DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY ARMOR CENTER AND FORT KNOX
FORT KNOX KENTUCKY 40121-5000

ATZK-OSC-C (11) 11 May 2001

MEMORANDUM FOR

Commanders, All Units Reporting Directly to This Headquarters
Commanders, Fort Knox Partners in Excellence
Directors and Chiefs, Staff Offices/Departments, This Headquarters

SUBJECT: Fort Knox Plan No. 2-01 – Fort Knox Energy Resources Management Plan

1. The high cost of energy makes it important that the Fort Knox community practice and participate in an installation-wide energy conservation effort. Wasteful use of our energy resources has the very direct and negative effect of reducing the monies available to fund other vital aspects of our training mission. Thus, an aggressive energy program will be essential to total mission accomplishment as we move into the next century.

2. Energy conservation programs are intended to be consistent with the primary mission of training and combat readiness. Approved exercises and mission requirements must be supported within installation resources. Energy conservation must compliment the mission by ensuring wise and efficient use of the energy resources available to us.

3. Towards this goal, the enclosed Fort Knox Energy Resources Management Plan was developed. The plan is published for the information, guidance, and action of all directorate staff, major commands, training commands, Partners in Excellence, and all other organizations within the installation as well as those off-post commands supported by this installation.

4. This plan supersedes U.S. Army Armor Center Plan 1-90, 23 April 1990, Fort Knox Energy Resources Management Plan. Questions regarding the plan should be directed to the Directorate of Base Operations Support (DBOS) Energy Manager, ATZK-OSC-C, 624-8358/1053.

FOR THE COMMANDER:

REGINALD R. BERRY
Colonel, AR
Garrison Commander

ATZK-OSC-C (11)
SUBJECT: Fort Knox Plan No. 2-01– Fort Knox Energy Resources Management Plan

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SAVE ARMY ENERGY

FORT KNOX ENERGY RESOURCES MANAGEMENT PLAN

Energy Conservation

Energy Conservation

USA ARMOR CENTER

HEADQUARTERS
U.S. ARMY ARMOR CENTER AND FORT KNOX
FORT KNOX, KENTUCKY 40121-5000

Energy Conservation

*Fort Knox Plan 2-01

Headquarters
U.S. Army Armor Center and Fort Knox
Fort Knox, Kentucky 40121-5000
11 May 2001

ENERGY RESOURCES MANAGEMENT PLAN

*This plan supersedes USAARMC Plan No. 1-90, 23 Apr 90.

Chapter 1
Energy Management

1-1. Introduction.

a. References.

(1) AR 11-27, Army Energy Program, 3 February 1997.

(2) Army Energy Resources Management Plan, 23 April 1990.

(3) Guide to Facilities Engineering Utility Systems Management, U. S. Army Training and Doctrine Command, 23 October 1989.

b. Objectives.

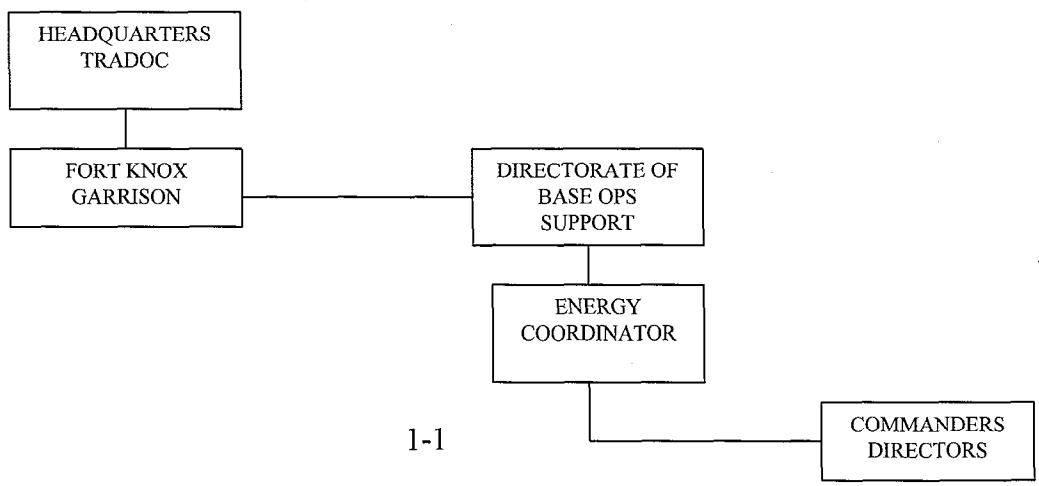
(1) Define responsibilities that may be used for implementation of the Energy Resources Management Plan.

(2) Specify the facilities energy goals that Fort Knox must meet in order to achieve the total Army objectives in energy management. These goals will be consistent with previously established mission, priorities, and combat readiness goals.

(3) Potential energy savings exist in almost every facility and situation. The largest savings can be obtained by increasing energy efficiency through education, increased awareness, involvement of installation personnel and improvements to the physical systems/structures. It is an objective of this plan to identify a program of energy management that will achieve energy conservation goals while satisfying the needs of mission, combat readiness, and personal comfort and convenience.

1-2. Energy Management Responsibilities.

a. Fort Knox Energy Management Structure.



b. HQ TRADOC. HQ TRADOC has the general responsibility for consolidating and disseminating pertinent information from Department of Defense (DOD), Department of the Army (DA), the General Material and Petroleum Agency (GMPA), and Office of the Chief of Engineers (OCE), including the Construction Engineering Research Laboratory (CERL) and Engineering and Housing Support Center (EHSC).

c. Fort Knox Garrison/Director of Base Operations Support has command oversite of:

(1) Preparation, review, and revision of the installation's Energy Resources Management Plan.

(2) An energy awareness program.

(3) An energy engineering program.

(4) A consumption monitoring program.

d. Energy Coordinator. The Energy Coordinator has the overall responsibility for facilities energy management, utilities contracts, including the dissemination of policy and procedures from higher headquarters. The coordinator will monitor utilities, fuel consumption and sales, maintain records of all allocations and energy goals, and prepare the monthly Defense Energy Information System (DEIS) and Revised Army DEIS Data System (RADDS) reports.

e. Commanders, Directors, or Chiefs. Commanders, directors, or chiefs are assigned responsibility for execution of this plan within their organization in the following manner:

(1) Appoint a representative, in writing, as "Unit Energy Coordinator," and provide a copy of the appointment to the DBOS Energy Coordinator.

(2) Prepare an internal energy conservation standing operating procedure (SOP) or policy memorandum that establishes how the Energy Resources Management Plan is to be disseminated through the organization and how information feedback is to be provided to commander, director, or chief.

(3) Promote energy conservation in the command information program or staff meetings.

(4) Ensure that each charge of quarters (CQ) or unit energy coordinator is making periodic inspections at night or when the building becomes vacant. During the course of such inspections, turn off unnecessary lights, adjust thermostats to unoccupied setting, turn off window air conditioners, and passes information to appropriate levels. These inspections may be consolidated with security or CQ inspections. In buildings occupied by more than one activity, each activity should perform in sections of their respective area, unless other formal

arrangements have been made. Fort Knox Form 104 (Energy Conservation Inspection Checklist) or comparable substitute should be used as a guide during these inspections. Any discrepancies found should be corrected, documented, and brought to the attention of the commander, director, or chief. Work requests will be submitted as required to obtain the proper facility temperatures where local controls are insufficient to regulate the heating or cooling system.

(5) Direct increased building inspections and take necessary actions to prevent freeze damage during periods of extreme cold weather. - Individuals responsible for facilities should increase inspections during extremely cold weather to ensure that heating systems are functioning and water pipes are not frozen.

(6) Review facility use and consolidate where possible for energy conservation. This is more important before the heating season, but also applies throughout the year.

(7) Make maximum use of available self-help materials, such as weather stripping, caulking, sheet plastic, etc., for the purpose of reducing air infiltration and heat loss/gain.

(8) Develop a mobility fuels energy conservation training and information program.

1-3. Historical Facilities Energy Consumption.

a. Goals and Goal Progress. Each year, HQ TRADOC assigns a facilities energy goal to Fort Knox. Progress against that goal is monitored through the DEIS. The Fort Knox goal is to reduce consumption 1.5 percent per year, each year starting 1985, ending 2010. Additionally, TRADOC has directly tied funding of the installation's utility bills to the assigned energy goals. Installation historical facilities energy consumption is tabulated below:

(TRADOC)

FY	ELEC (MWH)	ELEC (MBTU)	NAG (MBTU)	COAL & LPG (MBTU)	F/O (MBTU)	TOTAL (MBTU)
86	162,965	556,200	1,695,550	18,860	258,490	2,529,100
87	175,488	598,940	1,647,870	10,950	182,490	2,440,250
88	176,777	603,340	1,745,460	12,690	255,230	2,616,720
89	179,874	613,910	1,732,920	15,890	280,810	2,643,920
90	191,989	655,259	1.608,905	N/A	318,426	2,582,590
91	196,310	670.006	1,510,712	N/A	178,519	2,359,237
92	187,191	638,883	1,525,817	N/A	181,587	2,346,287
93	190,436	649,958	1,524,641	N/A	148,993	2,323,592
94	191,944	655,105	1,548,028	N/A	115,812	2,318,945
95	192,035	655,415	1,428,639	N/A	73,786	2,157,840

96	190,144	648,961	1,497,904	N/A	99,518	2,246,383
97	183,583	626,569	1,407,539	N/A	111,778	2,145,886
98	193,160	659,255	1,297,655	N/A	101,815	2,013,656
99	190,587	650,473	1,212,365	N/A	30,792	1,910,331
00	189,006	645,077	1,172,424	N/A	14,202	1,847,021

b. Installation Historical Square Footage.

FY	BUILDING SQUARE FOOTAGE (KSF)	EFFECTIVE POPULATION	A/C TONNAGE
86	18,709	33,611	14,326
87	19,240	35,435	15,238
88	19,337	32,502	15,903
89	19,252	33,702	17,464
90	19,179	27,805	18,766
91	19,136	27,406	21,239
92	19,053	32,003	24,684
93	18,990	30,474	24,684
94	17,786	29,780	25,004
95	17,781	28,351	25,921
96	17,542	24,709	26,857
97	17,600	24,027	27,084
98	17,165	24,639	26,415
99	16,441	24,304	25,940
00	16,053	26,915	25,940

1-4. Energy Management Program.

a. Energy Awareness/Program Promotion.

(1) Posters and energy handouts. Poster and other data is available for distribution from the energy coordinator.

(2) Energy Information Bulletins. Useful energy information and notices will be submitted for announcement in the Weekly Bulletin, the message marquee, and Armor Center Television on a regular basis.

(3) Energy Articles. In coordination with the Public Affairs Office, an energy related topic will be addressed, in depth, on a monthly basis in "Inside the Turret."

(4) Energy Awareness Month/Week. In conjunction with Army Energy Awareness Month, a single week in October will be set aside to concentrate local energy awareness efforts. A typical itinerary includes:

(a) CG Proclamation of Energy Awareness Month. Written proclamation by the CG for publication in the Weekly Bulletin and in "Inside the Turret."

(b) Memorandum for all Commanders, Directors and Chiefs. Memorandum from CG to all units emphasizing support of the Fort Knox energy program and speaking directly to Army energy theme.

(c) Command Energy Luncheon. The command energy luncheon should include a guest speaker from private industry and should focus on paying special recognition for outstanding contributions to the energy program during the previous year.

(d) "Inside the Turret" articles for the month of October are geared to the annual theme, as may be established by the Army Energy Office, HQ TRADOC, or the Installation Commander.

(e) The monthly energy coordinator meeting will place special emphasis on energy awareness and, in particular, conservation of heating fuels. Nearly two thirds of all facilities energy is used during the heating season.

(f) Department of the Army posters, highlighting Energy Awareness Month, will be distributed throughout the installation.

b. Consumption Monitoring and Management.

(1) Energy Management and Control System (EMCS). The EMCS currently interfaces with 159 buildings post wide. The system will be utilized to identify system problems and areas where temperatures may be above or below recommended levels and to accomplish night and week-ends set backs. Individual areas needing exemptions due to unique operations requirements should notify the EMCS office. EMCS is staffed on a 40 hour per week basis. In addition to operation and maintenance of the EMCS, personnel conduct building checks to verify system operational parameters, initiating corrective action as may be required to maintain prescribed temperatures.

(2) The greatest opportunity for energy savings is in the area of heating and air conditioning. Accordingly, a checklist will be used to determine compliance with prescribed heating and air conditioning guidelines (Appendices I and J). These 2 appendixes cover season start up procedures as well as operational requirements and restrictions.

(3) RADDS (DEIS) Reporting. Installation consumption data is reported monthly to the Energy Management Branch for compilation and entry into the RADDS reports. These are monthly reports which provide information on consumption and inventories, resupply, and bulk petroleum products to the Department of Defense. The system provides essential energy management information to the installation and is used to evaluate trends and to determine progress towards goals/targets.

(4) Monthly Utilities Consumption Report. The Monthly Utilities Consumption (MUC) report is an internal DBOS report which summarizes consumption and compares current year data to 5-year averages, yielding monthly performance indicators. The report will be prepared as soon as data is available, generally 20 to 30 days after end of reporting period. From this data graphs are generated for analysis.

(5) Monthly Energy Conservation Report. The Installation Energy Coordinator may prepare a monthly report for the Commanding General summarizing consumption data for facilities fuels. In addition the report will list significant energy actions, items of interest, and potential problems.

(6) Request for Adjustment of Facilities Energy Goal Annually (NLT 30 July), the DBOS will task unit energy coordinators with reporting increases, in. facilities energy use resulting from new construction, new equipment, or changes in mission. The Installation Energy Coordinator will compile and transmit the goal adjustment request to HQ TRADOC NLT 30 September.

(7) Utility Sales. The Energy Coordinator, will have responsibility for administering contract utility sales to reimbursable customers. In addition to routine management of this function, the following recurring requirements will be addressed:

(a) Utility sales rate calculations are due at TRADOC NLT 15 January. Input is required from DBOS Real Property Section (update original costs of distribution systems plus additional costs) and from DBOS Budget Branch (Facilities Engineering Technical Data Report).

(b) Modify utility sales contracts per new sales rates following completion of prescribed entry of data into Army Power Procurement program and signed by the Director of DBOS. Approval from TRADOC is not required, unless requested.

(c) Project annual utility expenditures in April and provide input to DBOS, Budget Branch.

(d) Miscellaneous Obligations Documents (MOD). Prepare MOD NLT end-of-month in order to obligate the upcoming month's utility expenditures.

c. Technology/Project Development. Emphasis will be to manage a maintenance, repair and construction program so as to assist the installation in reducing purchased utility costs and in achieving our assigned energy goals.

(1) Five Year Project Plan. In order to meet TRADOC mandated reductions in facilities energy consumption over the 9-year period FY 01 through FY 10, the DBOS will continue to actively implement conservation programs through its various energy projects. The Fort Knox project plan to meet the 10-year energy goal is outlined at appendix A.

(2) TRADOC Program for Special Energy Projects. Assess previously identified energy saving projects, and identify and develop new projects. New work energy conservation projects will be identified, prioritized, and submitted to HQ TRADOC for consideration for funding under the DSM/ESPC Programs as Special Energy Projects. Project listing, identifying projects with paybacks of approximately 10 years, will be submitted to TRADOC as they are prepared.

(3) Backlog Maintenance and Repair (BMAR). Many of the Energy Engineering Analysis Program (EEAP) projects were identified to be funded as BMAR projects. These projects are developed and documented so they can be validated as potential projects during TRADOC validation visits. Projects which contribute to energy conservation are given special scoring consideration by TRADOC validation teams. Higher validation scores ensure that these projects are given higher priority for future funding.

Chapter 2
Energy Contingency Plan

2-1. Introduction

a. References.

(1) AR 11-27, Army Energy Program, 3 February 1997.

(2) Army Energy Resources Management Plan, 23 April 1990.

(3) Guide to Facilities Engineering Utilities Systems Management, U.S. Army Training and Doctrine Command, 23 October 1989.

(4) AR 420-49, Utility Services, 28 April 1997.

b. Objectives.

(1) To clarify responsibilities and detail required compliance concerning the Energy Contingency Plan.

(2) To establish procedures for implementing energy conserving measures in anticipation of potential severe interruptions or reductions of resources, while retaining readiness and operational capability.

c. Definition of Energy Emergency. An energy emergency is any situation where energy supplies are interrupted or curtailed. This can be caused by actions at the national level, or can just as easily be the result of local conditions or events. In the case of a national emergency, the Defense Energy Emergency Management System (DEEMS) will be activated at the Department of Defense level to control the distribution of available energy supplies. At the local level, the Installation Energy Coordinator is responsible to work with the Installation Command Staff, and other installation personnel to ensure that operational readiness is maintained.

d. Types of Energy Emergencies. An energy emergency does not have to be the result of a cutoff of oil supplies by some foreign power. Many emergencies can be, and often are, caused by events closer to home. There are at least four ways that emergencies can occur that will affect Fort Knox and its ability to perform its primary mission.

(1) Natural Disasters. Floods, tornadoes, or earthquakes that disrupt the energy supply system.

(2) Technology Hazards. Accidental explosions or release of toxic substances.

(3) Civil Disturbances. Strikes against utility companies, riots, general civil disorder, or acts of sabotage and terrorism against the installation or its energy supply systems.

(4) National Emergencies. Outbreak of war or a reduction in imported energy supplies resulting in the imposition of fuel rationing.

e. Response to an Energy Emergency. In the event of facilities energy curtailment, the Installation Energy Coordinator will monitor local supply situations and will be prepared to respond to emergencies of varying degrees of severity. When available energy supplies are threatened or allocations are reduced, the following actions will be taken:

(1) The Installation Energy Coordinator will recommend mitigating actions to the Director, DBOS. In all cases, selected recommendations will have considered applicable portions of Appendices D through G of this plan. After review of the recommendations, the Director, DBOS, will select alternatives for recommendation to the Garrison Commander.

(2) An emergency meeting of the Command Staff will be called by the Chief of Staff in order to review the recommendations prepared by the DBOS/Garrison Command Staff. Once the Energy Conservation board has reviewed recommendations and has selected a course of action, the Chief of Staff will then direct its implementation.

(3) The Public Affairs Office will coordinate public dissemination of information related to the energy emergency. The Installation Energy Coordinator will keep both the Chief of Staff and Commanding General advised as to the status of emergency situation.

2-2. Fuel Oil Curtailment.

a. Fuel oil is generally provided to Fort Knox through contracts with firms that obtain products from suppliers and transport to Fort Knox. Thus, the availability of fuel oil is subject to conditions of extreme weather and availability from the contractor's supplier. Curtailment of fuel oil supplies may occur at any time.

b. Family housing areas are heated exclusively by natural gas. Generally, some of the installations larger facilities are heated by dual-fired heating systems which use either natural gas or fuel oil.

c. Oil-fired heating plants located in buildings, with dual-fired heating plants serving five or more facilities are located in Bldgs. 852, 1479, 5213, 5943 and 6541.

d. Assumptions.

(1) Fuel oil curtailment may be anywhere in the range of zero to 100 percent.

(2) The extent of fuel oil curtailment will depend on myriad external factors and, therefore, may be difficult to predict with any accuracy.

(3) Any fuel oil curtailment, either at the local or national level, will adversely affect availability of other fuels. A shortage of one fuel will ultimately create a shortage of alternate fuels.

d. Fuel Oil Curtailment Measures.

(1) Reduction of Base Load. A certain amount of facilities energy is consumed throughout the year, irrespective of weather conditions. This consumption is referred to as base load. However, fuel oil, coal, and liquefied petroleum gas are generally not used outside of heating season. Thus, there is no base load associated with these fuels. But because of assumptions made above, it is suggested that actions identified at appendix D be considered for implementation.

(2) Heating Season Actions. Energy usage increases during the heating season. Thus, fuel oil curtailment actions during the heating season would include those actions identified at appendix E.

2-3. Natural Gas Curtailment. Louisville Gas and Electric Company (LG&E) provides firm transportation of contract natural gas since 1995 to Fort Knox. Contract natural gas is provided through a DESC (Defense Energy Supply Support Center) nationwide best value contract. SIGCORP is the contractor beginning 1 October 2000 until 30 September 2002. LG&E's rate tariff is for transportation only, for Fort Knox. The natural gas total consumption is given below in MCF (thousand cubic feet):

	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
OCT	107,353	103,987	90,475	92,337	92,050	70,573	74,435	64,843	79,330	57,894	67,316
NOV	184,374	143,339	175,962	162,060	168,470	134,956	181,806	172,241	167,094	120,779	103,038
DEC	222,716	211,280	201,619	219,022	226,184	203,441	231,177	201,116	211,687	174,150	179,818
JAN	246,967	264,531	239,878	225,163	278,547	257,122	266,258	262,150	188,069	215,046	220,664
FEB	197,994	208,404	190,690	221,892	217,427	231,579	200,621	182,341	163,974	162,540	157,483
MAR	163,240	174,844	176,404	196,948	178,231	156,355	193,138	151,780	163,708	166,599	118,091
APR	142,368	103,203	106,419	123,245	94,355	94,978	114,861	109,968	91,870	77,103	89,414
MAY	73,604	49,896	87,882	53,420	64,468	60,572	44,262	62,672	45,707	45,216	42,504
JUN	57,013	50,863	53,671	49,402	43,403	45,305	31,049	41,692	37,274	38,976	37,837
JUL	54,752	52,139	51,793	46,427	44,887	44,401	37,839	39,895	36,093	40,209	40,155
AUG	54,633	52,139	51,918	39,136	46,939	43,333	38,542	39,005	37,681	38,768	40,075
SEP	57,030	52,086	54,665	51,183	47,979	44,414	40,289	38,840	37,371	39,773	41,882
MCF	1,562,044	1,466,711	1,481,376	1,480,235	1,502,940	1,387,029	1,454,277	1,366,543	1,259,858	1,177,053	1,138,277

a. Assumptions.

(1) LG&E will continue to transport contract gas for fee as stated in the transportation tariff. Many large industrial customers served by LG&E have the same arrangement.

(2) The extent of any natural gas curtailment will depend on myriad external factors and, therefore, may be difficult to predict with any accuracy.

(3) Any natural gas curtailment, either at the local or national level, will adversely affect availability of other fuels. A shortage of one fuel will ultimately create a shortage of alternate fuels.

b. Natural Gas Curtailment Measures.

(1) Reduction of Base Load. Any curtailment of natural gas would include energy conservation actions to reduce base load consumption. Although the majority of natural gas is used to heat facilities during the winter months, there is a significant natural gas base load during nonheating seasons . Presently, the natural gas base load is approximately 40,000 MCF per month or 54 MCF per hour. Thus, measures taken to mitigate the impact of natural gas curtailment would include those identified at appendix D.

(2) Heating Season Actions. Natural gas consumption increases dramatically during heating season. Thus, natural gas curtailment measures during heating season would include actions identified at appendix D.

(3) Air Conditioning Season Actions. Consideration shall be given to implementing applicable provisions of appendix H pertaining to operation of air conditioning systems at Ireland Army Community Hospital. Required actions are at appendix G.

2-4. Electrical Curtailment.

a. LG&E provides electric service to the majority of Fort Knox. Service is metered at the LG&E's Tip Top substation and is delivered at 34,500 volts to Fort Knox substations. Some remote tank ranges are supplied electricity from Online Rural Electric Cooperative Corporation (RECC), Salt River Electric, or Meade County RECC.

b. Effective 31 January 1978, LG&E indicated that the electrical supply for Fort Knox was subject to possible curtailments and has established that any electrical curtailment quotas would be based upon the previous year' s actual monthly consumption.

c. Assumptions.

(1) Electrical power supplied by LG&E and others will be subject to possible curtailments.

(2) The extent of electrical curtailment will depend on myriad external factors and, therefore, may be difficult to predict with any accuracy.

(3) Any electrical curtailment, either at the local or national level, will adversely affect availability of other fuels. A shortage of one fuel will ultimately create a shortage of alternate fuels.

d. Curtailment Measures.

(1) Base Load Actions. The majority of electrical energy at Fort Knox is consumed as a base load and is virtually independent of heating requirements. Most heating systems will not operate without electrical control power. Specific actions required to lower base load are at appendix D.

(2) Air Conditioning Season. During the air conditioning season, there is a significant increase in electrical consumption for operation of air conditioning systems, circulating fans, and water pumps. Consequently, implementation of actions at appendix G is warranted.

(3) Heating Season. During the heating season, there is an increase in electrical usage for interior and exterior lighting due to reduced daylight hours, heating equipment fans and pumps, and limited authorized electric resistance space heaters. Thus, implementation of actions at appendix E will have the added effect of reducing electrical consumption.

(4) Other. Reduced use of water in accordance with appendix F is appropriate and will reduce electrical load to power pumping equipment.

2-5. Status of Efforts to Provide 30-Day Storage of Fuel Oil. Some Facilities constructed since 1985 have storage tanks that have a 30-day supply of fuel oil. All MCA projects being planned have a requirement to provide a 30-day fuel supply for new facilities. There is an MCA project (PN T05790), currently in the long-range plan, to install fuel oil burners on 47 existing heating plants and to realize 30 days storage capacity at 171 heating plants.

2-6. Emergency Electrical Generator Capabilities. In the event of an electrical curtailment, the emergency generator capabilities are sufficient to meet the critical area requirements on the installation. The following critical areas of operations will not be significantly affected by electrical curtailment: Ireland Army Community Hospital, blood bank, sewage treatment plant, water plant, airfield, commissary, military police station, stockade, range control, eight sewage lift stations, Otter Creek, Military Affiliated Radio Systems (MARS) station, and Information Systems Command.

2-7. Contingency Planning for Health Care Facilities.

a. Commanders of health care facilities will establish priorities to phase energy reductions in their facilities in order to meet minimum essential requirements. Plans will encompass all forms of energy, with priorities based on the local situation. Contingency plans will avoid disruption of vital and basic services, particularly those affecting security, safety, and health. Substitute fuels will be considered where feasible. Administrative and operational requirements that can be reduced or suspended will be identified. Commanders should be fully aware of local community energy problems and consider them when developing their plans.

b. Specific actions required to lower energy consumption in health care facilities are enumerated at appendix H.

Appendix A
Ten-Year Project Plan

Project Title/Description

- Reduce glass area in approximately 400,000 SF of buildings at Knox.
- Modify boilers and chillers at Ireland Army Hospital to reduce MBTU consumption.
- Install GCHPs in various buildings to reduce BTU consumption.
- Remotely control seasons of use of Infrared heating.
- Reduce exterior lighting that burns in the daytime.
- Expand lighting controls.
- Expand use of automatic lighting sensors.
- Determine and execute a proper program to avoid multiple demand charges for various well pump stations. Will save Dollars but no BTUs.
- Negotiate the reduction of LG&E transportation dollar charges for natural gas. Will save Dollars but not BTUs.
- Reduce summer boiler use for hot water with local sources of hot water.
- Expand the use of EMCS/UTILITY MONITORING SYSTEM, to reduce the consumption of BTUs when spaces are occupied and unoccupied.
- Promote Energy Star computers, appliances, buildings, to reduce consumption.
- Install vinyl strip doors on frequently used large doors of tank shops.
- Identify projects to improve boiler efficiencies.
- Reduce hot water temperatures where applicable to max 120/125 °F.

Appendix B
ECIP Projects

ECIP projects must compete for available dollars on an SIR (saving to investment ratio) DoD wide. Few projects are funded where utility costs are relatively low. Installation priority status changes each year.

B-1. PROJECT: EMCS EXTENSION (INCREMENT 1)

Subject project is to install an extension to the existing central EMCS and upgrade the existing system to the latest specifications including central control equipment, field equipment, information systems, building sensors and controllers and modifications to building controls. FM radio control switches will be installed on the air conditioning units in 26 buildings for demand control. The EMCS and FM radio controls will be connected to the heating systems in approximately 400 buildings for night and weekend setback of space temperature.

B-2. ECIP CEILING FANS AND DOOR CURTAINS

Install polyvinylchloride (PVC) strip curtains on roll-up doors in 21 tank and vehicle repair buildings and ceiling fans in 28 maintenance buildings, two gymnasiums, the Leaders' Club ballroom and a gym converted to office space. Work includes provisions and installation of PVC strip curtains and ceiling fans and ancillary work required as a result of the installation, i.e., patching and painting of ceiling surfaces. Project includes a total of 33 buildings. Twenty buildings will have only ceiling fans installed and one building will have only PVC strip curtains installed.

B-3. ECIP MOD BOILERS/CHILLER IACH

Replace one 800-ton absorption chiller with 600-ton high efficiency electric centrifugal chiller and provide a variable speed chilled water pumping system. Connect existing and new chillers to EMCS for chiller optimization. Install new high efficiency steam boiler and air preheater on new and existing boilers. Repair underground steam lines. Project includes all work ancillary to the replacement as required. This project will replace old and inefficient boiler and absorption chiller equipment with new high efficiency heating and centrifugal air conditioning equipment. The location of the work will be Building No. 851, Ireland Army Community Hospital, and Building No. 852, boiler plant.

B-4. EMCS EXTENSION (INCREMENT 2)

Project is to install an extension to the existing central EMCS and upgrade the existing system to the latest specifications. A skeletal 1391 has been developed. A complete 1391 will be developed when project nears. Pertinent information will be provided at that time.
Long Range (LR)

B-5. EMCS EXTENSION (INCREMENT 3)

Project is to install an extension to the existing central EMCS and upgrade the existing system to the latest specifications. A skeletal 1391 has been developed. A complete 1391 will be developed when project nears. Pertinent information will be provided at that time.

B-6. INFRA-RED HEAT
Scheduled for FY 2001.

Project is to supplement existing steam coil unit heaters in 18 permanent motor vehicle repair shops with infra-red gas heaters. Unit and piping would be suspended at approximately 12 feet above working area.

B-7. AFHC (ECIP) INSULATE WALLS AND CEILINGS

Project is to install insulation in exterior walls and cathedral ceilings in 2676 family housing dwelling units in areas 7, 8, 10, 16-21, and 23-27. Project includes provision and installation of noncombustible insulation in exterior walls and fire-resistive rigid board-type insulation to cathedral ceilings. Project includes drilling, patching, painting and all ancillary work required for installation of insulation.

B-8. AFHC (ECIP) INSULATE EXTERIOR WALLS

Project is to install insulation in exterior walls of 894 dwelling units in family housing areas 11, 14, and 15. Project includes installation of approved noncombustible insulation and drilling, patching and spot painting of holes required for installation.

Appendix C
Annual Recurring Requirement Maintenance and Repair Projects

C-1. Annual maintenance contract for repair of EMCS electronic boards.

C-2. Annual maintenance contract for Williams Electric Company hardware, EMCS.

C-3. Annual telephonic software support contract, EMCS.

C-4. Annual contract for maintenance of uninterruptable power supply, EMCS.

Appendix D
Actions Applicable to Year-Round Emergencies

D-1. Purpose. Reduce overall base load energy consumption in the event of an energy shortage.

D-2. Procedures. Depending upon the energy emergency, specific actions, including across the board percentage reductions, will be selected in order to reduce energy consumption until the emergency has ended. The magnitude of percentage reductions, intentionally left blank below, will be recommended to the DBOS in accordance with para 2-1.e of this plan. The following measures are directed:

a. Reduce interior lighting by 0-50 percent. This can be accomplished by removing bulbs, fluorescent elements (disconnect ballasts), or replacing bulbs with lower wattage units.

b. Maximize use of candlelight services in chapels (even during daytime) to significantly reduce lighting requirements.

c. Rearrange work and class schedule to minimize night work and classes requiring electrical lighting support.

d. Reduce existing street lighting by 0-75 percent.

e. Reduce all exterior security lighting by 0-50 percent.

f. Eliminate use of porch lights in family housing areas.

g. Consolidate or eliminate use of hot plates, electric ranges, ovens, and refrigerators.

h. Disconnect water coolers.

i. Shut off all water heaters in all facilities other than family housing, troop barracks, mess halls, snack bars, cafeterias, kitchens, guest houses, visiting officers quarters, unaccompanied personnel housing, child care centers, essential medical facilities, and unused dining facilities. Lower water heater thermostats to the absolute minimum to satisfy comfort and hygiene requirements. Emergency procedures for sanitation with chemical disinfectants should be implemented wherever practical. Hot water usage shall be scheduled to accommodate reduced hot water capacity.

j. Reduce hours of use of televisions and stereos.

k. Reduce use of reproduction and copying machines on an hourly basis by 0-50 percent.

l. Reduce laundry operations.

m. Eliminate use of rectifiers for stationary tracked vehicle electrical power. Engines may be run to recharge batteries (except where mobility fuels have been curtailed).

n. Utilize emergency generators 0-25 percent of the time.

o. Decrease menu selections.

p. Use disposable dishes and flatware.

q. Serve one-pot stews and soups.

r. Serve only cold or no-cook items for desserts and appetizers.

s. Manage energy consuming equipment in food preparation: consolidate, turn off when not used, avoid intermittent use, eliminate preheating. Cook complete meals in oven when possible.

t. Conserve water and repair leaking faucets.

u. Take short showers instead of baths.

v. Reduce tank washing by 0-75 percent.

w. Temporarily discontinue fire hydrant flushing operations.

x. Reduce hours of operation of recreational services activities.

y. Complete closure of recreational facilities and activities, excluding Camp Carlson.

z. Consolidate barracks space (sq ft/person) to the maximum extent possible.

aa. Consolidate mess halls to the maximum extent possible.

Appendix E
Actions Applicable to Heating Season Emergencies

E-1. Purpose. Reduce energy consumption during an energy emergency in cold weather when heating plants are in operation.

E-2. Procedures. Dependent upon the energy emergency, specific actions, including across the board percentage reductions, will be selected in order to reduce energy consumption until the emergency has ended. The magnitude of some temperature reductions, intentionally left blank below, will be recommended to the DBOS in accordance with para 2-1e of this plan. The following measures are directed:

a. Switch dual fuel-fired heating plants as required. This would be at the determination of the DBOS.

b. Adjust temperatures in administrative areas, wards, clinics, and other hospital areas.

c. Reduce maximum authorized temperature by 0-10 °F when occupied and 0-15 °F when unoccupied to reduce heating fuel usage and fan electrical usage.

d. Increase frequency of surveillance to avoid water line freezing.

e. Consolidate facilities on a building-by-building basis. Winterize closed facilities.

f. Reduce number of occupied days per week for civilian and military personnel in facilities without dual-fire capability and that cannot be closed. During periods of nonoccupancy, the facilities will be maintained at 40 °F (or the absolute minimum required to prevent freeze damage).

g. If emergency warrants, close down Steindam Apartments during heating season since facilities are heated by electricity. Housing Division, DCFA, will relocate residents.

Appendix F
Actions Applicable to Spring and Fall Emergencies

F-1. Purpose. Reduce energy consumption during an energy shortage in either spring or fall seasons when neither heating nor air conditioning systems are in operation.

F-2. Procedures. Dependent upon the energy emergency, specific actions, including across the board percentage reductions, will be selected in order to reduce energy consumption until the emergency has ended. The following measures are directed:

a. Eliminate washing all privately-owned vehicles (POVs).

b. Eliminate watering and sprinkling of grass, gardens, lawns, driveways, hardstands, motor parks, parking areas, etc.

Appendix G
Actions Applicable to Summer Emergencies

G-1. Purpose. Reduce energy consumption when there is an energy shortage during air conditioning season and when air conditioning systems are in operation.

G-2. Procedures. Dependent upon the energy emergency, specific actions, including across the board percentage reductions, will be selected in order to reduce energy consumption until the emergency has ended. The magnitude of some temperature adjustment, intentionally left blank below, will be recommended to the DBOS in accordance with para 2-1e of this plan. The following measures are directed:

a. Increase minimum interior temperature to _____ °F when occupied and turn off A/C when unoccupied.

b. Operate air conditioners only when outside temperatures are above 80-90 °F.

c. Adjust temperatures in administrative areas, wards, clinics, and other hospital areas.

d. Restrict use of air conditioners that are for personnel comfort only. Facilities must have adequate ventilation systems or operable windows in order to turn off air conditioning systems.

e. Increase frequency of energy inspections to ensure compliance with emergency energy shortage policies.

f. Eliminate use of air conditioners in vehicles.

g. Adjust operating hours to coincide with peak personnel usage. Schedule activities during cooler hours.

Appendix H
Health Care Facilities

H-1. Purpose. Reduce overall energy consumption in the event of an energy shortage.

H-2. Procedures. Dependent upon the energy emergency, specific actions, including across the board percentage reductions, will be selected in order to reduce energy consumption until the emergency has ended. The following measures are directed:

a. Plan as simply and flexibly as the situation permits.

b. Specify type(s) of energy source- consumed in the production of heat utilities.

c. State capability to divert to other energy sources.

d. Provide fuel storage capacities available to include active/inactive tanks.

e. Identify tank trucks available to shift petroleum when necessary.

f. Establish critical levels of supply in terms of days of supply, as applicable. This should take into account contractor time/distance factors necessary to re-supply.

g. In the event established critical levels are reached or contract deliveries are defaulted, notify HQ Health Services Command (HSC) immediately. Point of contact is the Facilities Division, Deputy Chief of Staff, Logistics, DSN 471-2077.

h. Drastic actions that have a materiel effect on your mission capability will be reported to HQ HSC without delay.

i. The following stringent conservation actions will be considered in developing plans:

(1) Cut number of training exercises to an absolute minimum.

(2) Close outlying clinics, dispensaries, etc., during the heating season.

(3) Place maximum number of vehicles in administrative storage and maximize use of bus services and similar mass transportation means. Sufficient vehicles will be kept in service.

(4) Adjust temperatures in administrative areas.

(5) Shut off heat and winterize buildings or portions of buildings.

(6) Operate steam sterilizers only when a full load is available for processing or during nonpeak demand periods.

(7) Reduce nonpriority missions or stop those that can be delayed.

(8) Make a determination as to the areas of the hospital where air conditioning is critical. Prioritize these areas and coordinate with DBOS and the Contracting Officer's Representative for the hospital maintenance contract in order to reduce air conditioning load to the absolute minimum required to satisfy critical areas.

Appendix I
Heating Policy

I-1. General Policy for Startup/Shutdown of HVAC Systems.

a. This has always been an area of concern for the DBOS as it sometimes creates a compromise situation between energy conservation and occupant comfort. However, the DBOS is a customer service-oriented organization with one of its primary objectives being to provide a comfortable environment for all who live and work on the installation. Therefore, it is essential that comfortable space conditions be provided and maintained to help support the mission of the installation. This can be done through proper planning and a common sense approach while eliminating energy waste.

b. The DBOS will not rely on historical dates to determine when heating, ventilating and air conditioning (HVAC) systems are to be placed into operation or shut down. Weather conditions vary considerably from year to year and should dictate when and what type of action should be taken. In particular, short and long range weather forecasts should be consulted and used as a basis for future planning, e.g., getting HVAC equipment ready for a potentially early or late startup.

c. Installation weather equations will continue to be used to evaluate all impact of weather on facilities energy goals, such as the impact of unusual weather early or late in the season.

d. The final authority for deciding startup and shutdown dates rests with the Garrison Commander. It must be kept in mind that the Installation Commander is ultimately responsible for meeting assigned facilities energy goals regardless of decisions made which influence startup or shutdown of heating and air conditioning systems.

I-2. General Heating Policy.

a. Exceptions may be made for medical facilities, special process facilities, special equipment requirements, or special cases of medical exceptions, where the coordinated approvals of DBOS are obtained.

b. Temperatures will be reduced in buildings during periods of nonoccupancy (nights, weekends, holidays, etc.) to 55 °F or lower setting if the thermostat cannot be reduced to 55 °F.

c. Ventilation of buildings during heating periods will be limited to that necessary for the health of occupants.

d. EMCS will be used to the maximum extent possible to permit individual systems to be operated on a day-to-day basis depending on weather conditions. In this manner, unusual early season weather can be accommodated without continued use of the systems. In buildings where EMCS cannot control the HCVAC systems, occupants will use guidance provided in this plan to manually operate the HVAC system and conserve energy.

e. In general, issue or use of portable heaters (electric, kerosene, etc.) is prohibited except in emergencies verified by the DBOS or where such use eliminates the need for heating an entire building or much larger area of a building, or where no other heating source is feasible. All authorized portable heaters must be registered, approved, and tagged by the fire chief. The use of portable kerosene heaters (PKHS) in lodging, child care, public assembly, warehouse, and medical treatment facilities is prohibited without exception. PKHs may be used in administrative areas subject to compliance with the following fire and safety precautions:

(1) Fire.

(a) PKH must comply with Underwriters Laboratory Standard 647, 3 December 1983.

(b) PKH must be installed per National Fire Code Standard 31, chapter 5.

(c) Fuel for KPH will not be stored in buildings.

(d) PKH will be refueled outdoors.

(e) The building fire warden must inspect PKH during operation each day and at the close of each day.

(f) PKH must be secured in such a manner to eliminate the possibility of being accidentally knocked over.

(g) A minimum clearance of 36 inches must be maintained between the front, side, and rear of PKH and adjacent combustible materials.

(h) Kerosene must be Type 1.

(2) Safety.

(a) PKH will not be utilized in buildings where personnel suffer from respiratory diseases.

(b) The following warning will be displayed where PKHs are used:

"Tests have shown unvented portable kerosene heaters produce carbon monoxide gases in excess of the 50 parts per million limit set by the Occupational Safety and Health Administration."

f. In checking the effective temperature in a building, a wide range is possible, depending on where the readings are taken. In general, temperatures should be measured about 3 feet above the floor and 5 feet from the exterior walls. The only exception to this is in child care centers, where the readings should be taken about 1 foot above the floor and 5 feet from the exterior walls.

g. All heating plants of 5 MBTU per hour or greater capacity that burn natural gas or oil may be required to have dual fuel capability. Plants less than 5 MBTU capacity will be multiple fuel capacity where economically feasible.

h. Thirty-day storage of heating fuel oil, coal, or liquid petroleum gas (LPG) shall be maintained where these fuels are used as the primary heat source or backup for facility, including residential and building furnaces. Use the coldest 30-day period in the last 5 years as the basis for deterring quantities.

i. The indoor temperatures listed in table I-1 are considered to be the maximum allowed during the heating season. Any temperature below that listed may be used as long as that temperature is consistent with health and mission accomplishment.

j. New heating systems must be connected to existing central plants when it is determined to be the most cost effective on a life-cycle basis.

k. The primary fuel source to be used in any new heating system or fuel conversion will be the most cost-effective fuel available for that system on a life-cycle basis.

l. Consideration will be given to direct burial, shallow trench, and above-ground distribution lines for chill water and steam lines. Selection will be the most cost effective on a life-cycle basis.

Table I-1
Indoor Temperatures - Heating Season

Temperature	Type Activity
75 °F (note 1)	Recovery rooms, nurseries, and nursing units in medical treatment facilities.
80 °F (note 1)	Intensive care, special care nurseries, special treatment areas (burn unit, oral surgery, cystoscope, cardiac catheterization, etc.).
76 °F (note 1)	Operating rooms, delivery rooms, dental operatory, and dental laboratories in medical treatment facilities.
70 °F (note 2)	Private rooms, wards, nursing stations, patient care areas, and other occupied medical areas (i.e., nonpatient care, admin areas, waiting rooms, etc.) in medical treatment facilities.
70 °F (note 3)	Child development centers.
70 °F	Living quarters, dining facilities, lavatories and showers.
70 °F	Offices; morale, welfare,, and recreation, activities; Post Exchange; concessions; service clubs; commissary; chapels; labs; shops; classrooms; administrative areas; warehouses; hangers; storage areas; and other areas where personnel work seated or in a standing position involving little or no exercise.
70 °F (note 4)	Museums and libraries.
60 °F	Supply and equipment issue and similar rooms.
55 °F	Gymnasiums, physical fitness centers (activity areas only).
55 °F	Shops, warehouses, hangers, and storage areas where personnel do work in a standing position, moving around, involving moderate to vigorous exercise.
55 °F (note 5)	General setback temperature during periods of nonoccupancy on nonfamily housing buildings.

Notes to Table I-1:

1. Allowable temperatures comply with the requirements of Health Services Command Regulation 11-3. A relative humidity of 50 to 60 percent must be maintained.

2. Allowable temperatures comply with the requirements of Health Services Command Regulation 11-3. A relative humidity of 35 to 60 percent must be maintained.

3. Temperature must be measured within 1 foot above the floor.

4. Allowable temperatures comply with the requirements of the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE@). A relative humidity of 35 to 55 percent must be maintained.

5. Setback temperatures may be lower or higher, considering site-specific factors such as building thermal inertia and setup time, humidity levels, condensation problems, freeze protection, etc.

Appendix J
Air Conditioning Policy

J-1. Startup and Shutdown of Air Conditioning (A/C) Systems.

a. General policy for seasonal startup and shutdown of A/C systems is contained in appendix I, para I-1.

b. Special medical exceptions, medical facilities, communication, computer, and operational facilities requiring cooling to protect equipment will be exempt from the A/C startup and shutdown policy. Also, those buildings which do not have adequate ventilation as determined, by the DBOS will be exempt from this policy. Exemptions must be requested, in writing, from the DBOS.

J-2. Installation of A/C.

a. Long-Range A/C Plan. Per TRADOC requirement, the installation must establish a long-range (5-year minimum) program for A/C, evaporative cooling, and mechanical ventilation of existing facilities. The A/C plan will be incorporated into the Installation Master Plan.

b. Procedures. Prior to the installation of A/C in Army buildings, the following procedures are required:

(1) The severity of the cooling season (the combination of temperature and humidity) at each TRADOC installation determines the extent of A/C on post. The qualifying requirements are specified in AR 420-49, 28 April 1997, Air Conditioning and Refrigeration. In addition, all family housing units must comply with the cost limitation requirements specified in AR 210-50, 1 September 1997, Housing Management.

(2) Energy conservation is a primary concern on the installation. Before installing A/C, make sure the building or space to be air conditioned will meet the insulation and ventilation requirements of "Architect-Engineer Instructions, Design Guide." The design of the system must also conform to the requirements of AR 420-49, 28 April 1997.

(3) Unitary A/C units must meet the energy efficiency criteria provided in appendix B, Guide to Facilities Engineering Utility Systems Management, U.S. Army Training and Doctrine Command, 23 October 1989. If window units are to be installed, the energy efficiency ratio (EER) must not be less than 12, regardless of operating voltage.

c. Technical Equipment. Automated data processing equipment (ADPE) such as minicomputers or large multi-user systems, word processors, and technical equipment often

require more stringent environmental controls than personnel comfort applications. This equipment should all be located in a separate room where space conditions can be carefully controlled. Personal computers (PCs), including PC based word processors, in a room do not constitute a need for additional A/C. Separate cooling systems should be designed for technical equipment and should consider the following:

(1) Technical equipment should have a dedicated A/C system to maximize energy conservation. This can often prevent operation of large central systems at times of the year when A/C is needed only for the technical equipment. It is often economically justifiable to install smaller dedicated A/C systems for the purpose of cooling existing computer rooms that are presently cooled by larger central systems.

(2) Tape drives and disk drives are the parts of computer equipment that are most sensitive to adverse temperature and humidity conditions. Consideration should be given to locating these items remotely in a small space to reduce required cooling capacity and humidity control.

(3) The ceilings and walls of computer rooms should be sealed with vapor barriers to prevent the entrance of moisture into the space. Since it takes approximately 1,000 BTU to condense each pound of water, energy costs can be minimized if vapor barriers are in place to maintain a constant humidity level.

d. Absorption Chillers. Installation of absorption A/C equipment will not be considered as new construction or repair option unless the following criteria are satisfied:

(1) Waste steam must be available from incineration of solid wastes, heat recovery on large diesel engines, gas turbine exhausts or cogeneration systems.

(2) A life cycle cost analysis must be performed which shows absorption equipment to be the most economical option.

e. Work Classification. Maintenance and repair (MAR) projects may be submitted to replace window air conditioners with a central system for buildings where the window A/C units have failed or are in the process of failing. The window air conditioners must be installed real property, not occupant-owned, Nonappropriated Fund (NAF), or equipment-in-place.

(1) It is repair to replace failed or failing A/C systems or units serving one or more facilities with a new central system. The capacity of the system cannot be increased or the conditioned space made larger, except as noted below.

(2) The project can be a combination of repair and construction. The construction portion would be the incremental increases in capacity or conditioned space. The construction costs must be accounted for separately.

(3) The following exceptions are not considered construction.

(a) Using the smallest commercially available unit which is satisfactory for the application, even though its capacity exceeds currently installed capacity.

(b) An increase in capacity required by normal growth, but without adding more conditioned space.

J-3. Exceptions to Policy.

a. Justification for Central Systems. HQDA and TRADOC policy is to air condition entire buildings with central A/C systems. However, the use of multiple units is permitted provided it is cost effective on a life cycle cost basis. This is particularly encouraged in multipurpose facilities that include auditoriums, large conference areas, computer rooms, or other special areas. The potential for high density cooling loads and use after normal occupancy hours may demand that separate A/C units be installed in these types of facilities. Administrative spaces of large unairconditioned buildings can be individually cooled up to a certain tonnage (see AR 420-49, para 4-3). Emergency requirements can be met with window units, the understanding that the permanent solution will be as determined by a life cycle cost analysis.

b. Installation Approval Authority.

(1) The Installation Commander may approve the installation of occupant-owned window A/C equipment in specified areas where its use will provide comfort cooling. The DBOS may install a 120/240 volt receptacle, but the installation, maintenance, repair, and removal of the unit is the responsibility of the occupant. This policy does not apply to the use of nonappropriated fund (NAF). The areas are specified in AR 420-49, para 2-lla.

(2) The Installation Commander may approve the installation of a multiplicity of A/C units.

(3) The Installation Commander may re-delegate this authority to the DBOS. The Installation Commander, or a delegate is responsible for maintaining completed documentation (including a life cycle cost analysis and records for audit purposes).

c. A/C for Gymnasiums.

(1) No TRADOC installation is in a weather zone that will allow A/C in a gymnasium (wet bulb temperature of 73 °F for at least 4000 hours during the year or a dry bulb temperature of 93 °F for at least 1300 hours during the year). Note: For A/C policy, HQDA classifies a fitness center the same as a gymnasium; the entire facility must qualify or no A/C is allowed.

(2) Fort Knox qualifies for A/C of handball or racquetball courts (wet bulb temperature of 67 °F and a dry bulb temperature of 80 °F for at least 800 hours during the year).

(3) No TRADOC installation qualifies for A/C in weight rooms or aerobics rooms. HQDA does not consider weight rooms and aerobics rooms to be small and completely enclosed rooms as a handball or racquetball courts. Weight rooms and aerobics rooms qualify for A/C only if the entire facility qualifies for A/C. They may not be provided A/C separately.

(4) Locker rooms in gymnasiums may not be provided A/C under any circumstances due to the large make-up air requirement. Instead, adequate ventilation should be provided to these areas, particularly during the summer months.

J-4. General Policy.

a. Avoid A/C when ventilation will suffice, except where needed to provide a controlled environment for special purposes such as medical exceptions, medical treatment facilities, communications centers, computer, and operational facilities requiring cooling to protect equipment.

b. During the cooling season, A/C in administrative space shall be shut off, or the thermostat set to the high limit, one half hour before the end of the work day. It shall not be restarted until the beginning of the next workday unless circumstances warrant an earlier morning startup to prevent uncomfortable conditions for occupants, damage to equipment, humidity problems, etc.

c. A/C should not be utilized into buildings during periods when the outdoor temperature is below 75 °F, except in medical and special process facilities or where medical exceptions exist.

d. Mechanical A/C will not be provided to the following facilities: gymnasiums, indoor tennis courts, indoor swimming pools, laundries, boiler plants, mechanical equipment rooms, maintenance shops, vehicle storage areas, sauna/whirlpool rooms, and greenhouses.

e. In checking the effective temperature in a building, a wide range is possible, depending on where the readings are taken. In general, temperatures should be measured about 3 feet above the floor and 5 feet from the exterior walls.

f. The indoor temperatures listed in table J-1 are considered to be the minimum allowed during the A/C season. Any temperature above that listed may be used as long as that temperature is consistent with health and mission accomplishment.

Table J-1
Indoor Temperatures - A/C Season

Temperature	Type Activity
78 °F	Living quarters (including family housing, barracks, DVQ, VOQ, VEQ, and guest houses), general offices, MWR activities, PX, concessions, service clubs, chapels, shops, classrooms, administrative areas, child development centers.
78 °F	All nonpatient care areas, including administrative areas, public waiting rooms, nonpatient waiting areas, etc. in medical treatment facilities.
76 °F (note 1)	Operating and delivery rooms, intensive care, special care nurseries, special treatment area (burn unit, oral surgery, cystoscopy, cardiac catheterization, etc), private rooms, wards, nursing stations, and other patient care areas in medical treatment facilities.
75 °F (note 1)	Recovery rooms, nurseries and nursing units, dental operatory, dental labs, and other labs in medical treatment facilities.
75 °F (note 2)	specialized equipment areas and refrigerated display case areas in commissaries.
See para J-5b	Museums and libraries.

Notes to Table J-1:

1. Temperatures comply with the requirements of Health Services Command Reg 11-3. A relative humidity (RH) of 50 to 60 percent must be maintained.

2. Temperatures comply with USA Troop Support Agency conservation guidelines for commissaries. RH MUST be below 55 percent.

J-5. Storage of Historical Properties and Documents.

a. Historical properties and document collections require optimum temperature and humidity control for proper preservation. Because of the wide variety of facilities used for storage and display of these items, energy managers must be aware of the requirements and be creative in methods used to achieve them.

b. AR 870-20, 11 January 1999, Army Museums, Historical Artifacts and Art, para 3-18d, specifies the requirement for Army museums to be furnished with adequate climatic controls. The same requirement holds true for historical document collections. Ideal climatic controls for preservation hold relative humidity at 55 percent; however, the type and age of the facility may make this unreachable. Nevertheless, climatic controls for storage and display of historical materials should ensure that a constant temperature and relative humidity are maintained on a 24-hour basis, with no more than a 5 degree or 5 percent variation of the established norm for the facility.

c. Museums and other facilities containing historical properties and documents will be exempt from the heating and A/C policies contained in this document.