

## Guidelines – Montreal Protocol for Ozone Depleting Substances

### Issued by: Inspection Department – Operations Section

#### 1.0 Introduction

The Montreal Protocol on Substances that deplete the ozone layer is an international treaty designed to protect the ozone layer by phasing out the production of a number of substances believed to be responsible for ozone depletion. The treaty was opened for signature on 16 September 1987 and entered into force on 1 January 1989 followed by a first meeting in Helsinki (May 1989). Since then, it has undergone seven revisions, in 1990 (London), 1991 (Nairobi), 1992 (Copenhagen), 1993 (Bangkok), 1995 (Vienna), 1997 (Montreal) and 1999 (Beijing). Due to its widespread adoption and implementation it has been hailed as an example of exceptional international cooperation with Kofi Annan quoted as saying it is “Perhaps the single most successful international agreement to date...”

The ozone layer is found in the stratosphere between about 30 km above the earth. The ozone layer protects us from the harmful effects of ultraviolet (UV) radiation from the sun. Thinning of the ozone layer increases the amount of UV reaching the earth which can increase skin cancers, suppress the body’s immune system making people more vulnerable to disease, can cause cataracts and other eye disorders, damage marine life and reduce crop yields.

Thinning of the ozone layer was first reported in 1975. It was identified that certain chemicals notably Chlorofluorocarbons (CFC’s), Halons, Carbon Tetrachloride and Trichloroethane which are highly stable and eventually reach the stratosphere and are broken down by UV radiation, releasing free chlorine or bromine which catalyzes the destruction of ozone. Scientists predict that the ozone layer will recover if we cease emissions of the chemicals which are causing the damage, although it will be a slow process.

Efforts to control and phase-out ozone depleting substances was led by the United Nations. The 1987 Montreal Protocol on the Control of Substances that Deplete the Ozone Layer requires the signatory governments to regulate consumption and production. UAE is a signatory to the Montreal Protocol.

The protocol divides countries into two classes based on their level of use of controlled substances. Developed countries were required to cease all production and importation of controlled substances on 1 January 1996. Developing countries (Article 5 countries) have a 10 year grace period to meet the phase out targets. This grace period is a time to plan to meet the phase out targets in an orderly economical way. Alternatives already exist and these will become increasingly cheaper, while the cost of controlled substances will rise as supplies are harder to obtain.

#### 2.0 Ozone Depleting Substances



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There are a number of substances considered to have a detrimental effect on the earth's ozone layer. These substances are considered to be ozone depleting substances.

2.1 The following substances have been phased-out for production and consumption.

<b>Phased Out Substances</b>		<b>Phased Out Substances</b>	
Product Name	Chemical Name	Product Name	Chemical Name
<i>Chlorofluorocarbons (CFCs)</i>		<i>Other fully halogenated CFCs</i>	
CFC 11	Trichlorofluoromethane	CFC 13	Chlorotrifluoromethane
CFC 12	Dichlorodifluoromethane	CFC 111	Pentachlorofluoroethane
CFC 113	Trichlorotrifluoroethane	CFC 112	Tetrachlorodifluoroethane
CFC 114	Dichlorotetrafluoroethane	CFC 211	Heptachlorofluoropropane
CFC 115	Monochloropentafluoroethane	CFC 212	Hexachlorodifluoropropane
<i>Halons</i>		CFC 213	Pentachlorotrifluoropropane
Halon 1211	Bromochlorodifluoromethane	CFC 214	Tetrachlorotetrafluoropropane
Halon 1301	Bromotrifluoromethane	CFC 215	Trichloropentafluoropropane
Halon 2402	Dibromotetrafluoroethane	CFC 216	Dichlorohexafluoropropane
<i>Carbon Tetrachloride</i>		CFC 217	Chloroheptafluoropropane
CCl <sub>4</sub>	Carbon Tetrachloride	<i>Methyl Chloroform</i>	
<i>HBFC</i>		CH <sub>3</sub> CCl <sub>3</sub>	Trichloroethane
CH <sub>3</sub> Br	Methyl Bromide	R-500	Dichlorodifluoro/difluoromethane
<i>HBFC</i>		R-502	Chlorodifluoro/Chloropentafluoromethane

2.2 Hydrochlorofluorocarbons (HCFCs)

Currently, as HCFCs are considered to have lesser extent of destruction compared to CFCs, substances under the group of HCFC are being utilized as a replacement for the phased out substances listed above.

<b>HCFCs Production and Consumption Reduction Schedule</b>	
Amount of Consumption	Date
Baseline Level – Average	2009 – 2010
Freeze Level	01 January 2013
10% reduction	01 January 2015
35% reduction	01 January 2020
100% reduction	01 January 2030



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### 2.3 Trichloroethane

Trichloroethane is commonly known as methyl chloroform. It has a sweet smell and is being regulated under the Montreal Protocol. This chemical will be phased-out for production and consumption by 01 January 2015.

### 3.0 General Requirements

3.1 The venting of any substances listed above shall not be permitted. Recovery, recycling and reuse shall be practiced at all stages in the refrigeration and air conditioning industries and fire protection systems.

3.2 In order to comply with the phase-out requirements specified above, industry should consider alternative options that would lessen or eliminate the use of ozone depleting substances.

One alternative that can be considered is process change wherein the current industrial process will be modified and will contribute to the reduction or elimination of the use of ozone depleting substances.

On the other hand, there are a number of substances that have zero ozone depletion potential which can be used as a replacement.

### 4.0 Implementation

4.1 PCFC shall actively promote the goal of controlling ozone depleting substances and encourage a cooperative approach with industry, the workforce and the community to achieve the timely phase-out of ODS.

4.2 PCFC shall implement this Policy as appropriate through the exercise of their statutory powers.

4.3 The importers, traders and users of controlled substances shall be required to comply with this policy and adopt recovery, recycling and reuse practices.

### 5.0 Audit and Management Control

5.1 PCFC shall promote ODSs control by encouraging the use of audits and the development of management plans. JAFZA shall work with industry and other interested parties to develop management plan.

5.2 PCFC shall require occupiers of industrial premises or similar activities, which utilize ODSs to prepare a sound management and strategic action plan for CFC phase out.



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- 5.3 FEA in coordination with PCFC shall prepare an annual inventory of ODSs which are traded and used in the Emirate of Dubai.
- 5.4 PCFC in coordination with EPSS shall restrict the entry of controlled substances through ports.

### 6.0 Guidelines for Controlled Activities

#### 6.1 Refrigeration and Air Conditioning

- a. The CFC's 11, 12, 113, 114 and 115 are not allowed to be used in any new equipment for refrigeration and air conditioning since 1 January 1996.
- b. All existing air conditioning and refrigeration equipment utilizing controlled substances listed above shall be:
- Maintained leak free;
  - Supplied with gases from existing supplies or recycled sources; and
  - Converted to use approved gases.
- c. The venting of controlled refrigerants during equipment maintenance shall not be permitted.
- d. Recovery, recycle and reuse of refrigerants shall be practiced during repair and maintenance.
- e. Alternative refrigerants including but not limited to R134a, R125, R143a, R22, etc. which have low ozone depletion potential are already available in the market and are being used.
- f. After the adoption of this policy, all newly built centralized air conditioning and refrigeration system shall use alternative refrigerants with zero ozone depletion potential.

#### 6.2 Fire Protection Systems

- a. Halons 1211, 1301 and 2402 are not used in any new fire protection system since 1 January 1996. Alternative fire suppressant substances already available in the market shall be used in newly built fire protection systems.
- b. Existing halon systems shall be maintained in accordance with the requirements below.
- c. The venting of halons during repair and maintenance of existing fire protection system shall not be allowed. Existing large premises shall install equipment to recover, recycle and reuse halon.
- d. All halon filled cartridges or cylinders for fire extinguishers shall be periodically serviced only to qualified premises with halon recovery equipment.
- e. Companies with halon systems shall have these regularly maintained to minimize leakage.



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### 6.3 Foam Production

- a. No controlled substances is being used as blowing agents in foams manufactured in Free Zone or imported into Free zone after 1 January 1996.
- b. Alternative substances, which are already available in the market with low ozone depletion potential shall be used in the manufacture of foam and insulation materials.

### 6.4 Cleaning / Degreasing

- a. All products containing CFC-113 and III-Trichloroethane (also known as methylchloroform) which are ozone depleting substance are not used since 1 January 1996.
- b. Alternative substances which have low ozone depleting potential including but not limited to trichloroethylene, perchloroethylene and methylene chloride shall be used in dry cleaning and vapor degreasing activities.
- c. Companies should examine whether there is a need to clean items at all and whether water based caustic systems can be used before considering vapor and solvent degreasing systems.
- d. Different refrigerant gases should not be mixed in the same container.

### 6.5 Aerosol Sprays

- a. Aerosols which contain ozone depleting substances, with the exception of approved items for medical use, are not be allowed to be traded in Free Zone since 1 January 1996.
- b. Aerosol manufacturers shall not be allowed to use propellants with high ozone depletion potential.