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Policies and Procedures

Title: ARS Energy Management Plan

Number: 134.2-ARS

Date: July 6, 1998

Originating Office: Facilities Division, Facilities Engineering Branch, AFM/ARS

This Replaces: ARS 134.2 dated 4/21/95

Distribution: ARS Headquarters, Areas, Locations

This P&P provides the Agency's plan to implement the goals and requirements of the National Energy Conservation Policy Act (NECPA), as amended.

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1. Introduction

This plan provides policy, procedures, and responsibilities for the conservation and management of energy and water within the Agricultural Research Service (ARS). It implements the goals and requirements of the National Energy Conservation Policy Act (Public Law 95-619), as amended, and Executive Orders (E.O.) relating to energy conservation and management.

The scope of the ARS Energy Management Plan is Agencywide, encompassing policy, procedures, and activities as they relate to:

- Federal buildings and facilities owned and leased by ARS;
- Federal buildings and facilities delegated to ARS by General Services Administration (GSA);
- equipment owned, assigned or leased including vehicles, aircraft, and vessels;
- internal operations and procedures as they impact the consumption of energy, such as travel, procurement, work habits, etc.; and
- management and employee awareness of the energy program and its objectives, and their roles in meeting these objectives.

Background

The National Energy Conservation Policy Act (NECPA) (Public Law 95-619), as amended by the Federal Energy Management Improvement Act of 1988 (Public Law 100-615) and the Energy Policy Act of 1992 (Public Law 102-486), including Executive Order (E.O.) 12759 (April 17, 1991) and E.O. 12902 (March 8, 1994), established the energy management goals and requirements of the Federal Government.

Congress found that:

- the Federal Government is the largest single energy consumer in the Nation;
- the cost of meeting the Federal Government's energy requirement is substantial;
- there are significant opportunities in the Federal Government to conserve and make more efficient use of energy through improved operations and maintenance, the use of new energy efficient technologies, and the application and achievement of energy efficient design and construction;

- Federal energy conservation measures can be financed at little or no cost to the Federal Government by using private investment capital made available through contracts authorized by Title VIII of the NECPA, as amended; and
- an increase in energy efficiency by the Federal Government would benefit the Nation by reducing the cost of government, reducing national dependence on foreign energy resources, and demonstrating the benefits of greater efficiency to the Nation.

Mandated Goals and Requirements of NECPA and Executive Orders

NECPA:

- 20 percent reduction in energy consumption per gross-square-foot of the Agency's buildings in use by the year 2000 from the Agency's 1985 energy use.
- Installation of all cost-effective energy and water conservation measures, to the maximum extent practicable, by the year 2005.

E.O. 12902:

- 30 percent reduction in energy consumption per gross-square-foot of the Agency's buildings in use by the year 2005 from the Agency's 1985 energy use.
- 20 percent increase in energy efficiency in the Agency's industrial facilities by the year 2005 as compared to the 1990 benchmark established by the Department of Energy (DOE), to the extent these measures are cost effective, and shall implement all cost effective water conservation projects.
- Minimization of petroleum-based fuel use in Federal buildings and facilities by switching to less polluting or nonpetroleum-based energy source, such as natural gas or solar and other renewable energy sources, if practical and cost effective.
- Procurement of energy efficient products;
- Utilization of innovative financing and contractual mechanisms including, but not limited to, utility Demand-Side Management (DSM) programs and Energy Savings Performance Contracts (ESPC).

E.O. 12759:

- Implementation of vehicle fuel outreach programs, including but not limited to ride sharing and employee awareness programs, to reduce the petroleum usage by Federal employees and by contractor employees at Government-Owned Contractor-Operated (GOCO) facilities.

ARS Energy Policy and Performance Goals

The energy policy of ARS is to foster energy management practices which will ensure the most efficient use of energy and water in the Agency, while maximizing the ability of the Agency to accomplish its research mission and maintaining the health and safety of its employees and visitors.

In accordance with NECPA, an agency may exclude any Federal building, or collection of Federal buildings, from the energy reduction goals established for FY 2000 and FY 2005, if the Agency finds that compliance with such requirements would be impractical.

Due to the energy intensiveness of Agency research activities, ARS designates all Agency buildings and facilities to be “*exempt*” from the NECPA and Executive Order energy reduction requirements. To improve energy and water efficiency and conserve energy and water in exempt facilities, ARS will institute/emphasize operation and maintenance (O&M) conservation and employee awareness programs, conduct prioritization surveys, comprehensive facility audits, and retrofit measures to the maximum extent practicable by FY 2005. For economic reasons, priority consideration for conservation actions will be given to Agency-owned facilities 10,000 gross square feet (gsf) and larger, which include either a heating system, a cooling system, or both. ARS will take advantage of ESPC, Demand-Side Management (DSM) services, and utility rebates, to reduce direct Agency funding of energy conservation measures.

Reasons for ARS Exemption:

- Current Agency research missions have increased the demand for energy. The energy reduction mandate assumes Agency mission remains at 1985 level.
- The expense of engineering surveys, energy audits, retrofit, and energy monitoring is not always cost effective, due to the nature of ARS space and building inventory (over 3,000 buildings with an average size less than 4,000 square feet) widely dispersed around the United States.
- The Agency has been accomplishing energy conservation projects since the early 1980’s. Most of the obvious and high energy saving measures were completed before 1985. The remaining potential energy conservation opportunities are limited, generally expensive, and will produce less energy savings.
- The building modifications and changes in tenant operations that have taken place since 1985, including changes in climate conditions, have increased the demand for energy. Examples include installation of more fume hoods, refrigeration cold boxes, constant temperature rooms, building additions, conversion of existing office space to laboratories, and increased use of personal computers.

- Actual energy savings will not be effectively tracked due to constant renovation work. In addition, energy conservation actions at some facilities will not be cost effective due to planned building modernization.
- Current code requirements for increased laboratory ventilation to enhance health and safety of personnel will increase the Agency's demand for energy. Existing laboratory heating, ventilating, and air conditioning (HVAC) systems allow recirculation of a maximum amount of indoor air. Current laboratory design standards discourage this practice due to potential health hazards to building occupants. As part of the Agency's effort to modernize ARS facilities, these existing HVAC systems will be replaced with systems that will heat and cool 100 percent fresh air (no recirculation) which will result in a dramatic increase in cooling and heating energy demand.
- A major effort is needed to validate the Agency's energy usage using the National Finance Center's (NFC) records. NFC's energy/travel report subsystem is an old, non-database type system which is in need of modernization to allow better utilization and verification of the data. It has no ability to match energy consumption periods with utility billings. Data is not readily available on a site-by-site or building-by-building basis.
- A lack of individual utility metering for more than 3,000 ARS buildings prevents the Agency from establishing baseline, measure, and track consumption by energy source on a building-by-building basis. Many buildings are supplied by a central heating/cooling plant and serviced by only one or two gas and electric meters for several structures. Installation of separate utility meters by energy source for all buildings is not considered practical.

2. Existing Facilities

As provided by NECPA, due to the energy intensiveness of ARS research activities, ARS buildings and facilities are exempt from achieving the energy reduction goals established for Federal buildings. In accordance with E.O. 12902, ARS shall improve energy and water efficiency in such exempt facilities by conducting prioritization surveys, comprehensive facility audits, and retrofit measures. To the maximum extent practicable, ARS shall install all cost effective energy and water conservation measures no later than January 1, 2005.

The procedures contained in this section apply to both owned and leased facilities. See Section 4 of this plan to determine applicability for leased space.

Energy Conservation Standard

For alteration work in existing buildings, the following standards published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) apply:

- ASHRAE Standard 100.3: Energy Conservation in Existing Buildings.
- ASHRAE Standard 100.5: Energy Conservation in Existing Buildings - Institutional.
- ASHRAE Standard 100.6: Energy Conservation in Existing Buildings - Public Assembly.

Prioritization Survey

In 1996, ARS completed the prioritization surveys required by E.O. 12902. The surveys identified the energy consumption characteristics of existing ARS buildings and facilities, including the type, size, energy and water use levels of the facility. From the surveys, ARS formulated a national priority list for conducting comprehensive facility audits at locations with high energy utilization per building gsf.

Comprehensive Facility Audits

A comprehensive facility audit can be defined as a study of each Federal building to identify potential energy conservation opportunities (ECO's) to improve energy and water efficiency. E.O. 12902 requires Federal agencies to conduct comprehensive facility audits of approximately 10 percent of the Agency's buildings and facilities each year and to install all cost effective energy and water conservation measures no later than FY 2005. In addition, the E.O. requires agencies to minimize the use of petroleum products for facilities operations or building purposes by switching to an alternative energy source if it is estimated to minimize life-cycle costs and will not violate Federal, State, or local clean air standards. To satisfy the requirements, ARS has developed a 10-year plan for implementing a comprehensive energy audit program and retrofit measures. Subject to available annual funds, the Areas shall implement the Agency approved 10-year energy retrofit plan (dated August 19, 1996.)

Building Retrofit

During the comprehensive facility audits, all potential ECO's will be identified. ECO's may include modification to the building, its equipment, or O&M procedures. Many of the ECO's could have a major effect with little expenditure. Others will require considerable capital outlay to achieve a net savings over time.

Since it is unlikely that funding for all ECO's will be assigned simultaneously in the same fiscal year, ECO's shall be prioritized based on Savings-To-Investment Ratio (SIR). Assuming a

limited amount of available funding, it is important that the ECO's funded represent those that produce the most energy savings for the least amount of investment.

Generally, SIR is determined by dividing the energy saved by the required investment. For a detailed explanation of this procedure, refer to the latest edition of *Handbook 135, "Life-Cycle Costing Manual for the Federal Energy Management Program,"* published by the National Institute of Standards and Technology (NIST).

The NECPA requires that priority for accomplishing retrofit actions be given to energy saving adjustments in O&M procedures before actions that require substantial structural modification or installation of equipment. Additional consideration shall be given for implementing cost effective measures that minimize use of petroleum products for facilities operations or building purposes through switching to an alternative energy source.

Recommended "No or Low Cost" Energy Conservation Actions

Occupant conservation actions:

- Turn off lights/office equipment when not in use.
- Reduce the use of elevators. Walk down two flights or up one flight instead of using elevators.
- Keep windows/doors shut in areas that are being heated or cooled.
- Close blinds, shades, and drapes at night during the heating seasons to reduce heat loss through the window area. Open them during the day to use the sun for heating the rooms.
- Close blinds, shades, and drapes during the day in summer. These interior shading devices can reduce heat gain in the room as much as 50 percent.
- Minimize overtime work. Consolidate work areas of after-hours workers to minimize the amount of space that must be heated, air conditioned, and lighted.
- If rooms are individually controlled by thermostats, keep temperatures above 76° F in the summer and below 70° F in the winter.
- Avoid the use of fans and space heaters if the building HVAC systems are operating.
- Do not block HVAC air distribution outlets with books, furniture, etc.
- Keep energy conservation awareness a priority by way of staff meetings, newsletters, posters, etc.

Facility managers O&M conservation actions:

- Institute and emphasize energy conservation awareness programs for building occupants by publishing/announcing actions indicated above.
- Perform inspections of the facility to determine compliance with temperature and lighting criteria, condition of equipment, piping, and controls, and the need for repair.
- Do not add heat to keep buildings warmer than 55 °F when unoccupied in the heating season.
- Keep the building envelope, equipment and systems properly maintained to promote efficient operation of HVAC systems.
- Keep temperatures between 65 °F and 70 °F in the heating season and between 76 °F and 80 °F in the cooling season, where practicable (41 CFR 101).
- Do not cool buildings when unoccupied, except as required to achieve target temperature ranges during occupied hours in extreme weather conditions.
- Review building operating plans and tailor start-up and shut-down times of HVAC systems so that target temperature ranges are met within 1 hour of occupants arriving and departing the building, taking into account outdoor temperatures.
- Reduce the operating hours of HVAC systems, ventilation systems, water heating systems, lighting systems, escalators and elevators, and equipment and machines.
- Lower humidification/raise dehumidification set points.
- Install locking thermostats to prevent unauthorized settings.
- Reduce water temperatures to lavatories.
- Install timers and/or occupancy sensors, as appropriate, to cut off lights and equipment automatically.
- Use energy-efficient fluorescent lamps. Replace incandescent light bulbs with compact fluorescent lamps. Select replacement lamps with high Color Rendering Index (CRI) lamps and reduce number of lamps where lighting level will be adequate.
- Participate in load-shedding programs of electric utilities.

- Clean lighting fixtures and replace lamps (with energy efficient lamps) on a regular maintenance schedule to maintain proper lighting levels.
- Reduce lighting levels during working hours to 50 foot-candles (fc) at work station surfaces, 30 fc in general office space not at work station surfaces, and 10 fc in non-work areas, in conformance with 41 CFR 101. Eliminate unnecessary lighting. Turn lights off when not in use. Occupants in areas with computers and video display terminals may benefit from lower lighting level using parabolic fixture lenses - refer to Illuminating Engineering Society publications for guidance.
- Adjust system and equipment settings hourly, daily, weekly, or seasonally to obtain the most energy efficient operation, based on weather conditions and the system characteristics.
- Perform preventive maintenance and cleaning of HVAC equipment on a regular basis.

Energy conservation retrofit actions:

- Reduce heat conduction through ceilings, roofs, floors, and walls by installation of insulation and vapor barriers.
- Reduce solar heat gain through roofs by installing reflective roof surfaces.
- Reduce heat conduction and long-wave radiation through glazing areas by installing storm windows or multiple glazed windows, by insulating movable windows, or by installing operable windows.
- Control solar heat gain through glazing areas by use of shading, tinted or reflective glazing or films, or by installing air-flow windows, or window screens with reflective/insulating characteristics.
- Reduce infiltration by caulking and weatherstripping doors and windows or constructing vestibules.
- Improve HVAC equipment efficiency (i.e., chiller, boiler, furnace, etc).
- Reduce energy used for tempering supply air by installing Variable Air Volume systems, or by resetting supply air, hot water, or chilled water temperatures.

Demonstrations in Existing Facilities

In accordance with E.O. 12902, ARS shall designate one of its existing major buildings to become a showcase to highlight energy or water efficiency and also shall attempt to incorporate

cogeneration, solar and other renewable energy technologies, and indoor air quality improvements. In support of this initiative the Facilities Division (FD), in conjunction with the Areas and locations, will reevaluate possible candidate modernization projects on an annual basis for energy showcase designation. Selection of such buildings shall be based on considerations such as the level of non-Federal visitors, historic significance, and the likelihood that visitors will learn from displays and implement similar projects.

3. New Federal Buildings

In accordance with E.O. 12902, ARS shall utilize energy efficiency, water conservation, or solar or other renewable energy technologies in the design and construction of new Agency facilities to minimize the life cycle cost of such facilities. This section will apply as well to those buildings constructed for the purpose of leasing to the Agency.

Energy Design Standard

The governing energy design standard for Federal buildings is the DOE Standard, 10 CFR, Part 435 Energy Conservation Voluntary Performance Standards for Commercial and Multi-Family High Rise Residential Buildings; Mandatory for New Federal Buildings; Interim Rule.

ARS adopts the latest edition of *ASHRAE Standard 90.1, "Energy Efficient Design of New Buildings Except Low-Rise Residential Buildings,"* published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE), for energy conservation. Since it is an industry standard, ASHRAE 90.1 typically uses the verbs "recommended," "suggested," etc. Any text phrased as a recommendation in the Standard will be understood as a mandatory requirement. The performance of buildings designed according to ASHRAE 90.1 will be equivalent to those designed to 10 CFR 435.

New Building Showcases

In accordance with E.O. 12902, when the Agency constructs at least five buildings in a year, the Agency shall select and designate at least one of the buildings as energy showcase. FD, in conjunction with the Areas and locations, will identify major construction projects (with congressionally appropriated dollars) for energy showcase designations. The design of the energy showcase new building project shall incorporate advanced technologies and practices for energy efficiency, water conservation, or use of solar and other renewable energy.

4. Leased Federal Buildings

In accordance with E.O. 12902, ARS shall conduct surveys and audits of leased facilities to the extent practicable, and to implement the recommendations of those surveys and audits to the

extent they could be implemented under the terms of the lease and in coordination with the university's energy plans.

ARS-leased buildings pose a particular challenge to effect cost-effective energy conservation opportunities due to several factors. Opportunities for energy conservation vary considerably and are heavily affected by the term, size, cost of lease, cost of the proposed actions, administrative costs, and other leasing regulations. A careful balance of administrative costs involved in the acquisition of space, energy survey analysis, and the net economic effect of energy saved should be a standard for energy conservation programs for ARS-leased facilities.

The following guides, applying to ARS leasing activities, have been developed within the spirit of the current applicable energy laws and Executive Orders.

Scope

The procedures described below are applicable to the acquisition and permitting out of space and facilities by ARS. In applying these guidelines, it is important to recognize that the document and/or administrative procedures used in the acquisition or permit process do not, in and of themselves, deter or prohibit affirmative conservation efforts. In addition, where occupancy is on an assignment basis, the occupying agency must be made to cooperate to the fullest with the conservation activities of ARS.

GSA Assignments. In GSA-acquired leased space occupied by ARS, GSA is responsible for the development, implementation, and reporting of conservation efforts as they relate to the facility. ARS is expected to participate in and cooperate with the GSA efforts to the fullest. To the extent practicable, ARS shall develop and implement conservation actions (no or low cost) as they relate to the Agency's operation within the facility.

ARS Lease Agreements. ARS has authority to enter into lease agreements to obtain space and facilities for its operations. For the purpose of this section, space and facilities occupied under a cooperative agreement will be treated the same as those obtained through leasing action. While no formal energy conservation efforts should be conducted where the Agency does not pay for energy costs directly or where space is located in a building co-occupied with several other tenants, conservation of energy through management or operation changes is encouraged.

Size of Lease. In a number of ARS lease actions where the acquisition involves relatively small amounts of space, the dollar savings achieved through reduced consumption will normally not equal or exceed the cost of the action. It has been established that the administrative expense of extensive leasing and monitoring procedures will exceed any cost savings achieved through reduced energy consumption where the quantity of space is less than 10,000 gsf. Therefore, the audit and survey requirements of Section 2 of this plan and the certified energy analysis

requirements described below are not applicable to new leases or lease renewals for space quantities of less than 10,000 gsf.

Term of Lease. The cost effectiveness of conservation actions taken is predicated on the life of the building, in this case the term of occupancy. Considering the applicability of life cycle costing, it has been determined that a retrofit investment by the Government will not normally be cost effective and should not be undertaken when the life of occupancy is less than 5 years. The audit, survey, and retrofit requirements of Section 2 of this plan will not apply to leases of less than 5-year firm term or to renewable 1-year leases with less than five renewal options remaining.

In the case of long-term leases exceeding these time periods and where the amount of space is 10,000 gsf or more, the audit and survey requirements will apply and cost effective retrofit action shall be taken.

Leasing Procedures

In the absence of the size and/or lease term exclusions outlined above, positive actions by the Agency should be taken to ensure that facilities leased for ARS programs are energy efficient.

Lease Renewals. Prior to the renewal of leases, an energy survey to determine energy efficiency and retrofit potential of the occupied building shall be conducted. The scope of the survey must be commensurate with the size, cost, and term of the lease. This process should also be applied to alternative locations considered in the pre-renewal canvas. All of the facilities should then be ranked according to the existing and/or anticipated efficiency and that ranking made a part of the total evaluation process.

If it is determined that renewal of the existing lease is in the best interest of the Government, the Agency shall negotiate with the lessor prior to renewal, to identify and effect any actions that would increase the energy efficiency of the facility. In absence of voluntary action on the part of the lessor, and where cost effective to the Government over the term of the lease, the Agency shall consider funding the retrofit actions.

New Leases. Energy efficiency considerations shall be incorporated in solicitations for space and facilities to house ARS operations. These energy efficiency considerations shall be used as evaluation factors in determining the most beneficial offer. For all offers of buildings not yet constructed, only those meeting or exceeding the ASHRAE Standard 90.1 shall be considered as responsive. Verification that the design meets or exceeds this standard shall be furnished by the offeror through a registered architect or engineer or other qualified persons. Specific energy budgets (BTU/Sq.Ft./Year), commensurate with the proposed duty cycles and/or operating schedule of the Agency, shall be provided by the designer for analysis purposes.

If existing space or facilities are being considered, the energy performance goals for the building in the region in which it is located shall be established. Verification of this requirement will necessitate the offeror furnishing prior year utility data. This data shall reflect, or be adjusted to reflect the usage, hours of operation, etc., anticipated by the occupying ARS unit. In the absence of acceptable current performance, offerors shall be allowed to include proposed retrofit action with their offer, designed to bring their facility within the acceptable performance range. The design verification processes required for new buildings shall also be applicable to all such retrofit proposals.

Evaluation of Offers. In addition to the proposal requirements, energy costs shall be made a part of the evaluation process for new and renewable leases. This can be readily achieved by prorating the usage data submitted to the square footage offered or by converting design BTU's to the current dollar value and then applying to the square footage. This cost shall be added to the offered square foot cost for evaluation purposes.

Monitoring Energy Consumption

To ensure that energy efficiency is being achieved and maintained, consumption data is a prerequisite. Unless the lease is the fully-serviced type, leases shall include provisions for utility metering of the space or facility, if possible, with payment of the utility costs by the lessee. Annual consumption shall not exceed the levels made a part of the lease unless the operations of the Agency are the causative factor.

Continuing Conservation Efforts

Irrespective of the amount of space or the term of the lease, the Agency shall be alert to and seek out potential energy conservation measures on a continuing basis. Section 7 of this plan addresses methods of promoting employee involvement. Every effort shall be made to effect identified conservation measures through negotiation with the lessor.

Permitted Out Facilities

Buildings and facilities "owned" by ARS and permitted out shall be subject to the same treatment as those "owned" and occupied. The audit, survey, and retrofit requirements in Section 2 of this plan are applicable. Where permittees have been allowed to construct buildings or facilities on Federal land, they shall be urged to take action to improve the energy efficiency of the buildings and facilities. Retrofit to bring the building in line with acceptable energy consumption levels shall be a part of the permit renewal process. Permitted new buildings constructed on Federal land shall be constructed in conformance with ASHRAE Standard 90.1.

5. General Operations

General Operations, which includes all nonfacility energy consumption, annually accounts for more than half of the Agency's total energy consumption. The following provides the ARS strategy to improve energy and water efficiencies in the general operations categories.

Vehicle Transportation

Since gasoline consumption accounts for a large percentage of the Agency's energy consumption, the vehicle transportation sector is a prime target for conservation opportunities. E.O. 12759 required a 10 percent reduction in gasoline and diesel fuel consumption by FY 1995 from FY 1991 levels.

Although the 10 percent reduction goal for gasoline and diesel fuel (mandated by E.O. 12759) ended in FY 1995, DOE will continue to collect consumption data on these fuels as it has since 1975. To relieve the reporting burden on smaller agencies that consume only gasoline and diesel in passenger vehicles, DOE will work with the General Services Administration to capture that consumption and cost data directly to DOE. In most cases, these agencies already have reporting systems in place to accommodate this.

The following discusses the ARS strategy to reduce vehicle fuel consumption within ARS. A comprehensive energy policy shall be adopted for all vehicle resources of the ARS. This includes owned, GSA-leased, and commercially leased vehicles and equipment.

Owned and Leased Motor Vehicles. ARS owns and operates approximately 3,700 motor vehicles. Every effort shall be made to achieve the most fuel efficient mix of vehicles for the mission requirement and geographic location. In concert with normal planning and programming, the Agency shall develop and implement procedures specifically directed at achieving energy efficiency in the management and operation of vehicles. As a minimum, the procedures shall address:

- *Fleet Mix:* Acquiring fuel efficient vehicles to meet mission requirements. These vehicles shall be of the minimum size, weight, and options necessary to complete the mission requirements of the Agency.
- *Coordination of Vehicle Use:* Procedures for trip planning, pooling, redistribution of vehicles, and other methods of achieving the best utilization of vehicles.
- *Maintenance:* Procedures for an effective preventive maintenance program in accordance with manufacturer's standards, including regular tune-ups, wheel alignments, and keeping tires inflated to the pressure designated on the sidewall.

- *Use of Alternative Fuels:* Requirement for all ARS vehicle operators to use alternative fuels in ARS-owned or leased vehicles when the vehicle is a dual fuel vehicle or dedicated alternative fuel vehicle and where available competitively at fuel facilities participating in the Defense Fuel Supply Center (DFSC) credit card program. In addition, the requirement shall ensure that all bulk storage tanks are filled with alternative fuels purchased through DFSC contracts. Alternative fuels include ethanol/gasoline (E85), methanol/gasoline (M85), compressed natural gas (CNG), Liquefied Natural Gas (LNG), and Liquid Propane Gas (LPG).
- *Operator Training:* A program to keep operators alert to fuel efficient driving and operation techniques. This educational effort shall include such actions as driving at posted speed limits; avoiding sudden bursts of speed, tailgating, or pumping the accelerator pedal while the vehicle is not in motion; not idling the engine for long periods of time; eliminating unnecessary weight in the trunk or truck bed; and encouraging pooling and combining of travel needs.

Vehicle Fuel Efficiency Outreach Programs.

In accordance with E.O. 12759, ARS shall implement vehicle fuel efficiency outreach programs, such as ride sharing and employee awareness programs, to reduce petroleum fuel usage by ARS employees and contractors where appropriate. Procedures shall be developed to make users of ARS motor pool vehicles aware of the ride sharing aspects of the program. The Agency shall distribute available information to employees regarding the other outreach ride sharing programs.

Industrial/Laboratory Operations

In accordance with E.O. 12902, each agency shall develop and implement a program for its industrial facilities in the aggregate with the intent of increasing energy efficiency by at least 20 percent by the year 2005 as compared to the 1990 benchmark, to the extent these measures are cost effective, and shall implement all cost effective water conservation projects. DOE, in coordination with the 656 Committee, shall establish definitions and appropriate indicators of energy and water efficiency, and energy and water consumption and costs in Federal industrial facilities for the purpose of establishing a base year of 1990.

The industrial and laboratory operations of the Department and ARS are numerous and diverse, ranging from supply warehousing to centralized computer operations, from laboratory bench work to mass micro-organism reproduction, from road construction to farm operations. The Department will develop appropriate energy guidelines affecting industrial and laboratory operations. The guidelines will detail conservation measures that can be taken on a general scale, not site specific. The intent will be to provide a checklist of the processes, procedures, and equipment that should be examined, and possible actions to achieve optimum energy efficiency while maintaining a high level of employee safety and health. In the interim, every effort shall be made to reduce energy consumption within the Agency's industrial/laboratory operations

wherever possible. Related surveys, evaluations, and conservation efforts, involving major industrial/laboratory operations shall be performed after the guidelines are made available.

6. Procurement of Goods and Services

Procurement of Energy-Efficient Products

Best Practice Technologies. In accordance with E.O. 12902, ARS shall purchase energy-efficient products in accordance with the guidelines issued by OMB. The guidelines include listings of energy-efficient products and practices used in the Federal Government. At the minimum, OMB updates the listing annually. ARS shall purchase products listed as energy efficient in the guidelines whenever practicable, and whenever they meet the Agency's specific performance requirements and are cost effective. To the extent practicable and cost effective, ARS shall increase purchases of products that are in the upper 25 percent of energy efficiency for all similar products, or products that are at least 10 percent more efficient than the minimum level that meets Federal standards. This requirement shall apply wherever such information is available either through Federal or industry approved testing and rating procedures.

Accelerated Retirement of Inefficient Equipment. In accordance with the guidelines established by DOE, ARS shall take advantage of the cost effective early retirement of older, inefficient appliances and other energy and water using equipment in the Agency's facilities. Consideration shall be given to significant improvements in energy efficiency and water conservation opportunities to down size or otherwise optimize the replacement equipment as a result of associated improvements in building envelope, system, or industrial process efficiency, and reduction in pollutant emissions, use of chlorofluorocarbons, and other environmental improvements.

Government-Owned Contractor-Operated Facilities Management Contracts

In accordance with E.O. 12902, ARS shall incorporate energy efficiency and water conservation goals and requirements of the NECPA in all Government-Owned Contractor-Operated (GOCO) facilities management contracts. To the extent practicable, O&M solicitation shall contain an energy evaluation element and requirements for the contractor to monitor and report annual savings.

Use of Innovative Financing and Contractual Mechanisms

In accordance with E.O. 12902, in addition to available Agency appropriations, ARS shall utilize innovative financing and contractual mechanisms, including, but not limited to, utility demand

side management programs and energy savings performance contracts, to meet the goals and requirements of NECPA and the E.O.

Utility Demand-Side Management (DSM) Programs. Refers to utility-sponsored programs that increase energy efficiency and water conservation or the management of demand. The Agency shall review procedures used to acquire utility and other related services and, to the extent practicable, remove any impediments to receiving, utilizing, and taking DSM services, incentives, and rebates offered by utilities and other private sector energy service providers.

Energy Savings Performance Contracts (ESPC). As authorized under Title VIII of NECPA, ARS shall establish and utilize, to the extent practicable, a program of incentives for conserving, and otherwise making more efficient use of energy, as a result of entering into ESPC. The portion of the funds appropriated to the Agency for energy expenses for a fiscal year that is equal to the amount of cost savings realized by the Agency for such year from ESPC shall be obligated to undertake additional energy conservation measures.

Under ESPC, a private energy service company provides the capital for energy efficiency improvements including the performance of energy audits, purchase and installation of new equipment, operation and maintenance of new equipment, and personnel training. In exchange for its investments, the contractor receives a share of the energy cost savings that result from the conservation measures over the term of the contract.

To the maximum extent practicable, the Agency shall utilize ESPC and train its procurement and engineering personnel by participating in DOE's Federal Energy Management Program workshops on Energy Savings Performance Contracting.

7. Motivation

Management Commitment

ARS managers shall have a continuing awareness of the national need for energy conservation, examine management decisions as to their impact on consumption, and monitor the efforts of ARS in developing energy management objectives and progress toward meeting those objectives.

Energy Management Training

In accordance with NECPA, ARS shall establish and maintain a program to ensure that all its facility energy managers are "trained energy managers." The term "trained energy manager" means a person who has demonstrated proficiency or who has completed a course of study in the areas of fundamentals of building energy systems, building energy codes and applicable

professional standards, energy accounting and analysis, life-cycle cost methodology, fuel supply and pricing, and instrumentation for energy surveys and audits.

ARS managers shall encourage employees to participate in energy manager training courses. Employees may enroll in courses of study in the areas described above including, but not limited to, courses offered by private or public educational institutions, Federal agencies, or professional associations.

Employee Awareness

The success of the Agency's energy conservation program will be in direct relation to the understanding and commitment of all ARS employees. The educated and committed ARS employee will recognize the advantages of carrying out conservation actions within his or her home, thereby contributing to national conservation needs.

In addition to regularly scheduled staff meetings, to keep employee awareness at a high level, the Agency shall distribute available energy conservation publications and/or posters obtained from DOE.

Employee Involvement

To the greatest extent possible, all ARS employees should be involved in the energy conservation program, recognized for their achievements, and provided assistance in carrying out conservation initiatives. The following are only a few directions that can be taken. All ARS managers are urged to seek out and initiate other employee involvement program actions.

Conservation Committees. ARS managers are encouraged to establish an energy committee, representing a cross section of employees within their jurisdiction and, to the greatest extent possible, involve the committee in energy management decision making.

Incentive Awards. Through the Agency's employee incentives programs, ARS managers are encouraged to recognize and reward employees who have provided exceptional performance in implementing the Agency's energy conservation program.

8. Federal Energy Cost Accounting and Management

In accordance with E.O. 12902, ARS shall implement the guidelines established by OMB to assess accurate energy consumption for all buildings or facilities which the Agency owns, operates, manages or leases, where the Government pays utilities separate from the lease and the Government operates the leased space.

- Each facility manager shall maintain energy consumption and energy cost records for review by the Inspector General, the Congress, and the general public.
- Each facility manager shall establish a monitoring system to determine:
 - which facilities are the most costly to operate when measured on an energy consumption per square foot basis or other relevant analytical basis;
 - unusual or abnormal changes in energy consumption; and
 - the accuracy of utility charges for electric and gas consumption.

9. Data Collection and Reporting

It is in the interest of the Agency to limit reporting to the minimum necessary to ensure progress towards achieving the objectives of the program and to satisfy imposed external reporting requirements. To the greatest extent possible, existing systems, such as the Central Accounting System (CAS), budget processes, etc., will be utilized to satisfy these needs. As mandated by the Congress, DOE, and other cognizant agencies, the following constitute the principal formal reporting requirements of the Department and the USDA agencies.

Annual Report to Congress

As required under the Act, and by March 31 of each year, USDA shall report annually to the Secretary of Energy and the Office of Management and Budget (OMB). The report shall describe the Department's progress in achieving the goals of NECPA and E.O. 12902. The report should provide information on energy and water use and cost data and shall provide the greatest level of detail practicable for buildings and facilities by energy source.

The USDA's Office of Operations (OO) will have the responsibility for preparation of the Department's submission. As a minimum, ARS will be expected to report planned and completed facility retrofit actions, costs, gross square footage, performance of energy surveys, description of operations and maintenance procedures, and commentary on progress toward meeting the mandates, including use of ESPC and rebates. To satisfy this requirement, the Areas will be solicited for their input by February 15 of each year.

Report of Survey and Retrofit Progress

In order to meet the goals of NECPA and E.O. 12902, it is important that the comprehensive energy audits be accomplished as soon as possible after the completion of the preliminary energy surveys. Such actions will allow for timely programming and budgeting of building retrofit projects.

E.O. 12902 requires that comprehensive facility audits of approximately 10 percent of the agency's facilities are completed each year, and by FY 2005, the agencies shall install all cost effective energy and water conservation measures with payback periods of less than 10 years.

The Department has no way of measuring the agency's progress toward achieving the goals unless survey progress is periodically reported. To satisfy this need, agencies will be required to submit an annual report of survey and retrofit progress to the OO, by March 15 of each year. The format for this report will be provided by OO.

10. Life-Cycle Costing

For evaluating each type of energy conservation projects, the following life-cycle cost methodologies described in the latest edition of *Handbook 135, "Life-Cycle Costing Manual for the Federal Energy Management Program,"* published by the National Institute of Standards and Technology (NIST), shall be used.

- Retrofit of Existing Buildings: Use the Savings-To-Investment (SIR) method.
- New Construction: Use the Total Life-Cycle-Cost (TLCC) method.

11. Budgeting for Energy Management

Budget Treatment and Funding of Energy Conservation Measures

In accordance with NECPA, ARS shall specifically designate funds to implement the requirements of the Act in its budget request. In addition to available appropriations, ARS shall take maximum advantage of DOE's Federal Energy Efficiency Fund (FEEF) grant program (if available), utilize ESPC authorized by Title VIII of NECPA, Demand-Side Management (DSM) services, and other incentives offered by private sector energy service providers, to reduce the direct Agency funding of energy conservation program.

The NECPA and E.O. 12902 require certain immediate conservation measures. If these actions are to be carried out, ARS shall allocate adequate funds to accomplish the surveys and audit requirements of the laws and orders and the installation of cost effective energy and water conservation projects before FY 2005.

ARS managers in conjunction with the annual High Priority Requirements List (HPRL) preparation shall proceed immediately with programming and budgeting for energy and water conservation. Not only does this serve to meet the objectives of this energy management plan

and related statutes and directives, the resulting subsequent operational cost avoidance will also serve to meet the objective of reducing overall outlays.

As is expressed in Section 9 of this plan, it is the intent of ARS to maximize the use of the existing management system in fulfilling its energy program monitoring and reporting needs.

Budget Submission and Review

The Agency, in conjunction with its review of the annual HPRL, shall ensure that requests for energy retrofit funds are consistent with the objectives of this energy management plan. Requests for energy conservation funds shall be supported by life-cycle-cost analyses.

12. Summary of Responsibilities

Administrative and Financial Management (AFM)

AFM will be responsible for central planning, coordination, and support for the implementation of this plan.

Facilities Division (FD) will:

- Develop policies/procedures to achieve energy efficient design and construction of the Agency's buildings and facilities.
- Serve as the primary liaison related to energy and water conservation activities of the Agency. Monitor the implementation of the Agency's energy conservation program.
- In conjunction with the Areas and locations, identify candidate projects, select and designate new energy showcase facilities.
- Prepare/coordinate submission of the Agency's annual energy management report.

Procurement and Property Division (PPD) will:

- Develop and implement policies/procedures to achieve energy efficiency in ARS motor vehicles through reduction of gasoline and diesel fuel consumptions; use of alternate fuels; and acquisition of Alternative Fuel Vehicles (AFV).
- Utilize ESPC contracts as appropriate to include any necessary implementing procedures for entering into such contracts, and identify, verify, and utilize cost savings from such contracts.

- Incorporate the energy management goals and requirements of the NECPA and E.O. 12902 in all GOCO facilities management contracts. Ensure that each O&M solicitation will, to the extent practicable, contain an energy evaluation element.
- Prepare/submit an annual energy management report that addresses prior year accomplishments, milestones, and actions planned to further implement this plan involving procurement of energy efficient goods and services; utilization of ESPC and DSM services; and reduction of gasoline and diesel fuel consumption of ARS motor vehicles.

Financial Management Division (FMD) will:

- Develop policies, planning, reporting, and evaluation programs related to financial accounting and controls of cost savings realized from ESPC entered into by the Agency pursuant to Title VIII of NECPA.

Area Administrative Office (AAO) will:

- Be responsible for field administration and management of this plan.
- Institute/emphasize an energy conservation awareness program.
- Implement the Agency approved 10-year energy retrofit plan (dated August 18, 1996). Perform preliminary energy surveys, comprehensive energy audits, life-cycle cost analyses, and accomplish building retrofit including installation of separate utility meter by energy source in individual buildings and facilities, as appropriate.
- Utilize, to the maximum extent possible, DOE's FEEF grant program (if available) and the ESPC authorized by NECPA, to accomplish cost effective energy conservation measures.
- In concert with LAO, ensure that facility energy managers in the Area are "trained energy managers."
- In concert with FD, participate in the selection and designation of new energy showcase buildings and facilities.
- Prepare/submit the Area's annual energy management report addressing accomplishments, milestones, and actions planned to further implement the ARS Energy Management Plan in the Area.

Location Administrative Office (LAO) will:

- Institute/emphasize O&M conservation programs and employee awareness programs.
- Review its procedures to acquire utility and other related services and, to the extent practicable, remove any impediments to receiving, utilizing, and taking advantage of DSM services, incentives, and rebates offered by utilities and other private sector energy service providers.
- In concert with the AAO, implement the Agency approved 10-year energy retrofit plan (dated August 18, 1996). Perform preliminary energy surveys, comprehensive energy audits, life-cycle cost analyses, and accomplish building retrofits including installation of a separate utility meter by energy source in individual buildings and facilities, as appropriate.
- In concert with the AAO, prepare/submit the location's annual energy management report addressing the location's accomplishments, milestones, and actions planned to further implement the ARS Energy Management Plan.

13. Glossary

Comprehensive Facility Audit. A formal review of individual buildings to identify retrofit actions or options and estimate of the costs and benefits of those deemed applicable, normally limited to consideration of systems using large amounts of energy and readily available proven energy conservation technologies.

Cost Effective. The condition whereby an action saves more than it costs over the life of the improvement, building, or action.

Demand-Side Management (DSM). Refers to utility-sponsored programs that increase energy efficiency and water conservation or the management of demand. The term includes load management techniques.

Energy Conservation. Use of minimum amount of energy and water to achieve a given objective or result through changes in O&M procedures and modifications of building and/or equipment.

Energy Conservation Measures. Measures that are applied to a Federal building that improve energy and water efficiency, are life-cycle cost effective, and that involve energy and water conservation, cogeneration facilities, renewable energy sources, improvements in operations and maintenance efficiencies, or retrofit activities.

Energy Management. The traditional functions of management (planning, organizing, directing, and controlling) applied to energy and water resources, conservation, and efficiency.

Energy Savings Performance Contracts (ESPC). (Formerly known as Shared Energy Savings Contracts). Refers to a contract under which the contractor incurs the cost of implementing energy savings measures (including, but not limited to, performing the audit, designing the project, acquiring and installing equipment, training personnel, and operating and maintaining equipment) and in exchange for providing these services, the contractor gains a share of any energy cost savings directly resulting from implementation of such conservation measures during the term of the contract.

Energy Source. Nonrenewable sources such as electricity, fuel oil, natural gas, liquified petroleum gas, coal, purchased steam, and renewable sources such as agriculture and urban waste, geothermal energy, solar energy, and wind energy.

Energy Use. Energy that is used at a building or facility measured in terms of energy delivered to the building or facility.

Federal Building. Any building, structure, or facility, or part thereof, which is constructed, renovated, purchased, in whole or in part for use by the Federal Government and which consumes energy or water. It shall also include any building leased in whole or in part for use by the Federal Government where the term of the lease exceeds 5 years.

Industrial Facilities. Any building, structure, or facility, or part thereof, that uses large amounts of capital equipment and energy in connection with any process or system for the production of goods that is not devoted to the heating, cooling, ventilation, or service hot water requirements of the building.

Prioritization Survey. The determination of energy consumption characteristics of existing Federal buildings and facilities including the size, type, and consumption, to establish priorities for conducting comprehensive energy audits.

Retrofit. Physical changes to a building or its equipment to achieve higher levels of energy and water efficiencies. Retrofit actions may include installation of a separate utility metering device to measure actual energy use of a building by energy source (i.e., electric, natural gas, heating oil, LPG, steam, etc.) and providing dual fuel capability to major equipment using petroleum-based energy source.

Savings-To-Investment Ratio (SIR). An economic evaluation technique which expresses the savings as a ratio to costs, and calculated pursuant to the methodology prescribed in the National Institute of Standards and Technology (NIST) Handbook 135, "Life-Cycle Costing Manual for the Federal Energy Management Program." The SIR analysis method is used for comparing and ranking nonmutually exclusive projects to determine their relative priorities.

Total Life-Cycle Cost (TLCC). An economic evaluation technique that sums the costs of owning, operating, and maintaining a building over its useful life (including such costs as fuel, energy, labor, and replacement components) and calculated pursuant to the methodology prescribed in the National Institute of Standards and Technology (NIST) Handbook 135, “Life-Cycle Costing Manual for the Federal Energy Management Program.” In the case of leased buildings, the total life-cycle cost is calculated over the effective remaining term of the lease.

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