



**AIR FORCE ENERGY PROGRAM
PROCEDURAL MEMORANDUM (AFEPMP) 96-2
1 June, 1996**

AIR FORCE ENERGY OFFICE

AIR FORCE WATER MANAGEMENT PROGRAM

This memorandum is the implementation plan for the Air Force philosophy, organizational relationships, responsibilities, funding strategies, and procedures for implementing and managing water conservation programs at Air Force installations.

1. **Applicability.** This implementation plan applies to all Air activities and installations. They must perform the indicated actions as part of their planning for water management, as part of their Energy Program, and to meet Executive Order 12902 and the Energy Policy Act of 1992 (EPACT 92.)

2. **Background.** On 8 March 1994, President Clinton issued Executive Order 12902 on energy efficiency and water conservation. The mandate is an aggressive policy aimed at reducing energy and water use by federal facilities. All federal agencies must adhere to the provisions stated within the order, which augment criteria already directed by EPACT 92.

2.1. The Goals of EPACT 92 and EO 12902 Impacting upon the Water Program Management.

2.1.1. **Cost Effectiveness.** All conservation projects must be deemed cost-effective. Cost-effective implies a pay back period of less than 10 years. Projects required to comply with local constraints on water use will be considered individually and may be exempted from this requirement. The term applies to both energy conservation and water management (EPACT 92, Sec. 152 and EO 12902, Sec. 103).

2.1.2. **Water and Energy Prioritization Surveys.** All Federal Agencies must conduct a water and energy prioritization survey of the facilities it manages by 7 September 1995. The prioritization surveys will determine which facilities receive a comprehensive facility audit first. By 8 March 1995 (under EPACT 92, Sec. 152 and EO 12902, Sec 303), based on preliminary recommendations from the prioritization survey, all Federal Agencies must accomplish audits on 10% of its facilities followed by an additional 10% each year thereafter

2.1.2.1. Within 180 days following each comprehensive facility audit, all Federal Agencies must begin to implement program and funding recommendations derived from the audit.

2.1.3. **Annual Reporting.** All Federal Agencies must report annually to the Department of Energy (DOE) and the Office of Management and Budget (OMB) on its progress toward meeting established goals and deadlines as stated in the order.

3. Responsibilities.

3.1. HQ USAF/CEO/CEC.

OPR: HQ USAF/LGSP (Major Marsha Davis)

3.1.1. Provides overall Program policy.

AFEPPM 96-2 1 June 1996

3.1.2. Rank candidate ECIP & FEMP projects (with assistance from HQ AFCESA) before submission to OASD and subsequent review by Congress.

3.1.3. Provide HQ USAF/LGS with consolidated Air Force inputs for annual reports to Congress.

3.2. HQ AFCESA.

3.2.1. Provide assistance for program implementation.

3.2.2. Assist MAJCOMs and installations in identifying metrics to be used in conducting prioritization surveys.

3.2.3. Provide assistance in conducting comprehensive facility audits, tracking audit recommendations, and developing effective cost-saving projects with a discounted pay back period of less than 10 years.

3.2.4. Validate water conservation projects.

3.2.5. Consolidate MAJCOM report inputs for submission to AF/CEO for the annual report to Congress.

3.3. MAJCOMs.

3.3.1. Include water management planning within the responsibilities of the Energy Management Steering Group. Commands are responsible for developing their own programs

3.3.2. Review and update their plan to accomplish prioritization surveys and comprehensive audits annually.

3.3.3. Establish a monitoring program for implementing the recommendations of the comprehensive facility audits..

3.3.4. Submit ECIP and FEMP project submissions to HQ AFCESA as directed by call letters.

3.3.5. Evaluate overall success of base water programs and nominate the most successful units for water conservation awards.

3.3.6. Report status of prioritization surveys, comprehensive audits, and project programming/execution when requested.

3. 4. Installations.

3.4.1. Establish a water management program to include the following:

3.4.1.1. Develop a water management plan including contingency planning for mission support

3.4.1.2. Develop water conservation investment improvement projects

3.4.1.3. Monitor base water usage and all related costs

3.4.1.4. Establish an aggressive water conservation program

3.4.1.5. Foster an awards and recognition program

3.1.4.6. Report status of prioritization surveys, comprehensive audits, and project programming/execution when requested

4. AIR FORCE WATER MANAGEMENT PROGRAM.

4.1. **Program Objective.** The objective is to reduce water use without degrading military readiness, safety, mission effectiveness, or quality of life. Execution of policy on water management includes identifying and programming water conservation projects, and promoting water conservation awareness programs throughout the Air Force. The water conservation program is integrated within the energy management program at each installation.

4.2. **Facility Data Collection.** Developing a successful water management program depends in large part on the quality and quantity of pertinent data gathered for each facility. The program focuses its efforts on three main areas: Performing prioritization surveys, performing comprehensive facility audits according to initial prioritization survey results, and promoting effective project management.

4.3. **Prioritization Surveys.** Determine the potential costs and benefits of accomplishing water management projects. Recommend prioritization surveys include the following information:

4.3.1. A leak detection survey, if not accomplished within the previous five years.

4.3.2. The type, size, water/energy use, and performance of all water-related systems and their interaction with their surrounding facility.

4.3.3. A summary of appropriate water conservation maintenance and operating procedures currently implemented at the facility.

4.3.4. Recommendations for the acquisition and installation of water conservation measures including economic analysis and programming documents.

4.3.5. A strategy detailing the implementation of recommendations.

4.4. **The Renewable and Energy Efficiency Planning (REEP) Program Installation Report.** Accomplished by the US Army Construction Engineering Research Laboratory (CERL) for DoD), this report will serve as a ball park determinant of water usage and project cost for the prioritization survey. The REEP program analyzed 83 Energy Conservation Opportunities (ECO) at 239 DOD installations. Calculations are partitioned into separate rows so analysis can be conducted exclusively on water or energy issues, or both simultaneously. The REEP contains a financial savings summary that shows a particular ECO's total investment, total net discount savings, annual savings, simple pay back in years, savings-to-investment ratio (SIR), adjusted internal rate of return (AIRR), and societal savings. The societal savings figure can be used by MAJCOMs to rank bases for accomplishment of audits.

4.5. **Purpose of Water Program Audit.** The main purpose of an audit is to detect inefficient water systems, determine how much water and money is lost through leakage or waste, and determine a feasible method to implement conservation recommendations. Bases that have performed comprehensive audits within the last 3 years may consider the information acquired from those audits as current. Bases that require an audit are encouraged to seek out suppliers that will provide free audits. Air Force Facility managers may acquire a list from GSA, (202) 501-1763, of all utilities that offer no-cost water conservation audits and demand-side management services and incentives.

4.5.1. The American Water Works Association's (AWWA) "M36" manual and Enviro-Management & Research, Inc's. (EMR), "Water Management: A Comprehensive Approach For Facility Managers" are good references for audit implementation. For a copy of the M36 Manual call Pacific Northwest Laboratory (DOE) at (509) 372-4368, or the American Water Works Association at (303) 794-7711. For a copy of the EMR manual call 703-875-2800.

4.5.2. The Rocky Mountain Institute's "Water-Efficient Technologies" manual is a good reference for determining which water-efficient equipment may be appropriate for a particular facility. The manual contains a list of water-conserving products and their respective manufacturers. For a copy call 303-927-3851.

4.6. Installation Water Resources Analysis and Planning System (IWRAPS). IWRAPS could serve as a useful water conservation forecasting tool. The IWRAPS models are designed to calculate the winter and summer water requirements for military installations. The IWRAPS software can also:

4.6.1. Prepare water supply sustainability plans.

4.6.2. Compare water reduction measures for implemented water conservation programs.

4.6.3. Assess cost effectiveness of selected conservation measures.

4.6.4. The primary point of contact for IWRAPS information is HQ AFCESA/CESC, DSN 523-6338.

4.7. Funding Sources. In addition to funds available under the Energy Conservation Investment Program (ECIP) and Federal Energy Management Program (FEMP), the Air Force will seek and use Demand Side Management (DSM) and Energy Savings Performance Contracting (ESPC) to accomplish projects identified by the audits. Efforts should focus on the most cost-effective alternatives. Economic evaluation of water projects will include the following:

4.7.1. The cost of energy saved due to reduced water usage.

4.7.2. The direct cost of water

4.7.3. The cost of heating hot water saved.

4.7.4. O&M costs of wells, pumps, treatment facilities, etc.

4.7.5. Reduced sewer costs.

4.7.6. O&M savings realized by new processes, equipment (retrofit), or other implementations.

4.7.7. Availability of grant funding to improve economic analysis of programs.

4.8. Economic Analysis Tools. The National Institute of Standards and Technology's (NIST) life-cycle cost analysis software, Building Life Cycle Cost (BLCC) 4.2-95 and Handbook NBS 135 are on the National Institute of Building Sciences' (NIBS) Construction Criteria Base (CCB). The US Army's Construction Engineering Laboratory's Life Cycle Cost In Design (LCCID) is also on the CCB. These software packages allows the user to make a variety of economic calculations for energy and/or water conservation projects and are recognized by DOD for FEMP and ECIP projects. The software allows for seasonal variances, price escalation rates, and annual usage indices. The software also assists in the calculation of simple pay back,

net savings, adjusted internal rate of return (AIRR), and savings-to-investment ratios (SIR). NIBS updates the CCB quarterly and distributes it to all Air Force MAJCOMs and bases. Air Force energy managers may obtain more information on the CCB from HQ AFCEA/CES, 139 Barnes Dr, Suite 1, Tyndall AFB FL 32403-5319.

4.8.1. Typically the projects with the most economical pay backs include the following:

4.8.1.1. Plumbing retrofit (shower heads, toilets, etc.)

4.8.1.2. Leak detection and repair

4.8.1.3. Xeriscaping, waste water reuse, and other cost-effective landscaping techniques

4.8.1.4. Projects funded in whole or in part with grant money

4.8.1.5. Modifications to cooling towers, boilers and processes equipment

4.9. Program Implementation. The implementation and execution of a water conservation plan depends largely on the level of commitment by those involved in the implementation. Before a conservation program is implemented, notify the occupants of the facility of the program and its procedures. For example, distributing a letter to all occupants expressing support for and explaining the new program is a good start. The letter explains why changes are being made, what differences the changes will make and why water management projects are necessary.

4.9.1. Post notices near water equipment to notify correct usage and inform visitors of water conservation initiatives at that facility. Other program support methods might include setting up a hot line for questions or reporting detected leaks, distributing flyers to increase awareness, or setting up a bulletin board to track program progress and recognize exceptional efforts by individuals.

4.9.2. Monitor the program and keep close ties with the facility users to determine what is working and what is not. Monitor consumption rates to determine the effectiveness of the program. It is also very important to share program monitoring results with facility occupants to increase program awareness.

4.10. Technical Assistance.

4.10.1. To assist in the implementation of conservation programs, EPACK 92 and Executive Order 12902 directs DOE to provide the following:

4.10.1.1. Guidance explaining the relationship between water use and energy consumption as well as the energy savings achieved through water conservation efforts (still in process)

4.10.1.2. A guide outlining innovative funding options (still in process)

4.10.1.3. An annual newsletter consisting of sample contracts, case studies, guidance, and success stories (not available as yet)

4.10.1.4. Viable technologies available through the national energy laboratories (still in process)

4.10.1.5. Training to assist in the identification of cost-effective procedures (call FEMP for a seminar schedule at 1-800-566-2877)

4.10.1.6. A list of qualified water contractors nation-wide for inclusion on a Federal schedule

4.10.1.7. A model provision on water conservation to be included in new leasing contracts

4.10.2. To assist in the implementation of conservation programs, EPACT 92 and Executive Order 12902 directs GSA to provide the following:

4.10.2.1. A list of utilities that will perform no cost audits for water conservation and/or offer special services/incentives such as demand-side management (still in process)

4.10.2.2. Techniques and methods that will facilitate the procurement process. (still in process)

Attachment 1

GLOSSARY

Adjusted internal rate of return (AIRR) provides a measure of return on investment of a selected project relative to other potential investments that can be made.

Annual Savings refers to the expected yearly savings (in dollars) for implementing a particular project.

Comprehensive facility audit refers to an examination of a building or facility that provides sufficiently detailed information to allow an agency to enter into water savings performance contracts or to invite inspection and bids by private upgrade specialists for direct agency funded energy or water efficiency investments (EO 12902 Sec. 102).

Demand-side management refers to utility sponsored programs that promote water conservation to fulfill demand instead of increasing the supply of water to meet demand (supply side) (EO 12902 Sec. 104).

Federal building refers to any individual building structure, or part thereof, including the associated energy or water-consuming support systems, that is constructed, renovated, or purchased in whole or in part for use by the Federal Government and that consumes energy or water. Also included under this term shall be any building leased in whole or in part by the Federal Government where the term of the lease exceeds 5 years and the lease does not prohibit implementation of the provision in question (EO 12902, Sec. 107).

Federal facility, for Air Force purposes, refers to an *entire* base as a whole.

Gain sharing refers to incentive systems that allocate some portion of savings resulting in productivity to the workers who produce those gains (EO 12902, Sec. 110).

Industrial facilities refers to any fixed equipment, building, or complex used for the production of goods that uses large amounts of capital equipment in connection with, or as part of, any process or system, and within which the majority of energy use is not devoted to the heating, cooling, lighting, ventilation, or to service the hot water load requirements of the building (EO 12902, Sec. 111).

Life-cycle cost refers to the cost incurred over the life of a system.

Prioritization survey refers to a rapid assessment that will be used by an agency to identify those facilities with the potential projects so they can be ranked based on the degree of cost effectiveness and to schedule comprehensive facility audits prior to project implementation (EO 12902, Sec. 113).

Renewable energy sources refers to, but is not limited to, agricultural and urban waste, geothermal energy, solar energy, and wind energy (EO 12902, Sec. 115).

Savings-to-investment ratio (SIR) refers to the total net discount savings divided by the total investment.

Attachment 1

Energy Savings Performance Contracting refers to a contract under which the contractor incurs the cost of implementing water savings measures (including, but not limited to, performing the audit, designing the project, acquiring and installing equipment, training personnel, and operating and maintaining the equipment) and in exchange for providing these services, the contractor gains a share of any energy cost savings directly resulting from implementation of such measures during the time of the contract (EO 12902, Sec. 114).

Simple pay back refers to the amount of time required for the savings of a proposed project to cover (pay back) the initial investment cost. Total investment divided by annual savings.

Total Investment refers to the total amount of money required to initiate a proposed project.

Total Net Discount Savings refers to the sum of all discounted energy savings plus the sum of all non energy discounted savings.

Water savings performance contracts refers to contracts that provide for the performance of services for the audit, design, acquisition, installation, testing, operation, and maintenance/repair of an identified water conservation measure or series of measures at one or more locations (EO 12902, Sec. 105).

Xeriscaping refers to the strategic selection, placement, and maintenance of plants/soil/irrigation techniques and equipment that optimize water use.