Guide to Preparing Ozone-Depleting Chemical Elimination Plans for Installations

Prepared for: Army Acquisition Pollution Prevention Support Office

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With the Army Acquisition Pollution Prevention Support Office, Headquarters U.S. Army Materiel Command. It was prepared for Mr. George H. Terrell, AMCRDA-TE-E, (703) 617-9488, e-mail <gterrell@hqamc.army.mil>.

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14 January 1999

AS A RESULT of actions taken by parties to the Montreal Protocol and the 1990 Amendments to the Clean Air Act, the U.S. production of Class I ozone-depleting chemicals (ODCs) ended in 1995. While the Army strongly endorses the intent behind this production phase-out, it poses an enormous challenge for Army activities worldwide. And although significant progress has been made, Class I ODCs continue to be used extensively in the fire suppression systems and air conditioning and refrigeration equipment on Army installations.

RECYCLED STOCKS are now the only ODCs available to support the country's continued use of Class I ODCs. As supplies dwindle and availability decreases, the need for Installation Commanders to adequately plan for the absence of these chemicals is obvious. Failure to do so will result in a catastrophic impact to Army readiness and quality of life.

THIS GUIDE has been developed to assist Installation Commanders in this planning process. It provides step-by-step instructions on the preparation and execution of an Installation ODC Elimination Plan. I ask Commanders to read it thoroughly and apply it to the management of these limited resources. Direct, well thought out planning is essential to meet this immense challenge.

I AM CONFIDENT that the Army will continue its role as a leader in supporting our nation's efforts to preserve and protect the environment. I also remain confident that we are and will continue to be ready to execute our worldwide mission. As always, aggressive leadership is the key to our continued success.

--- Signed ---
DAVID A. WHALEY
Major General, GS
Assistant Chief of Staff
for Installation Management

PREFACE

Purpose

In 1994, Army installations were directed to "develop plans and budget for the retrofit or replacement of existing halon 1301 fire suppression systems and equipment utilizing CFCs as a refrigerant" (Deputy Assistant Secretary of the Army for Environment, Safety and Occupational Health memorandum, 18 Oct 94). Since then, the Army Acquisition Pollution Prevention Support Office (AAPPSO) has received numerous inquiries asking what should be included in an installation's Ozone-Depleting Chemical (ODC) Elimination Plan.

In response, AAPPSO has referenced the *Strategic Guidance and Planning for Eliminating Ozone-Depleting Chemicals from U.S. Army Applications* (Oct 94). Section IV, "Eliminating Ozone-Depleting Chemicals from U.S. Army Facilities Applications," identifies seven steps to building an ODC plan:

Step 1: Assign an Individual or Team to Manage the ODC Elimination Efforts
Step 2: Inventory Equipment and ODCs
Step 3: Conservation Measures
Step 4: ODC Recovery and Logistics
Step 5: Building Your ODC Elimination Plan
Step 6: Resourcing ODC Elimination
Step 7: Yearly Reporting Requirements and Plan Updates

On 3 Jul 97, the Assistant Chief of Staff for Installation Management (ACSIM) issued a policy memorandum and data call on the *Elimination of the Dependency on Ozone-Depleting Chemicals in Army Facilities*. As part of their response, three MACOMs provided "model" ODC plans that their installations had developed. However, review of these plans revealed that all were inadequate.

Therefore, AAPPSO accepted the action to prepare for ACSIM distribution a guide for Army installations on the development of ODC elimination plans.

ACSIM ODC Data Call

In the 3 Jul 97 memorandum, ACSIM requested specific information on all halon 1301 fire suppression systems and major pieces of chlorofluorocarbon (CFC) air conditioning and refrigeration (AC&R) equipment. The subsequent MACOM submittals showed good progress on ODC elimination, with half of the halon systems and two-thirds of the CFC systems removed since 1992. However, there are still over 470,000 lbs of halon and almost 300,000 lbs of CFC refrigerants installed. Removing these ODCs constitutes a $120M bill, of which only $30M is currently programmed.

The MACOM submittals also revealed that 135 pieces of CFC equipment are over 20 years old. Since older pieces of equipment leak significant amounts of refrigerant, and CFC leak rates are limited by law, proper accounting of efforts to replace these systems could result in an increase in the Army's environmental requirements of up to $46M.

Further, the analysis indicated that the "reserve" of CFC refrigerants being maintained at the installation level -- to support existing CFC systems -- is less than 5% of the total amount of CFC refrigerants installed. Since the average leak rate for these systems is approximately 10% per year, this reserve is wholly inadequate to support the prolonged use of this equipment without additional refrigerant. Army installations are thus dependent upon the continued availability of these refrigerants on the commercial market. However, the supply of some CFCs may run out soon, making many pieces of Army CFC equipment unsupportable as early as the end of FY00.

Lastly, the analysis revealed a considerable amount of halon, almost half a million pounds, had been lost when Army building fire suppression systems were retired. Halon in building fire suppression systems must be recovered for Army reuse. It is needed for the continued operation of Army weapon systems that require halon for fire and explosion suppression.

Overall, the 1997 ACSIM data-call revealed that although much progress had been made in eliminating ODCs, Army installations still do not have adequate ODC plans or adequate resource management of their ODC assets. ACSIM therefore decided that Installation Commanders needed clear, concise guidance on how to plan for the elimination of ODCs by the end of FY03.

Guide for Preparing ODC Elimination Plans

This Guide was put together to provide direct and detailed instructions on what is needed to adequately prepare and maintain an ODC elimination plan for your installation. For that purpose, the Guide is laid out in three sections:

Section 1: Background. Provides short, one-page summaries on key issues that are important to ODC elimination in Army facilities.

Section 2: Instructions. Provides chapter-by-chapter guidance on what should be included in your ODC Elimination Plan.

Appendices. Provides key policy memoranda, points of contact, topic summaries and other useful information related to ODC elimination on Army installations.

LIST OF ACRONYMS

AAFES	Army/Air Force Exchange Service
AAPPSO	Army Acquisition Pollution Prevention Support Office
AC&R	Air Conditioning and Refrigeration
ACSIM	Assistant Chief of Staff for Installation Management
AEPI	Army Environmental Policy Institute
AEC	Army Environmental Center
ARDEC	Army Armament Research, Development and Engineering Center
ASA(IL&E)	Assistant Secretary of the Army for Installations, Logistics and the Environment
ASA(RDA)	Assistant Secretary of the Army for Research, Development and Acquisition
ASHRAE	American Society of Heating, Refrigeration and Air-conditioning Engineers
ATR	Approved Technical Representative
BTU	British Thermal Unit
CAA	Clean Air Act
CAAA	Clean Air Act Amendments of 1990
CF_2ClBr	Bromochlorodifluoromethane (halon 1211)
CF_3Br	Bromotrifluoromethane (halon 1301)
CFC	Chlorofluorocarbon
CFR	Code of Federal Regulation
CHPPM	Army Center for Health Promotion & Preventative Medicine
CO_2	Carbon Dioxide
DASA(ESOH)	Deputy Assistant Secretary of the Army for the Environment, Safety and Occupational Health
DDRV	Defense Depot Richmond, Virginia
DeCA	Defense Commissary Agency
DLA	Defense Logistics Agency
DoDAAC	Department of Defense Activity Address Code
DRMO	Defense Reutilization and Marketing Office
DSCR	Defense Supply Center, Richmond
DUSD(ES)	Deputy Undersecretary of Defense for Environmental Security
EO	Executive Order
EPA	Environmental Protection Agency
EPR	Environmental Program Requirements
ESDF	Established Standard Deadline in Future (EPR code)
ESDP	Established Standard Deadline Past (EPR code)
ESPC	Energy Savings Performance Contracting
FSC	Federal Stock Code

FGS	Final Governing Standards
FM-200™	Tradename for HFC-227ea fire suppression agent produced by the Great Lakes Chemical Corporation (GLCC)
FR	Federal Register
GCC	Global Climate Change
GFE	Government Furnished Equipment
GHG	Greenhouse Gas
GPO	Government Printing Office
GSA	General Services Agency
HCFC	Hydrochlorofluorocarbon (Class II ODC)
HFC	Hydrofluorocarbon
HP	Horsepower
HQ	Headquarters
HQDA	Headquarters Department of the Army
HVAC	Heating, Ventilation and Air Conditioning
Inergen™	Tradename for an inert gas fire suppression agent produced by Ansul
LATR	Lead Approved Technical Representative
MACOM	Major Command
MIPR	Military Interdepartmental Purchase Request
MVAC	Motor Vehicle Air Conditioning
MWR	Morale, Welfare and Recreation
NSN	National Stock Number
OCONUS	Outside the Continental United States
ODC	Ozone-Depleting Chemical
ODS	Ozone Depleting Substance (equivalent to ODC)
OSD	Office of the Secretary of Defense
P2	Pollution Prevention
PL	Public Law
PSDF	Pending Standard and Deadline in Future (EPR code)
ROI	Return on Investment
RPMA	Real Property Maintenance Account
SAO	Senior Approval Official or Senior Acquisition Official per PL 102-484, Section 326 and subsequent policy
SAILE	See ASA(IL&E)
SARDA	See ASA(RDA)
SES	Senior Executive Service
SNAP	EPA Significant New Alternatives Policy
UNEP	United Nations Environmental Programme
USACE	U.S. Army Corps of Engineers
USC	United States Code
WMO	World Meteorological Organization

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APPENDICES

SECTION 1: BACKGROUND

This Section is presented in seven one-page chapters summarizing the treaties, laws, regulations, and issues that are key to the Army ODC Elimination Program:

Chapter 1: Montreal Protocol

Chapter 2: Title VI of the Clean Air Act

Chapter 3: CFC Equipment Leak Limits

Chapter 4: ODC Contracting

Chapter 5: Army ODC Policy

Chapter 6: ODCs Applications

Chapter 7: Why the Army Is Eliminating ODCs

Chapter 1: Montreal Protocol

In September of 1987, 24 countries signed the Montreal Protocol to the Vienna Convention on Substances that Deplete the Ozone Layer. It has now been signed by over 250 countries. The Montreal Protocol is an international treaty that addresses the production and import of ODCs. This treaty laid the groundwork for future agreements in three ways: 1) it formalized a process for international review on the protection of the ozone layer, 2) it provided a comprehensive list of ODCs, and 3) it legally limited the signatories' production of ODCs. The original Protocol froze ODC production in 1989 at 1986 levels and directed a 50% reduction in ODC production by the year 2000.

The Montreal Protocol also established a systematic method for countries to report their ODC production, consumption, import and export, as well as a means of sharing the results of research and development work to identify substitute materials. The agency that manages the Protocol and performs oversight of the signatories is the United Nations Environmental Programme (UNEP).

The Montreal Protocol was first implemented in the United States in February 1989 when the EPA issued the final rule "Protection of the Stratospheric Ozone" in the Federal Register (40 CFR Part 82).

Over the years, the parties of the Montreal Protocol have met to review and amend the Protocol as needed. The first such meeting resulted in the London Amendments of 1990, which established a ban on the production of the worst ODCs by the end of 2000. The second meeting resulted in the Copenhagen Amendments of 1992. These amendments accelerated the production phase-out of ODCs to the end of 1993 for halons and the end of 1995 for chlorofluorocarbons (CFCs), methyl chloroform, and carbon tetrachloride. Two other meetings of the parties, in Vienna in 1995 and in Rio in 1997, provided amendments on issues related to developing countries -- which have a ten-year grace period for their production phase-outs of Class I ODCs-- and the future phase-out of less harmful, Class II ODCs called hydrochlorofluorocarbons (HCFCs).

The Montreal Protocol currently identifies the following chemicals as Class I ODCs and establishes the associated production phase-out dates for developed countries:

Group I:	CFC-11, -12, -113, -114, -115	1 Jan 96
Group II:	Halon 1211, 1301, 2402	1 Jan 94
Group III:	Remaining CFCs	1 Jan 96
Group IV:	Carbon Tetrachloride	1 Jan 96
Group V:	1,1,1 Trichloroethane	1 Jan 96
Group VI:	Methyl Bromide	1 Jan 01
Group VI:	Hydrobromofluorocarbons	1 Jan 96

Chapter 2: Title VI of the Clean Air Act

In 1990 Congress passed the Clean Air Act Amendments (CAAA) (42 USC 7401 et. seq.). Title VI of these amendments regulates the production and purchase of ODCs, as well as the operation and maintenance of equipment that use ODCs. The following sections of Title VI are pertinent to Army operations on CONUS installations. OCONUS operations are subject to the host country's own ODC laws and regulations and/or the DoD Final Governing Standards (FGS).

Sections 602, 604, and 605 originally listed the same substances and production phase-out dates as the London Amendments of the Montreal Protocol. As the subsequent protocol amendments have been ratified, the EPA has issued rulings to update the list and now currently lists the same ODC classes, groups, and phase-out schedules as presented at the bottom of the previous page (Chapter 1).

Section 606 allows for the EPA to accelerate the ODC production phase-out if: 1) "credible current scientific information" demonstrate it is necessary for the continued protection of human health and the environment, 2) such changes are made in amendments to the Montreal Protocol, or 3) it is determined that more stringent schedules are technologically and economically achievable.

Section 608 (and subsequent rulings) establishes usage restrictions on the operation and maintenance of ODC-using equipment. Per this section, it is illegal to vent halon or any refrigerants into the atmosphere. Moreover, it is illegal to perform work on an air conditioning or refrigeration (AC&R) system without first receiving training and a certification from the EPA, or to sell CFC refrigerant to someone without the same certification. It is also illegal to dispose of AC&R equipment that still has refrigerant inside it. Finally, CFC AC&R systems are limited to a maximum percentage of refrigerant they can leak. If their annual leakage exceeds this percentage, they must be repaired or replaced (see Chapter 3).

Section 609 (and subsequent rulings) establishes additional standards and requirements for the servicing of motor vehicle air conditioners. It reiterates the prohibition on venting refrigerants, as well as the requirement to be EPA trained and certified to legally purchase refrigerant or work on mobile air conditioning equipment. It further establishes requirements for refrigeration recovery equipment and record keeping at shops that service mobile air conditioners.

Section 612 (and subsequent rulings) established the EPA SNAP program. Through the SNAP program, the EPA reviews and classifies potential ODC alternatives in the following categories: refrigeration, foam blowing, solvent cleaning, fire and explosion suppression, sterilants, aerosols, tobacco expansion, adhesives-coatings-inks, and pesticides. The EPA identifies each substitute by specific application as either acceptable (with or without conditions) or unacceptable. It is illegal to replace an ODC with an alternative that the SNAP program identifies as unacceptable. NOTE: Army policy requires that all ODC alternatives must not only have SNAP approval before use, but also have a toxicity clearance from the Army Surgeon General.

Chapter 3: CFC Leak Limits

Under Section 608 of the Clean Air Act Amendments of 1990, the EPA was directed to "promulgate regulations establishing standards and requirements regarding the use and disposal of class I substances." Section 608 further directs the EPA to "include requirements that will reduce the use and emission of such substances to the lowest achievable level."

On 5 Sep 95, the EPA issued a ruling defining their refrigeration system leak repair, retrofit, or replacement guidelines in the Federal Register (60 FR 40419). These guidelines amended 40 CFR 82 and specifically established the following maximum allowable leak rates for CFC AC&R equipment with a capacity refrigerant charge of more than 50 lbs (40 CFR 82.156(i)):

-- Commercial refrigeration equipment …… 35% per year
-- Industrial process refrigeration equipment …… 35% per year
-- Comfort cooling and other appliances …… 15% per year

40 CFR 82.156 requires that any CFC AC&R equipment leaking in excess of these limits must be repaired "within 30 days after discovery, or within 30 days after when the leaks should have been discovered if the owners intentionally shielded themselves from information which would have revealed a leak." Equipment taken off-line to perform a repair cannot be brought back on-line until an initial verification test indicates that the repairs have reduced the leak rate below the maximum allowable rate.

An installation may apply for an extension to the 30-day repair requirement. To do so, they must document all repair efforts undertaken to date and then notify the EPA of their inability to comply. Such applications must be made within 30 days of discovering the leak. EPA is required to respond to this application within 30 days of receipt.

The failure of an Army installation to comply with this regulation can result in fines of up to $25,000 per violation per day.

On 28 May 98, the EPA proposed (i.e., issued in the Federal Register under 63 FR 32044) lowering the maximum leak rates as follows:

-- Commercial refrigeration equipment …… 15% per year
-- Industrial process refrigeration equipment …… 20% per year
-- Comfort cooling and other appliances (existing) …… 10% per year
-- Comfort cooling and other appliances (new) …… 5% per year

Comments to the proposed rule were due 26 Jul 98. A final ruling is expected -- without significant changes to the new leak rates -- before the end of 1999.

Chapter 4: ODC Contracting

In the Defense Authorization Act for 1993 (PL 102-484), Congress inserted Section 326, "Elimination of Use of Class I Ozone-Depleting Substances in Certain Military Procurement Contracts." This section states "No Department of Defense contract awarded after June 1, 1993, may include a specification or standard that requires the use of a class I ozone-depleting substance or that can be met only through the use of such a substance." The section further states an approval to require ODCs may be granted "only if the senior acquisition official determines (based upon the certification of an appropriate technical representative of the official) that a suitable substitute for the class I ozone-depleting substance is not currently available."

Through a series of memoranda in 1993, the Office of the Secretary of Defense (OSD) clarified that the approval of a "senior acquisition official" was interpreted as requiring the signature of a General Officer or senior executive service (SES) member. The Army Judge Advocate General further clarified that this law not only applies to system acquisition contracts, but to contracts at all levels of the Army, including base operations. Therefore, AC&R servicing contracts, fire suppression servicing contracts, and even credit card purchases of CFC refrigerants or halon by law require both a technical certification of need and a General Officer or SES signature. This authority cannot be delegated. Therefore, some installations may require an SAO approval from their HQ MACOM staff to satisfy this law.

An AC&R servicing contract does not require an SAO approval if the CFC refrigerant used is provided as government furnished equipment (GFE). If the installation has been recovering the refrigerant from CFC equipment as it is retired, there will be a supply of CFC refrigerant on-hand to service it's existing CFC equipment. If this refrigerant is then made available to the support contractor, and is adequate to support the existing AC&R equipment, then no SAO approval is necessary.

PL102-484, S326 also requires the Army to submit a report to Congress on all approvals granted. Originally required quarterly, they are now required annually through CY00. They identify the contract, ODC type and quantity, and the equipment supported for each approval. When a contract involving the use of an ODC is approved at the installation level, the reporting information must be forwarded to the appropriate HQ MACOM office for inclusion in their annual report.

Executive Order 12843, "Procurement Requirements and Policies for Federal Agencies for Ozone-Depleting Substances," was signed by President Clinton on April 21, 1993. It was effected to impose on other federal agencies the same kind of procurement restrictions that PL102-484, S326 imposes on the DoD. Its requirements are much less stringent, however, and basically direct the federal government to "minimize the procurement" of ODCs and "give preference to the procurement of alternative chemicals." There are no EO 12843 reporting requirements.

Chapter 5: Army ODC Policy

The Army first published policy on ODC elimination in HQDA LTR 200-90-1, Subject: Eliminating or Minimizing Atmospheric Emissions of Ozone-Depleting Substances, 27 July 1990. Included in this policy were the following directives:

-- ODCs will be procured only in the absence of suitable alternatives.
-- ODCs are classified as controlled chemicals, and as such local procurement will be reported to the integrated materiel manager.
-- Direct release of ODCs to the atmosphere is prohibited.
-- Recycling and conservation will be done to the maximum extent possible.
-- Substitutes will be evaluated for their toxicity in the Army's intended use.
-- Adequate resources will be budgeted and programmed to carry out the requirements of this letter. Environmental-related requirements will be identified in the A-106 (Environmental Program Requirements) report.

There have been numerous policy documents since 1990, including:

-- Army Acquisition Executive, "Elimination of Ozone-Depleting Chemicals; Implementation of the Requirements of the National Defense Authorization Act for Fiscal Year 1993," 20 May 1993.
-- Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health), "Disposition of Excess Ozone-Depleting Substances (ODS) at Army Installations," 18 Oct 94.
-- *Strategic Guidance and Planning for Eliminating Ozone-Depleting Chemicals from U.S. Army Applications*, Nov 95.
-- Assistant Secretary of the Army (Installations, Logistics, and the Environment), "Ozone-Depleting Chemicals (ODC) Elimination at Army Installations," 13 Feb 96.

Current Army policy for ODC elimination in facilities is best summarized by Enclosure 1 of the ACSIM memorandum "Elimination of the Dependency on Ozone-Depleting Chemicals (ODCs) in Army Facilities," 3 Jul 97. The following are the six main points of that summation:

-- Installation Commanders are responsible for ODC elimination.
-- Tenant Commanders are responsible for complying with host ODC policies and supporting host ODC elimination efforts.
-- Class I ODCs must be eliminated from all facilities on Army installations by the end of FY03.
-- Installations may not contract for the use of Class I ODCs.
-- All Class I ODCs in Army facilities must be recovered. CFCs may be reused on the installation; halons must be sent to the Army ODC Reserve.
-- ODC alternatives must first be approved by the EPA SNAP program and receive a toxicity clearance from the Army Surgeon General before use in Army facilities.

Chapter 6: ODCs Applications

There are four general types of ODCs historically used in Army facilities: halons, chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and solvents (carbon tetrachloride and methyl chloroform or TCA). The specific chemical compounds are listed in Chapter 1: Montreal Protocol.

The typical applications in Army facilities of these ODCs are as follows:

-- Halon: Fixed, total flooding room fire suppression (halon 1301)
Portable (two-wheeled) flightline fire protection (halon 1211)
Hand-held building fire extinguishers (halon 1211)

-- CFCs: Large building chillers (R-11, R-12)
Large fixed air conditioning systems (R-12, R-500, R-502)
Climate test facilities (R-13, R-113, R-114)
Environmentally controlled warehouses (R-11, R-12, R-113)
Walk-in refrigerators and freezers (R-12, R-502)
Smaller, older appliances like ice-making machines (R-12)
Older household appliances (R-12)
Air conditioners in non-tactical vehicles (R-12)

-- HCFCs: Smaller fixed air conditioning systems (R-22)
Window air conditioners (R-22)

-- Solvents: Maintenance and repair activities (carbon tetrachloride, TCA)
General metal cleaning (carbon tetrachloride, TCA)

Carbon tetrachloride and methyl chloroform are Class I ODCs. The domestic production of these solvents ended in 1995. Since they only had a shelf life of six months, there should be no further use of these solvents on Army installations. The protective additives included in these solvents have broken down and they now may cause etching and corrosion on the parts they are being used to clean. To repeat: there should be no current use of carbon tetrachloride or methyl chloroform on Army installations. Identify any such use immediately to AAPPSO.

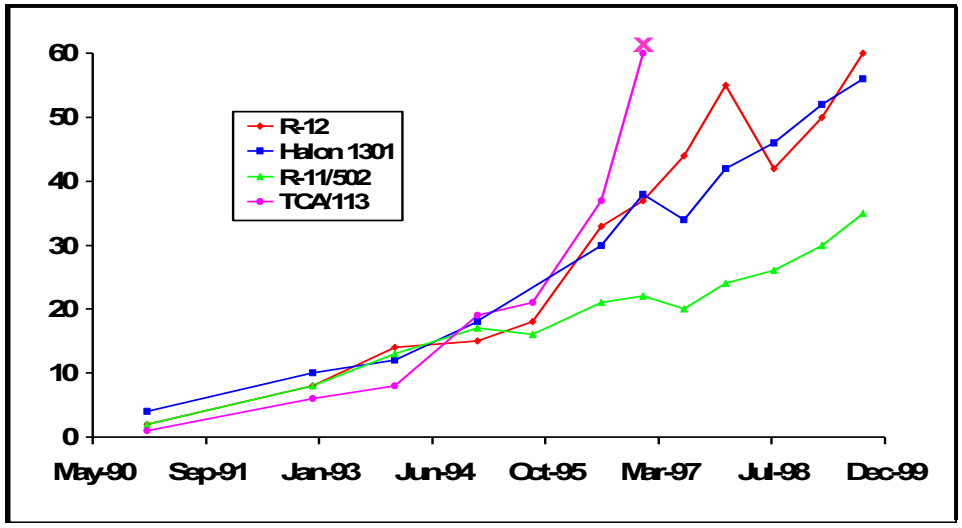
Halons and CFCs are also Class I ODCs. Their domestic production ended in 1993 and 1995, respectively, and so their continued commercial availability is dependent upon domestic recovery and recycling. HCFCs are Class II ODCs, and under current legislation they will continue to be produced in this country until at least 2020. Recycled product will be available for some time thereafter. Class II ODC legislation is continually being reevaluated, however, and some acceleration of their production phase-out schedule may occur in the future.

Chapter 7: Why the Army Is Eliminating ODCs

Ever since the first Army General Officer Steering Committee on ODCs convened in 1989, the Army has understood that the continued dependency on ODCs poses a real threat to Army readiness and quality of life. This is the principle reason why the Army continues to pursue a policy that calls for the complete elimination of Class I ODCs from its facilities by the end of FY03.

The cost of ODCs continues to increase, not only due to dwindling supplies of recycled product but also stiff taxation. In 1989, Congress included in the Omnibus Budget Reconciliation Act a graduated sales tax on ODCs, based on their ozone depleting potential. In 1992, Congress further taxed ODCs through provisions in the U.S. Energy Policy Act by including a floor tax on unused (stockpiled) product. The taxes paid on ODCs for the period 1993-1996 totaled over $2,500,000,000.

RETAIL ODC COSTS ($/LB)
(as of August 1, 1998)



Experts continue to raise serious concerns over the near-term availability of some ODCs. Spot shortages of R-12 were experienced in the summer of 1997, although the flood of illegal imports has bolstered R-12 stocks in 1998 and should carry the country through the summer of 1999. However, not only R-12 but also R-113 and R-114 may not be available as early as 2000. The remaining CFC refrigerants (R-11, R-500, R-502) may not be available past the summer of 2003. Experts also question the availability of halon 1301 past the end of 2003.

SECTION 2: INSTRUCTIONS

This Section is presented in seven chapters, corresponding to the seven chapters each installation ODC elimination plan should have. The chapters are:

Chapter 1: Installation

Chapter 2: Team

Chapter 3: Inventory

Chapter 4: Rules

Chapter 5: Recovery & Turn-in

Chapter 6: Management

Chapter 7: Resources

Each chapter in this Guide has the following parts:

-- A Title,

-- A Reference with an applicable citation to Army policy,

-- A Summary that provides a brief, direct description of the information required in the installation ODC plan, and

-- A section called “In the Plan” that provides specific examples of the information described in the Summary.

These instructions are not meant to be rigid requirements. Each installation is a unique entity with unique requirements. Tailoring of these instructions is encouraged.

Simply completing these instructions as presented, however, should provide the Installation Commander with enough information and structure to both properly manage the installation’s ODC assets and also identify the resources required to eliminate the installation’s dependency on ODCs by the end of FY03.

It should be noted that this plan MUST be a “living document.” It must be updated and corrected continuously for it to be of any practical use. Information such as the inventory, replacement schedule, regulations and points of contact will constantly be changing, and expedient use should be made of tabs, pencil markings, and white-out.

Chapter 1

Title: *Installation*

Reference: "*Army Installation/Regional Support Commanders are responsible for ensuring that Class I ODCs, as defined by section 602(a) of Title VI of the Clean Air Act, are eliminated in all facilities on their installations by the end of fiscal year 2003."*
ASA(IL&E) Memorandum 13 Feb 96

Summary:

The first chapter of the installation's ODC elimination plan should identify and **briefly** describe the installation. This isn't the place for a detailed history of the post. However, some basic information should be valuable to someone using the plan. This information could include:

-- Identification of the installation's MACOM, with a BRIEF description of the major activities conducted on the post.

-- Identification of the host activity, with a point of contact (name, phone & e-mail).

-- A list of all the installation tenants, identifying their MACOMs, units, and points of contact (names, phones & e-mails).

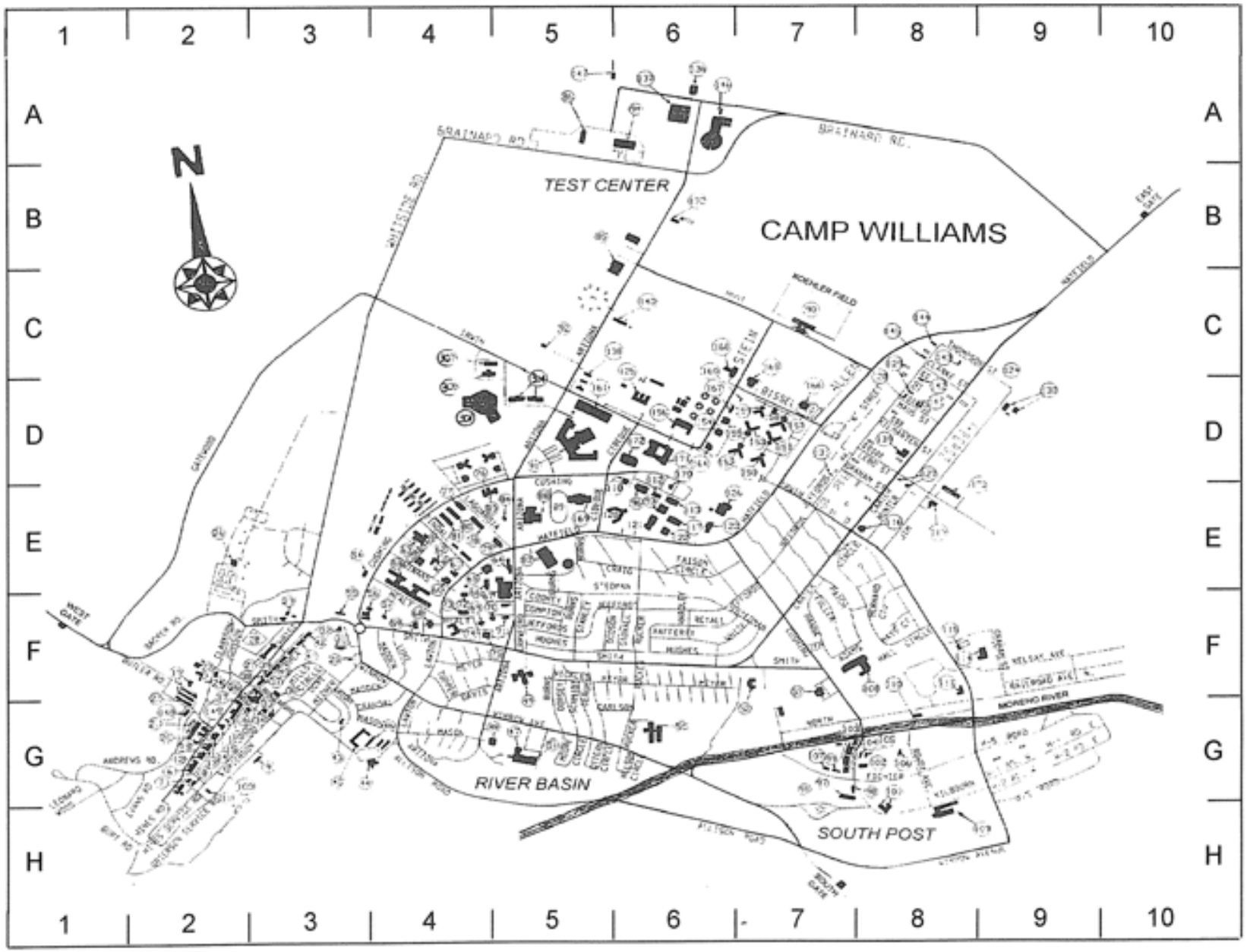
-- A map of the installation, identifying all buildings by number.

-- A BRIEF description of any characteristics of the installation which have had a significant impact on ODC use in the past, or could have a significant impact on ODC elimination in the future. For example: unusual climate, extensive use of "swamp cooling" or other unusual AC&R systems, use of a central cooling plant, lack of water to certain areas, demolition plans, or building renovation plans.

"In the Plan"

The following two pages are samples of:

1) An installation map with building numbers identified.
2) A list of host and tenant organizations with points of contact.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TEST CENTER
CAMP WILLIAMS
RIVER BASIN
SOUTH POST
BRAINARD RD.
WEST GATE
EAST GATE
SOUTH GATE
MORENO RIVER

SAMPLE
CAMP WILLIAMS LIST OF ORGANIZATIONS

INSTALLATION: CAMP WILLIAMS

HOST MACOM: CENCOM

MACOM	Unit	Area	POC	Number	Fax	E-mail
Host	HQ 9th Army	Main Post	CAPT David Browning	555-1234	555-9876	dbrowning@hq9th.army.mil
MEDCOM	Jones Medical Center	300 Series Bldgs	MSGT Barbara Turner	555-2345	555-8765	bturner@williams.army.mil
TRADOC	Army Missiles School	South Post	Mr. Cecil Page	555-3456	555-7654	cpage@williams.army.mil
Reserve	HQ 102 Reserve Cmd	Bldg 58	Ms. Debbie Goforth	555-4567	555-6543	dgoforth@williams.army.mil
National Guard	102nd TX Artillery Div	Bldg 36	Mr. Steve Cody	555-1122	555-9988	codysa@txang.texas.gov
Safety Center	Detachment 6	Bldg 87	LT Percy Sherman	555-5678	555-5432	psherman@williams.army.mil
AMC	Missile Test Activity	Test Center	MAJ John Cameron	555-6789	555-4321	jcameron@williams.army.mil
DFAS	Region 12	River Basin	Mr. Paul Appia	555-7890	555-3210	paul_appia@region12.dfas.mil
DLA	DRMO	Bldg 26	Ms. Chris Farschon	555-3344	555-7766	cfarschon@williams.army.mil
Air Force	Missile Detachment 5	Test Center	LtCol Francis Brewster	555-8901	555-2109	fbrewster@det6.afmtc.afmc.af.mil
AAFES	Post Exchange	Bldg 79	Mr. Gary Stewart	555-9012	555-1098	gstewart@williams.army.mil
DeCA	Commissary	Bldg 78	Ms. Cynthia Tyson	555-0123	555-0987	ctyson@williams.army.mil

Chapter 2

Title: *Team*

Reference: "*Installation Commanders are responsible for the elimination of all ODC use on their installations, including that of tenants, with the exceptions of the Army-Air Force Exchange Service and the Defense Commissary Agency." ACSIM Memorandum 3 Jul 97*

Summary:

The first task in preparing an installation ODC elimination plan isn't identifying where the ODCs are being used. It's identifying who's responsible for their use, and therefore responsible for their removal. Of course the final responsibility rests with the Installation Commander, but the day-to-day responsibility rests with the members and chair of the installation's ODC Elimination Team.

The chair of the ODC team is appointed by the Installation Commander. The principle function of the ODC team chair is a coordinator and facilitator. Since ODC elimination is the result of environmental laws, regulations and policies, the chair is often selected from the post environmental office. This isn't required, however, and base operations and logistics are also two other logical offices for the chair. More important than any background or training are individual leadership and communication skills, and the personal drive to take on and complete a challenging task.

Not only should the ODC Team chair be identified in Chapter 2, but also the rest of the installation ODC Elimination Team. The following should be on the Team:

-- Environmental. Someone familiar with the Clean Air Act, specifically Title VI and associated regulations, and Army policy on ODC elimination. For OCONUS installations, someone also familiar with the host country's environmental laws and regulations and the DoD FGS.

-- Real Property. Someone familiar with the scheduling and budgeting, as well as replacement and upkeep, of installation equipment.

-- Fire/Emergency Services. Someone familiar with fire laws, regulations, and policies, as well as fire system requirements and maintenance.

-- Contracting/Procurement. Someone familiar with the laws, regulations, and policies on base contracting, particularly that of base services and credit card purchases.

-- Legal. Someone familiar with contract law and/or environmental law.

-- Logistics/Readiness. Someone familiar with the procedures defining base supply, including requisitioning, storage, and distribution.

-- Garrison Administration. Someone familiar with the day-to-day operations of the post, including the functions of the host units and garrison offices.

-- Resources/Finance. Someone familiar with planning, programming, and budgeting requirements and limitations.

-- Tenants. Individuals with a reasonable understanding of the operations and requirements of the tenants they are representing.

It's important, once the team is formed, that the ODC Team chair seeks continued support from the Installation Commander and tenant Commanders. It is critically important to get the Commander(s) approval(s) on the installation ODC Elimination Plan. This approval should be in the form of a formal endorsement, such as a signed statement, representing a buy-in of the ODC Team's charter and/or roster. Continued support is also needed, and can be pursued by providing periodic updates on the team's progress, and/or seeking involvement in any team meetings or events from the Commanders' offices. A historical record of such updates and briefings should also be included in Chapter 2 of your ODC Elimination Plan.

ODC Team meetings should be held at least weekly until the team's mission, issues, actions, and individual responsibilities are established. Minutes should be taken and included in Chapter 2. Unresolved issues should be pursued aggressively. The ODC Team chair should continue to emphasize that the Army sees ODC elimination as a readiness and quality of life issue, and proper planning must be completed now to avoid serious problems in the near future.

The key issues the ODC Team must resolve – and which must be addressed in the ODC Elimination Plan – are outlined in the remaining chapters of this section. They are the inventorying of ODC equipment, the implementation of ODC regulations and policy, the establishment of ODC recovery and logistics procedures, the development of ODC management practices (including the preparation and upkeep of the ODC Plan), and the identification of resources needed to execute the ODC Elimination Plan.

"In the Plan"

The following three pages are samples of:

1) An Installation Commander's buy-in statement.
2) An Installation ODC Team roster.
3) An ODC Team mission statement.

SAMPLE
INSTALLATION COMMANDER'S BUY-IN STATEMENT

As a result of actions taken by parties to the Montreal Protocol and by Congress in the 1990 Amendments to the Clean Air Act, ozone-depleting chemicals (ODCs) such as halons and chlorofluorocarbons are no longer produced. The Congress in Public Law 102-484, Section 326, the President in Executive Order 12843, and the Environmental Protection Agency in regulations promulgated in support of the Clean Air Act have further limited the procurement and use of these chemicals. While I strongly endorse the intent behind these actions, they do pose a considerable challenge to maintaining effective facilities operations at Camp Williams.

Camp Williams extensively uses halon and chlorofluorocarbons in building fire suppression systems and air conditioning and refrigeration equipment. As recently as January 1999, the Army reiterated its policy to eliminate the use of ODCs in facilities by the end of fiscal year 2003. As recycled stocks of these chemicals diminish, the need to plan now for their absence is obvious. Failure to do so could catastrophically impact our readiness and quality of life.

To that end, I ask Camp Williams' leaders to assist my ODC Elimination Team in their efforts to prepare an ODC Elimination Plan. Resources are limited and solutions are still evolving, so a well-thought-out plan is essential. I further solicit the involvement of every element on this post to ensure successful execution of this Plan when it is completed.

I remain confident that Camp Williams will continue its role as a leader in support of the Army's efforts to preserve and protect the environment. I am also confident that we can and will do this while maintaining our readiness and quality of life. As always, a common commitment is the key to our continued success.

JEFFREY R. CONRAD
Brigadier General, USA
Commander

SAMPLE
CAMP WILLIAMS ODC ELIMINATION TEAM

Function	Name	Unit	Symbol	Number	Fax	E-mail
Team Chief	CAPT David Browning	Command Admin	GCW-GCA	555-1234	555-9876	dbrowning@hq9th.army.mil
Supply	Ms. Susanne Funk	Director of Logistics	GCW-LGP	555-4455	555-0099	sfunk@williams.army.mil
Legal	Mr. Gordon Kuljien	Staff Judge Advocate	GCW-JAA	555-7834	555-5624	gkuljien@williams.army.mil
Procurement	Ms. Billie Groeninger	Director of Contracting	GCW-CPS	555-1981	555-6390	bgroeninger@williams.army.mil
Finances	Mr. Bill Ruppert	Director of Resources	GCW-RMP	555-8267	555-2059	bruppert@williams.army.mil
Environmental	LT Erica Jordan	Director of Public Works	GCW-PWEP	555-3727	555-3041	edjordan@williams.army.mil
Real Property	Mr. Marian Coburn	Director of Public Works	GCW-PWF	555-6606	555-4909	mcoburn@williams.army.mil
Fire Chief	Mr. R. W. Siegel	Director of Public Works	GCW-PWO	555-5425	555-0075	wsiegel@williams.army.mil
Tenant	MSGT Barbara Turner	Jones Medical Center	GCW-JACH	555-2345	555-8765	bturner@williams.army.mil
Tenant	Mr. Cecil Page	Army Missiles School	USAMS-DSO	555-3456	555-7654	cpage@williams.army.mil
Tenant	Ms. Debbie Goforth	HQ 102 Reserve Cmd	102CC-ADM	555-4567	555-6543	dgoforth@williams.army.mil
Tenant	CAPT Andrew McEntee	Missile Test Activity	AMSMT-BF-W	555-6789	555-4321	amcentee@williams.army.mil
Tenant	Mr. Paul Appia	DFAS Region 12	DFAS-PMDY-O	555-7890	555-3210	paul_appia@region12.dfas.mil
Tenant	Ms. Chris Farschon	DRMO	DRMO-DFA	555-3344	555-7766	cfarschon@williams.army.mil

SAMPLE

ODC TEAM MISSION STATEMENT

Mission:

Through responsible management of all ODC assets, facilities modification and energy efficiency programs, and environmental and real property OMA resources, Camp Williams will completely eliminate its dependency on Class I ODCs.

Objectives:

Camp Williams will retrofit, replace, or otherwise retire all air conditioning and refrigeration equipment using chlorofluorocarbon refrigerant by the end of fiscal year 2003.

Camp Williams will recover all chlorofluorocarbon refrigerant installed in retired air conditioning and refrigeration equipment and reuse it to support routine operations of existing air conditioning and refrigeration equipment, until that equipment is in turn retired.

Camp Williams will convert or retire all halon total flooding fire suppression systems by the end of fiscal year 2003.

Camp Williams will recover all halon from converted or retired total flooding fire suppression systems and turn it in to the Army ODC Reserve, for use in critical weapon system applications.

Camp Williams will minimize the impact on the operations and maintenance account of all ODC retrofits, replacements, or other conversions by using to the maximum extent possible resourcing options available through facilities modernization and energy efficiency programs.

Chapter 3

Title: *Inventory*

Reference: "*These responsibilities include the inventory of Installation owned equipment and facilities occupied by Army and non-Army tenant organizations.*"
ASA(IL&E) Memorandum 13 Feb 96

Summary:

The core of the ODC elimination effort on the installation is the inventory. It's vitally important that the ODC inventory is accurate, complete, and up to date.

Accurate. The following guidelines define an accurate Class I ODC inventory:

-- Only AC&R equipment that use CFC refrigerant can be included. Don't include equipment that use HFCs (such as R-134a, the principal CFC alternative refrigerant) or Class II ODCs (HCFCs) (such as R-22, commonly found in fixed air conditioning equipment with a capacity under 100 tons).

-- Only fire suppression systems that use halon 1301 can be included. Don't include fire suppression systems that use HFCs (such as FM-200™), CO2, or inert gasses (such as Inergen™). Also, don't include halon 1211 fire extinguishers. They're being replaced through attrition and aren't as important.

Complete. The following guidelines define a complete Class I ODC inventory:

-- Include all serviced CFC equipment. Don't include hermetically sealed equipment like home refrigerators, window air conditioners, or drinking fountains.

-- Include all halon 1301 fixed flooding systems, regardless of the size or condition of the systems. Even if the system is turned off, or the halon bottles are disconnected (or missing), the system should be included. If it's going to cost to remove or replace the system, it should be included in the ODC inventory.

-- Include any bulk halon 1211 uses. There may be some emergency and rescue vehicles on post that still use it. Don't include fire extinguishers.

-- Include enough basic information on each ODC system to identify its location, the type and amount of ODC installed, and the use and condition of the system.

Up to Date. No matter how detailed an "old" list of Class I ODC equipment is, it's not current. Depending on who did it, when it was done and why, odds are it's inaccurate and incomplete. It makes for a good starting point, but it must be validated.

For a proper ODC inventory, any "old" inventory must be validated with a building by building inspection of equipment and systems, done by someone who knows where Class I ODCs are used and is familiar with where they could be on the installation.

The following is a list of the basic information you need to include in your halon and CFC inventories, so you can properly manage the ODC equipment on your installation.

CFC Equipment Inventory. Your CFC equipment inventory should identify the following information (this information should be available at the site of the equipment):

-- Location: building number and room or area.

-- Manufacturer and model number.

-- ASHRAE number for the refrigerant (i.e., R-11).

-- Amount of a full charge of refrigerant, in pounds.

-- Date when the equipment was installed.

-- Refrigeration capacity of the equipment, either in horsepower, BTU, or tons.

You'll also need other basic information on each piece of CFC equipment, that may or may not be available at the site. Having the following information is critical to proper planning for the support and replacement of CFC equipment, and should be available either from the building manager, the DPW, or the equipment servicing contractor:

-- Leak rate, in pounds of refrigerant. This could be annual, bi-annual, or monthly. (Reference annual leak limits on page 29.)

-- Name and number for a person responsible for the day-to-day operation.

-- Name and number for the contractor (or unit) responsible for servicing.

** You may also want an average power use, in kilowatts, if available.

Halon Systems Inventory. Your inventory of halon 1301 fire suppression systems should identify the following information. This information should also be available at the site:

-- Location: building number and room.

-- Amount of halon, in pounds. Also identify any reserve halon stored on site.

-- Area (square feet) and volume (cubic feet) of the protected room. The area can be estimated by counting the ceiling tiles or floor tiles. The volume can be estimated by multiplying the ceiling height by the estimated area.

-- Type of equipment protected (communications, computers, etc.).

-- Whether there is water to the building (just a yes or no).

You'll also need other basic information on each halon system, that may or may not be available at the site. The following information is critical, however, to proper planning for the support and replacement of your halon fire suppression systems. It should be available from the building manager, the unit that own the halon system, the post fire marshal, or the system servicing contractor:

-- Cost(s) of the most expensive piece(s) of equipment being protected.

-- Whether the room and/or building is manned 24 hours.

-- Name and number of a person responsible for the day-to-day operation of the equipment being protected.

-- Name and number of the contractor or unit responsible for servicing the system.

Your installation ODC inventory shouldn't include halon systems or CFC equipment that are installed in weapon systems. Examples are the halon 1301 (chemical name: CF_3Br) 2 ¾ lb handheld fire extinguishers or the 9,000 BTU R-12 vehicle-mounted environmental control units. Also do not include ODC equipment in temporary facilities, tactical field-mobile structures, DeCA commissaries or AAFES exchanges. Finally, do not include GSA vehicles, even if their air conditioners still use R-12 refrigerant. DeCA, AAFES and GSA have their own ODC elimination programs.

Your ODC inventory also shouldn't include halon 1211 (CF_2ClBr) fire extinguishers, either the small 5-10 lb hand-held building extinguishers or the large, wheeled flight-line extinguishers. These extinguishers have alternatives identified and are being replaced through attrition. It should include, however, any halon 1211 installed in or maintained for flight-line emergency rescue vehicles. Report any such use to AAPPSO.

Lastly, your ODC inventory shouldn't include any equipment or stores of the ODC solvents carbon tetrachloride or 1,1,1 trichloroethane (also called methyl chloroform or TCA). These solvents were very heavily used on Army installations in the '70s and '80s for metal cleaning, both in cleaning machines (vapor degreasers and immersion systems) and in hand-wipe applications (using aerosol cans or pump bottles). But these solvents haven't been produced in over three years, and they had shelf-lives of only six months. So if you still have access to these solvents, they've gone bad. Their use now could actually damage the parts instead of clean them. They should be disposed of promptly through the DRMO.

The following tables list some examples of the types of units or functions where ODCs could be found on your installation. These aren't all-exclusive lists, however. For completeness, each building on your installation must be checked for ODC systems.

WHERE HALONS ARE

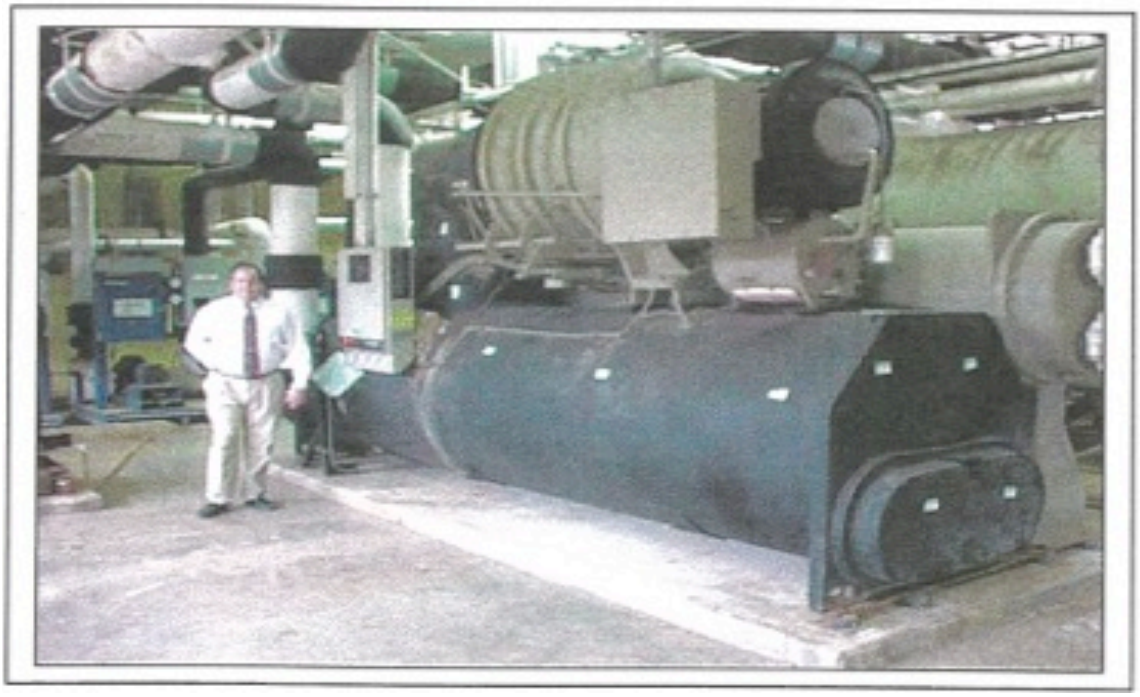
Building	Equipment
Communications & Control Centers	Total Flooding Systems
Computer Centers	Total Flooding Systems
Emergency/Uninterrupted Power	Total Flooding Systems
Flammable Materials Warehouses	Total Flooding Systems
Flight-lines	Emergency Rescue Vehicles
Hydraulic Pump Rooms	Total Flooding Systems
Maintenance Facilities	Total Flooding Systems
Medical/Dental Clinics	Total Flooding Systems
Museums	Total Flooding Systems
Ordance Silos	Total Flooding Systems
SATCOM Stations	Total Flooding Systems
Tactical Simulators	Total Flooding Systems
Test Facilities	Total Flooding Systems

HALON SYSTEM CYLINDERS

WHERE CFCS ARE

Building	Equipment
Banks, Stores, Other Services	Air Conditioning
Barracks	Air Conditioning
Central Plants	Refrigeration Systems
Chapels, Libraries	Air Conditioning
Childcare/Recreation Centers	Air Conditioning
Clubs	Refrigeration, Air Conditioning
Communications & Control Centers	Air Conditioning
Computer Centers	Air Conditioning
Fire/Military Police Stations	Air Conditioning
Gymnasiums/Bowling Alleys	Air Conditioning
Lodgings, Hotels	Air Conditioning
Maintenance Facilities	Refrigeration, Air Conditioning
Medical/Dental Clinics	Refrigeration, Air Conditioning
Mess Halls	Refrigeration, Air Conditioning
Museums, Theaters, Halls	Air Conditioning
Office Buildings	Air Conditioning
SATCOM Stations	Air Conditioning
Schools, Training Centers	Air Conditioning
Test Facilities	Refrigeration, Air Conditioning

CFC BUILDING CHILLER



“In the Plan”

The following two pages are samples of:

1) An installation inventory of halon 1301 fire suppression systems.
2) An installation inventory of CFC AC&R equipment.

SAMPLE
CAMP WILLIAMS HALON INVENTORY

Bldg No.	Room Protected	Halon Location	Halon (Reserve)	Area SQFT	Volume CUFT	Assets Protected	Cost of Assets	Responsible Orgn	POC Name	POC Phone	Water to Bldg?	Manned 24 Hrs?
22	East Bay	Halon Room	786 (0)	2200	22000	Motor Storage	$30M	Garrison	Tom Bush	555-5790	Y	N
50	Main Hall	Room 121	500 (0)	2500	25000	Artifacts	$1M	Garrison	Tom Bush	555-5790	Y	N
51	1400	1431	400 (400)	862	6896	Comm Equipment	$10M	DFAS Region 12	James Ellor	555-0864	Y	N
58	230	232	200 (100)	256	2048	Computers	$5M	HQ 9th Army	MSGT Curry	555-1278	Y	Y
58	231	232	160 (0)	420	3360	Comm Equipment	$1M	HQ 9th Army	MSGT Curry	555-1278	Y	N
63	120	Equipment Room	350 (0)	1600	16000	Computers	$120K	Garrison	Tom Bush	555-5790	Y	N
67	Main Bay	Halon Room	800 (800)	2400	38400	Emergency Power	$650K	Garrison	Tom Bush	555-5790	Y	N
85	HAZMAT Area	Halon Locker	80 (0)	100	1000	Flammable Chemicals	$5K	Test Center	Lisa Whiting	555-2233	Y	N
86	Central Bunker	Equipment Shed	350 (0)	1800	16200	Explosives	$50K	Test Center	Lisa Whiting	555-2233	N	N
94	Simulator Bay #2	201	600 (600)	1200	24000	Flight Simulator	$20M	Test Center	Lisa Whiting	555-2233	Y	N
130E	Interior	Exterior	200 (200)	180	2160	SATCOM Antennae	$100K	987th Comm Squadron	LT Brad Shaw	555-0412	N	N
130W	Equipment Room	Utility Room	140 (0)	240	1920	SATCOM Equipment	$250K	987th Comm Squadron	LT Brad Shaw	555-0412	Y	N
146	Control Room	Utility Room	120 (100)	600	4800	Computers	$100K	Test Center	Lisa Whiting	555-2233	Y	N
301	108	110	120 (100)	352	2992	Computers	$160K	Medical Center	Steve Parks	555-8212	Y	Y
301	OXON Lab	Utility Room	120 (100)	392	3528	Laboratory Equipment	$780K	Medical Center	Steve Parks	555-8212	Y	N
301	Basement	Basement	220 (220)	600	6000	Em Power Generator	$450K	Medical Center	Steve Parks	555-8212	Y	N
308	Area 3	Equipment Room	260 (0)	400	4000	HAZMAT Chemicals	$20K	Medical Center	Steve Parks	555-8212	Y	N

SAMPLE
CAMP WILLIAMS CFC INVENTORY

Bldg No.	Room No.	Type of Equipment	Refrig	Make	Model/ Serial No.	Year Installed	Capacity HP-Btu-Ton	Servicing Orgn	Servicing POC	Refrig Charge	Refrig Leak	Leak Rate
19	Bay 1	Refrigeration	R-11	Trane	PCV1JC202/ L-3016466	1975	150 Ton	All American	Pete Aulterman 555-1357	675	180	27%
22	East Bay	Refrigeration	R-11	Trane	PCV1JC202/ L-3016468	1977	150 Ton	All American	Pete Aulterman 555-1357	600	190	32%
45	Basement	Chiller	R-11	York	YTAIA2B1/ YHRM24384	1967	50 Ton	All American	Pete Aulterman 555-1357	450	99	22%
49	Basement	Chiller	R-11	Trane	CUHE-025G/ L84H22069	1957	250 Ton	All American	Pete Aulterman 555-1357	440	53	12%
50	100	Chiller	R-11	Carrier	19DH6365CE/80 4430891	1985	225 Ton	All American	Pete Aulterman 555-1357	1013	98	10%
51	Equipment Room	Chiller	R-11	Carrier	19DH6365CE/80 4430890	1983	225 Ton	All American	Pete Aulterman 555-1357	1200	90	8%
58	110	Split System	R-12	Climatrol	UDS1000-3U /8G71C	1980	50 Ton	All American	Pete Aulterman 555-1357	75	5	7%
67	West Yard	Walk-in Cooler	R-12	Copeland	CBAM-0500/ 13C78	1976	50 HP	Crawford Services	Michelle Kisner 555-2468	20	8	40%
87	Storage Locker #1	Walk-in Freeer	R-502	Master Bilt	BRCLX-750 /U01284	1977	35 HP	Crawford Services	Michelle Kisner 555-2468	11	5	45%
101	Dock	Chiller	R-12	Chrysler	110/ A590	1941	50 Ton	All American	Pete Aulterman 555-1357	290	58	21%
103	Mechanical	Chiller	R-11	Trane	44-31C32B/ 10173A	1957	180 Ton	All American	Pete Aulterman 555-1357	800	115	14%
108	550	Chiller	R-11	Trane	F5-25B-26B/ 1810	1961	250 Ton	All American	Pete Aulterman 555-1357	1125	145	13%
109	Utility	Chiller	R-12	Westing-house	Tru-Cool 1200	1972	350 Ton	All American	Pete Aulterman 555-1357	720	120	17%
137	Equipment Room	Chiller	R-11	Carrier	19DG5343CD /7625119	1977	800 Ton	All American	Pete Aulterman 555-1357	800	88	11%
146	MPR Labs	Environment Chamber	R-13	Unknown	Unknown	1960	36K BTU	AstroTech	Chris Hartline 555-3579	50	5	10%
146	20	Chiller	R-11	York	YDTJ-67/ 0417651	1987	500 Ton	All American	Pete Aulterman 555-1357	600	54	9%

Chapter 4

Title: *Rules*

Reference: "*Installation Commanders should be reminded of the Requirements of Sections 608 and 609 of the Clean Air Act concerning the training and certification of personnel responsible for servicing/maintaining equipment which utilize ODS as a refrigerant.*"
DASA(ESOH) Memorandum 18 Oct 94

Summary:

The ODC Team should oversee the installation's compliance with a number of laws, regulations and policies that restrict the use of ODCs. Some of these are addressed in Chapter 1. As a minimum, however, your ODC Elimination Plan should address the following national, federal, and Army directives. Your ODC Plan should also address any regional, state, or municipal ODC directives that may affect your installation.

OCONUS ODC Elimination Plans should address the applicability of these laws and directives, as well as the host country's ODC laws and regulations and the DoD FGS.

Section 608 of the Clean Air Act. Through this Section the EPA has promulgated a number of rulings on the operation and maintenance of facility AC&R equipment. Included in these rulings are:

-- A ban on the venting of any refrigerant or halon during the service, maintenance, repair or disposal of AC&R and fire suppression equipment.

-- A requirement that all technicians who service AC&R equipment must be certified by the EPA.

-- A requirement that only EPA-certified technicians can purchase CFCs.

-- A requirement to use only EPA-approved recovery/recycling equipment, and to certify to your local EPA region any operation that uses such equipment.

-- A requirement to safely dispose of ODCs in AC&R equipment that are entering a waste stream, like old refrigerators and window air conditioners.

-- A requirement to repair substantial leaks in AC&R equipment with a charge of 50 pounds or more.

Your installation may not be directly affected by these rulings, however, because almost all of the AC&R and fire suppression servicing being done on Army installations is contracted out. These contractors are already required to comply with the training and certification requirements of law. It's very important, however, that the ODC Team identify who is actually doing the maintenance on each piece of AC&R equipment.

40 CFR 82 Leak Limits. This ruling specifically addresses the last Section 608 bullet, dealing with substantial leaks in AC&R equipment. It limits the amount of ODC refrigerant a piece of equipment may annually leak. For refrigeration equipment used in commercial and industrial processes, the limit is 35% per year. For "comfort cooling" and other applications, however, the limit is 15% per year. For older systems, this can be a serious limitation.

Additionally, in May 98 the EPA proposed to lower the permissible leak rates as follows: industrial process refrigeration 20% per year, old commercial refrigeration 15% per year, new commercial refrigeration 10% per year, old comfort cooling and existing appliances 10% per year, and new comfort cooling 5% per year. A final ruling establishing these new leak limits is expected before the end of 1999. The old and new leak limits are presented in the table below.

40 CFR 82 CFC ANNUAL LEAK LIMITS

System	Old Rate	New Rate
Industrial Process Refrigeration	35%	20%
Commercial Refrigeration (Old)	35%	15%
Commercial Refrigeration (New)	35%	10%
Comfort Cooling (Old)	15%	10%
Comfort Cooling (New)	15%	5%
Other Appliances (Old)	15%	10%
Other Appliances (New)	15%	5%

Owners are required to fix these substantial leaks within 120 days for the industrial process refrigeration equipment, and within 30 days for all other equipment. Repairs must be validated by testing. If you can't fix the leak, or decide not to, then you must have a retrofit or retirement plan in place for the equipment within 30 days.

Section 609 of the Clean Air Act. By the authority of this section, the EPA has promulgated a number of rulings that established standards and requirements for the servicing of motor vehicle air conditioners (MVACs).

However, these rulings may not apply to your installation. For example, tactical vehicles are exempted. Of the Army non-tactical vehicles that have air conditioners, most are serviced off-post. However, **all** these limitations and requirements apply if shops on your post are servicing the air conditioners of **any** non-tactical vehicles, either in a motor pool or at the Morale, Welfare and Recreation (MWR) auto hobby shop.

It's very important that the ODC Team identify who is actually doing the maintenance on the air conditioners of all non-tactical vehicles on the post. Included in the Section 609 rulings are:

-- The requirement to recover or recycle any refrigerant used in MVAC air conditioners, using EPA-approved recovery/recycling equipment.

-- The requirement that all technicians who service MVAC air conditioners must be certified by the EPA.

-- The requirement that only technicians certified by the EPA can purchase ODC refrigerants.

-- The requirement to use only alternative refrigerants approved by the EPA's SNAP Program when retrofitting or replacing MVAC air conditioners.

EPA Fines. Violations of Section 608/609 rulings have resulted in fines on military installations. The fines can be up to $25,000 per violation per day.

Public Law 102-484, Section 326. Public Law 102-484 is the Defense Authorization Act for Fiscal Year 1993. Section 326 specifically prohibits the Department of Defense from awarding any contract after June 1, 1993 that requires the use of a Class I ODC. This prohibition applies to the purchase of AC&R equipment, fire suppression systems, CFC refrigerant and halon. It also applies to installation service contracts that require the contractors' technicians to top off AC&R equipment or charge halon systems.

Section 326 also sets up a process, however, that allows such contracts to be awarded. First, a technical certification must identify that there's no suitable substitute available for the ODC. Then, a General Officer or Senior Executive Service (SES) member must sign an approval (called a Senior Approval Official (SAO) approval). All DoD approvals are annually compiled by each Service and submitted to Congress.

For installations, AAPPSO has determined that any ODC elimination plan that describes the complete elimination of Class I ODCs by the end of FY03 can constitute a valid technical certification for HVAC and fire suppression systems support contracts. Reference to such a plan makes any required ODC support "interim" to the final phase-out, and interim support is valid. Also, an SAO approval is not required if previously recovered CFCs are provided to the servicing contractor as GFE. This not only minimizes the cost of the interim support, but also means the service contract does not have to be reported to Congress via your MACOM and AAPPSO.

Each HQ MACOM and AMC MSC has an identified Lead Approved Technical Representative (LATR). The LATRs' job is to both assist installations in the preparation of SAO approvals and also to prepare an annual compilation of these approvals and submit it to AAPPSO. AAPPSO then compiles the MACOM submittals into an Army report and submits it through OSD to Congress.

The following table is a list of Army LATRs for 1998. If the listed LATR is no longer there, the phone number should put you in contact with the appropriate office. If that doesn't work, contact the air quality environmental specialist in your Command HQ.

LIST OF MACOM & AMC MSC LATRS

COMMAND	LATR	DSN	Commercial Phone
AMC	Mr. George Terrell	767	(703) 617-9488
FORSCOM	Ms. Rochelle Williams	367	(404) 669-7454
MDW	Mr. Ed Dunn	323	(202) 685-3387
MEDCOM	Mr. Damon Cardenas	471	(210) 221-6441
MTMC	Mr. Paul Limvorratre	761	(703) 681-7040
NGB	Ms. Colleen Betker	327	(703) 607-7976
SMDC	Mr. Bill Davis	646	(205) 955-2190
TRADOC	Ms. Elaine Pearson	680	(757) 727-2988
USACE	LTC Carl D. Owens	763	(202) 761-8645
USAREUR	Dr. Mike Gill	370	49-6221-577328
USARC	Mr. Doug Chatham	367	(404) 464-8759
USARPAC	Mr. Stuart Hayashi	315	(808) 438-9333
USARSO	Mr. William McElvens	288	011-507-287-3019
USMA	Mr. Joseph Shandling	688	(914) 938-3224
-- AMCOM	Mr. Ron Hagler	645	(205) 955-0348
-- ARL	Dr. James Walbert	955	(301) 394-4856
-- ARO	Dr. George Neece	832	(919) 549-4204
-- SBCCOM	Ms. Maryalice Miller	584	(410) 671-3564
-- CECOM	Mr. John Myer	992	(908) 532-5392
-- IOC	Mr. Frank Novak	793	(309) 782-1891
-- STRICOM	Mr. Michael Willoughby	970	(407) 384-3923
-- TACOM	Mr. Tom Landy	786	(810) 574-5954
-- TECOM	Ms. Susan Grill	298	(410) 278-1378
-- TMDE	Mr. James Knight	746	(205) 867-9504

Army ODC Policy. Current Army policy on ODC elimination in facilities is summed up in the one-page enclosure to the ACSIM policy memo of 3 July 1997, "Elimination of the Dependency on Ozone-Depleting Chemicals (ODCs) in Army Facilities." This memo and enclosure is included in Appendix 1. The referenced enclosure identifies six main policies:

1) Installation Commanders Are Responsible for ODC Elimination. Installation Commanders are responsible to the MACOM and HQDA for the condition and operation of their installations. They must document the condition of their installations through the Army Environmental Program requirements (EPR) report. Even though ODC projects are currently not a high priority for environmental funding, Army policy still requires that they be included in the EPR. Through the EPR, ACSIM and the HQ MACOMs can scope the size of the Army ODC elimination effort and track its progress. Without EPR reporting of ODC projects, **HQDA will have to initiate annual MACOM data calls**.

Installation Commanders are responsible for preparing and maintaining an inventory of all ODC equipment, both installation-owned and tenant-owned. Commanders are also responsible for the development and execution of their ODC Elimination Plans.

Installation Commanders are not necessarily responsible for the resourcing of every ODC replacement project on the entire installation. However, they are responsible for ensuring that the elimination of all the Class I ODCs installed on post – including those in tenant facilities – is being adequately planned for and funded. The Commander's agents for ensuring that this is taking place should be the installation ODC Elimination Team, as described in Chapter 1 of this Section.

2) Tenant Commanders Are Responsible for Complying with Host ODC Policies and Supporting Host ODC Elimination Efforts. Tenant Commanders' responsibilities extend to whole ODC elimination effort as described in this Section, namely: support of and participation on the ODC Team; preparation and maintenance of an ODC inventory; compliance with applicable ODC laws and regulations; recovery, recycling and turn-in of excess ODCs; proper management of ODC materiel and equipment; and adequate resourcing of ODC management efforts and replacement projects in support of their own ODC equipment.

3) Class I ODCs Must Be Eliminated from All Facilities on Army Installations by the End of FY03. This policy has been in place since the February 13, 1996 ASA(I,L&E) memorandum, subject: "Ozone-Depleting Chemicals (ODC) Elimination at Army Installations" (see Appendix 2). It's based on the fact that CFC refrigerants and halon 1301 may not be available commercially to support equipment requirements beyond the summer of 2003. This policy is not expected to change in the near future.

4) Installations May Not Contract for the Use of Class I ODCs. Such contracts are prohibited by PL 102-484, Section 326, as described earlier in this Chapter and in Section 1. This prohibition not only applies to the direct purchase of Class I ODCs, but also to facilities service contracts that require technicians to "top off" or replace leaked or discharged ODCs. Such service contracts can legally only be awarded with a technical certification and an SAO approval, as described earlier. This requirement applies to both CONUS and OCONUS installations.

5) All Class I ODCs Installed in Army Facilities Must Be Recovered. CFCs and halons cannot be sold, traded, turned into the Defense Reutilization and Marketing Office (DRMO), or otherwise transferred from Army ownership. All ODCs in non-sealed systems must be recovered when the system is retired.

Recovered CFC refrigerants may be reused to support another CFC system or systems on the same installation. This is called "cascading" and is the recommended means of recycling CFCs. Recovered CFCs can be provided GFE to the contractor servicing the installation AC&R equipment, to avoid having to go through the contract approval process required by PL 102-484, Section 326.

Any excess CFCs not needed to support existing AC&R equipment on the installation must be turned in to the Army ODC Reserve at the Defense Supply Center, Richmond (DSCR) in Richmond, Virginia. See Chapter 5 of this Section and Appendix 10 for turn-in procedures.

All -- **repeat all** -- recovered halon must be turned in to the Army ODC Reserve. It can't be used to support another fire protection system on your installation. This halon is needed to support mission critical fire and explosion suppression systems in Army weapon systems. Soldiers' lives are at stake.

6) ODC Alternatives Must First Be Approved by the EPA SNAP Program and Receive a Toxicity Clearance from the Army Surgeon General Before Used in Army Facilities. The EPA analyzes and rules on submittals by the chemical manufacturers for inclusion to the SNAP list. It's illegal to use an ODC alternative in an application that is "disapproved" on the SNAP list.

Even if the chemical is SNAP-approved, however, it still must get a toxicity clearance from the U.S. Army Center for Health Promotion and Preventative Medicine (CHPPM), which is the Surgeon General agent for toxicity issues.

The only alternative refrigerant that currently has a toxicity clearance for use in stationary building AC&R systems is HFC-134a. If you wish to use another refrigerant in your installation, you need to request a toxicity clearance.

A request for a toxicity clearance should be submitted from your supporting Surgeon's office, through AAPPSO and the AMC Surgeon's office, to CHPPM. It should name the chemical and its manufacturer (with address and phone number) and specify the use your installation has in mind for the ODC alternative. Some additional technical information may also be needed from the supplier or manufacturer, such as:

-- Scope and length of use in the commercial marketplace.

-- Any human or animal toxicity information.

-- A Material Safety Data Sheet (MSDS).

-- Any reports of adverse health effects in manufacture or use.

SAMPLE TOXICITY CLEARANCE REQUEST

DEPARTMENT OF THE ARMY
CAMP WILLIAMS
CRAWFORD, TX 78901

AMMX-XT-PM 11 AUGUST 1999

MEMORANDUM THRU

COMMANDER, U.S. ARMY MATERIEL COMMAND, ATTN: AMCRDA-TE-E (MR. JOSEPH A. MACKO, JR.), 5001 EISEHOWER AVE, ALEXANDRIA, VA 22333-0001

COMMANDER, U.S. ARMY MATERIEL COMMAND, ATTN: AMCSG-L, 5001 EISENHOWER AVE, ALEXANDRIA, VA 22333-0001

FOR COMMANDER, U.S. ARMY CENTER FOR HEALTH PROMOTION AND PREVENTATIVE MEDICINE, ATTN: MCHB-DC-T, ABERDEEN PROVING GROUND, MD 21010-5422

SUBJECT: Request for Toxicity Clearance

1. Request a toxicity evaluation be performed and a toxicity clearance be issued for SUPERFREEZE, a new refrigerant being considered for use in centrifugal building chillers to replace CFC-11.

2. Enclosed is technical information on the refrigerant that has been provided by the manufacturer. The manufacturer is Best Stuff, Inc., 5022 Eclipse Ave, Industrial Place, IN 55431. The manufacturer point of contact is Mr. Bill Cool at (606) 656-6066. The point of contact for this request in this office is CPT Joe Jones at DSN 484-8844.

THOMAS V. LOOSE
COL, OD
Director of Public Works

“In the Plan”

The following two pages are samples of:

1) A statement of compliance with Sections 608/609 of the Clean Air Act.
2) An SAO approval for an AC&R service contract.

SAMPLE
STATEMENT OF COMPLIANCE
SECTIONS 608 AND 609 OF THE CLEAN AIR ACT

An extensive review of the maintenance accomplished on stationary air conditioning and refrigeration equipment installed on Camp Williams has been conducted by the ODC Elimination Team. As a result of this review, no in-house Army or tenant personnel have been identified as providing maintenance support to this equipment. All maintenance support for this equipment is being performed by contractor technicians, who are fully liable to the provisions of Section 608 of the Clean Air Act. No Army technicians are therefore liable to the training and certification requirements of Section 608 of this Act.

An extensive review of the maintenance accomplished on halon 1301 total flooding fire suppression systems installed on Camp Williams has been conducted by the ODC Elimination Team. As a result of this review, Army fire-fighting personnel have been identified as providing some level of maintenance support to this equipment. These Army personnel have received training that satisfies the requirements of Section 608 of this Act. Most of the maintenance support for these systems, however, is being performed by contractor technicians, who are fully liable to the provisions of Section 608 of the Clean Air Act.

An extensive review of the maintenance accomplished on mobile air conditioning systems at Camp Williams has been conducted by the ODC Elimination Team, including the activities of the motor pool and MWR automobile hobby shop. As a result of this review, no in-house Army or tenant personnel have been identified as providing maintenance support to this equipment. All maintenance support for this equipment is being performed by contractor technicians, who are fully liable to the provisions of Section 609 of the Clean Air Act. No Army technicians are therefore liable to the training and certification requirements of Section 609 of this Act.

SAMPLE
SENIOR APPROVING OFFICER (SAO) APPROVAL
PER PUBLIC LAW 102-484, SECTION 326

MEMORANDUM THRU

CHIEF OF STAFF

DEPUTY COMMANDER

FOR COMMANDER

SUBJECT: Approval for Use of Class I Ozone-Depleting Chemicals (ODCs) – DECISION MEMO

1. Purpose. To obtain approval of the Commander for the use of Class I ODCs in the Directorate of Public Works (DPW) operation and maintenance contract.

2. Recommendation. That the Commander approve the use of Class I ODCs in the DPW operation and maintenance contract.

3. Discussion.

a. Public Law 102-484, Section 326 imposes procedures for eliminating the use of Class I ODCs in DoD procurements. No DoD contract may include a requirement to use a Class I ODC unless the contract is approved by a Senior Acquisition Official (SAO) of General Officer or Senior Executive Service (SES) rank. The CENCOM Commanding General has assigned the duty of SAO to the Installation Commanders (TAB A).

b. The Public Law further restricts SAOs to grant approval only upon certification that there is no suitable substitute for the ODC. HQDA has determined that a proper ODC Elimination Plan, supporting the Army policy for installations to be free of Class I ODCs by the end of FY03, constitutes adequate certification for the support of an "interim" ODC requirement. The Camp Williams ODC Elimination Plan is enclosed at TAB B.

4. Point of contact for this action is CAPT David Browning, GCW-GCA, extension 53952.

THOMAS V. LOOSE
COL, OD
Director of Public Works

COORDINATION:

DOE concur/nonconcur _____ DATE: _____
SJA concur/nonconcur _____ DATE: _____
DOC concur/nonconcur _____ DATE: _____

APPROVED/DISAPPROVED _____ DATE: _____

Chapter 5

Title: *Recovery & Turn-in*

Reference: "*All CFC refrigerant in serviced equipment must be recovered before the equipment is retired. It is needed for the continued operation of CFC equipment on your installation. If in excess to your requirements, it is needed by the Army ODC Reserve." ACSIM Memorandum 3 Jul 97*

Summary:

All Class I ODCs should be considered precious commodities. Their prices have increased forty-fold over the last ten years, and ODC solvents are no longer available. CFC refrigerants R-12, R-113, and R-114 are expected to follow suit soon. National experts project that most ODCs, including halon 1211 and 1301, may not be domestically available (at least at under $100/lb) as early as the end of FY03.

CFC Recovery. Army policy requires the recovery of all installed CFCs. By recovery we mean the capture of refrigerant in the system. EPA rulings have identified specific recovery and recycling equipment, and established specific recovery procedures, to optimize the recovery process. What's important to the Army, however, is that the contractor who retires the piece of CFC equipment also recovers the refrigerant installed and provides it to the equipment owner, so it doesn't leave Army ownership.

Halon Recovery. Army policy also expressly requires the recovery of all installed halon. Halon recovery is much simpler, however, since the halon "installed" in a fire suppression system is typically sitting in transportable cylinders that are connected to the system through valves and plumbing. Again, what's important is that the halon remains in the control of the system owner and doesn't leave Army ownership.

WARNING!

A halon system cylinder may weigh over 400 lbs, and may be pressurized to over 400 psi. They are designed to dump their entire contents through a small pipe in a matter of seconds, and so their valves have "hair trigger" actuators. Some actuators are mechanical (pneumatic), which means bumping them the wrong way can set them off. Some are electrical, which means static electricity could set them off. In either case, halon cylinders can (and sadly, have) become large and very deadly unguided missiles.

WARNING!

Safety Procedures. Halon cylinders **must** be secured ("safetied") when they're removed from a fire suppression system. Simply disconnecting the actuator isn't enough. With a pneumatic actuator, the puncture pin may be exposed, and the slightest pressure could cause the seal to blow. With an electric actuator, an explosive initiator may be installed, and static electricity could cause the seal to blow (any explosive initiator **must** be removed).

But the most important thing to securing a system halon cylinder is that it **MUST** have a safety cap installed. Specifically, a discharge port or anti-recoil safety cap. These caps direct any gas release out sideways from the cylinder, and in several directions. When a safety cap is properly installed, a halon system cylinder is incapable of "taking off." The halon can still vent -- with considerable force -- and the cylinder may pitch and jerk, but it won't become airborne. More detailed securing instructions are included in the Army ODC Reserve Turn-in Procedures provided in Appendix 10.

ODC Storage. All recovered halon must be turned in to the Army ODC Reserve. Installations are encouraged to reuse CFC refrigerants, however, and have to turn in recovered CFCs only when they no longer have a need for them on the installation (i.e., there are no more AC&R systems using that specific refrigerant on the post). So CFC cylinders must be stored until needed.

The best way to store CFC cylinders is to have the support contractor store them. As long as adequate management and documentation is performed, the CFCs still remain in Army ownership until consumed, but do not need to be handled, watched, or take up valuable floor space. And there's no government transportation or delivery of the cylinders, since the contractor is storing them. The contractor who installs the new replacement AC&R equipment (who are usually the personnel who retire the old equipment and recover the old refrigerant) can be directed per the contract to deliver the recovered CFC refrigerant to the installation AC&R support contractor.

Two other recommended ways to store CFC cylinders on post are in either a hazardous material or compressed gas cylinder storage facility. The means to deliver the CFCs to the support contractor would have to be established.

Excess ODCs. Army policy since 1990 has required that all halon and excess CFCs be shipped directly to the Army ODC Reserve. The Army ODC Reserve is the Army's account in the DoD Ozone Depleting Substance (ODS) Reserve. The DoD ODS Reserve is managed by DLA through the Defense Supply Center, Richmond (DSCR) and located at the Defense Depot Richmond Virginia (DDRV). DLA also operates two ODC OCONUS collection points at DDDE-Germesheim GE and FSIC Pearl Harbor HI.

Excess CFCs are defined by Army policy (DASA(ESOH) memorandum of 18 Oct 94, see Appendix 3) as CFC refrigerant that "is no longer required by the installation to support operational equipment (e.g. chillers, air conditioners, freezers, etc.)." It is highly encouraged that as much recovered CFC refrigerant as possible be reused on the owning installation.

However, “reuse” doesn’t include trading or selling CFCs for any reason. If you can’t use the refrigerant on the installation, it must be turned in to the Army ODC Reserve. There are critical applications in Army weapon systems that require CFCs for interim support until retrofit can be completed to a non-ODC alternative.

NOTE: The halon 1211 in fire extinguishers is not “excess” unless the extinguishers are being replaced. Alternative non-ODC fire suppression agents have been identified and halon 1211 extinguishers are being phased out through attrition. This includes both the small hand-held extinguishers usually found in buildings and the large wheeled fire extinguishers usually found at airfields.

Turn-in to the Army ODC Reserve. No authorization or pre-notification is required to turn ODCs into the DoD ODS Reserve. All types of containers are acceptable, including cylinders, fire extinguishers, drums, and canisters. Government recovery cylinders are available free of charge through DSCR. DSCR will also cover turn-in shipping costs (if greater than $250) by forwarding a MIPR to the shipping unit. However, DSCR will not give monetary credit to the shipping unit for either the ODC or the cylinders.

All containers must be packaged and labeled in compliance with Department of Transportation (DOT) regulations, and also tagged or labeled with the following:

-- The shipper’s DoD Activity Address Code (DoDAAC).

-- The shipping activity, with point-of-contact and phone number.

-- The NSN(s) of the container(s) being shipped.

-- The type of ODC being shipped (halon 1301, R-12, etc).

-- The number of containers on the pallet or in the crate.

Overheated or mixed products can be shipped to the ODS Reserve. However, the following items should NOT be sent to the ODS Reserve: Class II ODCs (specifically R-22), Class II ODC blends (such as HotShot™, FreeZone™, and FRIGC™), hydrofluorocarbons (HFCs) (specifically, R-134a and HFC-227ea (FM-200™)), empty fire extinguishers, empty commercial containers, aerosol cans, inert gases (such as Nitrogen, CO_2, and Inergen™), and dry chemicals.

NOTE: The DoD ODS Reserve doesn’t accept all the Class I ODCs that may be found on post. Two such exceptions are R-13 and R-113. These CFCs must be disposed of through the post DRMO.

Complete ODC turn-in instructions are provided in Appendix 10. Included are shipping instructions, points of contact, overseas collection sites, NSNs for turn-in containers, and handling procedures for preparing halon system cylinders.

“In the Plan”

The following page is a sample record for tracking ODC recovery and turn-ins.

SAMPLE
CAMP WILLIAMS ODC RECOVERY RECORD

ODC	From Bldg	Container NSN	Container Size	No.	Total Lbs	Excess ?	Stored At	Storage POC	Lbs Left	Recovery Date	Transfer Doc. Number
R-11	169	6830-01-355-9756	170 lbs	2	240	N	All American	P. Aultman 555-1357	0	02-Aug-94	N/A
R-11	91	6830-01-355-9756	170 lbs	11	1,870	N	All American	P. Aultman 555-1357	1,870	18-Sep-96	N/A
R-12	88	6830-01-355-6648	145 lbs	2	290	N	All American	P. Aultman 555-1357	0	13-Oct-94	N/A
R-12	88	6830-01-355-4013	45 lbs	1	45	N	All American	P. Aultman 555-1357	0	13-Oct-94	N/A
R-12	301	6830-01-355-6648	145 lbs	10	1,450	N	All American	P. Aultman 555-1357	870	28-Feb-95	N/A
R-500	301	6830-01-358-5123	127 lbs	4	508	Y	N/A	N/A	N/A	28-Feb-95	ODC Reserve W99DAK443281
R-113	301	---	25 lbs	1	25	Y	N/A	N/A	N/A	28-Feb-95	DRMO DD Form 1348 #1284
Halon 1301	26	8120-00-531-8193	150 lbs	1	150	Y	N/A	N/A	N/A	01-Jan-98	ODC Reserve W99DAK763249
Halon 1301	137	8120-00-531-8193	150 lbs	4	600	Y	N/A	N/A	N/A	04-Mar-97	ODC Reserve W99DAK813220

Chapter 6

Title: *Management*

Reference: "*Army policy dictates that all ODC equipment must be replaced within the next five years. The need to prepare now for the absence of these chemicals is obvious. Failure to do so will result in an adverse impact on Army readiness."*
ACSIM Memorandum 3 Jul 97

Summary:

All Class I ODCs must be eliminated from Army facilities by 1 October 2003. That's less than five years away! These are tough times, and there are a lot of bills to pay with very limited means to pay them. But that means there's more need for planning, not less. We have to do the best we can with what we have, replace first what's most important to replace, and be prepared to take advantage of opportunities that may arise (like increased attention on ODCs or available end-of-year funding).

There are three steps to properly manage the elimination of Class I ODCs from your installation: prioritizing projects, choosing alternatives, and developing schedules.

Prioritizing Projects. The first step is to review your halon and CFC inventories and establish some sort of priority for each replacement project. Since different organizations may be involved with different "colors" of money, the inventories may need to be grouped into subparts that correspond to who is responsible for funding. In many instances, this may not be clearly defined. If not, it needs to be defined now!

1) Prioritizing Halon Projects. For halon, the first, overriding priority should be the **mission of the equipment** the fire suppression system is protecting. The idea is that replacement halon won't be available sometime in the near future. When there's no halon available for recharging a fire suppression system that inadvertently discharges, the mission of the equipment is compromised because it's no longer protected from fire.

This means the prioritization of halon projects is very subjective. For example, which halon system is more important, the one in the flight simulator building or the one in the Ops Center? What about the one protecting the emergency power supply? The bottom line is, these decisions shouldn't be made solely by the base DPW. They're operational decisions that need to receive some level of attention from the effected unit staff.

The only other factor to consider when prioritizing halon replacement projects is how much halon is being removed for each dollar spent; i.e., how much bang for the buck. As practical as this sounds, however, it should only be considered for "breaking a tie" between projects protecting equally important equipment.

2) Prioritizing CFC Projects. The prioritization of CFC projects is less mission-oriented than for halon projects. That's because: 1) facility AC&R systems are for the most part quality-of-life, instead of operational, 2) CFC use is much more regular; i.e., 10-20% per year of the installed charge, 3) Army policy allows for the "stockpiling" of retired CFCs, whereas the "stockpiling" of halon is prohibited, and 4) there are finable requirements to replace certain CFC equipment (i.e., the 40 CFR 82.152 leak limits).

So the first, overriding priority for CFC projects should be the replacement of equipment that is out of compliance with the 40 CFR 82.152 leak limits. With the new leak limits, up to **half** the Army's CFC building chillers could be out of compliance. This is the **only situation** where installation funds should be readily available for ODC elimination, and **every opportunity** should be taken to legitimately identify CFC AC&R equipment as out of compliance with this regulation. See Chapter 7 for details.

The second factor to consider is the type of CFC refrigerant used. The supply of R-12 will dry up soon, probably around FY00. So the replacement of equipment that uses R-12 should be a priority. R-13, R-113, and R-114 will dry up not long after that. R-11 will probably be the last CFC refrigerants available, and so R-11 projects (except to replace excessive leakers) should be the last CFC replacement projects executed.

Another factor to consider should be the amount of refrigerant each piece of equipment is using. You want to replace first the equipment that is using the most CFCs. For example, say you have three R-11 building chillers. Chiller A has 1,000 lbs installed and is leaking at 6% per year. Chiller B has 500 lbs installed and is leaking 8% per year. Chiller C has 200 lbs installed and is leaking 10% per year. Chiller C has the worst leak rate, but is loosing only 20 lbs per year. Chiller B is loosing 40 lbs per year. However, Chiller A, with the "best" leak rate, is loosing 60 lbs per year! So with everything else equal, Chiller A should be replaced before Chiller B or Chiller C.

"Cascading" CFC Refrigerant. In the previous example, there's another associated reason for replacing chiller A before chiller B or chiller C. It has to do with the idea of "cascading" the refrigerant from a retired system to support other systems that use the same type of refrigerant. Not only does Chiller A use the most refrigerant, but in this example it also has the most refrigerant installed.

Therefore, by retiring Chiller A first, you can keep Chillers B and C going longer. If you recover 90% (900 lbs) of the R-11 installed in Chiller A, you can theoretically keep Chiller B and Chiller C going for 15 years! On the other hand, 90% of the refrigerant in Chiller C could only support Chillers A and B for less than two years. More thorough examples of how to cascade CFC refrigerants are provided in the Appendix 9.

Choosing Alternatives. There are only two requirements in choosing CFC and halon alternatives. Army policy says you must have an EPA SNAP approval and a toxicity clearance from the Army Surgeon General before you can use an ODC alternative.

The EPA SNAP lists of approved ODC alternatives are available through a number of publications and on a number of home pages, including AAPPSO's. The AAPPSO web-site is <www.aappso.com>. The EPA web-site is <www.epa.gov/ozone/title6/lists/index.html>. EPA will also fax you a copy of the Approved SNAP list for a desired application: call the EPA Hotline for Stratospheric Ozone Policy at 1-800-296-1996.

The second requirement is to have a toxicity clearance from the Army Surgeon General. An updated list of the alternatives that already have toxicity clearances can be found at <chppm-www.apgea.army.mil/tox>. If the ODC alternative you're considering doesn't already have a toxicity clearance, and the product is SNAP-approved and commercially available, CHPPM should be able to process a toxicity clearance in a matter of weeks. See Chapter 5 for instructions on applying for a toxicity clearance.

Alternatives for Halon 1301. For facilities halon 1301 applications, the #1 alternative of choice is water. More than 90% of the halon fire suppression systems in the country have been or are being converted to water, tying in to the sprinkler system that already exists in the building. It's cheap, it's easy, and it won't hurt electrical equipment as long as the system is designed to turn the power off before the water comes on.

There may be some applications, however, where it's not so simple. Such as in a control center, or at an uninterrupted power supply, or some other function where you don't want to shut down the power. Or the protected equipment is proven to be vulnerable to water, even when the power is shut off. In some such applications, it may be satisfactory to simply install very sensitive sensors and rely on manual intervention (i.e., a hand-held fire extinguisher) for response. Other applications may require alternative gaseous agents, which can be very expensive.

A good source for expert technical opinion on alternatives is the contractor who's currently servicing the equipment. There are also expert software packages available, such as the Army's Halon Alternative Selection Tool (HAST) which AAPPSO distributed in 1997. The bottom line, however, is that the owners of the protected equipment must play a major role in the selection of the replacement. The continued operation of their equipment should be the overriding consideration for the halon replacement effort.

Alternatives for CFC Refrigerants. At the time this Guide was printed, only R-134a was both SNAP-approved and had a toxicity clearance for facilities AC&R equipment. R-134a is domestically the alternative refrigerant of choice for applications from automobile air conditioners to small appliances to centrifugal building chillers.

However, there are other viable alternatives. First, there are Class II ODCs (called hydrochlorofluorocarbons). The most notable are R-22 and R-123. These refrigerants are common, can offer very efficient and effective cooling, and are readily available. Your home air conditioner, for example, probably runs on R-22. Class II ODCs do have legally directed production phase-out dates, but not until 2020 or beyond, and the recycle market will keep them available long past those dates. A toxicity clearance may be needed, but for R-22 or R-123, such clearances should be easily processed.

Another group of "viable" alternatives is Class II ODC blends. This group includes a number of refrigerants that are already SNAP-approved, such as FRIGC™, HotShot™ and FreeZone™. Most have been mixed so that their chemical properties are very close to R-12's, so that they can be sold for use in R-12 equipment. However, none – repeat **none** – can be used in a piece of R-12 AC&R equipment without some modification. There is no R-12 "drop-in" replacement. Some disreputable salesmen may claim their product can be used in your R-12 equipment without changes, even to top off the existing charge of R-12. This is simply not true. Using another refrigerant in your R-12 system without making changes risking serious and expensive damage. Don't do it.

There are "not-in-kind" AC&R alternatives such as swamp coolers and desiccant systems that are for the most part peculiar to a region or climate. They should be considered as long as they're used commercially in similar applications. Then there are larger systems using alternative power sources or naturally chilled water. Any consideration for such systems should be reserved for replacing chiller plants servicing multiple buildings, and the replacement should be in conjunction with special programs being offered by the government or local utility company.

Developing Schedules. The last step in managing ODC elimination is setting up replacement schedules that include cost estimates. There are a lot of program management software packages that can lay out a schedule, and any of them can do the job. Remember -- all ODC replacement projects should be completed by 1 Oct 03.

Cost estimates should be based on actual contractor estimates. Your current halon support contractors should be more than willing to provide replacement estimates for whatever alternatives you select. For CFC equipment, the resourcing can be more creative and therefore your costs can be much more variable (see Chapter 7). Start with a simple replacement cost based on a GSA schedule, and then work from there. For proper management, the sources and colors or money should also be identified in as much detail as possible.

"In the Plan"

The following six pages are samples of:

1) A prioritized list of halon systems with alternatives identified.
2) A prioritized list of CFC equipment with alternatives identified.
3) A schedule of halon replacement projects with cost estimates.
4) A schedule of CFC replacement projects with cost estimates.

SAMPLE
CAMP WILLIAMS HALON PROJECT ESTIMATES

Proj No.	Priority	Bldg No.	Room Protected	Halon Location	Halon (Resv)	Assets Protected	Alternate Agent	Replacement Estimate	Replacement Contractor	Replacement Ctr POC	Funding Organization	Funding Orgn POC
1	High	301	Basement	Basement	220 (220)	Em Power Generator	Water	$4,250	National Fire Protection	Kevin Crawford 555-9981	Medical Center	Steve Parks 555-8212
2	High	67	Main Bay	Halon Room	800 (800)	Emergency Power	Inergen	$82,000	National Fire Protection	Kevin Crawford 555-9981	Garrison	Tom Bush 555-5790
3	High	94	Simulator Bay #2	201	600 (600)	Flight Simulator	FM-200	$55,800	Missile Test Systems Inc.	Bill Ruppert 555-2772	Test Center	Lisa Whiting 555-2233
4	High	51	1400	1431	400 (400)	Comm Equipment	Water	$16,499	National Fire Protection	Kevin Crawford 555-9981	DFAS Region 12	James Ellor 555-0864
5	Medium	308	Area 3	Equipment Room	260 (0)	HAZMAT Chemicals	FM-200	$21,000	National Fire Protection	Kevin Crawford 555-9981	Medical Center	Steve Parks 555-8212
6	Medium	22	East Bay	Halon Room	786 (0)	Motor Storage	CO2	$30,650	National Fire Protection	Kevin Crawford 555-9981	Garrison	Tom Bush 555-5790
7	Medium	85	HAZMAT Area	Halon Locker	80 (0)	Flammable Chemicals	FM-200	$3,500	Missile Test Systems Inc.	Bill Ruppert 555-2772	Test Center	Lisa Whiting 555-2233
8	Medium	86	Central Bunker	Equipment Shed	350 (0)	Explosives	CO2	$23,720	Missile Test Systems Inc.	Bill Ruppert 555-2772	Test Center	Lisa Whiting 555-2233
9	Medium	301	OXON Lab	Utility Room	120 (100)	Laboratory Equipment	Water	$2,582	National Fire Protection	Kevin Crawford 555-9981	Medical Center	Steve Parks 555-8212
10	Medium	130E	Interior	Exterior	200 (200)	SATCOM Antennae	Water	$3,040	ATCOM Corporation	Vicky Trang 555-9006	987th Comm Squadron	LT Brad Shaw 555-0412
11	Medium	130W	Equipment Room	Utility Room	140 (0)	SATCOM Equipment	Water	$6,600	ATCOM Corporation	Vicky Trang 555-9006	987th Comm Squadron	LT Brad Shaw 555-0412
12	Medium	146	Control Room	Utility Room	120 (100)	Computers	Water	$2,700	Missile Test Systems Inc.	Bill Ruppert 555-2772	Test Center	Lisa Whiting 555-2233
13	Low	301	108	110	120 (100)	Computers	Water	$2,248	National Fire Protection	Kevin Crawford 555-9981	Medical Center	Steve Parks 555-8212
14	Low	58	230	232	200 (100)	Computers	VED w/ Manual	$2,500	National Fire Protection	Kevin Crawford 555-9981	HQ 9th Army	MSGT Curry 555-1278
15	Low	58	231	232	160 (0)	Comm Equipment	Water	$2,840	National Fire Protection	Kevin Crawford 555-9981	HQ 9th Army	MSGT Curry 555-1278
16	Low	63	120	Equipment Room	350 (0)	Computers	Water	$8,375	National Fire Protection	Kevin Crawford 555-9981	Garrison	Tom Bush 555-5790
17	Low	50	Main Hall	Room 121	500 (0)	Artifacts	Water	$10,000	National Fire Protection	Kevin Crawford 555-9981	Garrison	Tom Bush 555-5790

SAMPLE
CAMP WILLIAMS CFC PROJECT ESTIMATES

Proj No.	Priority	Bldg No.	Equipment	Model/ Serial No.	Altrn Refrig	Replacement Cost	Replacement Contractor	Replacement POC	Funding Organization	Funding POC
1	Non-Compliance	22	R-11 Chiller	PCV1JC202/ L-3016468	R-123	$102,000	All American	Pete Aulterman 555-1357	Garrison	Tom Bush 555-5790
2	Non-Compliance	19	R-11 Chiller	PCV1JC202/ L-3016466	R-123	$102,000	All American	Pete Aulterman 555-1357	Garrison	Tom Bush 555-5790
3	Non-Compliance	109	R-12 Chiller	Tru-Cool 1200	R-134a	$280,000	All American	Pete Aulterman 555-1357	TRADOC	Dan Aldridge 555-6277
4	Non-Compliance	45	R-11 Chiller	YTAIA2B1/ YHRM24384	R-22	$67,600	All American	Pete Aulterman 555-1357	Garrison	Tom Bush 555-5790
5	Non-Compliance	101	R-12 Chiller	110/ A590	R-22	$67,600	All American	Pete Aulterman 555-1357	TRADOC	Dan Aldridge 555-6277
6	Non-Compliance	67	R-12 Cooler	CBAM-0500/ 13C78	R-134a	$10,000	Crawford Services	Michelle Kisner 555-2468	HQ 9th Army	MSGT Curry 555-1278
7	Non-Compliance	87	R-502 Freezer	BRCLX-750 /U01284	R-134a	$18,000	Crawford Services	Michelle Kisner 555-2468	Garrison	Tom Bush 555-5790
8	R-12 Equipment	58	R-12 Chiller	UDS1000-3U /8G71C	R-22	$67,600	All American	Pete Aulterman 555-1357	Garrison	Tom Bush 555-5790
9	Big CFC User	108	R-11 Chiller	F5-25B-26B/ 1810	R-134a	$180,000	All American	Pete Aulterman 555-1357	Garrison	Tom Bush 555-5790
10	Big CFC User	103	R-11 Chiller	44-31C32B/ 10173A	R-134a	$140,000	All American	Pete Aulterman 555-1357	TRADOC	Dan Aldridge 555-6277
11	Big CFC User	50	R-11 Chiller	19DH6365CE/804 430891	R-134a	ESPC	Hammond Utilities Inc.	Felix Moreno 888-555-4030	DFAS Region 12	James Ellor 555-0864
12	Big CFC User	51	R-11 Chiller	19DH6365CE/804 430890	R-134a	ESPC	Hammond Utilities Inc.	Felix Moreno 888-555-4030	DFAS Region 12	James Ellor 555-0864
13	Big CFC User	137	R-11 Chiller	19DG5343CD /7625119	R-134a	ESPC	Hammond Utilities Inc.	Felix Moreno 888-555-4030	Test Center	Lisa Whiting 555-2233
14	Low	49	R-11 Chiller	CUHE-025G/ L84H22069	R-134a	$180,000	All American	Pete Aulterman 555-1357	Garrison	Tom Bush 555-5790
15	Low	146	R-11 Chiller	YDTJ-67/ 0417651	R-134a	ESPC	Hammond Utilities Inc.	Felix Moreno 888-555-4030	Test Center	Lisa Whiting 555-2233
16	Low	146	R-13 Env Chamber	Unknown	R-508B	$1,120,000	AstroTech	Chris Hartline 555-3579	Test Center	Lisa Whiting 555-2233

SAMPLE
CAMP WILLIAMS HALON REPLACEMENT SCHEDULE

PROJECTS				SCHEDULE											
No.	Priority	Bldg	Assets	1Q99	2Q99	3Q99	4Q99	1Q00	2Q00	3Q00	4Q00	1Q01	2Q01	3Q01	4Q01
1	High	301	EPG					$4,250							
2	High	67	EPG	$82,000											
3	High	94	Flt Sim					$55,800							
4	High	51	Comm Eqpt							$16,499					
5	Medium	308	HAZMATs									$21,000			
6	Medium	22	Motor Strg											$30,650	
7	Medium	85	Flammables												
8	Medium	86	Explosives												
9	Medium	301	Lab Eqpt												
10	Medium	130E	Antennae												
11	Medium	130W	SATCOM												
12	Medium	146	Computers												
13	Low	301	Computers												
14	Low	58	Computers												
15	Low	58	Comm Eqpt												
16	Low	63	Computers												
17	Low	50	Artifacts												
Total Environmental OMA:				**$0**				**$0**				**$0**			
Total Real Property OMA:				**$82,000**				**$16,499**				**$30,650**			
Total Other Accounts:				**$0**				**$55,800**				**$21,000**			
TOTAL FUNDS REQUIRED:				**$82,000**				**$72,299**				**$51,650**			

SAMPLE
CAMP WILLIAMS HALON REPLACEMENT SCHEDULE

PROJECTS				SCHEDULE								
No.	Priority	Bldg	Assets	1Q02	2Q02	3Q02	4Q02	1Q03	2Q03	3Q03	4Q03	TOTALS
1	High	301	EPG									$4,250
2	High	67	EPG									$82,000
3	High	94	Flt Sim									$55,800
4	High	51	Comm Eqpt									$16,499
5	Medium	308	HAZMATs									$21,000
6	Medium	22	Motor Strg									$30,650
7	Medium	85	Flammables			$3,500						$3,500
8	Medium	86	Explosives	$23,720								$23,720
9	Medium	301	Lab Eqpt			$2,582						$2,582
10	Medium	130E	Antennae			$3,040						$3,040
11	Medium	130W	SATCOM				$6,600					$6,600
12	Medium	146	Computers				$2,700					$2,700
13	Low	301	Computers								$2,248	$2,248
14	Low	58	Computers								$2,500	$2,500
15	Low	58	Comm Eqpt								$2,840	$2,840
16	Low	63	Computers							$8,375		$8,375
17	Low	50	Artifacts					$10,000				$10,000
Total Environmental OMA:				**$0**				**$25,963**				**$25,963**
Total Real Property OMA:				**$9,640**				**$0**				**$138,789**
Total Other Accounts:				**$32,502**				**$0**				**$109,302**
TOTAL FUNDS REQUIRED:				**$42,142**				**$25,963**				**$274,054**

SAMPLE
CAMP WILLIAMS CFC REPLACEMENT SCHEDULE

PROJECTS				SCHEDULE											
No.	Priority	Bldg	Equipment	1Q99	2Q99	3Q99	4Q99	1Q00	2Q00	3Q00	4Q00	1Q01	2Q01	3Q01	4Q01
1	Compiance	22	R-11 Chiller	$102,000											
2	Compiance	19	R-11 Chiller			$102,000									
3	Compiance	109	R-12 Chiller					$260,000							
4	Compiance	45	R-11 Chiller									$67,600			
5	Compiance	101	R-12 Chiller										$67,600		
6	Compiance	67	R-12 Cooler											$10,000	
7	Compiance	87	R-502 Freezer											$18,000	
8	R-12	58	R-12 Chiller												$67,600
9	Big User	108	R-11 Chiller												
10	Big User	103	R-11 Chiller												
11	Big User	50	R-11 Chiller					$0							
12	Big User	51	R-11 Chiller					$0							
13	Big User	137	R-11 Chiller												
14	Low	49	R-11 Chiller												
15	Low	146	R-11 Chiller												
16	Low	146	R-13 Chamber												
Total Environmental OMA:				**$204,000**				**$280,000**				**$163,200**			
Total Real Property OMA:				**$0**				**$0**				**$67,600**			
Total Other Accounts:				**$0**				**$0**				**$0**			
TOTAL FUNDS REQUIRED:				**$204,000**				**$280,000**				**$230,800**			

SAMPLE
CAMP WILLIAMS CFC REPLACEMENT

PROJECTS				SCHEDULE								
No.	Priority	Bldg	Equipment	1Q02	2Q02	3Q02	4Q02	1Q03	2Q03	3Q03	4Q03	TOTALS
1	Compiance	22	R-11 Chiller									$102,000
2	Compiance	19	R-11 Chiller									$102,000
3	Compiance	109	R-12 Chiller									$280,000
4	Compiance	45	R-11 Chiller									$67,600
5	Compiance	101	R-12 Chiller									$67,600
6	Compiance	67	R-12 Cooler									$10,000
7	Compiance	87	R-502 Freezer									$18,000
8	R-12	58	R-12 Chiller									$67,600
9	Big User	108	R-11 Chiller	$180,000								$180,000
10	Big User	103	R-11 Chiller			$140,000						$140,000
11	Big User	50	R-11 Chiller				$0					$0
12	Big User	51	R-11 Chiller				$0					$0
13	Big User	137	R-11 Chiller	$0								$0
14	Low	49	R-11 Chiller					$180,000				$180,000
15	Low	146	R-11 Chiller	$0								$0
16	Low	146	R-13 Chamber					$1,120,000				$1,120,000
Total Environmental OMA:				**$0**				**$0**				**$647,200**
Total Real Property OMA:				**$320,000**				**$180,000**				**$567,600**
Total Other Accounts:				**$0**				**$1,120,000**				**$1,120,000**
TOTAL FUNDS REQUIRED:				**$320,000**				**$1,300,000**				**$2,334,800**

Chapter 7

Title: *Resources*

Reference: "*Each installation shall continue to develop plans and budget for the retrofit or replacement of existing halon 1301 fire suppression systems and equipment utilizing CFCs as a refrigerant."*
DASA(ESOH) Memorandum 18 Oct 94

Summary:

To successfully eliminate the Class I ODCs from your installation, you must be able to pull together funds from a variety of sources. Chapter 7 of your plan should describe the means the ODC Team has planned to execute the schedules developed in Chapter 6. There are basically four different sources of funding for ODC replacement projects:

-- Unit specific funds.

-- Installation RPMA OMA funds.

-- Installation Environmental OMA funds.

-- Special program funds.

Unit Specific Funds. Tenant funding of ODC replacement projects has been quite successful. This is especially true of halon replacement projects, since they're more operationally oriented. All efforts should be made to encourage tenants to program and budget for ODC elimination in their facilities.

Installation Environmental OMA Funds. These funds are managed through the Army Environmental Program Requirements (EPR) process. Current EPR guidance directs that routine replacement of ODC equipment and systems should not be paid for with environmental funds. There are two instances, however, where ODC replacement projects can and should be paid with environmental funds.

The first is to replace those CFC systems that are out of compliance with EPA regulations; i.e., the 40 CFR 82.152 CFC leak limits. If the servicing record indicates a piece of CFC AC&R equipment has leaked in excess of the currently prescribed rate, then the replacement of that system should be identified in the EPR as a Class I project. The specific category is Class I ESDP – Established Standard and Deadline Passed.

If the servicing record indicates that a piece of CFC AC&R equipment will probably leak next year at a rate in excess of pending, more stringent EPA limits, then the replacement of that system should be identified in the EPR as a Class II priority (high assessment or "must fund") project. The specific category is Class 2 ESDF (Established Standard and Deadline in Future) if the leak rate is anticipated to exceed the existing limitation, and Class 2 PSDF (Pending Standard and Deadline in Future) if the leak rate is anticipated to exceed a new, more stringent pending limitation.

MACOMs should program environmental resources sufficient to meet all the requirements documented in the EPR. MACOMs and installations must align or realign resources as necessary to ensure compliance with all legal requirements.

The second instance where ODC replacement could be funded as an environmental project is where the replacement can be identified as a pollution prevention (P2) project with a payback of five years or less. AEC periodically provides EPR guidance that includes forms and instructions on how to determine a project's Return on Investment (ROI), and the latest instructions should be used.

Installation RPMA OMA Funds. This is the most logical place to seek funding for the remainder of your ODC elimination projects. These funds are supposed to be available for the replacement of equipment that's beyond its useful service life. Since prior to 1980 the expected service life of most AC&R equipment was 20 years, all the CFC equipment installed in Army facilities before 1980 should now be considered as beyond their useful service life and obsolete.

The same can be said for halon fire suppression systems. As the price of halon 1301 soars, it will soon become no longer economically feasible to replace the halon when the system discharges. Since a discharged halon system isn't operational – until it's supplied with a new charge of halon -- a halon fire suppression system is only functional for as long as halon is available. Therefore, all halon 1301 fire suppression systems will soon be obsolete because the halon won't be economically available.

Special Program Funds. There are increasingly more opportunities to make use of special projects to fund ODC elimination, especially the replacement of CFC equipment. The two main opportunities currently available are in the related areas of energy efficiency and greenhouse gas reductions.

Again, with the cost of new building chillers in the $100,000+ range, a chiller replacement can't justify itself on energy savings alone. The Army continues to fund energy savings projects, however, and chiller replacements should definitely be competitive in this arena. Over the past 25 years, the energy efficiency of AC&R building chillers has increased by over 50%, from 1.1 to 1.7 tons per kilowatt. This not only saves energy; it also equates to potential savings of tens of thousands of dollars a year in lower utility bills for an installation.

Many local and regional utility companies also often offer special incentives to customers to reduce their energy consumption. These programs will most likely increase as climate change legislation increases, since power companies are the primary source of greenhouse gas (GHG) emissions in this country. Federal, DoD, and Army climate programs will also increase as the country (and the world) gear up for serious GHG reductions.

The most significant special program going on right now that can provide funding for CFC equipment replacement is Energy Savings Performance Contracting (ESPC). The idea is simple; great energy efficiencies have been achieved over the last 20 years in technologies that impact the operations of office buildings. Efficiency improvements in air conditioning chillers is one; efficiency improvements have also been made in lighting, ventilation, insulation, and overall energy management (through computers). Added together, relatively simple building improvements can now result in significant reductions to energy costs.

However, such building improvements cost investment capital, which is a rare commodity. That's where the ESPC comes in. A service contractor signs on to make building improvements and then operates the building for a specified number of years for a fee less than the current utilities bill. All improvements, including any new equipment (i.e., a new chiller), are transferred to the government. It's a win-win situation, because there are no capital expenditures, the cost to operate the building goes down, and the contractor makes his profit from the energy savings and the long-term commitment.

After a slow start, the DoD is getting into ESPCs in a big way. ESPCs contracts for CONUS installations are currently available for use by DoD activities through the Huntsville U.S. Army Corps of Engineers (USACE). OCONUS contracts for Army activities are also being developed. The POC at Huntsville is Mr. Bobby Starling at (256) 895-1531. The Navy and the Air Force are also pursuing additional EPSCs that will increase the CONUS and OCONUS coverage and provide even more opportunities for Army installations. If your installation has building chillers over twenty-five years old, you should definitely be pursuing EPSCs at some level to compensate for the lack of investment capital.

APPENDIX 1: ACSIM MEMORANDUM 3 JUL 97

DEPARTMENT OF THE ARMY
ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT
600 ARMY PENTAGON
WASHINGTON DC 20310-0600

REPLY TO ATTENTION OF

S: 26 Sep 97

DAIM-ED-P2

3 JUL 1997

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Elimination of the Dependency on Ozone-Depleting Chemicals (ODCs) in Army Facilities

1. References:

a. Memorandum, Assistant Secretary of the Army (Installations, Logistics, and the Environment), 13 Feb 95, subject: "Ozone-Depleting Chemicals (ODC) Elimination at Army Installations."

b. *Strategic Guidance and Planning for Eliminating Ozone-Depleting Chemicals from U.S. Army Applications*, Nov 95.

c. Memorandum, Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health), 18 Oct 94, subject: "Disposition of Excess Ozone-Depleting Substances (ODS) at Army Installations."

d. Memorandum, Army Acquisition Executive, 20 May 93, subject: "Elimination of Ozone-Depleting Chemicals; Implementation of the Requirements of the National Defense Authorization Act for Fiscal Year 1993."

2. The Clean Air Act of 1990 established production phase-out dates for ODCs. The production of halon was banned after 1 Jan 94, and the production of chlorofluorocarbons (CFCs) was banned after 1 Jan 96. Since then, halon prices have increased thirty-fold, and CFCs may be unavailable in some areas as early as next year. Per reference 1.a, Army policy dictates all ODC equipment must be replaced within the next five years. The need to prepare now for the absence of these chemicals is obvious. Failure to do so will result in an adverse impact to Army readiness.

3. It is important operationally and economically that the halon and CFCs installed in Army facilities are recovered for reuse by

APPENDIX 1: ACSIM MEMORANDUM 3 JUL 97 (CONTINUED)

the Army. They are not to be traded, sold, turned in to DRMO, or in any other way transferred out of Army ownership. The halon in building fire suppression systems and in fire extinguishers is needed for the continued operation of Army weapon systems such as the M1 Abrams tank and the UH-60 Blackhawk helicopter. All CFC refrigerant in serviced equipment must be recovered before the equipment is retired. It is needed for the continued operation of CFC equipment on your installation. If in excess to your requirements, it is needed by the Army ODC Reserve.

4. The above referenced documents delineate current Army policy on eliminating ODCs from Army installations. A summary of those policies is provided at enclosure 1.

5. Referenced 1.a and 1.c identify the need for Installation Commanders to prepare ODC equipment inventories and develop and maintain ODC elimination plans. Installation Commanders are responsible for the elimination of all ODC use on their installations, including that of tenants, with the exceptions of the Army-Air Force Exchange Service and the Defense Commissary Agency. Reference 1.b provides detailed instructions on how to build installation ODC elimination plans. To gauge the level of Army preparedness for the unavailability of ODCs, we request a status of these planning efforts. Specifically, please provide the number of your installations that have an ODC elimination plan per reference 1.b, and also the number of your installations that have not yet developed this plan.

6. To properly evaluate both the current status of ODC conversions in Army facilities and the outstanding unfunded requirement, we request that all addressees complete and submit the forms provided at enclosure 2. Instructions are provided for each form.

7. Please forward your submissions to the Army Acquisition Pollution Prevention Support Office (AAPPSO) by 26 Sep 97. My point of contact at AAPPSO is Mr. George Terrell, Army ODC

APPENDIX 1: ACSIM MEMORANDUM 3 JUL 97 (CONTINUED)

DAIM-ED-P2
SUBJECT: Elimination of the Dependency on Ozone-Depleting Chemicals (ODCs) in Army Facilities

Elimination Program Director, (703) 617-9488, facsimile (703) 617-5146, e-mail gterrell@hqamc.army.mil. Technical questions may be directed to Mr. David Koehler, Ocean City Research Corporation, (703) 212-9006, facsimile (703) 212-9019, e-mail ocrc2@erols.com. OASCIM point of contact is Mr. Bob Schroeder, (703) 693-0544.

for J C Menig

RANDOLPH W. HOUSE
Major General, GS
Assistant Chief of Staff
Installation Management

Encls
as

DISTRIBUTION:
Chief of Staff,
U.S. Army Training and Doctrine Command, Ft. Monroe, VA 23651-5000
U.S. Army Europe and Seventh Army, APO AE 09014-0100
U.S. Army Pacific, Ft. Shafter, HI 96858-5100
U.S. Army South, APO AA 34004-5000
U.S. Army Forces Command, Ft. McPherson, GA 30330-6000
U.S. Forces Korea, APO AP 96205-0010
U.S. Army Materiel Command, 5001 Eisenhower Avenue, Alexandria, VA 22333-0001
U.S. Army Medical Command, Ft. Sam Houston, TX 78234-6000
U.S. Army Military District Washington, Ft. Leslie J. McNair, Washington, DC 20319-5050
U.S. Army Corps of Engineers, 20 Massachusetts Avenue NW, Washington, DC 20314-1000
U.S. Army Space and Strategic Defense Command, P.O. Box 1500, Huntsville, AL 35807-3801
U.S. Military Academy, West Point, NY 10996-5000
U.S. Army Reserve, 2400 Army Pentagon, Washington, DC 20310-2400
National Guard Bureau, 2500 Army Pentagon, Washington, DC 20310-2500

3

APPENDIX 1: ACSIM MEMORANDUM 3 JUL 97 (CONTINUED)

DAIM-ED-P2
SUBJECT: Elimination of the Dependency on Ozone-Depleting Chemicals (ODCs) in Army Facilities

CF:
Chief of Staff
U.S. Army Safety Center, Ft. Rucker, AL 36362-5363
U.S. Army Environmental Center, Aberdeen Proving Ground, MD 21010-5401
U.S. Army Center for Health Promotion and Preventive Medicine, Aberdeen Proving Ground, MD 21010-5244
U.S. Army Community & Family Support Center, Hoffman Building 1, 2461 Eisenhower Avenue, Alexandria, VA 22331

4

APPENDIX 1: ACSIM MEMORANDUM 3 JUL 97 (CONTINUED)

SUMMARY OF POLICY
ELIMINATION OF OZONE-DEPLETING CHEMICALS (ODCs)
FROM ARMY INSTALLATIONS

1. **INSTALLATION COMMANDERS ARE RESPONSIBLE FOR ODC ELIMINATION.**
   -- Responsible for the documentation of all installation ODC elimination requirements using the Environmental Program Requirements (EPR) report.
   -- Responsible for preparing and maintaining an inventory of installation-owned and tenant-owned ODC equipment installed in their installation facilities.
   -- Responsible for development & execution of installation ODC elimination plans.

2. **TENANT COMMANDERS ARE RESPONSIBLE FOR COMPLYING WITH HOST ODC POLICIES AND SUPPORTING HOST ODC ELIMINATION EFFORTS.**

3. **CLASS I ODCs MUST BE ELIMINATED FROM ALL FACILITIES ON ARMY INSTALLATIONS BY THE END OF FY03.**
   -- Class I ODCs are defined by Section 602(a) of the Clean Air Act of 1990.

4. **INSTALLATIONS MAY NOT CONTRACT FOR THE USE OF CLASS I ODCS.**
   -- Public Law 102-484, Section 326, prohibits the Army from letting contracts that require the use of Class I ODCs. This includes contracts for the servicing of AC&R equipment and fixed fire suppression systems, as well as the direct purchase of CFC refrigerants and halon.
   -- Approvals may be granted only through the preparation of a technical certification of need identifying that no ODC alternative is available, and the formal approval of a General Officer or Senior Executive Service member.

5. **ALL CLASS I ODCS INSTALLED IN ARMY FACILITIES MUST BE RECOVERED.**
   -- ODCs must not be sold, traded, turned in to the post Defense Reutilization and Marketing Office (DRMO), or otherwise transferred from Army ownership. All ODCs in non-sealed systems must be recovered when the system is retired.
   -- Halon installed in fixed, total flooding fire suppression systems must be turned in to the Army ODC Reserve when the system is retired. This halon must not be reused to support another facility fire protection system on the installation.
   -- Recovered CFC refrigerants may be reused to support another CFC systems on the same installation. This is referred to as "cascading" and is recommended in lieu of purchasing CFC refrigerant to service existing equipment.

6. **ODC ALTERNATIVES MUST FIRST BE APPROVED BY THE EPA SIGNIFICANT NEW ALTERNATIVES PROGRAM AND RECEIVE A TOXICOLOGY CLEARANCE FROM THE ARMY SURGEON GENERAL BEFORE USE IN ARMY FACILITIES.**

ENCL 1

APPENDIX 2: ASA(IL&E) MEMORANDUM 13 FEB 96

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
INSTALLATIONS LOGISTICS AND ENVIRONMENT
110 ARMY PENTAGON
WASHINGTON DC 20310-0110

February 13, 1996

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Ozone-Depleting Chemicals (ODC) Elimination at Army Installations

This delineates responsibilities and establishes procedures to which all Army installations will comply in the execution, reporting and resourcing of their respective ODC elimination plans. The Strategic Guidance and Planning for Eliminating Ozone-Depleting Chemicals from U.S. Army Applications, October 1995, provides information on the overall Army ODC Elimination Program, with specific guidance for installations on the development and execution of installation ODC elimination plans. ODC elimination in Army weapon systems is being addressed on a programmatic basis and should not be included in installation ODC elimination plans. For the purposes of ODC elimination, Army-Air Force Exchange Service (AAFES) and Defense Commissary Agency organizations will not be considered as tenants. These organizations have developed and are implementing their own ODC elimination plans.

Army Installation/Regional Support Commanders are responsible for ensuring that Class I ODCs, as defined by section 602(a) of Title VI of the Clean Air Act, are eliminated in all facilities on their installations by the end of fiscal year 2003. These responsibilities include the inventory of installation owned equipment and facilities occupied by Army and non-Army tenant organizations. The manner in which installation ODC elimination plans are executed should be consistent with existing host-tenant agreements. In some cases, these agreements may require Installation Commanders to execute, report and request resources for tenants. In other cases, tenants may execute their own ODC elimination projects, and report and obtain resources through their respective chains of command. In any event, Installation Commanders are responsible for ensuring appropriate actions are initiated and that Class I ODCs are eliminated in all facilities on their installations by the end of fiscal year 2003.

Commanders, Directors and Chiefs of Army tenant organizations on Army and non-Army installations are responsible for complying with installation policies and supporting the ODC elimination efforts of their host Installation Commander. This support should be consistent with existing host-tenant

APPENDIX 2: ASA(IL&E) MEMORANDUM 13 FEB 96 (CONTINUED)

agreements. When host-tenant agreements specify, tenant commanders, directors and chiefs will take appropriate actions through their organizational chains of command to execute, report and resource efforts to eliminate Class I ODCs (i.e., retrofit/replacement of mission-unique equipment). These mission-unique requirements will be forwarded to the installation Commander to ensure that they are incorporated in the installation ODC elimination plan.

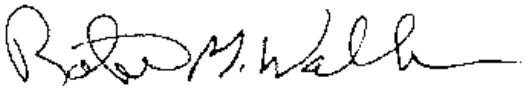
Host-tenant agreements which are not in compliance with the above policy should be re-negotiated as soon as possible, incorporating ODC elimination in the environmental compliance section. These agreements should specifically address host and tenant resourcing responsibilities as previously discussed.

Commanders, Directors and Chiefs of Army organizations in GSA-leased facilities and Army users of GSA-leased vehicles will support applicable GSA programs to eliminate the use of ODCs. This support will be provided in accordance with existing lease agreements.

Installation Commanders will document all installation ODC requirements, in accordance with existing host-tenant agreements, using the Environmental Pollution Prevention, Control and Abatement Report (RCS DD-P&L(SA) 1383 (OMB A-106 Report)). Major Army Commands (MACOMs) will provide a copy of the consolidated reports for all installations under their command, or a copy of the consolidated reports for tenants who must report separately, to the Army Acquisition Pollution Prevention Support Office (AAPPSO). These reports will be used to support requests for funding in the budget process.

AAPPSO will provide additional guidance as required.

My point of contact for this action is Colonel H. E. Wolfe, 697-0440 and the technical point of contact in AAPPSO is Mr. Thomas A. Bush, DSN 284-5941, commercial (703) 274-5941, facsimile (703) 274-5146.



Robert M. Walker
Assistant Secretary of the Army
(Installations, Logistics & Environment)

APPENDIX 2: ASA(IL&E) MEMORANDUM 13 FEB 96 (CONTINUED)

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U.S. Army Medical Command, Ft. Sam Houston, TX 78234-6000
U.S. Army Military District of Washington, Ft. Lesley J. McNair, Washington, D.C. 20319-5050
U.S. Army Corps of Engineers, 20 Massachusetts Ave., NW, Washington, D.C. 20314-1000
U.S. Army Safety Center, Ft. Rucker, AL 36362-5363
U.S. Army Community & Family Support Center, Hoffman Building 1, 2461 Eisenhower Avenue, Alexandria, VA 22331

Superintendent, United States Military Academy, West Point NY 10996

APPENDIX 3: DASA(ESOH) MEMORANDUM 18 OCT 94

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
INSTALLATIONS LOGISTICS AND ENVIRONMENT
110 ARMY PENTAGON
WASHINGTON DC 20310-0110

OCT 18 1994

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Disposition of Excess Ozone-Depleting Substances (ODS) at Army Installations

Reference memorandum, Deputy Under Secretary of Defense (Environmental Security), 13 Apr 1994, subject: Phase-out of Class I Ozone Depleting Substances (ODS).

The referenced memorandum provided OSD guidance on the disposition of excess ODS at Department of Defense installations. This memorandum establishes procedures to which all Army installations shall comply. The procedures contained in the attachment are intended to maintain unit operational readiness while also eliminating the Army's dependence on ODSs. These procedures apply to both weapon system and facility applications, unless otherwise noted.

Installation commanders should be reminded of the requirements of Sections 608 and 609 of the Clean Air Act concerning the training and certification of personnel responsible for servicing/maintaining equipment which utilize ODS as refrigerants.

The policy and procedures contained in this memorandum, with attachment, shall be implemented by all Army installations, to include those installations identified for closure under the Base Realignment and Closure (BRAC) Act. Discrepancies between this memorandum and individual installation BRAC agreements should be referred to the Army Acquisition Pollution Prevention Support Office (AAPPSO) for resolution.

Each installation shall continue to develop plans and budget for the retrofit or replacement of existing halon 1301 fire suppression systems and equipment utilizing CFCs as a refrigerant. The Strategic Plan for Eliminating ODS from Army Facilities is being developed and will be available first quarter, fiscal year 1995.

AAPPSO will provide additional guidance and policy as required.

APPENDIX 3: DASA(ESOH) MEMORANDUM 18 OCT 94 (CONTINUED)

My points of contact in AAPPSO are Dr. Daniel P. Verdonik and Mr. Thomas A. Bush, DSN 284-0815/6, Comm (703) 274-0815/6, fax (703) 274-5146.

Lewis D. Walker
Deputy Assistant Secretary of the Army
(Environment, Safety and Occupational Health)
OASA(I,L&E)

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U.S. Army Corps of Engineers, 20 Massachusetts Ave., NW, Washington, D.C. 20314-1000

APPENDIX 3: DASA(ESOH) MEMORANDUM 18 OCT 94 (CONTINUED)

OZONE-DEPLETING SUBSTANCES GUIDANCE

It is DOD policy that: 1) no ODS shall be sold, contracted for disposal, or given away to any activity, to include turn-in to Defense Reutilization Management Office (DRMO), 2) all excess ODS shall be shipped directly to the DoD Reserve at the Defense General Supply Command (DGSC), Richmond, Virginia (shipments must be identified as originating from an Army activity in order for the Army account to be credited with the turn-in quantity), and 3) all shipments to the DOD Reserve shall comply with CFR 49, Section 173.301, Requirements for Shipment of Compressed Gas Cylinders.

Excess ODS are defined as: 1) for halon (1301 and 1211), that halon which is currently not installed in an operational fire suppression system. Halon bottles installed as back-up in operational systems or maintained as a "combat load" by tactical units for weapon system applications are not considered excess. Halon becomes "excess" as fire suppression systems are retrofit or replaced with systems employing non-ODS substitutes. Halon shall not be stockpiled or placed into a reserve at the installation level. 2) for chlorofluorocarbon (CFC) -11, CFC-12, CFC-500, CFC-502 and other refrigerants, when that particular refrigerant is no longer required by the installation to support operational equipment (e.g. chillers, air conditioners, freezers, etc.). Installations shall recycle/re-use all refrigerants to the maximum extent possible in lieu of procurement of replacement refrigerant. Refrigerants shall be shipped to DGSC Richmond after all existing equipment utilizing a particular refrigerant is retrofit or replaced, or when the installation deems that recycle/re-use of a particular refrigerant is no longer required. Refrigerants recovered from weapon system applications shall be shipped to the DoD reserve to support continuing weapon system requirements. 3) for CFC-113, methyl chloroform (1,1,1 Trichloroethane), and other solvents, when that particular solvent is no longer required by the installation to support continuing operations. Un-used and recyclable solvents shall be shipped to DGSC Richmond. Used solvents which have been classified as hazardous waste are not considered excess and shall be disposed of IAW applicable Laws and regulations.

Facility requirements for ODS shall not be supported through the DOD Reserve. Installations may continue to procure or requisition ODS via normal supply procedures under the conditions of Public Law 102-484, Section 326, for as long as stocks are available.

APPENDIX 4: ARMY ODC ELIMINATION PROGRAM POCS

ACTIVITY	NAME	DSN	COMMERCIAL PHONE
AAPPSO Program Director	Mr. George Terrell	767	(703) 617-9488
AAPPSO Support Contractor	Mr. Dave Koehler	---	(703) 212-9006
CHPPM Toxicity	Mr. Joseph Macko	584	(410) 436-3387
ACSIM Environmental	Mr. Bob Schroeder	223	(703) 693-0544
ACSIM Fire Protection	Mr. Bruce Park	328	(703) 428-6174
ACSIM AC&R	Mr. Hank Gignilliat	328	(703) 428-7003
AEC HAZMATs	Mr. Mike Eck	584	(410) 436-1227
AEC Air Quality	Mr. Larry Webber	584	(410) 436-1214
USACE ESPC Manager	Mr. Bobby Starling	760	(256) 895-1531
DoD ODS Reserve Project Manager	Mr. Steve Minus	695	(804) 279-5203
EPA Stratospheric Ozone Hotline	---	---	(800) 296-1996
AMC	MAJ Mike Laduc	767	(703) 617-8910
FORSCOM	Ms. Rochelle Williams	367	(404) 669-7454
TRADOC	Ms. Mary Olivier	680	(757) 727-2265
MDW	Mr. Ed Dunn	323	(202) 685-3387
MEDCOM	Mr. Damon Cardenas	471	(210) 221-6441
MTMC	Ms. Melody Stoddard	761	(703) 681-6547
SMDC	Mr. Bill Davis	646	(205) 955-2190
USACE	LTC Carl D. Owens	763	(202) 761-8645
USAREUR	Dr. Mike Gill	370	011-49-6221-577328
USARC	Mr. Doug Chatham	367	(404) 464-8759
USARPAC	Mr. Stuart Hayashi	315	(808) 438-9333
USARSO	Mr. William McElven	288	011-507-287-3019
USMA	Mr. Joseph Shandling	688	(914) 938-3224
NGB	Ms. Colleen Betker	767	(703) 607-8910

APPENDIX 5: WWW SITES RELATED TO ODC ELIMINATION

PROPONENT	ORGANIZATION	FUCTION	WEB SITE
Army	AAPPSO	ODC Elimination Program Management	www.aappso.com
Army	AEC	Environmental Policy and Guidance	aec-www.apgea.army.mil
Army	AEPI	Environmental Policy and Guidance	aepi.atdc.gatech.edu
Army	ARDEC	List of ODC Specs & Standards	www.pica.army.mil/orgs/edmd/edd/sb/Environment.htm
Army	CHPPM	Army Surgeon General Toxicity Clearances	chppm-www.apgea.army.mil/tox
Army	USACE Huntsville Engineering Center	ESPCs and Other DoD Energy Programs	www.hnd.usace.army.mil
Army	Logistics Support Activity	DoD, Army and Other Service Regulations	www.logpars.army.mil/reflib
Army	USACE Civil Engineering Center	DENIX	www.denix.cecer.army.mil/denix/denix.html
OSD	DUSD(ES)	DoD Environmental Security Home Page	www.acq.osd.mil/ens
Navy	NSEIC	Navy Environmental Information Exchange	www.navyseic.com
Air Force	PRO-ACT	Installation Pollution Prevention Information	www.afcee.brooks.af.mil/pro_act/pro_actform.htm
Federal Government	GPO	CFRs	www.access.gpo.gov/nara/cfr/cfr-table-search.html
Industry	ARI	AC&R Information	www.ari.org
Ozone Layer Interest Group	Ozone Action!	General Ozone Layer Information	www.deq.state.mi.us/aqd/eval/amu/o3action.html
United Nations	WMO	General Climate Information & Links	www.wmo.ch
NASA	Global Change Master Directory	General Climate Information & Links	gcmd.gsfc.nasa.gov

APPENDIX 6: SUMMARY OF OZONE DEPLETION SCIENCE

The following excerpts are taken from "The Changing Ozone Layer," a 1995 joint publication by the World Meteorological Organization and the United Nations Environmental Programme.

Ozone (O_3) is a form of the element oxygen (O) which has three atoms on each molecule instead of the two of normal oxygen molecules (O_2). It is formed in the stratosphere by the action of solar radiation on oxygen molecules in a process called photolysis; O_2 molecules are broken down to yield atomic oxygen, which in turn combines with molecular oxygen to produce ozone.

Although exceedingly rare, ozone molecules play a vital role in the life of our planet. They absorb harmful solar ultraviolet radiation (below about 320 nm) shielding us and all other animals and plants from damage. The stratosphere (10-50 km above the earth's surface) contains 90% of all the ozone in the atmosphere. Looking up through the atmosphere, the ozone column has its maximum partial pressure in the lower stratosphere 19-23 km above the Earth.

Even as the sun's energy produces new ozone, these gas molecules are continuously destroyed by natural compounds containing oxygen, nitrogen, hydrogen, and chlorine or bromine. Such chemicals were all present in the stratosphere long before humans began polluting the air. Nitrogen compounds come from soils and the oceans, hydrogen comes mainly from atmospheric water vapour and chlorine comes from the oceans in the form of methyl chloride and methyl bromide. Now human beings have upset the delicate balance of production and destruction.

By releasing additional chlorine- and bromine- containing chemicals into the atmosphere we have enhanced the destruction of ozone leading to lower ozone concentrations in the stratosphere. Some CFCs and halons can survive more than a century. They are carrying thousands of tons of chlorine and bromine atoms into the stratosphere. This is many times greater than the chlorine reaching the stratosphere naturally from the ocean in the form of methyl chloride and bromide.

In October 1987, ozone concentrations over Antarctica fell to half their normal levels, and the <ozone> hole spread across an area the size of Europe. In the Ozone Assessment Report released in 1991 the news was even worse: ozone values had dropped significantly not only in the winter-spring but *also in summer*. Since people spend far more time outdoors and UV-B is highest during the summer, ozone loss at that time of the year poses a much greater threat to human health.

During the last ten years (1984-1993), the overall global ozone average level has fallen to 297 m atm cm from 306 in 1964-1980 (about 3%). However, of the equatorial belt, where there are no significant ozone changes, is excluded, the decline over the middle and polar latitudes is more than twice as large.

APPENDIX 6: SUMMARY OF OZONE DEPLETION SCIENCE (CONTINUED)

Under cloudless conditions, each 1% reduction in ozone results in an increase of about 1.3% in the UV-B reaching the surface of the earth. The total ozone decline so far has resulted in a small increase in UV-B (280 to 320 nm) reaching the ground except over the tropical belt. Further ozone decline could have considerable harmful consequences, not only to humans but to other life forms and tropospheric chemistry.

Crops and the aquatic ecosystems including plankton, could be damaged with yet unforeseen consequences. Some effects are largely a function of overall dose, while others depend upon reaching a given cumulative threshold. The Impact Assessment Panel is estimating that a sustained 1% decrease in total ozone will result in an increase in non-melanoma skin cancers of approximately 2%.

The following excerpt is taken from the World Meteorological Organization news release of 22 June 1998 entitled "WMO and UNEP Issue Summary of Scientific Assessment of the Ozone Layer 1998."

Among the recent major scientific findings and observations mentioned in the Executive Summary of the Ozone Assessment 1998 are:

-- The combined total abundance of ozone-depleting compounds in the troposphere (the lowest part of the atmosphere) peaked in 1994 and is now slowly declining.

-- In the northern polar latitudes, in six of the last none boreal winter-spring seasons, ozone has declined during some months by 25% to 30% below the 1960s average.

-- The abundance of ozone-depleting substances in the stratosphere is expected to peak by the year 2000. However, when changing atmospheric conditions are combined with natural ozone variability, detecting the start of the ozone layer recovery may not be possible for perhaps another 20 years.

The following excerpt is taken from the World Meteorological Organization news release of 1October 1998 entitled "Record Ozone Depletion in the Antarctic."

The surface area of the ozone hole (values less than 220 m atm-cm) over the Antarctic now covers an area two and a half times the size of Europe from the Atlantic to the Ural Mountains, an all time September high, according to the current bulletin on the State of the Ozone Layer, issued today by the WMO in Geneva. "The ozone hole this September is also the deepest ever recorded at this period of year" said Dr. R.D. Bojkov, Special Advisor to the Secretary General on Ozone and Global Environment Issues. To illustrate the severity of the depth of depletion, WMO said that more than 85% of the ozone in the lower stratosphere over an area of over 10 million km^2 was destroyed.

APPENDIX 7: PRODUCTION PHASE-OUT OF CLASS II ODCS

The London Amendment (June 1990) to the Montreal Protocol on Substances that Deplete the Ozone Layer first established production phase-out dates for Class II Ozone Depleting Substances, otherwise known as HCFCs. These phase-out dates were later codified by the Clean Air Act Amendments of 1990, Section 605:

HCFC-141b	1 Jan 2003
HCFC-142b	1 Jan 2010 (for new systems) 1 Jan 2020 (to support existing systems)
HCFC-22	1 Jan 2010 (for new systems) 1 Jan 2020 (to support existing systems)
All other HCFCs	1 Jan 2030

The Copenhagen Revisions (November 1992) to the Montreal Protocol changed the production phase-out for developed countries from simple cut-off dates to a graduated production phase-out schedule for HCFCs:

1 Jan 1996	Freeze on production level, with cap at 100% of 1989 HCFC production and 3.1% of 1989 CFC production
1 Jan 2004	Production cap at 65% of 1996 production
1 Jan 2010	Production cap at 35% of 1996 production
1 Jan 2015	Production cap at 10% of 1996 production
1 Jan 2020	Production cap at 1% of 1996 production
1 Jan 2030	Full production phase-out

This phase-out schedule was not codified by the EPA through a ruling, however. Instead, in December 1993 the EPA promulgated it's own class II phase-out program (58 FR 65018). This ruling limits both the production and the use of HCFCs:

1 Jan 2003	Ban on production and import of HCFC-141b
1 Jan 2010	Freeze on production and import of HCFC-22 (R-22) BAN ON R-22 USE IN NEW SYSTEMS
1 Jan 2010	Freeze on production and import of HCFC-142b BAN ON HCFC-142B USE IN NEW SYSTEMS
1 Jan 2015	Freeze on production and import of all HCFCs BAN ON ALL HCFC USE IN NEW SYSTEMS
1 Jan 2020	Ban on all production of HCFC-22 (R-22)
1 Jan 2020	Ban on all production of HCFC-142b
1 Jan 2030	Ban on all production of all HCFCs

APPENDIX 7: PRODUCTION PHASE-OUT OF CLASS II ODCS (CONTINUED)

The Vienna Amendment (December 1995) to the Montreal Protocol changed the production cap of 3.1% of 1989 CFC production to 2.8% and accelerated the full production phase-out of HCFCs to 2020 for new equipment. In other words, HCFC production at 5% of the 1996 level will still be allowed up to January 1, 2030, but only in support of existing equipment.

There has been no action taken by the EPA to promulgate a ruling to codify the either the Copenhagen Revisions or the Vienna Amendment, though there has been some discussion on this issue in 1998, since current projections indicate the U.S. production under the current EPA limitations may approach the limitations defined by the Vienna Amendment in the near future.

It is important to remember, however, that there is still an ongoing national and international debate over accelerating the phase-out of class II ODCs. Also, the EPA is not required by the CAAA of 1990 to promulgate final regulations on the production, use, and disposal of HCFCs until December 1999.

The EPA has levied unique production and use restrictions on HCFC-141b. This solvent was banned from use in “industrial solvent cleaning operations,” defined as high-performance electronics and precision cleaning applications. This ban was partially lifted when an extension was granted for “existing uses” in industrial operations to January 1, 1997. There is no use restrictions in other applications, such as textile cleaning, dry cleaning, flushing of auto air conditioning systems, and hand wipes. The usage ban also does not apply to aerosol applications.

APPENDIX 8: HALON ALTERNATIVE SELECTION TOOL (HAST)

The HAST program is a software tool designed to perform an initial screening of the large number of fire hazards that are currently protected with halon 1301. Through a selection model, the program ranks potential alternative replacement options and recommends the most appropriate system based on cost and estimated level of fire damage. The model takes into account the cost over the expected system lifetime and the relative level of expected physical damage and associated dollar loss. The software represents a "first approximation" and the final selection of a replacement system should involve a qualified fire protection engineer.

The software's database is designed for a military "site" (e.g., camp, installation, base). It allows for the entry of multiple buildings within a site and multiple rooms within a building. Data are entered for each site, building, and all associated rooms in that particular building. After inputting the required data, the program calculates the recommended replacement option and provides cost estimates and other relevant information. Reports that are generated include a record of the input data, the recommended replacement options, system cost estimates, and total quantities of existing halon 1301. The report generation format is also capable of prioritizing the rooms in which the halon 1301 system should be replaced.

This product is to be used only as a programming aid and under no circumstances should it be used in place of the expertise of a professional engineer. All statements, technical information, recommendations and designs contained therein are based on calculations developed by and testing conducted by Hughes Associates, Inc. using the best available technology and equipment. The HAST calculations are believed to be reliable, but the accuracy or completeness thereof is not guaranteed.

COMPUTER HARDWARE REQUIREMENTS

The minimum computer hardware requirements are:

- 486 (or better) IBM-compatible computer
- Windows TM 3.1 or Windows TM 95
- VGA (or higher) monitor
- 8 megabytes of random-access memory (RAM)
- 5 megabytes of available hard disk storage
- Printer supported by Windows 3.1 or Windows 95 (Optional)

APPENDIX 9: CASCADING OF CFC REFRIGERANT

The DASA(ESOH) memorandum of 18 Oct 94 and the *Strategic Guidance and Planning for Eliminating Ozone-Depleting Chemicals from U.S. Applications* both strongly recommend that installation ODC managers plan the retirement of their AC&R equipment so that the installation operations are not dependent on the future availability of CFC refrigerants. This involves the retirement of older equipment as soon as possible, and the recovery/ recycle of the retired equipment's refrigerant for reuse on the installation. This process is called "cascading" CFCs.

The most important thing you need to have to be able to properly plan to cascade your CFC refrigerant is an adequate inventory of your CFC AC&R equipment. You also need to have a good idea of the annual leak rate on your equipment, which should be included in your inventory. With this information, you should be able to 1) identify your worst leakers and/or largest users of CFCs, and 2) determine your annual CFC requirements.

With your inventory in hand, you should first focus on retiring a major piece of CFC equipment for every type of CFC refrigerant you need (R-11, R-12, R-502, etc.) if you don't already have this type of refrigerant on-hand. If you have a continuing need for R-12, R-113, or R-114, you should retire at least one of these systems as expeditiously as possible.

The first pieces of this equipment you retire should then be the older pieces, since RPMA money may already be programmed for their replacement. The oldest equipment are also usually the worst leakers, and should be near (or over) their design economic life. Also, the older equipment are usually the least energy efficient – significant improvements have been made over the last ten years, for example, in building air conditioning centrifugal chillers, with achievable efficiency improvements of 40% or more.

Finally, remember that estimates are just estimates. Your CFC equipment should be monitored closely to keep track of refrigerant usage, and your plans should be updated accordingly.

What follows are three very general examples of plans to cascade CFC refrigerants. These examples use equipment averages and broad assumptions, while your plans should not. (For example, these examples assume no refrigerant servicing requirement in the year a piece of equipment is retired, which is not good to assume unless all your change-outs will occur in October.) However, they do illustrate the basic progression of equipment retirements that your plan should reflect, so that your installation no longer needs to purchase CFC refrigerants.

APPENDIX 9: CASCADING OF CFC REFRIGERANT (CONTINUED)

EXAMPLE #1

SITUATION: Your installation has three R-12 centrifugal chillers of average size providing air conditioning for three administrative buildings.
Average size Army R-12 chiller = 800 tons @ 2.2 lbs/ton = 1760 lbs
Average R-12 chiller leak rate = 15 percent per year
Chillers are 10/15/20 years old with 10/15/20% leak rates:
Annual leakage = 1760 x (0.10 + 0.15 + 0.20) lbs = 792 lbs

WITHOUT PLANNED CASCADE
Retire the oldest chiller in FY02 at 23 years old: cost =$640,000
Recover 90% of refrigerant: cascade 1,584 lbs of R-12
R-12 use for FY02-04: 1760 x (0.10 + 0.15) = 440 lbs per year

Year	FY99	FY00	FY01	FY02	FY03	FY04
CFC Price	$100/lb	$150/lb	$210/lb	$280/lb	$360/lb	$500/lb
CFC Qnty	792lbs	792lbs	792lbs	0	0	0
CFC Cost	$792K	$118.8K	$166.3K	0	0	0
Conv Cost	0	0	0	$640.0K	0	0
TOTAL	$79.2K	$118.8K	$166.3K	$640.0K	$0	$0

TOTAL FY99-03 = $1,004,300
TOTAL FY04-12 = UNSUPPORTABLE

WITH PLANNED CASCADE
Retire oldest system in FY99 at 20 years old: cost = $640,000
Recover 90% of refrigerant: cascade 1,584 lbs of R-12
Since the remaining systems using 440 lbs/year, the recovered 1,584 lbs will last +3 years
Therefore, retire next oldest system in FY02 at 18 years old: cost = $640,000
Recover another 1,584 lbs, plus 264 lbs left over = 1,848 lbs R-12
Since the remaining systems are now using only 176 lbs/year, the 1,848 lbs of R-12 should last over ten years!
Retire last system in FY12 at 23 years old: cost $640,000

Year	FY99	FY00	FY01	FY02	FY03	FY04
CFC Price	$100/lb	$150/lb	$210/lb	$280/lb	$360/lb	$500/lb
CFC Qnty	0	0	0	0	0	0
CFC Cost	0	0	0	0	0	0
Conv Cost	$640.0K	0	0	$640.0K	0	0
TOTAL	$640.0K	$0	$0	$640.0K	$0	$0

TOTAL FY99-03 = $1,280,000
TOTAL FY04-12 = $ 640,000

APPENDIX 9: CASCADING OF CFC REFRIGERANT (CONTINUED)

EXAMPLE #2

SITUATION: Your installation has two R-11 centrifugal chillers of average size providing air conditioning for two administrative buildings.
Average size Army R-11 chiller = 550 tons @ 2.2 lbs/ton = 1210 lbs
Average R-11 chiller leak rate = 15%/year
Chillers 15/17 years old with 13/17% leak rates:
Annual leakage is 1210 x (0.13 + 0.17) lbs = 363 lbs

WITHOUT PLANNED CASCADE: Retire the oldest chiller in FY07 at 25 years old: cost = $440,000

Year	FY99	FY00	FY01	FY02	FY03	FY04
CFC Price	$50/lb	$70/lb	$100/lb	$140/lb	$190/lb	$250/lb
CFC Qnty	363lbs	363lbs	363lbs	363lbs	363lbs	363lbs
CFC Cost	$18.2K	$25.4K	$36.3K	$50.8K	$69.0K	$90.8K
Conv Cost	0	0	0	0	0	0
TOTAL	$18.2K	$25.4K	$36.3K	$50.8K	$69.0K	$90.8K

TOTAL FY99-03 = $290,500
TOTAL FY04-12 = UNSUPPORTABLE

WITH PLANNED CASCADE: Retire the oldest system in FY99 at 17 years old: cost = $440,000
Recover 90% of refrigerant: cascade 1,089 lbs of R-11
Remaining system is using 157 lbs/year, so 1,089 lbs will last 7 years
Retire the last R-11 system in FY06 at 22 years old: cost = $440,000

Year	FY99	FY00	FY01	FY02	FY03	FY04
CFC Price	$50/lb	$70/lb	$100/lb	$140/lb	$190/lb	$250/lb
CFC Qnty	0	0	0	0	0	0
CFC Cost	0	0	0	0	0	0
Conv Cost	$440.0K	0	0	0	0	0
TOTAL.9K	$440.0K	0	0	0	0	0

TOTAL FY99-03 = $440,000
TOTAL FY04-12 = $440,000

APPENDIX 9: CASCADING OF CFC REFRIGERANT (CONTINUED)

EXAMPLE #3

SITUATION: Your installation has four R-12 cold storage units and three R-12 walk-in refrigerators for food storage for the troops.
Average Army R-12 cold storage unit = 35 horse-power @ 5.9 lbs/hp = 207 lbs of R-12 in each
Average cold storage leak rate = 25%/year
Cold storage units are 7/8/9/10 years old with 20/23/27/30% leak rates:
Annual leakage = 207 x (0.20 + 0.23 + 0.27 + 0.30) = 207 lbs of R-12
Average Army major R-12 appliance = 7.5 horse-power @ 5.9 lbs/hp = 44 lbs of R-12 in each
R-12 appliances are 8/9/10 years old with 20/25/30% leak rates:
Annual leakage = 44 x (0.20 + 0.25 + 0.30) lbs = 33 lbs R-12

WITHOUT PLANNED CASCADE
Retire the oldest C/S unit in FY99 at 10 years old: cost = $35,000
Retire next oldest C/S unit in FY01 at 11 years old, and then one every other year thereafter
Retire oldest R-12 appliance in FY99 at 10 years old: cost = $11,300
Retire next oldest R-12 appliance in FY01 at 11 years old, and then one every year thereafter

Year	FY99	FY00	FY01	FY02	FY03	FY04
R-12 Price	$100/lb	$150/lb	$210/lb	$280/lb	$360/lb	$500/lb
R-12 Qnty	0	83lbs	0	0	0	0
R-12 Cost	$0	$12.5K	$0	$0	$0	$0
Conv Cost	$46.3K	0	$46.3K	$11.3K	$35.0K	$0
TOTAL	$46.3K	$12.5K	$46.3K	$11.3K	$35.0K	$0

TOTAL FY99-03 = $151,400
TOTAL FY04-12 = $ 35,000
TOTAL COST = $186,400

WITH PLANNED CASCADE
Retire two oldest R-12 C/S units in FY99: cost = 2 x $35,000 = $70,000
Recover 90% of the refrigerant: cascade 372 lbs of R-12
Total R-12 requirement for FY99-01: 277 lbs
Retire oldest R-12 appliance in FY02 at 13 years old: cost = $11,300
Recover 90% of the refrigerant: cascade 39 lbs of R-12
Total cascaded R-12 in FY02: 39 lbs + 95 lbs remaining = 134 lbs
Total R-12 requirement for FY02: 100 lbs, with 34 lbs left over
Retire third R-12 C/S unit in FY03 at 12 years old: cost = $35,000
Recover 90% of the refrigerant: cascade 186 lbs of R-12
Total cascaded R-12 in FY03: 186 lbs + 34 lbs remaining = 220 lbs
Total R-12 requirement for FY03-05: 189 lbs, with 31 lbs left over

APPENDIX 9: CASCADING OF CFC REFRIGERANT (CONTINUED)

EXAMPLE #3 (Continued)

Retire second R-12 appliance in FY06 at 16 years old: cost = $11,300
Recover 90% of the refrigerant: cascade 39 lbs of R-12
Total cascaded R-12 in FY06: 39 lbs + 31 lbs left over = 70 lbs
Total R-12 requirement FY06: 52 lbs, with 18 lbs left over

Retire last R-12 appliance in FY07 at 18 years old: cost = $11,300
Recover 90% of the refrigerant: cascade 39 lbs of R-12
Total cascaded R-12 in FY07: 39 lbs + 18 lbs left over = 57 lbs
Total R-12 requirement in FY07: 41 lbs, with 16 lbs left over
Retire the last R-12 C/S unit in FY08 at 19 years old: cost = $35,000

Year	FY99	FY00	FY01	FY02	FY03	FY04
R-12 Price	$100/lb	$150/lb	$210/lb	$280/lb	$360/lb	$500/lb
R-12 Qnty	0	0	0	0	0	0
R-12 Cost	0	0	0	0	0	0
Conv Cost	$70.0K	$0	$0	$11.3K	$35.0K	$0

TOTAL FY99-03 = $116,300
-- Saved Cost = $ 35,100 (23%)
TOTAL FY04-12 = $ 57,600
TOTAL COST = $173,900
-- Saved Cost = $ 12,500 (7%)

APPENDIX 10: DoD ODS TURN-IN PROCEDURES

PREFACE

DLA is assigned the mission of managing the Army Reserve of Ozone Depleting Substances to ensure that the supplies for mission critical uses are available. DLA provides central management for the receipt, storage and issuance through DSCR, which is the DLA activity that manages ODSs. DDRV is the initial storage site.

It is imperative that you turn in to the ODS Reserve the following excess CFCs and halons: **CFC's-11, 12, 114, 500, 502, and Halons - 1202, 1211, 1301**. The ODS Reserve accepts both used and new CFCs and halons in a relatively pure state (i.e. not as a component of other products). These chemicals may have been purchased under Federal Supply Classes (FSC) 6830 and 4210, or from a commercial source. Solvent CFC -113 (Type I & II) and 1,1,1 trichloroethane (FSC 6850 and 6810) can also be turned in to the ODS Reserve provided their containers are sealed and unopened.

Section 1 provides procedures on how to turn-in excess ODS. Section 2 provides guidance for European turn-ins to the collection site at Germesheim, GE and Pacific theater turn-ins to the collection site at Pearl Harbor, HI. Section 3 lists the National Stock Numbers (NSNs) assigned to ODS turned in to the ODS Reserve and associated recovery cylinders. Section 4 lists the names of the chemicals in the ODS Reserve.

For questions concerning requisitions and stock availability, contact Ms. Audrey Studevant, DSCR-JDSA, DSN 695-3756 or (804) 279-3756. Procedural concerns may be addressed to Mr. Steve Minus, DSCR-RP, DSN 695-5203 or (804) 279-5203.

SECTION 1: GENERAL ODS TURN-IN INFORMATION

I. Procedures

A. No authorization/pre-notification to the item manager or ODS Program Office is required when turning in ODS to the Reserve.

B. The ODS Reserve accepts all containers, to include cylinders, fire extinguishers, drums, spheres, and canisters. Government recovery cylinders are available free of charge through DSCR and can be requisitioned through normal MILSTRIP procedures. Only these cylinders should be used for recovering ODS from systems. The government cylinders used for recovering CFC refrigerants are painted orange, and halons red. Both have yellow tops and dual port (two valves) to distinguish them from standard spec single port valve gas cylinders.

APPENDIX 10: DoD ODS TURN-IN PROCEDURES (CONTINUED)

C. Turned in ODS containers must be tagged/labeled as follows:
1. The shippers DoD Activity Address Code (DoDAAC).
2. The shipping activity with POC and phone number.
3. The NSN of cylinder(s) containing the recovered ODS (see Section 3).
4. Type of ODS (i.e., Halon 1301 or CFC-12).
5. The quantity of containers on the pallet or within the shipping crate.
6. Packaged and labeled in compliance with DOT regulations.

Note: When multiple containers (cylinders, drums, spheres, canisters, or fire extinguishers) with the same NSN are shipped in palletized or in a box/crate, apply only one tag/label to the shipment, not to each item.

D. Fire suppression system cylinders and canisters with electrical charges or initiators must be deactivated prior to shipment to the ODS Reserve. Also, safety caps must be used to cover exposed actuation mechanisms and discharge ports on these special cylinders, otherwise dangerous safety situations could arise during the shipping, receiving, or storage process. Local fire protection equipment companies can provide safety services. Special handling procedures for Halon system cylinders are provided later in Section 1. If further guidance is needed, contact Mr. Joe Schmierer of the ODS Reserve Program Office at DSN 695-5202 or (804) 279-5202.

E. Monetary credit will not be given for turned in ODS or cylinders. However, ownership credit will always be given to the Army for the pounds of ODS turned in. ODS can be requisitioned from the ODS Reserve by Army-authorized activities.

F. Empty spec cylinders must be turned in to the ODS Reserve. Spec gas empty cylinders (see Section 3 for applicable NSNs) should not be used for recovery purposes. Spec gas cylinders will be refurbished and refilled with product for future applications. Empty recovery cylinders not expected to be used must also be returned to the ODS Reserve.

G. Solvent CFC-113 and 1,1,1 trichloroethane when turned in must be in their original containers in which the seal has never been broken.

H. Burnt out or mixed reserve products can be turned in to the ODS Reserve. Clearly identify the chemical by defining its components (i.e. R-12 & R-502).

I. The following items should not be turned in to the ODS Reserve:
1. Empty fire extinguishers (with the valves removed)
2. Empty commercial containers
3. Aerosol cans with Reserve chemicals
4. Dry chemicals

APPENDIX 10: DoD ODS TURN-IN PROCEDURES (CONTINUED)

II. Transportation Guidance

A. When shipping ODS refer to the following regulations if needed:

1. MIL-STD-129L, Military Standard Marking for Shipment and Storage.
2. DLAR 4145.25, Storage and Handling of Compressed Gases and Liquids in Cylinders, and of Cylinders or the following applicable Service regulation:
   (a) AR-700-68
   (b) NAVSUPINST 4440.128C
   (c) MCO 10330.2C
   (d) AFR 67-12
3. Code of Federal Regulations 49.173 (particularly 173.301), Requirements for the Shipment of Compressed Gas Cylinders.

B. Transportation cost assistance can be provided for shipments costing $250.00 r greater. This cost assistance is strictly for transporting ODS and not for packing costs. For transportation cost assistance, fax the following data to Mr. Steve Minus at (804) 279-4970 or DSN 695-4970:

1. Type and quantity of ODS
2. Total weight of shipment
3. The shipping cost
4. Requesting facility and point of contact

C. Turn-ins should be forwarded to the following address:

DEFENSE DEPOT RICHMOND VIRGINIA (DDRV)
SW0400
CYLINDER OPERATIONS
8000 JEFFERSON DAVIS HIGHWAY
RICHMOND, VA 23297-5900

D. If your activity is personally transporting ODS to the Reserve, be sure to schedule your delivery with the DDRV Dispatch Office at DSN 695-3834 or (804) 279-3834.

APPENDIX 10: DoD ODS TURN-IN PROCEDURES (CONTINUED)

Special Handling Procedures for Turning in Halon 1301 System Cylinders

A. Halon 1301 is typically incorporated into built-in fire suppression systems applications with the charged Halon cylinder connected to the system piping. Because the Halon is over pressurized with nitrogen to facilitate distribution, these system cylinders are usually disconnected from the system and used as the transportation cylinder to return the product to the Reserve as the system are taken out of service. However, fire suppression system cylinders and canisters with electrical charges or initiators must be deactivated prior to shipment to the Defense Reserve. Special care should be taken when deactivating and disassembling the systems. The valves on these cylinders are designed in a manner that upon activation, the y are changed instantly from a closed position to a fully open position and will dispense the Halon in under 10 seconds. The combination of these sensitive valves and the high pressure within the cylinders require compliance with good safety practices.

B. Instructions from dismantling a Halon Fire Suppression System are provided as follows:

1. The first step is to deactivate the actuation system, which is usually electrical or pneumatic. However, disconnection from the electrical or pneumatic source is not sufficient from a safety standpoint. In the case of pneumatic systems, there is often still a small pin exposed that must be covered with a safety cap before handling. Just the slightest touch on this pin could cause full activation of the valve. In the case of electrically activated valves, simple disconnection of the electrical leads to the solenoid valves is acceptable. However, if the electrical connection is to an explosive initiator, it is very important to remove the initiator. This is a very important safety practice, because static electricity can cause the explosive to detonate. These actions should be done before any other dismantling is initiated.

2. The next step is to disconnect any discharge piping from the discharge port. Immediately upon disconnection of the piping, install an anti-recoil device(discharge port safety cap). Safety caps should be used to cover exposed actuation mechanisms and discharge ports on these special cylinders, otherwise dangerous safety situations could arise during the shipping, receiving, or storage process. Application of manufacturer's designed and supplied caps are the proper safety practice. In some cases the threads are not exactly the same as pipe threads and may not hold under pressure of release. However, if pipe caps, plugs or plates are substituted for manufacturer's caps, at least pout opposing holes must be drilled in the anti-recoil cap, plug or place to disperse any release of the Halon of the valve inadvertently activates. Anti-recoil device safety caps/plugs/plates must always be in place before handling the cylinders.

3. Adherence with the above safety practices is paramount before removing any cylinders from the mounting positions. Once the safety devices are in place, cylinders can be moved with relative safety. However, these are high-pressure compressed gas cylinders and require all the safety handling practices of any other gas cylinder. Also, protective safety wear is required for personnel deactivating cylinders.

SECTION 2: PROCEDURES FOR OVERSEAS COLLECTION SITES

Defense Distribution Depot Europe (DDDE) Germesheim, Germany

I. The primary turn-in site for the ODS Reserve is located at DDRV. However, a collection site has been established at Germesheim, GE for European bases. This is not a mini-Reserve, only a collection site. The following procedures apply:

II. Only halon and refrigerant products will be accepted. Of you have other eligible items, please contact Mr. Steve Minus at (804) 279-4970 or DSN 695-4970.

III. Turn-in procedures:

A. All ODS containers being shipped to DDDE-Germesheim will be coordinated in advance through the Transportation Office by telephoning 378-3733/3618 or civilian 07274-58733/58618. DDDE receives IDS on Mondays and Tuesdays. If units cannot turn in on these days, special accommodations will be made.

B. All types of ODS containers will be accepted to include cylinders, fire extinguishers, drums, spheres, and canisters. The exception is aircraft specific halon canisters, which should be returned through the airframe maintenance channels. Government recovery cylinders are available free of charge through DSCR for ODS turned in and can be requisitioned through the normal MILSTRIP procedures. The government cylinders used for recovering CFC refrigerants are painted orange, and halon red. Both have yellow tops and dual port (two valves) to distinguish them from single port valve standard spec gas (virgin) cylinders.

C. All ODS containers being turned in to DDDE-Germesheim must have the following information attached:

1. The shipper's DoD Activity Address Code (DoDAAC).
2. The shipping activity with POC and phone number.
3. The NSN of cylinder(s) containing the recovered ODS (see Section 3).
4. Type of ODS (i.e., Halon 1301 or CFC-12).
5. the quantity of containers on the pallet or within the shipping crate.

APPENDIX 10: DoD ODS TURN-IN PROCEDURES (CONTINUED)

Note: When multiple containers (cylinders, drums, spheres, canisters, or fire extinguishers) with the same NSN are shipped palletized on in a box/crate, apply only one tag/label to the shipment, not to each item. Pallets must contain items of the same type (i.e., cylinders, drums, canisters, etc.). Boxed/crated loads may contain different size containers, but should contain the same type of product, and must note on the exterior that multiple NSNs are within.

D. Fire suppression system cylinders and canisters with electrical charges or initiators must be deactivated prior to shipment to DDDE. Also, safety caps must be used to cover exposed actuation mechanisms and discharge ports on these special cylinders, otherwise dangerous safety situations could arise during the shipping, receiving, or storage process. Local fire protection experts can provide safety services. Special handling procedures for halon system cylinders are provided in Section 1. If further guidance is needed, contact Mr. Joe Schmierer of the ODS Reserve Program Office in Richmond, VA at DSN 695-5202 or (804) 279-5202.

E. Monetary credit will not be given for turned in ODS or cylinders. However, ownership credit will always be given to the Army for the pounds of ODS turned in. ODS can be requisitioned from the ODS Reserve by Army-authorized activities.

F. The following procedures must be followed:

1. Units with leaking containers must transfer the ODS into proper storage containers before shipment to DDDE-Germesheim. If guidance is needed, please call one of the DDDE-Germesheim POCs as provided in paragraph H of this section.

2. Cylinders must be banded together in an upright position, using a wooden collar, on wooden pallets using metal/steel-banding material or secured in a wooden crate.

3. Halon fire extinguishers/system cylinders must have safety pins installed and secured to prevent accidental release. Safety caps will be installed on all cylinders.

4. DD Form 1348-1 must be the document used to turn in ODS cylinders, with the address shown in paragraph G.4.

5. The cargo vehicle (truck/trailer) must have the means for forklift off-loading (removable side rails, etc.). Containers must not be off-loaded by hand.

APPENDIX 10: DoD ODS TURN-IN PROCEDURES (CONTINUED)

G. Transportation Guidance

1. When transporting compressed gas cylinders with ODS, the following guidelines apply to military and in some cases contracted carriers:

(a) Military carriers must be in compliance with USAREUR Regulation 55, USAFE Regulation 75, the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR), and the equivalent in Germany (GGVS).

(b) Any shipment performed by U.S. military and military vehicles will require driver training and certification, inspection requirements of vehicles, and other requirements as mandated by regulation.

(c) Shipments coming from outside of Germany must be in compliance with exporting and importing country requirements.

(d) Shipments performed over water must be in compliance wit the international Maritime Dangerous Goods Code (IMDG).

2. For units in Germany without appropriate transportation capability, transportation services for ODS to the new collection point at DDDE will be made through DRMO disposal contracts commencing 1 May 1997. Units that want to utilize this service are required to provide a separate DD Form 1348-1 to fund transportation, and shall contact the servicing DRMO for instructions. DRMS will monitor shipments for regulatory compliance.

3. Transportation cost assistance can be provided for shipments costing $250.00 or greater. This cost assistance is strictly for transporting DS and not for packing costs. The $250.00 minimum transportation cost assistance applies to shipping ODS from the overseas base to DDDE. Shipments from the consolidation point will be funded by the ODS Reserve for transporting ODS to the United States. For transportation cost assistance fax the following data to Mr. Steve Minus at (804) 279-4970 or DSN 695-4970:

(a) Type and quantity of ODS
(b) Total weight of the shipment
(c) The shipping cost
(d) Requesting facility and point of contact

4. Turn-ins originating in Europe, except for the United Kingdom, should be forwarded to the following consolidation point:

SWE300
DEFENSE DISTRIBUTION DEPOT EUROPE
BUILDING 7886
U.S. DEPOT GERMESHEIM
GATE 2
76726 GERMESHEIM

H. Points of contact at Germesheim are:

Richard Hawkins	DSN 378-3533	07274-58-533
SFC Pretlow	DSN 378-3733	07274-58-733
Peter Wuerschke	DSN 378-3729	07274-58-729

After duty hours, contact gate guards at 378-3678. Security guards have the home telephone numbers of the designated personnel.

Fleet and Industrial Supply Center (FISC), Pearl Harbor, Hawaii

I. The primary turn-in site for the DoD ODS Reserve is located at DDRV in Richmond, VA. However, a collection site has been established at Pearl Harbor, HI. This site is not a mini-Reserve, only a collection site. The following procedures apply.

II. Only halon and refrigerant products will be accepted. Of you have other eligible items, please contact Mr. Steve Minus at (804) 279-4970 or DSN 695-4970.

III. Turn-in procedures:

A. Deliveries will be accepted Monday through Friday, 0800-1400 (except holidays). Advance notification is not required on quantities of four (4) pallets or less. For quantities greater than four pallets, a delivery schedule should be coordinated in advance with FISC Pearl Harbor, Code 302, telephone (808) 474-3770. Any other special accommodations should be coordinated at the same number.

B. All types of ODS containers will be accepted to include cylinders, fire extinguishers, drums, spheres, and canisters. The exception is aircraft specific halon canisters, which should be returned through the airframe maintenance channels. Government recovery cylinders are available free of charge through DSCR for ODS turned in and can be requisitioned through the normal MILSTRIP procedures. The government cylinders used for recovering CFC refrigerants are painted orange, and halon red. Both have yellow tops and dual port (two valves) to distinguish them from single port valve standard spec gas (virgin) cylinders.

APPENDIX 10: DoD ODS TURN-IN PROCEDURES (CONTINUED)

C. All ODS containers being turned in to FISC Pearl Harbor must have the following information attached:

1. The shipper's DoD Activity Address Code (DoDAAC).
2. The shipping activity with POC and phone number.
3. The NSN of cylinder(s) containing the recovered ODS (see Section 3).
4. Type of ODS (i.e., Halon 1301 or CFC-12).
5. the quantity of containers on the pallet or within the shipping crate.

Note: When multiple containers (cylinders, drums, spheres, canisters, or fire extinguishers) with the same NSN are shipped palletized on in a box/crate, apply only one tag/label to the shipment, not to each item. Pallets must contain items of the same type (i.e., cylinders, drums, canisters, etc.). Boxed/crated loads may contain different size containers, but should contain the same type of product, and must note on the exterior that multiple NSNs are within.

D. Fire suppression system cylinders and canisters with electrical charges or initiators must be deactivated prior to shipment to FISC Pearl Harbor. Also, safety caps must be used to cover exposed actuation mechanisms and discharge ports on these special cylinders, otherwise dangerous safety situations could arise during the shipping, receiving, or storage process. Local fire protection experts can provide safety services. Special handling procedures for Halon system cylinders are provided in Section 1. If further guidance is needed, contact Mr. Joe Schmierer of the ODS Reserve Program Office in Richmond, VA at DSN 695-5202 or (804) 279-5202.

E. Monetary credit will not be given for turned in ODS or cylinders. However, ownership credit will always be given to the Army for the pounds of ODS returned to the ODS Reserve. ODS can be requisitioned by Army-authorized activities.

F. The following procedures must be followed:

1. Units with leaking containers must transfer the ODS into proper storage containers before shipment to DDDE-Germesheim. If guidance is needed, please call one of the DDDE-Germesheim POCs as provided in paragraph H of this section.

2. Cylinders must be banded together in an upright position, using a wooden collar, on wooden pallets using metal/steel-banding material or secured in a wooden crate.

3. Halon fire extinguishers/system cylinders must have safety pins installed and secured to prevent accidental release. Safety caps will be installed on all cylinders.

4. DD Form 1348-1 must be the document used to turn in ODS cylinders, with the address shown in paragraph G.4.

5. The cargo vehicle (truck/trailer) must have the means for forklift off-loading (removable side rails, etc.). Containers must not be off-loaded by hand.

G. Transportation Guidance

1. When transporting compressed gas cylinders with ODS, the following guidelines apply to military and in some cases contracted carriers:

(a) Shipments coming from outside of Hawaii must be in compliance with exporting and importing country requirements.

(b) Shipments performed over water must be in compliance with the International Maritime dangerous Goods Code (IMDG).

2. Transportation cost assistance can be provided for shipments costing $250.00 or greater. This cost assistance is strictly for transporting DS and not for packing costs. The $250.00 minimum transportation cost assistance applies to shipping ODS from the Hawaiian or Pacific base to the consolidation point. Shipments from the consolidation point will be funded by the ODS Reserve for transporting ODS to DDRV, Richmond, VA. For transportation cost assistance fax the following data to Mr. Steve Minus at (804) 279-4970 or DSN 695-4970:

(a) Type and quantity of ODS
(b) Total weight of the shipment
(c) The shipping cost
(d) Requesting facility and point of contact

3. Turn-ins originating in the Pacific region should be forwarded to the following consolidation point:

N00604
FLEET AND INDUSTRIAL SUPPLY CENTER
BOX 300
CODE 302/BLDG 1762
PEARL HARBOR, HAWAII 96860-5300
76726 Germesheim

H. Point of contact at FISC Pearl Harbor is Stan Sousa, (808) 474-4076.

APPENDIX 10: DoD ODS TURN-IN PROCEDURES (CONTINUED)

SECTION 3: NSNs

EMPTY RECOVERY CYLINDERS

COMMODITY	EMPTY RECOVERY SIZE (LBs)	CYLINDER NSNs
HALONS		
Halon 1202	160	8120-01-356-1781
Halon 1211	200	8120-01-356-1248
Halon 1211	1500	8120-01-356-1249
Halon 1301	117	8120-01-371-0533*
*DENOTES A HIGH-PRESSURE CYLINDER OF 600 PIS PLUS		
REFRIGERANTS		
R-11	59	8120-01-356-5960
R-11	170	8120-01-356-9756
R-11	1400	8120-01-355-9763
R-12	45	8120-01-355-4017
R-12	145	8120-01-355-4018
R-12	1190	8120-01-355-4019
R-114	57	8120-01-356-1245
R-114	165	8120-01-356-1246
R-114	1360	8120-01-356-1247
R-500	43	8120-01-357-6774
R-500	127	8120-01-357-7656
R-500	1045	8120-01-357-7657
R-502	44	8120-01-357-6770
R-502	128	8120-01-357-6771
R-502	1050	8120-01-357-6769

EMPTY SPEC GAS (VIRGIN) PRODUCT CYLINDERS (FOR TURN-INS ONLY)

COMMODITY	EMPTY RECOVERY SIZE (LBs)	CYLINDER NSNs
HALONS		
Halon 1202	160	8120-01-339-6277
Halon 1202	2000	8120-01-371-0532
Halon 1211	200	8120-01-337-2899
Halon 1211	1500	8120-01-396-2165
Halon 1301	137 & 150	8120-00-531-8193
Halon 1301	1123 & 1240	8120-01-356-5961

APPENDIX 10: DoD ODS TURN-IN PROCEDURES (CONTINUED)

ODS TURN-INS

COMMODITY	EMPTY RECOVERY SIZE (LBs)	CYLINDER NSNs
REFRIGERANTS		
R-11	59	8120-01-355-9760
R-11	170	8120-01-355-9761
R-11	1400	8120-01-355-9762
R-12	45	8120-01-337-1816
R-12	145	8120-01-337-6242
R-12	1190	8120-01-355-4016
R-114	57	8120-01-354-9400
R-114	165 (49x10)	8120-00-063-3983
R-114	165 (36x12)	8120-01-337-6236
R-114	1360	8120-01-356-1244
R-500	43	8120-01-357-6773
R-500	127	8120-01-357-6772
R-500	1045	8120-01-357-9137
R-502	44	8120-01-357-7655
R-502	128	8120-01-357-6239
R-502	1050	8120-01-357-6907
HALONS		
Halon 1202	160	6830-01-356-1780
Halon 1211	1-5	6830-01-376-8013
Halon 1211	6-10	6830-01-376-8014
Halon 1211	11-20	6830-01-376-8015
Halon 1211	21-60	6830-01-376-8016
Halon 1211	61-125	6830-01-376-8017
Halon 1211	126-200	6830-01-356-1209
Halon 1211	201-340	6830-01-376-8018
Halon 1211	341-1500	6830-01-356-1211
Halon 1301	1-5	6830-01-376-8394
Halon 1301	6-10	6830-01-376-8395
Halon 1301	11-20	6830-01-376-8396
Halon 1301	21-70	6830-01-376-8397
Halon 1301	71-100	6830-01-376-8398
Halon 1301	101-117	6830-01-371-0501
Halon 1301	118-125	6830-01-376-8399
Halon 1301	126-150	6830-01-356-9752
Halon 1301	151-200	6830-01-376-8400
Halon 1301	201-260	6830-01-376-8401
Halon 1301	261-350	6830-01-376-8402
Halon 1301	351-530	6830-01-376-8403
Halon 1301	531-600	6830-01-376-8404
Halon 1301	601-1240	6830-01-356-5958

APPENDIX 10: DoD ODS TURN-IN PROCEDURES (CONTINUED)

REFRIGERANTS

R-11	59	6830-01-355-9754
R-11	170	6830-01-355-9756
R-11	1400	6830-01-355-9758
R-12	45	6830-01-355-4013
R-12	145	6830-01-355-6648
R-12	1190	6830-01-355-4015
R-114	57	6830-01-356-1203
R-114	165	6830-01-356-1205
R-114	1350	6830-01-355-1207
R-500	43	6830-01-357-7650
R-500	127	6830-01-358-5123
R-500	1045	6830-01-357-7654
R-502	44	6830-01-357-6726
R-502	128	6830-01-357-6727
R-502	1050	6830-01-357-6905

DRUMS/CANS CONTAINING CFC SOLVENTS FOR TURN-INS

COMMODITY	DRUM/CAN CAPACITY	DRUM/CAN NSNs
CFC/Solvent 113		
	6 oz	6850-01-424-8532
	1 pint	6850-01-424-8533
	1 quart	6850-01-424-8540
	1 gal/11 lbs	6850-01-424-8531
	100 lbs	6850-01-424-8535
	200 lbs	6850-01-424-8536
	5 gal/60 lbs	6850-01-424-8534
	55 gal/690 lbs	6850-01-424-8537
1,1,1 Trichloroethane		
	6 oz	6810-01-424-8538
	1 pint	6810-01-424-9662
	1 quart	6810-01-424-9665
	1 gal/12 lbs	6810-01-424-8539
	5 gal/60 lbs	6810-01-424-9674
	55 gal/640 lbs	6810-01-424-9673

APPENDIX 10: DoD ODS TURN-IN PROCEDURES (CONTINUED)

SECTION 4: CLASS I ODS IN THE ODS RESERVE

CFCs	Chemical Name	Symbol
CFC-11	Trichlorofluoromethane	$CFCl_3$
CFC-12	Dichlorodifluoromethane	CF_2Cl_2
CFC-114	Dichlorotetrafluoroethane	$C_2F_4Cl_2$
R-500	Azeotropic mix of R-12 and 1,1,1 Difluoroethane (HFC-152a)	CF_2Cl_2/C_2F_2
R-502	Azeotropic mix of Chloropenta-fluoroethane (R-115) and Chlorodifluoromethane (HCFC-22)	CF_2Cl/C_2F_5Cl
Halons		
Halon 1202	Dibromodifluoromethane	CF_2Br_2
Halon 1211	Bromochlorodifluoromethane	CF_2ClBr
Halon 1301	Bromotrifluoromethane	CF_3Br
Solvents		
Methyl Chloroform	1,1,1 Trichloroethane	CH_3CCl_3
CFC-113	Trichlorotrifluoroethane	$C_2F_3Cl_3$