours.

Interior Lighting

- Lighting should be shut off in any area that is not occupied.
- All lighting, except emergency lighting, shall be shut off during unoccupied building hours.

- Replace all inoperable lamps or fixtures with energy efficient lamps and fixtures.
- Coordinate with the ECO and the Energy Manager to install lighting occupancy sensors in common areas to reduce unnecessary lighting energy consumption in areas that are occupied intermittently.
- Coordinate with the ECO and the Energy Manager at Public Works to install photocell sensors in areas that receive adequate natural daylighting.

Air Conditioning

- Perimeter windows and doors must be kept shut when a building's air conditioning is operating.
- Set air conditioning unit thermostats to 76°F during the cooling season. Air conditioning should only operate in buildings during occupied hours. Air conditioning thermostats should be turned up to 80°F and/or shut completely off during unoccupied hours.
- Heating ventilation and air conditioning (HVAC) air distribution outlets cannot be obstructed with furniture or devices that impede airflow.
- When replacement is required, retrofit HVAC equipment with energy efficient equipment that meets the 30% below ASHRAE 90.1 requirements.
- Have all requests for "authorization for purchase and installation" of new and replacement window air-conditioners and portable heat pumps approved by the Energy Manager, Public Works Branch, Facilities Division before purchase. All new window units must meet the energy efficiency ratio requirements of either 30% below ASHRAE Standard 90.1-2007 or an equivalent efficiency that meets the criteria in Standard 189.1-2009 (see References (m) & (o)). For specific information about this standard, request information from the Energy Manager.

ENCLOSURE (6)

Heating

- Heating perimeter windows and doors must be kept shut when a building's heating is operating.
- Set heating unit thermostats to 70°F during the heating season.
- Heating should only operate in buildings during occupied hours. Heating thermostats should be turned down to 55°F or shut completely off during unoccupied hours. Do not let buildings with water lines go below 32°F to avoid freezing water lines.
- Do not use space heaters if the buildings HVAC systems are operating.
- HVAC air distribution outlets cannot be obstructed with furniture or devices that impede airflow.
- When replacement is required, retrofit HVAC equipment with energy efficient equipment that meets the 30% below ASHRAE 90.1 requirements.

Miscellaneous Loads

- Office equipment and computers should be shut off during unoccupied hours.
- Power strips should be shut off to equipment to further reduce power consumption whenever possible. Note: This may not be possible for computer network systems due to automatic updates that are done to computers during unoccupied building hours.
- Newly purchased plug load equipment should satisfy Federal Energy Management Program (FEMP) or Energy Star performance requirements.

Domestic Hot Water Systems

- Domestic Hot Water systems should not exceed 120°F to minimize energy consumption when the tank is under 160 gallons.

- Domestic Hot Water systems should be set to 160°F to deter the growth of bacteria in tanks greater than 160 gallons.

Water

- Water leaks in piping and fixtures shall be reported to the ECO and a maintenance ticket shall be submitted when identified.
- All new fixtures installed shall meet the FEMP or Energy Star product procurement requirements.

Purchasing

- All personnel involved in the purchasing of goods or services on the base should follow the FEMP recommendations or Energy Star requirements. See the following link for specific requirements:

http://ww1.eere.energy.gov/femp/technologies/procuring_eeproducts.html

LIFE-CYCLE COSTING (LCC) TOOLS

The following tools are publications found on the Department of Energy (DOE) Federal Energy Management Program (FEMP) and Whole Building Design Guide websites.

1. DOE, FEMP, "Building LCC Program," Version 5.3-10.
http://www1.eere.energy.gov/femp/information/download_blcc.html#blcc.

Provides six modules for analyzing the LCC of projects, including energy and water projects.

2. DOE, FEMP, "Energy Escalation Rate Calculator," EERC Version 2.0-10.
http://www1.eere.energy.gov/femp/information/download_blcc.html#blcc

Computes annual escalation rate for energy costs to be used for escalation rates for contract payments in Energy Savings Performance Contracts (ESPC) and Utilities Energy Services Contracts

3. DOE, FEMP, "Handbook 135, LCC Manual for FEMP,"
http://www1.eere.energy.gov/femp/information/download_blcc.html#blcc

Explains the principles of LCC analysis along with the FEMP criteria.

4. DOE, FEMP, "Annual Supplement to Handbook 135,"
http://www1.eere.energy.gov/femp/information/download_blcc.html#blcc

Contains printed tables with the factors used within the LCC software to establish the FEMP discount factors and energy price escalation rates.

5. DOE, FEMP, "Guidance on LCC Analysis Required by Executive Order 13123," April 2005,
https://www.eecbg.energy.gov/femp/pdfs/lcc_guide_05.pdf

6. Whole Building Design Guide, NAVFAC, "Economic Analysis Handbook P-442," Oct 1993,
<http://www.wbdg.org/ccb/NAVFAC/PPUBB/p442.pdf>

ENCLOSURE (7)

REFERENCES

- (a) Public Law 109-58, "Energy Policy Act of 2005," August 8, 2005
- (b) Executive Order 13423, "Strengthening Federal Environmental, Energy, and Transportation Management," January 24, 2007
- (c) Public Law 110-140, "Energy Independence and Security Policy Act of 2007," December 19, 2007
- (d) Memorandum of Understanding, "Federal Leadership in High Performance and Sustainable Buildings," January 24, 2006
- (e) National Defense Authorization Act 2010, PL 111-08428, "10 U.S.C. § 2911: Energy performance goals and plan for Department of Defense," October 2009
- (f) Executive Order 13514, "Federal Leadership in Environmental, Energy, and Economic Performance," October 8, 2009
- (g) OMB Policy Letter 92-4, "Procurement of Environmentally-Sound and Energy-Efficient Products and Services," November 2, 1992
- (h) DoDI 4170.11. "Installation Energy Management," September 9, 2009
- (i) OPNAVINST 4100.5D, "Energy Management," April 12, 1994
- (j) SECNAVINST 4100.9A, "Department of the Navy Shore Energy Management," October 1, 2001
- (k) Marine Corps Order (MCO) P11000.9C W/ CH 1-4, "Real Property Facilities Manual, Volume VI, Energy and Utilities Management," November 12, 1991
- (l) Headquarters U.S. Marine Corps, "Ten by '10, Top 10 Things To Do by 2010 to Reduce USMC Energy Risks," Washington DC: Facilities Energy & Water Management Program Campaign Plan, May 05, 2009

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(m) ANSI/ASHRAE/IESNA, Standard 90.1-2007, "Energy Standard for Buildings Except Low Rise Residential Buildings," 2007

(n) Department of Energy, Energy Efficiency and Renewable Energy, Federal Energy Management Program, "Case Studies"

(o) ANSI/ASHRAE/USGBC/IES, Standard 189.1-2009, "Standard for the Design of High Performance Green Buildings," January 22, 2010

(p) NAVFAC, Engineering & Construction Bulletin, "Navy Shore Energy Building Standard," Policy, Issue No. 2011-01, December 20, 2010

ENCLOSURE (8)