



TOGETHER
for a sustainable future

OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.



TOGETHER
for a sustainable future

DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

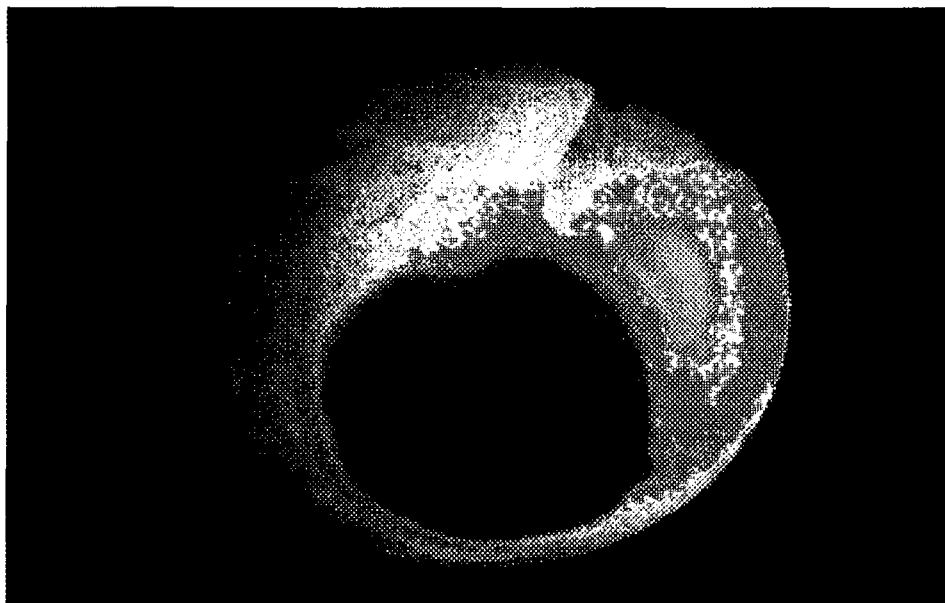
22861



National Cleaner Production Center Foundation

Registered under Section 42 of the Companies Ordinance, 1984

REPORT ON HALON CONSUMPTION AND INSTALLED AMOUNT OF HALON IN PAKISTAN



FOR PREPARATION OF THE HALON PHASE-OUT STRATEGY AND ACTION PLAN

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
MONTREAL PROTOCOL BRANCH

National Cleaner Production Center Foundation
B # 4-A, P. O. Morgah, Rawalpindi (PAKISTAN)
Ph: (92 51) 5487 041-45, Ext. 202 & 447
Fax: (92 51) 5487254
E-mail: unncpc@isb.paknet.com.pk
URL: [HTTP://WWW.UN.ORG.PK/UNIDO/NCPC/INDEX.HTM](http://www.un.org.pk/unido/ncpc/index.htm)

TABLE OF CONTENTS

EXECUTIVE SUMMARY:	4
1. INTRODUCTION	7
2. NATIONAL AGENCY RESPONSIBLE FOR ODS PHASE OUT	8
3. DATA SOURCES	8
3.1 Methodology	8
3.1.1 Team	8
3.1.2 Questionnaires	8
3.1.3 Organizations visited	8
3.1.4 Data Collection	9
3.2 Ministry of Environment & Local Bodies	9
3.1.1 Ozone Cell:	10
3.3 Ministry of Industry & Production	10
3.4 Ministry of Commerce and Trade	10
3.5 Central Board of Revenue	10
3.6 Ministry of Petroleum & Natural Resources (MPNR)	11
3.6.1 Refineries and Oil Exploration:	11
3.6.2 Oil and Gas Development Corporation	11
3.6.3 Sui Northern Gas Pipeline Ltd.	11
3.6.4 Sui Southern Gas Co. Ltd. (SSGC)	11
3.7 Ministry of Power/WAPDA	11
3.7.1 WAPDA House:	11
3.8 Ministry of Defense	11
3.8.1 Pakistan Navy	11
3.8.2 Pakistan Army	12
3.8.3 Pakistan Air Force	12
3.8.4 Pakistan Atomic Energy Commission	12
3.9 Civil Aviation Authority	12
3.10 Civil Defense Authority	12
3.11 Mari Time	12
3.11.1 Karachi Port Trust	12
4. ORGANIZATION INCHARGE OF FIRE AND SAFETY:	12
4.1 Fire Protection Association	12
4.2 Fire Safety Codes & Standards:	13
4.2.1 Halogenated Extinguishing systems	13
4.2.2 National Fire Codes and Standards	13
4.3 Fire Equipment Inspection, Testing & Certification:	15
4.3.1 Civil Defense	15
4.3.2 National Institute of Fire Technology, Islamabad	15
4.3.3 Fire Brigade Islamabad	15
5. NATIONAL HALON CONSUMPTION AND INSTALLED CAPACITY;	15
5.1 Halon Imports:	15
CPP\ Halon Survey Final Report 2, 7/1/2003, 7:00 AM	2

5.1.1	Data by Ozone Cell:	16
5.1.2	Data by CBR:	16
5.1.3	Data by Federal Bureau of Statistics:	17
5.1.4	Data by the Importers:	18
5.2	Average Legal Halon Imports:	19
5.3	Halon Exports:	19
5.4	Halons Consumption:	19
5.5	Installed Halons Capacity:	19
6.	FIRE EQUIPMENT MANUFACTURERS/DISTRIBUTORS:	20
6.1	List of Equipment Manufacturers:	20
6.2	List of Equipment Dealers and Halon Importers:	20
6.3	Main Halon Users	21
7.	CONCLUSION:	21
8.	RECOMMENDATIONS:	24
	ANNEX 1. FIRE FIGHTING EQUIPMENT MANUFACTURERS	25
	ANNEX 1.0 Fire fighting equipment manufacturers	25
	ANNEX 1.1 Haseen Habib Corporation Pvt. Ltd. Lahore	28
	ANNEX 1.2. Haseen Habib Trading Company, Karachi	34
	ANNEX 1.3. Firestop Aids (Pvt.) Ltd.	39
	ANNEX 1.4 MAB Fire Protection Pvt. Ltd.	42
	ANNEX 2. MAIN USERS OF HALONS FOR FIRE PROTECTION	45
	ANNEX 2.0 Main users of Halon for fire protection	45
	ANNEX 2.1 Main users of Halon (PIA) for fire protection	48
	ANNEX 2.2 Main users of Halon (PTCL) for fire protection	50
	ANNEX 3. MEETINGS WITH VARIOUS ORGANIZATIONS	52
	ANNEX 3.1. Meeting at Ministry of Environment	52
	ANNEX 3.2. Meeting at Ministry of Industries, Commerce and CBR	54
	ANNEX 3.3. Meeting at Bureau of Statistics	56
	ANNEX 3.4. Meeting with Fire Fighting Equipment Suppliers	58
	ANNEXURE-4.0; HALONS INSTALLED CAPACITY	60

EXECUTIVE SUMMARY:

In Pakistan phase-out of the use of Halons 1211 (portable) and Halons 1301 (fixed) and Halon 2402, for fire extinguishing constitutes a specific problem and requires an overall national strategy and planning to minimize the phase-out costs and to limit the negative impact of application of the installed Halon fire fighting equipment in the transitional period of its replacement with environment friendly alternative fire protection technologies.

Halons have been widely used in Pakistan for the same reasons as elsewhere, namely their highly effective capacity for extinguishing fires and its ability to do this without causing secondary damage such as contamination with water or powder (clean type agent). Other advantages of halons are, ease of handling and relative cheapness of the Halon systems, and the simplicity of the equipment required for their delivery.

Pakistan has never produced Halons, which have been imported, mostly from Italy, Germany, France, Saudi Arabia and China. While Halon 2402 as such was not imported to Pakistan in bulk, a small amount of it was, however, imported in 2001-02.

In Pakistan, The Ministry of Environment, Local Government & Rural Development has the sole responsibility for implementation of the provisions of the Montreal Protocol. Keeping in view Pakistan's commitments to the international community, an Ozone Cell under the project entitled "Institutional Strengthening for the Implementation of the Montreal Protocol for the phase-out of Ozone Depleting Substances" with the financial assistance of Multilateral Fund of the Montreal Protocol has been established in this Ministry. The Ozone Cell became operational in January 1996.

For the national Halon-phase out survey in Pakistan, UNIDO signed a contract with National Cleaner Production Center Foundation in May 2003 for a comprehensive survey of the present use of Halons in the country. The ToRs in addition to the Halon import and installed capacity in Pakistan included the identification of authorities responsible for fire protection, applicable codes and standards, procedures for Halon fire fighting equipment inspection, testing and certification, sources of Halon supply for refilling operations, manufacturers and distributors of Halon fire fighting equipment and its major end users.

During the survey it was observed that Halon-1301 fixed fire fighting systems are mainly installed for protection of computer and telecommunication equipment, sensitive and/or high value electronic equipment and machinery in control rooms and commanding centers, power plant generators, tanks with flammable liquids in the refineries and other installations, equipment at offshore installations, chemical storage facilities, engines of ships and airplanes, goods in cargo bay areas, banks, valuable public and private property. The use of Halon-1211 portable extinguishers is being used normally in the telecommunication, mass communication, Banks, hotels, industries, crew cabins and transport vehicles. Halon 2402 are used for AB types of fires.

Halon is being provided to the Fire equipment manufacturers through the following five sources:

1. Legal Import
2. Other import under different name plates
3. Smuggling from China
4. Ship breaking at Gadani, Baluchistan. (Visited the site but not found any Halons. Not available after 1995).

5. Import as part of the equipment.

All the information on the use of Halons 1211 and Halons 1301 within Pakistan has been compiled by contacting the Fire Authorities, Equipment Inspection, Testing and Certification institutions, Manufacturers and Distributors of fire equipment and Defense authorities. Detailed information related to installed Halon quantities and Halon refilling requirements was obtained from key Halon importers, fire fighting equipment end users, industries, telecommunication centers, airline companies and airport administrations, defense organizations (army, navy and air force), power supply sector, shipping companies, banks, and other public/office building administrations, computer centers.

Average Import per year as per Ozone Cell Data	=	5.60 M. Tons
Average Import per year as per CBR Data	=	6.22 M. Tons
Average Import per year as per Importers Data	=	6.67 M. Tons
Net Average	=	6.16 M. Tons

The variation in the average import data values per year is due to averaging the values of different years. The average import of Halons to the country is approximately 6.5 M. Tons per year.

The installed capacity of Halons in Pakistan is approximately 460 M. Tons, including Halon 1211, 400 M. Tons, while that of Halon 1301, 60.00 M. Tons, with the average consumption of 6-7 M. Tons per year. The data is based on the Primary (direct) and secondary (indirect) sources. It was impossible to conduct the survey of each individual organization due to the duration of contract time. It was determined to approach 1-3 organizations of each sector and apply multiplier on the basis of information collected regarding the sector. Based on the methodology adopted and data collected, it is still foreseen that another 50 – 100 M. Tons of Halons would be available as installed capacity.

Good practices can reduce Halon consumption in Pakistan, like many other developing countries, newly-installed non-critical fire extinguishers and systems, for reasons including:

- a lack of awareness of halons' impact on the environment;
- lack of awareness of national commitment to halon phase out;
- lack of regulatory structure;
- aggressive marketing of halons;
- improper servicing and maintenance practices;
- lack of information on available alternatives;

All of the above stimulate demand for halons. Appropriate standards and codes of practice can be powerful tools:

- to significantly reduce unnecessary emissions of halon into the atmosphere,
- promote the use of alternatives to halon,
- promote halon banking and recycling for essential uses,
- promote an orderly phase out of halons - in time to meet the requirements of the Montreal Protocol.

Recommendations for Halons Phase out Plan for Pakistan:

The Halon consumption phase-out strategy should take into consideration two types of issues.

1. Prevention of new Halon fire fighting equipment manufacturing/import and installation. This target can be achieved by introduction of a comprehensive ban on import of Halon fire fighting equipment and provision of technical advice and financial assistance to local manufacturers in conversion of their production to Halon-free alternatives.
2. Maintenance of already existing Halon fire fighting equipment. With respect to the high cost of its replacing/retrofitting, especially for Halon-1301 fixed fire fighting systems, it is recommended to establish an inventory database on installed Halon quantities and, if economically viable, a Halon recovery, recycling and storage facility (Halon Bank) under the supervision of "Ozone Cell" which could be used for refilling of installed Halon fire fighting equipment through the transitional period of its replacement or till the end of its technical lifetime.

After comprehensive survey of present consumption and installed capacity, the recommendations are as follows:

- Formulation of a Halon Bank Management Project
- Organization of stakeholder workshops
- Demonstration projects for alternatives, the recovery and recycling of halons
- Training on service requirements and customs issues
- National policy development

1. INTRODUCTION

The Govt. of Pakistan ratified the Vienna Convention on 18.12.1992 (Accession), the Montreal Protocol, on the 18 December 1992 (Accession), London Amendment on 18 December 1992 (Accession) and the Copenhagen Amendment 17.2.1995 (Ratification). While Montreal Amendment-1997 and the Beijing Amendment-1999 are yet to be ratified by the Govt. of Pakistan for which M/oE, LG&RD has initiated the case for ratification.

The Ministry of Environment, Local Government & Rural Development assumes sole responsibility for implementation of the provisions of the Montreal Protocol. Keeping in view Pakistan's commitments to the international community, an Ozone Cell under the project entitled "Institutional Strengthening for the Implementation of the Montreal Protocol for the phase-out of Ozone Depleting Substances" with the financial assistance of Multilateral Fund of the Montreal Protocol has been established in this Ministry. Ozone Cell became operational in January 1996.

- Government of Pakistan implemented first control measure under the Montreal Protocol i.e. freeze of Annex-A, Group-I Substances at average consumption level of the years 1995, 1996 & 1997 on 01 July 1999 thereby meeting its first obligation successfully as per ODS phase out schedule of the Montreal Protocol.
- The Ministry of Commerce introduced an import authorization / licensing system to regulate, discipline and monitor imports of ODS in the country on the advice of the Ministry of Environment, Local Government & Rural Development in July 1998. This system has enabled Government of Pakistan in implementing the first control measure under the Montreal Protocol i.e. freeze of Annex A Group I substances at 1995, 1996 & 1997 average consumption level on 01 July 1999. Ministry of Commerce has issued S.R.O. 489(I)/2000 dated 17 July 2000 as well as a Public Notice in August 2000 in this regard.

The Executive Committee of the Multilateral Fund, at its 20th Meeting held in Montreal in October 1996 has approved the Country Program of Pakistan.

Ministry of Commerce Govt. of Pakistan has issued instructions on the proposed reduction and phase-out schedule of the ODS as under:

- | | |
|--|-----|
| a. 50% reduction from 1995 – 97 average levels on 01-01-2005 | |
| July 2002 | 10% |
| July 2003 | 15% |
| July 2004 (valid till 30-06-2005) | 25% |
| b. 85% reduction from 1995 – 97 average levels on 01-01-2007 | |
| July 2005 | 15% |
| July 2006 (valid till 30-06-2007) | 20% |
| c. 100% reduction from 1995-97 average levels on 01-01-2010 | |
| July 2007 | 5% |
| July 2008 | 5% |
| July 2009 (valid till 31-12-2009) | 5% |

ODS Phase out schedule for Halons under the Montreal Protocol, in Pakistan is as follows:

- Freeze at 1995-97 Average Levels; Jan. 1st, 2002
- 50% Reduction from 1995-97 Average Levels; Jan 1st, 2005

- 100% Reduction from 1995-97 Average Levels; Jan 1st, 2010

2. NATIONAL AGENCY RESPONSIBLE FOR ODS PHASE OUT

The National agency responsible for implementation of ODS phase-out in Pakistan is the "**OZONE CELL**" under the "MINISTRY OF ENVIRONMENT, LOCAL GOVERNMENT AND RURAL DEVELOPMENT", located at Room # 1, 2nd Floor Hajvairy Plaza, Blue Area Islamabad.

Fax: 92-51-9205883
 Tel: 92-51-9205881, 9205412
 E-mail: ozonecell@comsats.net.pk)

Contact persons:

1.Name: <u>Syed Asad Sibtain</u>	Position: <u>Joint Secretary</u>
2.Name: <u>Mr. Mohamad Yousaf</u>	Position: <u>Project Director</u>
3.Name: <u>Mr. Mohamad Shukat</u>	Position: <u>Deputy Director</u>

3. DATA SOURCES

3.1 Methodology

3.1.1 Team

A team of the following members was constituted to conduct the survey:

1. Dr. Irshad Ahmad, CPP as Team Leader
2. Mr. Waqar Ahmad, Marketing Promoter
3. Mr. Adeel Aslam, Environmental Engineer
4. Mr. Bashir Malik, Fire Adviser ARL
5. Mr. Abdul Qayum Basit, Office Support

3.1.2 Questionnaires

Based on the UNIDO Questionnaire, various simple questionnaires were developed to collect the information from individual organizations. Samples are attached as Annexure 1 & 2

3.1.3 Organizations visited

Govt. Organizations:

- Ministries of Environment, Industries and Commerce
- Central Board of Revenue
- Oil and Gas Development Corporation
- Water and Power Development Authority

Fire Institutes,

- Civil Defense
- Institute of Fire and Technology
- Fire Brigade
- Fire Protection Association of Pakistan

Importers/Distributors

Haseen Habib, Parveen Atique, MAB, Firestop, Habib Corp. Platinum Traders, Saifmax, Qureshi Tools, Minhas Corp, Miraj Trading and Pak Global.

End users.

Airlines, CAA, Refineries, Oil & Gas, Defense, Hotels, Banks, TeleCoomm, Mass Comm., Industries, Hospitals, Misc.

3.1.4 Data Collection

The data is collected:

- a. Primary Data: Directly visiting the organizations or meeting with concerned person of the organization.
- b. Secondary Data: Indirectly either by the suppliers of the Halons or the persons indirectly involved with the organization.

It was impossible to conduct the survey of each individual organization due to the duration of contract time. It was determined to approach 1-3 organizations of each sector, or the suppliers of fire extinguishing equipment and apply multiplier on the basis of information collected regarding the sector. Based on the methodology adopted the following data was collected as follows.

Average Halon Import	=	6.16 M. Tons
Average Halon Consumption	=	6-7 M. Tons
Installed capacity of Halon	=	460 M. Tons

3.2 Ministry of Environment & Local Bodies

In a meeting with Joint Secretary Ozone Cell on May 09, 2003, explained the objectives of the study and briefed about the Terms of Reference and Scope of work for the Phase Out Survey for Halons in Pakistan and requested the support of the concerned Govt. department to obtain the true data.¹

The Joint Secretary asked about the manpower at NCPC and advised to submit the profile for the record, extended his full support and advised that the efforts should be made to collect the verifiable and certifiable data. Regarding the potential stakeholders for Halons the JS suggested to visit the following department/organization.

- a. Central Board of revenue
- b. Customs
- c. Ministry of Industries
- d. Ministry of Commerce
- e. Ministry of Defense Production
- f. Directorate of Federal Bureau of Statistics
- g. Export Promotion Bureau
- h. Halons Equipment Manufacturers and Halons end Users

It was agreed that NCPC Team would visit Ozone Cell, to meet Ch. Zahoor and discuss in detail and seek guidelines, along with the authority letter for the survey team. Mr. Shaukat,

¹ Minutes of the meeting with joint secretary Ozone Cell and Director are attached as Annexure 3.1
CPP\ Halon Survey Final Report 2, 7/1/2003, 7:00 AM

Dy. Director will provide the addresses and contacts of all the concerned potential stakeholders listed above along with the following items:

- List of Halons importers
- List of the industries
- Freeze Level list
- Category allocation

3.1.1 Ozone Cell:

Discussed the road map with the Director and requested for the guidelines that how to proceed with the survey. The Director has provided the Authority Letter to NCPC Foundation to conduct the survey on the behalf of the Government of Pakistan and also provided the following lists.

- List of the CFC importers
- List of the industries
- Freeze Level list

3.3 Ministry of Industry & Production

Mr. M. Usman Assistant chief informed that there is no data of Halons available with Ministry of Industries and Production. Their working parameters are specifically to suggest the Pre budget and post budget situation regarding tariff and customs for the different industries in Pakistan. As Halons are not manufactured in the country therefore he referred to CBR for the needful because CBR deals with the customs and imported materials.

In a meeting, Mr. Zaidi, the Joint Secretary MOI informed that although, MOI has no concern with the imported chemicals, but a section in MOI, look after the chemicals/products having impacts on Environment. No information was available.

3.4 Ministry of Commerce and Trade

Miss Khalida Bashir section incharge informed that MOC is still working on Halons phase out survey infact the whole data is not compiled yet and it would take some time for the finalization of all the data. MOC don't have the list of Halons Importer list. She provided the Pakistan Customs Tariff Code of Halons i.e. **2903.4600**.

3.5 Central Board of Revenue

Both Miss Khalida (MOC) as well as Mr. Usman (MOI) suggested to visit CBR for the collection of data and emphasized that the required information will only be obtained through the CBR because it wholly deals with the customs and also to get the importers list of Halons and its customers/Users.

Mr. Gul Rehman informed that due to the preparation of upcoming **Annual Budget 2003-04**, nobody can enter the office without the **permission of Member**.

In a meeting with Dr. Athar Masood, Member CBR, confirmed the code from the code book and informed that the code comprise the following three chemicals:

- a. Bromochlorodifluoromethane
- b. Bromotrifluoromethane
- c. Dibromotetrafluroethane

Dr. Athar informed that the import data under this code would be available only in total for the three chemicals not individual. Dr. Athar provided the relevant data.²

3.6 Ministry of Petroleum & Natural Resources (MPNR)

Mr. Ejaz Hussain Randhawa; Manager TS, had meeting with Mr. Sabir Hussain, Director General Oil, who informed that such data is not available with MPNR. The data however can be obtained from individual organizations regarding their installed capacity. The following organizations were contacted and obtained the data of halons if being used.

3.6.1 Refineries and Oil Exploration:

- Attock Refinery Limited
- Pakistan Refinery Ltd.
- National Refinery Limited
- Pakarab Refinery
- British petroleum
- OMV

3.6.2 Oil and Gas Development Corporation

Meeting with Mr. Ansari, Chief HSE, who has the provided data

3.6.3 Sui Northern Gas Pipeline Ltd.

Meeting was held with General Manger and concerned staff

- Mr. Nadeem Sheryar GM (Plan&Dev and HSE)
- Mr. Farrukh Majeed Sr.Engineer HSE
- Mr. Rohail Sibtain HSE Engineer

Asked about details of Montreal Protocol, promised to collect and provide the data within a week.

3.6.4 Sui Southern Gas Co. Ltd. (SSGC)

Mr. Fasih A. Siddiqui, Dy. Chief Engineer HSE. Asked to send a letter to Mr. G.A. Shahwani, General Manager HSE. He will expedite and try to provide data at the earliest

3.7 Ministry of Power/WAPDA

3.7.1 WAPDA House:

Meeting with Ch. Abdul Ghafoor, GM Thermal

Asked about objectives of the project, Suggested to wait for 15 days, Promised to deal with on priority. Installed capacity at WAPDA House Lahore Halon 1211(100x6) = 600 kg
Tried to have meeting with Ch. Fazal Ahmad, GM Hydrel (Not Present)

3.8 Ministry of Defense

3.8.1 Pakistan Navy

² Minutes of the meeting with MoI, MoC and CBR are attached as Annexure 3.2
CPPN Halon Survey Final Report 2, 7/1/2003, 7:00 AM

Meeting with Lieut. Commander, who asked about the details of Montreal Protocol and will hold meeting with Commander to decide regarding data. Letter sent to Commander Fire Brigade. M/s Miraj Ltd. informed that they have supplied Halons 1301=5000 kg to Pak Navy

3.8.2 Pakistan Army

Meeting with a Brigadier requested to provide data, which is only required for the installed capacity of Halons and its annual consumption. The survey is least bothered about its used and types of equipment.

3.8.3 Pakistan Air Force

Data collected through indirect source.

3.8.4 Pakistan Atomic Energy Commission

Provided data, using 3000 kgs of Halons (CFC) per year, purchasing from local market

3.9 Civil Aviation Authority

Civil Aviation HQ, **Provided Data** i.e. Halon 1301=164 and Halon 1211=1850

3.10 Civil Defense Authority

Civil Defence Punjab: Had meeting with Mr. Capt ® Muhammad Hashim Tareen Director Briefed the objective, who Advise to send letter through Home Secretary Punjab

3.11 Mari Time

3.11.1 Karachi Port Trust

Fire Station Incharge provided data; Computer Section fixed Halon-1301= 600 kg and Halon-1211- 6x60= 600. Replacing to phase out with Halotron

4. ORGANIZATION INCHARGE OF FIRE AND SAFETY:

4.1 Fire Protection Association

Fire Protection Association of Pakistan (FPAP) is an NGO working for the fire and safety activities in Pakistan.

Address: **607, West Land Trade Center, Near Flyover, Shahed-I-Millat Road,**

Karachi-753350.

Fax: 92-21-4313603

Tel: 92-21-4313603

E-mail: info@fpap.org.pk

Main activities performed: FPAP is extending its advisory services for the industry and masses through their core of experts in the following targeted areas.

- Fire Risk Assessment and Management.
- Fire Safety Inspections and Audits
- Advise on the installation of fire extinguishers as per internationally practiced codes.
- Planning and designing of Fire alarm & detection systems
- Planning and designing of fire hydrants and water sprinkler systems
- Planning and designing of fixed fire protection systems
- Preparation of Fire safety posters and checklists

Contact person's name : **Mr. Tariq Moeen** Position: Secretary FPAP

4.2 Fire Safety Codes & Standards:

4.2.1 Halogenated Extinguishing systems

PCT Code for Halons i.e. 2903-46000

• Halons 1211	Bromochlorodifluoromethane	CBrClF ₂
• Halons 1301	Bromotrifluoromethane	CBrF ₃
• Halons 2402	Dibromotetrafluoroethane	CBrF ₂ CBrF ₂

Halon Nomenclature System:

The Halon system for naming halogenated hydrocarbons was devised by the US Army Corps of Engineers to provide a convenient and quick means of reference to candidate fire extinguishing agents.

Halon Ozone Depletion Potential (ODP)

• Halon-1211 ODP	=	3.0
• Halon-2402 ODP	=	6.0
• Halon-1301 ODP	=	10.0

4.2.2 National Fire Codes and Standards

In Pakistan, National Fire Codes and Standards of National Fire Protection Association (NFPA) USA are followed.³

Name: **National Fire Protection Association Codes and Standards,**
(an international codes and standards organization)

Address: 1 Batterymarch Park, Quincy, MA 02269-9101

4.2.2.1 Fire Extinguishers

NFPA 10 is the standard for Portable Fire Extinguishers was prepared by the Technical Committee on Portable Fire Extinguishers, and acted on by the NFPA Inc. at its annual meeting held in May 21-24, 1990 and was issued by the Standards Council on July, 20, 1990.

³ National Fire Codes 2002: NFPA Codes and Standards (an international codes and standards organization).
CPP\ Halon Survey Final Report 2, 7/1/2003, 7:00 AM

The provision of this standard apply to the selection, installation, inspection, maintenance, and testing of portable extinguishing equipment. This standard is prepared for the use and guidance of persons charged with selecting, purchasing, installing, approving, listing, designing and maintaining fire-extinguishing equipment. The fire protection requirement of this standard are general in nature and are not intended to abrogate the specific requirements of other NFPA standards for specific occupancies.

4.2.2.2 Halon 1301

NFPA 12A is the standard, on Halon 1301 (bromotrifluoromethane) Fire Extinguishing Systems and was issued by the Standards Council on July 14, 1989 in Washington. This standard contains minimum requirements for Halon 1301 Fire Extinguishing systems, and includes only the essentials necessary to make the standard work able in the hands of those skilled in the field.

4.2.2.3 Halon 1211

NFPA 12B is the standard on Halon 1211 (bromochlorodifluoromethane) Fire Extinguishing Systems. This standard contains minimum requirements for Halon 1211 Fire Extinguishing systems. It includes only the essentials to make the standard work able in the hands of those skilled in the field.

4.2.2.4 Guidance

These standards are prepared for the use and guidance of those charged with purchasing, designing, installing, testing, inspecting, approving, listing, operating and maintaining halogenated extinguishing systems, so that such equipment will function as intended throughout its life.

4.2.2.5 Use and Limitations Guidance

Halons 1211, 1301 and 2402 are included in the Montreal Protocol on substances that deplete the Ozone Layer signed September 16, 1987. The protocol permits continued availability of halogenated fire extinguishing agents at 1986 production levels. Halons 1211, 1301 and 2402 fire extinguishing systems are useful within the limits of this standard in extinguishing fires in specific hazards or equipment, and in occupancies where an electrically nonconductive medium is essential or desirable, where cleanup of other media presents a problem

Some of the more important types of hazards and equipment that Halons systems amy satisfactorily protect include:

- Gaseous and liquid flammable materials
- Electrical hazards such as transformers, oil switches, circuit breakers and rotating equipment
- Engines utilizing gasoline and other flammable fuels.
- Ordinary combustibles such as paper, wood and textiles.
- Hazardous solids.
- Electronic computers data processing equipment and control rooms.

4.3 Fire Equipment Inspection, Testing & Certification:

In Pakistan there is no approval system for fire protection equipment and fire extinguishing media. Civil defence Authorities play a role by themselves to advise the organizations for suitable systems.

No approval and/or certificate are required for fire protection equipment and media. Civil Defense Authority regulates its works and are the authority responsible for such activities.

4.3.1 Civil Defense

Name: **Civil Defense Islamabad**

Address: Directorate General **Civil Defense Ministry of Interior Govt. of Pakistan, Sitara Market G-7 Islamabad**

Fax: **92-51-9721148**

Tel: **92-51-9202077**

Contact person's name: **Mr. Mohammad Siddique** Position: **Director General**

Main activities performed:

- Advise that all systems shall be thoroughly inspected and tested (at least annually) for proper operation, by competent personnel of civil defense, to ensure that the system is in full operating conditions.
- Advise suitable tests when indicated during inspection for their advisability.
- Provide inspection report
- Advise that the system shall be inspected visually between the annual inspections and tests.
- Advise that the weight and pressure of the fire extinguisher/container shall be recorded on a attached tag.

4.3.2 National Institute of Fire Technology, Islamabad

Address: **Sitara Market G-7 Islamabad**

Fax: **92-51-9721148**

Tel: **92-51-922362**

Contact person's name: **Mr. Khan Afsar** Position: **Director**

4.3.3 Fire Brigade Islamabad

Address: **Islamabad**

Fax: NA

Tel: **92-51-9202077**

Contact person's name: **Mr. Sarfaraz Haider Sherazi** Position: Assistant Director

5. NATIONAL HALON CONSUMPTION AND INSTALLED CAPACITY;**5.1 Halon Imports:**

The Halons were imported into Pakistan up to 1995, from the following countries;

- United States of America,
- Italy
- Republic of Germany
- Saudi Arabia and

- China

After the ban on Halons, Europe and USA have stopped their manufacture. Therefore, after 1995, the Halons are being imported from

- China
- Saudi Arabia and
- India through UAE

Imports of Halons into Pakistan are either in the form of large cylinders or fire extinguishers.

BCF Halon 1211 is being imported in two different forms:

- In bulk quantity:** BCF Halon 1211 is being imported in bulk quantity of 600 kg and 1350 kg cylinders and is being refilled locally in portable fire extinguishers.
- In portable fire extinguishers:** Portable Halon fire extinguishers at an average of 2 tons per year are also imported in 4/6 Kg cylinders.

5.1.1 Data by Ozone Cell:

The data obtained from the Ozone Cell regarding import figures is⁴

Halon Import	1996	1997	1998	1999	2000	2001
Halon 1211 in bulk, MT*						
Halon 1301 in bulk, MT*						
Total Halon, MT	7.0	2.0	5.0	5.0	5.0	9.6

Maximum Import per Year = 9.60 M. Tons

Minimum Import per Year = 2.00 M. Tons

Average Import per year as per Ozone Cell Data = 5.60 M. Tons

*Separate data for Halons 1211 and 1301 is not available because all the three Halons are imported under a single Pakistan Custom and Tariff (PCT) Code i.e. 2903.4600

Under the Pakistan Customs Tariff (PCT) Code for Halons 2903-4600, the following three chemicals are allocated:⁵

- Bromochlorofluormethane (Halon 1211)
- Bromotrifluormethane (Halon 1301)
- Dibromotetrafluroethane (Halon 2402)

5.1.2 Data by CBR:

The data obtained from the CBR regarding import figures is⁶:

Halon Import	1996	1997	1998	1999	2000	2001	2002
Halon 2402 in bulk MT							7.900
Total Halon, MT	2.700	1.400	1.800	8.600	6.130	9.358	13.550
Total Halon, Rs. in Millions	0.326	0.185	0.260	1.406	1.238	1.525	2.307

⁴ Director, Ozone Cell, Ministry of Environment and local bodies

⁵ Minutes of the meeting at Federal Bureau of Statistics Karachi are attached as Annexure 3.4

⁶ Member CBR, Islamabad, Dr. Athar Masood

Maximum Import per Year	=	13.55 M. Tons
Minimum Import per Year	=	1.40 M. Tons
Average Import per year as per CBR Data	=	6.22 M. Tons

5.1.3 Data by Federal Bureau of Statistics:

The data obtained from the Pakistan Statistical Year Book 2003 regarding imports ⁷

Halon Import	1992 -93	1993 -94	1994 -95	1995 -96	1996 -97	1997 -98	1998 -99	1999 -00	2000 -01	2001 -02
Organic Chemicals, Rs. in Millions	9.27	10.55	13.49	18.42	18.93	23.37	23.08	30.75	38.15	36.89

The above mentioned PCT Code is based on the 511-3800, Bureau of Statistics Code for organic chemicals "Halogenated derivatives of a-cyclic hydrocarbons containing two or more halogens", which includes the following chemicals:

- i. 5113805 pentachlorofluoroethane
- ii. 5113811 bromochlorodifluoromethane (Halon 1211)
- iii. 5113812 bromotrifluoromethane (Halon 1301)
- iv. 5113813 dibromotetrafluoromethane (Halon 2402)
- v. 5113819 chlorotrifluoromethane
- vi. heptachlorofluoropropane
- vii. hexachlorodifluoropropane
- viii. dichlorohexafluoropropane
- ix. difluoromethane
- x. bromochlorodifluoromethane and other derivatives

According to Pakistan Statistical Year Book 2003, Page 636-637, Under Trade, 18.6 Imports by Commodity Group, the imported chemicals are reported under the following heads.

- I. Organic Chemicals
- II. Inorganic Chemicals, elements, oxides and Halogen salts.
- III. Other inorganic chemicals
- IV. Radio active and associated materials

The data by the Federal Bureau of Statistics, for the code 5113800 is given as follows;⁸

5113800; Halogenated derivatives of a-cyclic hydrocarbons containing two or more halogens		
Year	Quantity (M.Tons)	Cost (Million Rupees)
2001-02	418.145	33.938
2000-01	395.107	34.199
1999-2000	993.507	92.630
1998-99	957.656	85.506
1997-98	533.950	48.076
1996-97	1177.046	93.718
1995-96	361.046	28.877
1994-95	182.820	08.427

⁷ Pakistan Statistical Year Book 2003, Federal Bureau of Statistics, Govt. of Pakistan, March 2003

⁸ FTS; Foreign Trade Statistics of Pakistan 1990 - 2002

1993-94	274.254	17.681
1992-93	258.107	12.632
1991-92	348.104	24.730
1990-91	309.158	11.278

The Bureau of Statistics has also compiled data for the import of fire extinguishers being imported from 1991-2002.

Year	Quantity (M.Tons)	No. of Portable Extinguishers 8424.1000
2002-03 (Jul-Mar)	117	34,126
2001-02	100	35,494
2000-01	25	42,854
1999-2000	-	34,393
1998-99	-	28,898
1997-98	10	26,663
1996-97	-	43,294
1995-96	104	50,259
1994-95	159	52,971
1993-94	-	28,760
1992-93	-	34,434
1991-92	102	33,015

5.1.4 Data by the Importers:

Haseen Habib Corporation (Pvt.) Ltd. has provided the following Halons data, which was imported by them. (Total Import 8.86 M. Tons)

Halon Import	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Halon 1211 M.Ton	1.0	1.0	-	-	-	-	-	1.61	-	1.35	2.0	1.7
Halon 1301 M. Ton	1.0											
Total Halons M. Tons	2.0	1.0	-	-	-	-	-	1.61	-	1.35	2.0	1.7

Haseen Habib Trading Co. has provided the following Halons data, which was imported by them. (Total Import 71.23 M. Tons)

Halon Import	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Halon 1211 M.Ton	-	-	-	-	2.0	4.6	4.9	4.2	5.0	4.8	-	-
Halon 1301 M. Ton	-	-		0.20	0.03							
In Portable extinguishers M.Tons			1.0	3.0	4.0	4.5	4.5	5.5	5.0	6.0	6.5	6.5
Total Halons M. Tons	-	-	1.0	3.20	6.03	9.1	9.4	9.7	10.0	10.8	6.5	6.5

Maximum Import per Year = 12.15 M. Tons
 Minimum Import per Year = 1.00 M. Tons
 Average Import per year as per Importers Data = 6.67 M. Tons

5.2 Average Legal Halon Imports:

Average Import per year as per Ozone Cell Data =	5.60 M. Tons
Average Import per year as per CBR Data =	6.22 M. Tons
Average Import per year as per Importers Data =	6.67 M. Tons
Net Average =	6.16 M. Tons

The variation in the average import values per year is due to averaging the values of different years.

5.3 Halon Exports:

Pakistan is not manufacturing Halons locally and mostly depends upon the imports from other countries. No figures are available from any source regarding the export of Halons.

5.4 Halons Consumption:

According to three legal sources the average Halons import to Pakistan is 6.16 M. Tons, which is all being consumed in the country. As per the World Bank, the average consumption of Halons in Pakistan comes to 9 tons per year.⁹

5.5 Installed Halons Capacity:

In meetings with different lead fire extinguisher equipment suppliers and importers, informed regarding the installed capacity of Halons in the country and about the potential users. The data regarding installed Halons capacity in the country given in the list below is based on the direct information from the end users as well as the information provided by the suppliers/importers.¹⁰

Halons Installed Capacity in Pakistan¹¹

Summary of Installed Halon Capacity in Pakistan					
Table #:	Area	Halons-1211 Kgs	Halons-1301 Kgs	Halons-Others* Kgs	Halons-Total Kgs
1	Civil Aviation/Air Lines	7756	20755	610	29121
2	Telecommunication	15023	1420	0	16443
3	Mass communication	7000	0	0	7000
4	Industry	102963	3427	0	106390
5	Oil and Gas	16647	2597	0	19244
6	WAPDA and Power Plants	32580	4664	0	37244
7	Hospitals	5900	0	0	5900
8	Banks	9589	11771	0	21360
9	Hotels	1570	0	0	1570
10	Buildings	1790	854	0	2644
11	Defense	140955	15380	0	156335
12	Electronics	3415	305	0	3720
13	Miscellaneous	50077	0	0	50077
14	Maritime	2600	600	0	3200
15	Communication	2000	0	0	2000
	GRAND TOTAL	399865	61772	610	462248

⁹ Jitendra J. Shah/Person/World Bank on 06/16/2003

¹⁰ Minutes of the meeting with Fire Fighting equipment suppliers are attached as Annexure 3.4

¹¹ Details of Installed Capacity are attached as Annexure 4.0

Based on the methodology adopted and data collected, it is still foreseen that another 50 – 100 M. Tons of Halons would be available as installed capacity in the country.

6. FIRE EQUIPMENT MANUFACTURERS/DISTRIBUTORS:

6.1 List of Equipment Manufacturers:

S No.	Name	Range of Products
1.	Haseen Habib Corporation Pvt. Ltd. 27, Nicholson Road, Lahore Fax: <u>92-42-636 8855</u> Tel: <u>92-42-636 7222-3</u> E-mail: <u>info@firechief.com.pk</u>	Details are available in Annexure 1.1
2.	Miraj Limited: Plot # 11, Sector 15, Korangi Industrial Area, Karachi Phone: 92-21-5050145-6, Fax: 92-21-5060663	Deals in Fire Vehicles including fire extinguishers

6.2 List of Equipment Dealers and Halon Importers:

S No.	Name	Range of Products
1.	Haseen Habib Trading Company. 7, Shaheen View, Block-6, P.E.C.H.S., Shahra-e-Faisal, Karachi Fax: 92-21-4526242 Tel: 92-21-4526240-1 E-mail: fbarry@haseenhabib.com	<ul style="list-style-type: none"> • Halons • CO2 • Foam • Dry Powder • Halotron
2.	Pak Global Corporation E-29-31 Montan Building, M.A. Jinnah Road, Karachi, P.O. Box 6346 Phone: 2442436, 2442304	<ul style="list-style-type: none"> • CO2 • Foam • Dry Powder
3.	Platinum Traders 6,7 Shams Chamber, Sharah-I-Liaqat, Karachi Phone: 2429803, 2429813 Fax:	<ul style="list-style-type: none"> • CO2 • Foam • Dry Powder
4.	Minhas Corporation (Pvt.) Ltd. 12-Souq-I-Idris, 961 Murree Road, Rawalpindi Phone: 4841482 Fax.	<ul style="list-style-type: none"> • Halons • CO2 • Foam • Dry Powder
5.	Qureshi Tools and Hardware Store O/166, Waris Khan, Murree Road, Rawalpindi Phone: 5559634, 5536380 Fax: 5536380	<ul style="list-style-type: none"> • CO2 • Foam • Dry Powder
6.	Miraj Limited Plot # 11, Sector 15, Korangi Industrial Area Karachi Phone: 92-21-5050145-6 Fax: 92-21-5060663	<ul style="list-style-type: none"> • Fire Vehicles • CO2 • Foam • Dry Powder
7.	Pak Global Corporation E 29-31, Montan Building, M. A. Jinnah Road Karachi Phone: 92-21-2442436, 2442304 Fax: 92-21-2415369	<ul style="list-style-type: none"> • CO2 • Foam • Dry Powder
8.	MAB Fire Pvt. Ltd.	<ul style="list-style-type: none"> • Halons

	MAB House 24-C, South Park Avenue, Phase II, Extension Karachi Phone: 92-21-5895295 Fax: 92-215887166	<ul style="list-style-type: none"> • CO2 • Foam • Dry Powder • Halotron • FM-200
9.	Firestop Aids Pvt Ltd. Suit # 6-B, Dinar Chambers, West Wharf Road, Karachi. Phone: 92-21-231565, 2313065 Fax: 92-21-2310457	<ul style="list-style-type: none"> • Halons • CO2 • Foam • Dry Powder • Halotron
10.	Fire Safety Corporation 107-Seema Electronics Center, 1 st Floor, Magazine Lane, Abdullah Haroon Road, Karachi. Phone: 92-21-7768017 Fax: 92-21-7736520	<ul style="list-style-type: none"> • Halons • CO2 • Foam • Dry Powder
11.	Tyco International Ltd. Suite # 3, 2 nd Floor, Ali Plaza, 1-E Jinnah Avenue, Blue Area Islamabad Phone: 92-51-2870315-6 Fax: 92-51-2870317	<ul style="list-style-type: none"> • Intergen • CO2 • Foam • Dry Powder

6.3 Main Halon Users

S No.	List of companies:	Amount of Halon installed kgs			Annual need Halon refilling kgs		
		1211	1301	Others	1211	1301	Others
1.	Civil Aviation Authority / Air Lines	7756	20755	-	610	-	-
2.	Telecommunication	15023	1420	-	200	-	-
3.	Mass Communication	7000	-	-	30	-	-
4.	Industry	102963	3427	-	500	-	-
5.	Oil & Gas	16647	2597	-	50	-	-
6.	Power Sector	32580	4664	-	300	-	-
7.	Hospital	5900	-	-	20	-	-
8.	Banks	9589	11771	-	50	-	-
9.	Hotels	1570	-	-	-	-	-
10.	Buildings	1790	854	-	-	-	-
11.	Defense	140955	15380	-	5000	-	-
12.	Electronics	3415	305	-	25	-	-
13.	Miscellaneous	50077	-	-	-	-	-
14.	Maritime	2600	600	-	20	-	-
15.	Communication	2000	-	-	-	-	-
	Total	399865	61772	610	6805		

7. Conclusion:

Although Halons have four characteristics, that make them extremely effective and applicable.

1. They are highly effective against Class A, B, and C fires (solid, liquid/gaseous, and electrical fires).
2. They are "clean compounds" that do not leave behind residue that could potentially damage whatever they are used on.
3. Can be used safely around live electrical equipment since they do not conduct electricity.
4. They are relatively safe for human exposure.

Even though halons have many advantages, but they are unfortunately also very harmful to the ozone layer. They have an ozone depletion potential (ODP) value of between ten and sixteen, as compared to common refrigerants whose value is one. It is because of this environmental danger that the measures have been taken against halon production and use in recent years.

On January 1, 1994, the producing and importing of any new halon was banned through international agreement in accordance with the Montreal Protocol, effective April 6, 1998, the Halon Rule stated that:

- Bans the manufacture of halon blends;
- Prohibits the intentional release of halons during training of technicians and during testing and repair.

Disposal of halon-containing equipment; requires appropriate training of technicians regarding emissions reduction; and requires proper disposal of halon and of halon-containing equipment. The rule on the other hand does not prohibit, however, the sale or use of halon blends produced prior to April 6, 1998.

Halon 1211 and Halon 1301 can be recycled by recovering halon that is still contained in cylinders no longer in use, or from leaking containers. However, recycling techniques are generally unavailable and very costly for halon blends. Since production of new halon has been banned, recycled halon is now the only source of supply, and even that will eventually run out of the market very soon.

Many of the current alternatives to halons have less harmful impacts upon the environment than halons themselves. There is, of course, the traditional alternatives, such as water, carbon dioxide, dry chemicals, and foam. New alternatives have been discovered through research, and "fall into four categories:

- i. halocarbon compounds;
- ii. inert gas mixtures;
- iii. water-mist or fogging systems;
- iv. powdered aerosols".

Not all alternatives are ideal, though. Some can present health and safety hazards, and some are less effective as fire extinguishers and must be used in greater amounts.

Looking closely at just one of these substitutes, many advantages can be seen over Halon 1211, thus making a strong case for possible implementation of alternatives. Halotron 1 has a much lower Ozone Depletion Potential, (.014), as compared to Halon 1211 (ODP 3-4). It also has a lower Global Warming Potential (GWP), and lower toxicity. Furthermore, the atmospheric lifetime of Halotron 1 is three and a half to eleven years, whereas Halon 1211 is twelve and a half to twenty-five years ("Physical"). Halotron 1 has proved effective in tests on Class A, B, and C fires, just as halons have.

The other substitutes for Halon 1211 that are "Acceptable Subject to Narrowed Use Limits". Limiting factors of these alternatives include, among others, possible harmful exposure effects on humans, high global warming potentials, and long atmospheric lifetimes. Included in this group are: HBFC-22B1, HFC-227ea, HFC-236fa, CF3I, and C6F14 (PFC-614, CEA-614), all of which are for non-residential use only ("Substitutes for Halon 1211").

Acceptable alternatives for Halon 1301 include Powdered Aerosol C (PyroGen, Soyuz), Powdered Aerosol A (SFE), as well as the traditional substitutes ("Substitutes for Halon 1301"). There are several alternatives to Halon 1301 that are "acceptable subject to use conditions", and these include: HBFC-22B1, HCFC-22, HCFC-124, HCFC Blend A, HFC-23, HFC-125, HFC 134a, HFC 227 ea, HFC-236fa, C3F8, C4F10, CF3I, IG-01, IG-55, and IG-541 ("Substitutes for Halon 1301"). Limiting factors for these alternatives are much the same as for Halon 1211.

After looking closely at the harmful effects of halons, it seems clear that alternatives are both desired and necessary. Since production has been banned and use is limited, halons are becoming more and more scarce, and therefore more expensive. We will one day run out of halons completely, so it would seem the most logical and economic course of action would be to phase out halon use entirely and focus on learning to use the alternatives in the safest and most effective way. One thing becomes clear; the safety of our future world depends upon our ability to understand and use alternatives to halons that are available today.

Keeping in view the installed capacity in Pakistan and annual Halon consumption, it is recommended to develop a halon banking system in Pakistan along with the storage, recycling and refilling facilities for the essential uses, which are being exempted or not yet decided to phase out even in the Montreal Protocol. The training and capacity building at the local level is the essential part of the Halon Management Plan.

All the information on the use of Halons 1211 and Halons 1301 within Pakistan is being collected by contacting the fire authorities, equipment inspection, testing and certification institutions, manufacturers and distributors of fire equipment and defense authorities. Detailed information related to installed Halon quantities and Halon refilling requirements was obtained from key Halon importers, fire fighting equipment end users, industries, telecommunication centers, airline companies and airport administrations, defense organizations (army, navy and air force), power supply sector, shipping companies, banks, and other public/office building administrations, computer centers, etc.

The average import of Halons to the country is approximately 6.5 M. Tons per year, while the installed capacity of Halon 1211 is 400 M. Tons, while Halon 1301 is 60.00 M. Tons. Annual consumption is in the range of 6-7 M. Tons per year. Good practices can reduce Halon consumption in Pakistan like many other developing countries, newly-installed non-critical fire extinguishers and systems, for reasons including:

- a lack of awareness of halons' impact on the environment;
- lack of awareness of national commitment to halon phase out;
- lack of regulatory structure;
- aggressive marketing of halons;
- improper servicing and maintenance practices;
- lack of information on available alternatives;

All of the above stimulate demand for halons. Appropriate standards and codes of practice can be powerful tools:

- to significantly reduce unnecessary emissions of halon into the atmosphere,
- promote the use of alternatives to halon,
- promote halon banking and recycling for essential uses,
- promote an orderly phase out of halons - in time to meet the requirements of the Montreal Protocol.

8. Recommendations:

The Halon consumption phase-out strategy should take into consideration two types of issues.

1. Prevention of new Halon fire fighting equipment manufacturing/import and installation. This target can be achieved by introduction of a comprehensive ban on import of Halon fire fighting equipment and provision of technical advice and financial assistance to local manufacturers in conversion of their production to Halon-free alternatives.
2. Maintenance of already existing Halon fire fighting equipment. With respect to the high cost of its replacing/retrofitting, especially for Halon-1301 fixed fire fighting systems, it is recommended to establish an inventory database on installed Halon quantities and, if economically viable, a Halon recovery, recycling and storage facility (Halon Bank) under the supervision of "Ozone Cell" which could be used for refilling of installed Halon fire fighting equipment through the transitional period of its replacement or till the end of its technical lifetime.

After comprehensive survey of present consumption and installed capacity of Halons in Pakistan it is recommended:

- Formulation of a Halon Bank Management Project
- Organization of stakeholder workshops
- Demonstration projects for alternatives, the recovery and recycling of halons
- Training on service requirements and customs issues
- National policy development

ANNEX 1. Fire Fighting Equipment Manufacturers**National Cleaner Production Center Foundation**

Registered under Section 42 of the Companies Ordinance, 1984

**ANNEX 1.0 Fire fighting equipment manufacturers**

Name of the company: _____

Address: _____

Fax: _____ Tel: _____ E-mail: _____

Contact person's name: _____ Position: _____

A. Brief description of the enterprise (date of establishment, number of employees, products manufactured, other details):

A.1 Legal status of the company (ownership):

A.2 Branches/service offices in other parts of the country:

A.3 Financial status of the company (provide figures for last 4 year period):

	1999	2000	2001	2002
Total turn over, US\$				
From halon activity, US\$				
Total production costs, US\$				
Profit, US\$				

A.4 Halon consumption:

	1999	2000	2001	2002
Number of Halon-1211 extinguishers produced				
Halon-1211 used, kg				
Number of Halon 1301 fixed fire fighting systems produced				
Halon-1301 used, kg				

If other type of halon was used, please specify the product, the total number of units manufactured and quantities of halon consumed.

B. Business activities

B.1 Range of portable fire extinguishers presently covered by the company:

Type of extinguishers: Halon-1211 (Y/N)____, ABC powder (Y/N)____, CO2 (Y/N)____, Foam (Y/N)____, Other (Y/N) ____ (pls. specify)

Manufacturing of extinguishers: Y/N____, Import (Y/N)____, if "Yes", specify the type, number, total quantity of extinguishing media and the country the product is imported from:

B.2 Range of fixed fire fighting systems presently covered by the company:

Type of systems: Halon-1301 (Y/N)____, CO2 (Y/N)____, Foam (Y/N)____, Sprinkler (Y/N)____, Water mist (Y/N)____, HFC based (Y/N)____, HCFC based (Y/N)____. Other (Y/N) ____ (pls. specify)

Manufacturing of systems: Y/N____, Import (Y/N)____, if "Yes", specify the type, number, total quantity of extinguishing media and the country the product is imported from:

B.3 Servicing and refilling of extinguishers and systems produced/distributed Y/N

____, If "Yes", specify the type, number, quantity of extinguishing media consumed for refilling:

C. Halon phase-out plans

C1. Portable Halon fire extinguishers

Has the company any plans for conversion of its production to halon-free alternative technology Y/N____, if "Yes" when____, specify the alternative selected:

Operational costs

Selected alternative: Before conversion, US\$	After conversion, US\$
---	------------------------

ABC powder

CO2

Foam

Other

— Please, provide detailed breakdown of costs for materials, extinguishing media, electricity etc.

Capital costs

Cylinders manufacturing	Present equipment	Proposed equipment	Investment cost, US\$
Material reception,			

Control and storage			
Cutting			
Pressing and forming			
Welding			
Pressure testing			

Corrosion protection and painting	Present equipment	Proposed equipment	Investment cost, US\$
Cleaning and phosphatizing			
Painting			
Drying			
Exhaust system And cleaning device			

Filling, assembling and packing	Present equipment	Proposed equipment	Investment cost, US\$
Filling of extinguishing media			
Assembling			
Packing			

C.2 Fixed Halon-1301 fire fighting systems

Has any alternative been identified by the company Y/N _____

If "Yes", Which alternative:

Has any license arrangement been made:

Can the company install such systems today:

Other comments:

Has the company plans for conversion of production of Halon fixed fire fighting system to an alternative Y/N _____, if "Yes", specify when and the alternative selected:

Please, provide detailed breakdown of pre and post conversion operational costs.
Please, provide detailed breakdown of capital (investment) cost of equipment and services needed for conversion of your company to production of halon-free fixed fire fighting systems.



National Cleaner Production Center Foundation

Registered under Section 42 of the Companies Ordinance, 1984

ANNEX 1.1 Haseen Habib Corporation Pvt. Ltd. Lahore

Name of the company: **HASEEN HABIB CORPORATION PVT. LTD.**

Address: **27, Nicholson Road, Lahore**

Fax: **92-42-636 8855** Tel: **92-42-636 7222-3** E-mail: **info@firechief.com.pk**

Contact person's name: **Mr. Aamir Barry** Position: **Managing Director**

D. Brief description of the enterprise

Date of establishment, **Established in Lahore 1965.**

Number of employees, **100**

Products manufactured, **Manufacturers of a wide range of Fire Fighting Equipment**

Other details): **Largest Importer & stockiest in the country for Fire Fighting & Safety Equipment, Fire Alarm & Detection Systems.**

A.1 Legal status of the company (ownership): **Private Limited Company**

A.2 Branches/service offices in other parts of the country: **Head office and Factory at Lahore, branch offices/display centers are located in Karachi, Lahore Rawalpindi and Faisalbad.**

A.3 Financial status of the company (provide figures for last 4 year period):

	1999	2000	2001	2002
Total turn over, US\$	850,000	938,860	1157,775	1411,800
From halon activity, US\$	18,000	18,000	16,000	15,000
Total production costs, US\$	NA	NA	NA	NA
Profit, US\$	NA	NA	NA	NA

A.4 Halon consumption:

	1999	2000	2001	2002
Number of Halon-1211 extinguishers produced	47	52	48	50
Halon-1211 used, kg	235	300	212	300
Number of Halon 1301 fixed fire fighting systems produced	-	-	-	-
Halon-1301 used, kg	-	-	-	-

If other type of halon was used, please specify the product, the total number of units manufactured and quantities of halon consumed. **NIL**

E. Business activities

B.1 Range of portable fire extinguishers presently covered by the company:

Type of extinguishers:

- Halon-1211 (Y/N) **YES**, ABC powder (Y/N) **YES**,

- CO2 (Y/N) **YES**, Foam (Y/N) **YES**,
- Other (Y/N) **YES** (pls. specify) **Halotron-1**,
- Manufacturing of extinguishers: Y/N **YES**,
- Import (Y/N) **YES**, if "Yes", specify the

Type	Number	Total quantity of extinguishing media	Country the product is imported from
Halotron-1		1000 kg/year	Halotron Inc. USA

DRY CHEMICAL POWDER Fire Extinguishers:							
Model	Power Content	Discharge	Max.Range	Hose Length	Type of Discharge	Total Weight	For Class

WATER TYPE Fire Extinguisher:	
A new fire extinguisher for class 'A' fire risk where soda acid fire extinguishers are being used. Being free from any acid, it is safe for the operator and non-damaging to the material.	
Model	W - SP - 10
SPECIFICATONS	BSS 5423
CAPACITY	10 Liters (2 gallons)
THROW	7 - 8 meters (25-39 feet)
DISCHARGE TIME	60 - 90 Seconds
DESIGN	Main body contains water which is pressurized by nitrogen gas. By squeezing the lever, water is released. Pressure gauge at the front indicates inside pressure.
TO OPERATE	By squeezing lever. Discharge can be interrupted.
CONSTRUCTION	2 deep drawn halves of 18 swg (1.22mm) M.S. sheet welded together
TEST PRESSURE	25 KG/Cm ² (350 lbs per sq. Inch)
PROTECTION	Coated internally and externally with Epoxy Polyester Powder by electrostatic process and then stoved at 200 ° C
FINISH	Red. with instruction label.
FOR CLASS	A

AFFF Fire Extinguisher:	
Suitable for: Fires of oil, petrol, paints, varnishes and other highly inflammable liquids..	
Model	AFFF - 10

TYPE	AFFF (Aqueous Film Forming Foam)
CAPACITY	9 Liters (2 gallons)
CONTENTS	0.57 liters of AFFF mixed with 8.5 liters of water and pressurized with compressed air.
SPECIFICATONS	B.S.S. 5423
OPERATING	By squeezing operating lever
DURATION OF DISCHARGE	30 - 50 Seconds.
THROW	6.7 meters (20-25 feet)
CONSTRUCTION	2 deep drawn halves of 18 swg (1.22 mm) M.S. sheet welded together.
TEST PRESSURE	25 Kg/Cm ² (350 lbs per sq. inch)
PROTECTION	Special epoxy polyester powder coating by electrostatic process, on internal and external surfaces.
FINISH	Red, with instruction label.
FOR CLASS	A & B

Trolley Mounted Dry Chemical Powder FIRE EXTINGUISHERS:

Model	DC-SP-50	DC-100
Contents	50 Kg (110 lbs) dry chemical powder	100 Kg dry chemical powder
Pressurizing Gas	Niteogen	CO ₂ in external cartridge
Construction	Main varrel of 10 Swg.M.S. Sheet, welded, tested to 25 Kg/cm ² (350 lbs/sq inch):	
Max. Range	8-12 meters (25-36 ft)	8-12 meters (25-36 ft)
Discharge	30-50 Seconds	60-100 Seconds
Attachments	6 meters (20 ft) of high pressure 3/4" (18 mm) dia hose, on-off control and discharge nozzle.	
Trolley	2-wheeled, with rubber tyres	
Paint	Red/Blue	



WATER TYPE FIRE EXTINGUISHERS:

Type	Water	Water
Model	W-150	W-SP-45
Extinguishing Material	150-liters (34-gallons) of plain	45-liters (10-gallons) of

Construction	Main Cylinder of 10 guage M.S.sheet, welded.	
Pressurizing Agent	2 Kg. of CO ₂ gas in a Cartridge fitted on the external side of main body.	Nitrogen, Stored Pressure.
Duration of Discharge	120-180 Seconds	30-50 Seconds
Operating Pressure	7Kg/cm ² (nominal) Approx.	
Range of jet	15-20 meters (50-70 feet)	10-15 meters (35-50 ft.)
Wheels	2 rubber wheels of 400 mm (16") dia	2 rubber wheels of 225mm (9") dia
Attachments	1) 25 mmx7.5m (1" x 25 ft) high pressure rubber hose 2) One on-off valve with hand control. 3) One nozzle.	1) 18 mmx3m (3/4" x 10ft) high pressure rubber hose. 2) One on-of valve with hand control. 3) One nozzle.
Finish	Fire brigade red.	Fire brigade red.
Principle of Operation	By opening valve of CO ₂ gas cartridge, the gas is released into the main body and expels the water to the outside, through flexible rubber hose and nozzle	By squeezing the lever
Label	Non-damaging with instructions for operation.	



B.2 Range of fixed fire fighting systems presently covered by the company:

Type of systems:

- Halon-1301 (Y/N) **NO,**
- CO2 (Y/N0) **YES,**
- Foam (Y/N) **YES,**
- Sprinkler (Y/N) **YES,**
- Water mist (Y/N) **NO,**
- HFC based (Y/N) **NO,**
- HCFC based (Y/N) **YES,**
- Other (Y/N) **YES** (pls. specify) **FM-200**
- Manufacturing of systems: Y/N **YES, Partly**
- Import (Y/N) **YES,** if "Yes", specify the

Type	Number	Total quantity of extinguishing media	Country the product is imported from
CO2		5000 kg	Spain
FM-200		500 Kg	Spain

- Foam (Y/N) YES,
- Sprinkler (Y/N) YES,
- Water mist (Y/N) NO,
- HFC based (Y/N) NO,
- HCFC based (Y/N) YES,
- Other (Y/N) YES (pls. specify) **FM-200**
- Manufacturing of systems: Y/N YES, Partly
- Import (Y/N) YES, if "Yes", specify the

Type	Number	Total quantity of extinguishing media	Country the product is imported from
CO2		5000 kg	Spain
FM-200		500 Kg	Spain

B.3 Servicing and refilling of extinguishers and systems produced/distributed Y/N YES

If "Yes", specify the type, number, quantity of extinguishing media consumed for refilling:

Type	Number	Total quantity of extinguishing media for refilling
CO2		
Halotron-I		

F. Halon phase-out plans

C1. Portable Halon fire extinguishers

Has the company any plans for conversion of its production to halon-free alternative technology Y/N YES if "Yes" when As per Country's Policy, specify the alternative selected: For the past three years, marketing, Haltron-I as replacement of Halon 1211 and FM-200 as Halon 1301

Operational costs (Search for Alternatives= US\$ 20,000)

Selected alternative:	Before conversion, Rs	After conversion, Rs
ABC powder	25-750 / kg (Chinese/German)	
CO2	50 / kg Local	Same
Foam (AFFF)	200/ Lit (Germany)	Same
Halotron-I		2000 / kg (USA)

Please, provide detailed breakdown of costs for materials, extinguishing media, electricity etc.

Capital costs

Cylinders manufacturing	Present equipment	Proposed equipment	Investment cost, US\$
Material reception, Control and storage			The Existing Equipment will be adequate
Cutting			
Pressing and forming			
Welding			
Pressure testing			

Corrosion protection and painting	Present equipment	Proposed equipment	Investment cost, US\$
Cleaning and phosphatizing			The Existing Equipment will be adequate
Painting			

Drying			
Exhaust system And cleaning device			

Filling, assembling and packing	Present equipment	Proposed equipment	Investment cost, US\$
Filling of extinguishing media		Gas Transfer Equipment	15,000.00
Assembling			
Packing			

C.2 Fixed Halon-1301 fire fighting systems

Has any alternative been identified by the company Y/N **YES**

If "Yes", Which alternative: FM-200

Has any license arrangement been made:
NO

Can the company install such systems today: YES

Other comments: We import only filled cylinders and send back to Manufacturers for re-filling. We need to have some stck of FM-200 gas and the gas transfer Machine.

Has the company plans for conversion of production of Halon fixed fire fighting system to an alternative Y/N

YES, if "Yes", specify when and the alternative selected: _____ CO2 or FM-200 _____

Please, provide detailed breakdown of pre and post conversion operational costs.

Please, provide detailed breakdown of capital (investment) cost of equipment and services needed for conversion of your company to production of halon-free fixed fire fighting systems.

For having FM-200 gas in stock and to purchase gas transfer (filling Machine) the estimated investment is US\$ 35,000.00

Dealing with the following users

- Municipal Bodies
- Wapda
- Sea Ports & Airport
- Pakistan Army
- Air Force
- Navy
- Cement Factories
- Fertilizer Plants
- Sugar & Textile Mills
- Processing Industries
- Civil Aviation
- Civil Defence
- Hotels
- Banks
- Commercial Buildings Plazas
- Power Plants
- Educational Institutions
- Export Market



National Cleaner Production Center Foundation

Registered under Section 42 of the Companies Ordinance, 1984

ANNEX 1.2. Haseen Habib Trading Company, Karachi

Name of the company: **HASEEN HABIB TRADING COMPANY**
Address: **7, Shaheen View, Block-6, P.E.C.H.S., Shakra-e-Faisal, Karachi**
Fax: **92-21-4526242** Tel: **92-21-4526240-1** E-mail: **fbarry@haseenhabib.com**
Contact person's name: **Mr. Ateeq-ur-Rahman Barry** Position: **Chief Executive**

G. Brief description of the enterprise

Date of establishment, **HASEEN HABIB was established in Karachi 1969.**

Number of employees, **100**

Products manufactured, **Not Manufacturers**

Other details): **Largest Importer & stockiest in the country for Fire Fighting & Safety Equipment, Fire Alarm & Detection Systems.**

A.1 Legal status of the company (ownership): **Sole Proprietary**

A.2 Branches/service offices in other parts of the country: **Head office at Karachi, branch offices/display centers are located in Karachi, Lahore & Rawalpindi / Islamabad.**

A.3 Financial status of the company (provide figures for last 4 year period):

	1999	2000	2001	2002
Total turn over, US\$	1200,000	1330,000	1400,000	1500,000
From halon activity, US\$	24,000	26,600	28,000	30,000
Total production costs, US\$	NA	NA	NA	NA
Profit, US\$	84,000	93,100	98,000	105,000

A.4 Halon consumption:

	1999	2000	2001	2002
Number of Halon-1211 extinguishers produced				
Halon-1211 used, kg				
Number of Halon 1301 fixed fire fighting systems produced				
Halon-1301 used, kg				

If other type of halon was used, please specify the product, the total number of units manufactured and quantities of halon consumed.

H. Business activities

B.1 Range of portable fire extinguishers presently covered by the company:

Type of extinguishers:

- Halon-1211 (Y/N) **YES, BCF Halon 1211**

- ABC powder (Y/N) **YES, Dry Chemical Powder**
- CO2 (Y/N) **YES, Foam (Y/N) AFFF Foam YES,**
- Other (Y/N) **YES (pls. specify) Halotron, HCFC Blend B China Water, and Soda Acid**
- Manufacturing of extinguishers: Y/N **NO,**
- Import (Y/N) **YES, if "Yes", specify the**

Type	Number	Total quantity of extinguishing media	Country the product is imported from
Halons			<u>EDWARDS USA</u>
			<u>ANSUL USA</u>
Halons			<u>SFFECO SAUDI ARABIA</u>
NAF SIII			<u>SAFETY HI-TECH ITALY</u>

Trolley Mounted Fire Extinguishers

- Dry Chemical Powder
- CO2 (Carbon Dioxide)
- Water
- AFFF Foam
- BCF Halon 1211
- Chemical Foam

B.2 Range of fixed fire fighting systems presently covered by the company:

Type of systems:

- Halon-1301 (Y/N) **YES,**
- CO2 (Y/N0) **YES,**
- Foam (Y/N) **YES,**
- Sprinkler (Y/N) **YES,**
- Water mist (Y/N) **NO,**
- HFC based (Y/N) **YES (FM-200),**
- HCFC based (Y/N) **NO,**
- Other (Y/N) **NO, (pls. specify)**
- Manufacturing of systems: Y/N **NO,**

Fixed Systems

- Sprinkler System
- Foam Injection System
- NAF S-III Fire Suppression System (Safest Alternative for Halon 1301)
- Hydrant System

- Import (Y/N) **YES, if "Yes", specify the**

Type	Number	Total quantity of extinguishing media	Country the product is imported from

--	--	--	--

B.3 Servicing and refilling of extinguishers and systems produced/distributed Y/N

YES

If "Yes", specify the type, number, quantity of extinguishing media consumed for refilling:

Type	Number	Total quantity of extinguishing media for refilling
Dry Chemical		
CO2		
Foam		
Halons		

I. Halon phase-out plans

C1. Portable Halon fire extinguishers

Has the company any plans for conversion of its production to halon-free alternative technology Y/N **YES** if "Yes" when **As per Country's Policy**, specify the alternative selected: **NFS3, FM-2000, HCFC Blend-B**

Operational costs (**Search for Alternatives= US\$ 10,000**)

Selected alternative: Before conversion, Rs		After conversion, Rs
ABC powder	50-80 / kg (250/kg US brand)	Same
CO2	75 / kg Local	Same
Foam	200/ Lit (Germany)	Same
Halon 1211	1050/ kg	
(NFS3)		2000 / kg
FM-2000(HFC-227)		2500 / kg
Halotron		1500 / kg

Please, provide detailed breakdown of costs for materials, extinguishing media, electricity etc.

Capital costs

Cylinders manufacturing	Present equipment	Proposed equipment	Investment cost, US\$
Material reception, Control and storage			
Cutting			
Pressing and forming			
Welding			
Pressure testing			

Corrosion protection and painting	Present equipment	Proposed equipment	Investment cost, US\$
Cleaning and phosphatizing			
Painting			
Drying			
Exhaust system			

And cleaning device			

Filling, assembling and packing	Present equipment	Proposed equipment	Investment cost, US\$
Filling of extinguishing media			
Assembling			
Packing			

C.2 Fixed Halon-1301 fire fighting systems

Has any alternative been identified by the company Y/N _____

If "Yes", Which alternative:

Has any license arrangement been made:

Can the company install such systems today:

Other comments:

Has the company plans for conversion of production of Halon fixed fire fighting system to an alternative Y/N _____, if "Yes", specify when and the alternative selected:

Please, provide detailed breakdown of pre and post conversion operational costs. Please, provide detailed breakdown of capital (investment) cost of equipment and services needed for conversion of your company to production of halon-free fixed fire fighting systems.

Oil & Gas Industry

- Sui Southern Gas Company
- Pakistan State Oil
- Shell Pakistan Ltd.
- Lasmo oil Pakistan Ltd.
- BP Pakistan Exploration
- Pakistan Refinery Ltd.
- National Refinery Ltd.
- Pak Arab Refinery Ltd.
- Pakistan Petroleum Ltd.
- Mobil
- Schlumberger
- OMV Pakistan
- Orient Petroleum
- BHP Petroleum
- Caltex
- FOTCO
- Asia Petroleum

Hotels, Restaurants & High Rise Buildings

- Avari Towers
- Sheraton
- Pearl Continental
- McDonalds
- KFC
- Pizza Hut

- TGI Fridays
- Naval Heights
- Dadex Eternit
- STFA Foundation

Power Projects

- Hub Power Company
- National Power International
- Kot Addu Power Co.
- Aes Lal Pir Power Project
- Uch Power Plant
- General Electric
- Black & Veatch International

- Wall Mart
- SSGC Building
- NIC Bldg., Islamabad
- MCB Bldg., Islamabad

- Rousch Power Plant
- Coastal Power
- Saba Power
- Kohinoor Electric
- Tapal Energy
- Japan Power
- Southern Power

Chemical & Pharma Industry

- Glaxo
- Bristol Myers Squibb
- Pfizer
- ICI Pakistan Ltd.
- Novartis
- Knoll Pharmaceutical
- Roche

- Clariant Pakistan Ltd.
- Fauji Fertilizer
- Engro Chemical
- Engro Vopak Terminal Ltd.
- Pakistan PTA Ltd.
- FJFC

Banks

- State Bank
- National Bank
- Citi Bank

- Prime Commercial Bank
- Schon Bank

Tele Communication

- PTCL
- Insta Phone

- Tele Card

Other Industry

- Proctor & Gamble
- Rackitt & Colman
- Lever Brothers Pakistan
- Gul Ahmed Group of Industries
- of Industries

- AlKaram Group of Industries
- Paramount Group of Industries
- Sapphire Group

Govt. Organizations

- Municipal Bodies
- WAPDA
- Civil Aviation Authority
- Civil Defense
- Karachi Port Trust

- Pakistan Railways
- Rice Export Corp. of Pakistan
- Pakistan International Airline
- Pakistan National Shipping Corp.

Defense

- Naval Stores Depot
- Air Stores Depot
- Central Ordnance Depot
- Joint Staff Head Quarters
- PMO
- Aero

- Defense Science & Technology Pakistan
- HMC



National Cleaner Production Center Foundation

Registered under Section 42 of the Companies Ordinance, 1984

ANNEX 1.3. Firestop Aids (Pvt.) Ltd.

Name of the company: **Firestop Aids (Pvt.) Ltd.**

Address: **Suite # 6-B, 1st Floor, Dinar Chamber, West Wharf Road, Karachi**

Fax: **92-21-2310457** Tel: **92-21-2315675, 2313065** E-mail: **ffst@cyber.net.pk**

Contact person's name: **Mr. Inam Nabi** Position: **General Manager**

A. **Brief description of the enterprise** (date of establishment, number of employees, products manufactured, other details):

- Established in 1972,
- Number of Employees varies from 60-70.

Provide quality Fire and safety products in the range of;

- Fire Extinguishers
- Fire Suppression
- Fire Fighting Foams
- Fire Hoses
- Fire Alarm and Detection
- Safety Equipment
- Mobile Equipment

A.1 Legal status of the company (ownership): **Pvt. Ltd. Co.**

A.2 Branches/service offices in other parts of the country:

- Karachi
- Lahore

A.3 Financial status of the company (provide figures for last 4 year period):

	1999	2000	2001	2002
Total turn over, US\$	20,000	25,000	27,000	30,000
From halon activity, US\$	200	250	270	300
Total production costs, US\$	NA	NA	NA	NA
Profit, US\$	1600	2500	2700	3000

A.4 Halon consumption:

	1999	2000	2001	2002
Number of Halon-1211 extinguishers produced				
Halon-1211 used, kg	300	300	300	300
Number of Halon 1301 fixed fire fighting systems produced				
Halon-1301 used, kg				

If other type of halon was used, please specify the product, the total number of units manufactured and quantities of halon consumed.

B. Business activities

B.1 Range of portable fire extinguishers presently covered by the company:

Type of extinguishers:

- Halon-1211 (Y/N) **YES** _____,
- ABC powder (Y/N) **YES** _____,
- CO2 (Y/N) **YES** _____,
- Foam (Y/N) **YES** _____,
- Other (Y/N) **YES** _____ (pls. specify) **Halotron**

Manufacturing of extinguishers: Y/N _____, Import (Y/N) _____, if "Yes", specify the type, number, total quantity of extinguishing media and the country the product is imported from:

The materials, which are not available in the country, are imported from various countries, and average annual business of imported materials is US\$ 10,000

B.2 Range of fixed fire fighting systems presently covered by the company:

Type of systems:

- Halon-1301 (Y/N) **NO** _____,
- CO2 (Y/N) **YES** _____,
- Foam (Y/N) **YES** _____,
- Sprinkler (Y/N) **YES** _____,
- Water mist (Y/N) **YES** _____,
- HFC based (Y/N) **NO** _____,
- HCFC based (Y/N) **NO** _____.
- Other (Y/N) **YES** _____ (pls. specify) **FM 200**

Manufacturing of systems: Y/N **NO** _____, Import (Y/N) **NO** _____, if "Yes", specify the type, number, total quantity of extinguishing media and the country the product is imported from:

B.3 Servicing and refilling of extinguishers and systems produced/distributed Y/N _____, If "Yes", specify the type, number, quantity of extinguishing media consumed for refilling:

- **Provides services of refilling in Powder, Chemicals and CO2.**
- **No Cylinders refilled Annually 10,000**

C. Halon phase-out plans

C1. Portable Halon fire extinguishers;

- **Reduced the business of Halons since 1990, and advise consumers to switch over to suitable alternative**

Has the company any plans for conversion of its production to halon-free alternative technology Y/N _____, if "Yes" when _____, specify the alternative selected:

Not Applicable

Operational costs	_____	_____
Selected alternative:	Before conversion, US\$	After conversion, US\$
ABC powder		
CO2		
Foam		
Other	_____	_____

Please, provide detailed breakdown of costs for materials, extinguishing media, electricity etc.

Capital costs: **Not Applicable**

Cylinders manufacturing	Present equipment	Proposed equipment	Investment cost, US\$
Material reception, Control and storage			
Cutting			
Pressing and forming			
Welding			
Pressure testing			

Corrosion protection and painting	Present equipment	Proposed equipment	Investment cost, US\$
Cleaning and phosphatizing			
Painting			
Drying			
Exhaust system And cleaning device			

Filling, assembling and packing	Present equipment	Proposed equipment	Investment cost, US\$
Filling of extinguishing media			
Assembling			
Packing			

C.2 Fixed Halon-1301 fire fighting systems

Has any alternative been identified by the company Y/N _____

If "Yes", Which alternative:

Has any license arrangement been made: _____

Can the company install such systems today: _____

Other comments:

Has the company plans for conversion of production of Halon fixed fire fighting system to an alternative Y/N _____, if "Yes", specify when and the alternative selected:

Please, provide detailed breakdown of pre and post conversion operational costs.



National Cleaner Production Center Foundation

Registered under Section 42 of the Companies Ordinance, 1984

ANNEX 1.4 MAB Fire Protection Pvt. Ltd.

Name of the company: **MAB Fire Protection (Pvt.) Ltd.**

Address: MAB House 24-C, South Park Avenue, Phase II, Extension Karachi

- Phone: 92-21-5895295
- Fax: 92-215887166
- Contact person's name: Mr. Shrafat Hussain Dara
- Position: General Manager

A. **Brief description of the enterprise** (date of establishment, number of employees, products manufactured, other details):

- Established 1984
- 100 plus
- Engaged in specialized engineering, designing, installation, commissioning and supply of fire extinguishing systems and relative chemicals.
- This company has introduced Halons fire fighting systems for the first time in Pakistan. Stopped importing after 1990 and introduced FM 200, NAFS3, CEA 410 and other substitutes of Halons.

A.1 Legal status of the company (ownership): **Pvt. Ltd. Co.**

A.2 Branches/service offices in other parts of the country:

- Lahore
- Islamabad
- Hyderabad

A.3 Financial status of the company (provide figures for last 4 year period):

	1999	2000	2001	2002
Total turn over, US\$ Million	18.38	16.70	18.03	25.01
From halon activity, US\$				
Total production costs, US\$				
Profit, US\$				

A.4 Halon consumption:

	1999	2000	2001	2002
Number of Halon-1211 extinguishers produced (Sale)	40	97	153	318
Halon-1211 used, kg (Supplied)	300	436	466	1189
Number of Halon 1301 fixed fire fighting systems produced				
Halon-1301 used, kg				

If other type of halon was used, please specify the product, the total number of units manufactured and quantities of halon consumed.

If other type of halon was used, please specify the product, the total number of units manufactured and quantities of halon consumed.

B. Business activities

B.1 Range of portable fire extinguishers presently covered by the company:

Type of extinguishers:

- Halon-1211 (Y/N) YES,
- ABC powder (Y/N) YES,
- CO2 (Y/N) YES,
- Foam (Y/N) YES,
- Other (Y/N) YES (pls. specify) **Halotron**

Manufacturing of extinguishers: Y/N _____, Import (Y/N) _____, if "Yes", specify the type, number, total quantity of extinguishing media and the country the product is imported from:

B.2 Range of fixed fire fighting systems presently covered by the company:

Type of systems: Halon-1301 (Y/N) _____, CO2 (Y/N) _____, Foam (Y/N) _____, Sprinkler (Y/N) _____, Water mist (Y/N) _____, HFC based (Y/N) _____, HCFC based (Y/N) _____. Other (Y/N) _____ (pls. specify)

Manufacturing of systems: Y/N _____, Import (Y/N) _____, if "Yes", specify the type, number, total quantity of extinguishing media and the country the product is imported from:

B.3 Servicing and refilling of extinguishers and systems produced/distributed Y/N _____, If "Yes", specify the type, number, quantity of extinguishing media consumed for refilling:

C. Halon phase-out plans

C1. Portable Halon fire extinguishers

Has the company any plans for conversion of its production to halon-free alternative technology Y/N _____, if "Yes" when _____, specify the alternative selected:

Operational costs _____

Selected alternative: Before conversion, US\$

After conversion, US\$

ABC powder

CO2

Foam

Other

Please, provide detailed breakdown of costs for materials, extinguishing media, electricity etc.

Capital costs

Cylinders manufacturing	Present equipment	Proposed equipment	Investment cost, US\$
Material reception, Control and storage			
Cutting			
Pressing and forming			
Welding			
Pressure testing			

Corrosion protection and painting	Present equipment	Proposed equipment	Investment cost, US\$
Cleaning and phosphatizing			
Painting			
Drying			
Exhaust system And cleaning device			

Filling, assembling and packing	Present equipment	Proposed equipment	Investment cost, US\$
Filling of extinguishing media			
Assembling			
Packing			

C.2 Fixed Halon-1301 fire fighting systems

Has any alternative been identified by the company Y/N _____

If "Yes", Which alternative:

Has any license arrangement been made: _____

Can the company install such systems today: _____

Other comments: _____

Has the company plans for conversion of production of Halon fixed fire fighting system to an alternative Y/N _____, if "Yes", specify when and the alternative selected:

Please, provide detailed breakdown of pre and post conversion operational costs.
 Please, provide detailed breakdown of capital (investment) cost of equipment and services needed for conversion of your company to production of halon-free fixed fire fighting systems.

ANNEX 2. Main Users of Halons for Fire Protection
National Cleaner Production Center Foundation
 Registered under Section 42 of the Companies Ordinance, 1984

ANNEX 2.0 Main users of Halon for fire protection

Name of the user: _____
 Address: _____
 Fax: _____ Tel: _____ E-mail: _____
 Contact person's name: _____, Position: _____

A. User's profile:

B. Portable Halon-1211 fire extinguishers

Please, describe briefly the type of risk presently protected with portable Halon fire extinguishers:

Total number of Halon-1211 portable extinguishers installed: _____
 Total quantity of Halon-1211 in the installed portable extinguishers: _____ kg
 Number of Halon portable extinguishers bought during the last three years:
 2000: _____, 2001: _____, 2002: _____
 Quantity of Halon-1211 bought for servicing and refilling of installed portable extinguishers during the last three years: 2000: _____ kg, 2001: _____ kg, 2002: _____ kg.
 Quantity of Halon-1211 released for essential use (fire suppression) in the last three years:
 2000: _____ kg, 2001: _____ kg, 2002: _____ kg.

C. Fixed Halon-1301 fire fighting systems

Please, describe briefly the type of risk protected with Halon –1301 fire fighting systems:

Total number of Halon –1301 fire fighting systems installed: _____
 Total quantity of Halon –1301 in the installed fire fighting systems: _____ kg

Number of Halon fire fighting systems bought and installed during the last three years:

2000: _____, 2001: _____, 2002: _____

Quantity of Halon-1301 bought for servicing and refilling of installed systems during the last three years: 2000: _____ kg, 2001: _____ kg, 2002: _____ kg

Quantity of Halon-1301 released for essential use (fire suppression) in the last three years:

2000: _____ kg, 2001: _____ kg, 2002: _____ kg.

D. Other types of Halon installed in the fire fighting equipment

Please, describe briefly the type of risk protected

Please, specify the type of Halon used: _____

Total number of Halon portable extinguishers installed: _____

Total quantity of Halon in the installed portable extinguishers: _____ kg

Total number of Halon fixed fire fighting systems installed: _____

Total quantity of Halon in the installed fire fighting systems: _____ kg

Total quantity of Halon bought for servicing and refilling of installed portable extinguishers and fixed fire fighting systems during the last three years: 2000: _____ kg, 2001: _____ kg, 2002: _____ kg

Total quantity of Halon released for essential use (fire suppression) in the last three years:

2000: _____ kg, 2001: _____ kg, 2002: _____ kg.

E. Halon phase-out plans

Is the user aware of the Montreal Protocol and that Halons used as fire extinguishing agent in some types of portable fire extinguishers and fixed fire fighting systems are controlled substances to be phased out Y/N _____,

if "Yes", has the user established Halon phase-out plan Y/N _____

If "Yes", please specify the selected alternative for:

a) Halon portable extinguishers: _____

b) Halon fixed fire fighting systems: _____

Describe briefly the phase-out plan indicating expected duration of its implementation:

Has the user established an interim stock of Halons for servicing and refilling of installed Halon fire fighting equipment for the transitional period of its replacement with the selected alternatives Y/N _____

If "Yes", indicate the amount of Halon-1211: _____ kg, Halon-1301: _____ kg,
Other Halon: _____ kg (specify Halon type)

If "No", has the user made any arrangement for supply of Halons for servicing and refilling
operations Y/N _____.

Has any estimate been made on the Halon phase-out cost Y/N _____, if "Yes", give
indication in US\$



National Cleaner Production Center Foundation

Registered under Section 42 of the Companies Ordinance, 1984

ANNEX 2.1 Main users of Halon (PIA) for fire protection

Name of the User: **Pakistan International Airlines**

Address: **Head Office Building Karachi**

Fax: 92-21-4572225

Tel: 92-21-4794710

E-mail: tmoeen@piac.com.pk

Contact person's name: Mr. Tariq Moeen

Position: Chief Fire Protection

A. User's profile:

Commercial Air Line, for passengers and Cargo Services

B. Portable Halon-1211 fire extinguishers

Please, describe briefly the type of risk presently protected with portable Halon fire extinguishers:

Halon is mainly being used in aircrafts, and some quantity in ground facilities.

Total number of Halon-1211 portable extinguishers installed: **300**

Total quantity of Halon-1211 in the installed portable extinguishers: **600** kg

Number of Halon portable extinguishers bought during the last three years:

2000: **20**, 2001: **20**, 2002: **20**

Quantity of Halon-1211 bought for servicing and refilling of installed portable extinguishers during the last three years: 2000: **450** kg, 2001: **450** kg, 2002: **450** kg.

Quantity of Halon-1211 released for essential use (fire suppression) in the last three years:

2000: **450** kg, 2001: **450** kg, 2002: **450** kg.

C. Fixed Halon-1301 fire fighting systems

Please, describe briefly the type of risk protected with Halon -1301 fire fighting systems:

Used in aircraft engines

Total number of Halon -1301 fire fighting systems installed: _____

Total quantity of Halon -1301 in the installed fire fighting systems: _____ kg

Number of Halon fire fighting systems bought and installed during the last three years:

2000: _____, 2001: _____, 2002: _____

Quantity of Halon-1301 bought for servicing and refilling of installed systems during the last three years: 2000: _____ kg, 2001: _____ kg, 2002: _____ kg

Quantity of Halon-1301 released for essential use (fire suppression) in the last three years:

2000: _____ kg, 2001: _____ kg, 2002: _____ kg.

D. Other types of Halon installed in the fire fighting equipment

Please, describe briefly the type of risk protected

D. Other types of Halon installed in the fire fighting equipment

Please, describe briefly the type of risk protected

NIL

Please, specify the type of Halon used: _____

Total number of Halon portable extinguishers installed: _____

Total quantity of Halon in the installed portable extinguishers: _____ kg

Total number of Halon fixed fire fighting systems installed: _____

Total quantity of Halon in the installed fire fighting systems: _____ kg

Total quantity of Halon bought for servicing and refilling of installed portable extinguishers and fixed fire fighting systems during the last three years: 2000: _____ kg, 2001: _____ kg, 2002: _____ kg

Total quantity of Halon released for essential use (fire suppression) in the last three years: 2000: _____ kg, 2001: _____ kg, 2002: _____ kg.

E. Halon phase-out plans

Is the user aware of the Montreal Protocol and that Halons used as fire extinguishing agent in some types of portable fire extinguishers and fixed fire fighting systems are controlled substances to be phased out Y/N YES ,

if "Yes", has the user established Halon phase-out plan Y/N YES

If "Yes", please specify the selected alternative for:

a) Halon portable extinguishers: _____ CO₂

b) Halon fixed fire fighting systems: _____ CO₂

Describe briefly the phase-out plan indicating expected duration of its implementation:

- For ground facilities the practice of Halons has been stopped
- For aircrafts the use is linked with the international practice.

Has the user established an interim stock of Halons for servicing and refilling of installed Halon fire fighting equipment for the transitional period of its replacement with the selected alternatives Y/N NO

If "Yes", indicate the amount of Halon-1211: _____ kg, Halon-1301: _____ kg,

Other Halon: _____ kg (specify Halon type)

If "No", has the user made any arrangement for supply of Halons for servicing and refilling operations Y/N YES From Local Market.

Has any estimate been made on the Halon phase-out cost Y/N NO , if "Yes", give indication in US\$



National Cleaner Production Center Foundation

Registered under Section 42 of the Companies Ordinance, 1984

ANNEX 2.2 Main users of Halon (PTCL) for fire protection

Name of the User: **Pakistan Telecommunication Corporation Ltd.**

Address: _____

Fax: _____ Tel: _____ E-mail: _____

Contact person's name: _____, Position: _____

A. User's profile:

B. Portable Halon-1211 fire extinguishers

Please, describe briefly the type of risk presently protected with portable Halon fire extinguishers:

Total number of Halon-1211 portable extinguishers installed: _____

Total quantity of Halon-1211 in the installed portable extinguishers: _____ kg

Number of Halon portable extinguishers bought during the last three years:

2000: _____, 2001: _____, 2002: _____

Quantity of Halon-1211 bought for servicing and refilling of installed portable extinguishers during the last three years: 2000: _____ kg, 2001: _____ kg, 2002: _____ kg.

Quantity of Halon-1211 released for essential use (fire suppression) in the last three years:

2000: _____ kg, 2001: _____ kg, 2002: _____ kg.

C. Fixed Halon-1301 fire fighting systems

Please, describe briefly the type of risk protected with Halon -1301 fire fighting systems:

_____ Total
 number of Halon -1301 fire fighting systems installed: _____

Total quantity of Halon -1301 in the installed fire fighting systems: _____ kg

Number of Halon fire fighting systems bought and installed during the last three years:

2000: _____, 2001: _____, 2002: _____

Quantity of Halon-1301 bought for servicing and refilling of installed systems during the last three years: 2000: _____ kg, 2001: _____ kg, 2002: _____ kg

Quantity of Halon-1301 released for essential use (fire suppression) in the last three years:

2000: _____ kg, 2001: _____ kg, 2002: _____ kg.

D. Other types of Halon installed in the fire fighting equipment

Please, describe briefly the type of risk protected

Please, specify the type of Halon used: _____

Total number of Halon portable extinguishers installed: _____

Total quantity of Halon in the installed portable extinguishers: _____ kg

Total number of Halon fixed fire fighting systems installed: _____

Total quantity of Halon in the installed fire fighting systems: _____ kg

Total quantity of Halon bought for servicing and refilling of installed portable extinguishers and fixed fire fighting systems during the last three years: 2000: _____ kg, 2001: _____

kg, 2002: _____ kg

Total quantity of Halon released for essential use (fire suppression) in the last three years:

2000: _____ kg, 2001: _____ kg, 2002: _____ kg.

E. Halon phase-out plans

Is the user aware of the Montreal Protocol and that Halons used as fire extinguishing agent in some types of portable fire extinguishers and fixed fire fighting systems are controlled substances to be phased out Y/N _____ ,

if "Yes", has the user established Halon phase-out plan Y/N _____

If "Yes", please specify the selected alternative for:

a) Halon portable extinguishers: _____

b) Halon fixed fire fighting systems: _____

Describe briefly the phase-out plan indicating expected duration of its implementation:

Has the user established an interim stock of Halons for servicing and refilling of installed Halon fire fighting equipment for the transitional period of its replacement with the selected alternatives Y/N _____

If "Yes", indicate the amount of Halon-1211: _____ kg, Halon-1301: _____ kg,

Other Halon: _____ kg (specify Halon type)

If "No", has the user made any arrangement for supply of Halons for servicing and refilling operations Y/N _____.

Has any estimate been made on the Halon phase-out cost Y/N _____, if "Yes", give indication in US\$

ANNEX 3. Meetings with various Organizations**National Cleaner Production Center Foundation**

Registered under Section 42 of the Companies Ordinance, 1984

ANNEX 3.1. Meeting at Ministry of EnvironmentMeeting with Joint Secretary Ozone Cell on May 09, 2003

- Participants:**
1. Syed Sabtain, Joint Secretary, Ozone Cell
 2. Ch. Zahoor Sardar, Project Director
 3. Mr. M. Shaukat, Dy. Director
 4. Mr. Ibrahim Saeed, NCPC Consultant
 5. Dr. Irshad Ahmad, Clean Production Promter

Discussion:

- Dr. Irshad explained the objectives of the study and briefed about the Terms of Reference and Scope of work for the Phase Out Survey for Halons in Pakistan and requested the support of the concerned Govt. department to obtain the true data.
- The Joint Secretary asked about the manpower at NCPC and advised to submit the profile for the record, extended his full support and advised that the efforts should be made to collect the verifiable and certifiable data. Regarding the potential stakeholders for Halons the JS suggested to visit the following department/organization.
 - d. Central Board of revenue
 - e. Customs
 - f. Ministry of Industries
 - g. Ministry of Commerce
 - h. Ministry of Defense Production
 - i. Directorate of Federal Bureau of Statistics
 - j. Export Promotion Bureau
 - k. Halons Equipment Manufacturers and Halons end Users

Decisions:

1. NCPC Team will visit Ozone Cell, to meet Ch. Zahoor and discuss in detail and seek guidelines, along with the authority letter for the survey team.
2. Mr. Shukat will provide the addresses and contacts of all the concerned potential stakeholders listed above.
3. Mr. Shukat will provide:
 - List of Halons importers
 - List of the industries
 - Freez Level list
 - Category allocation

Meeting with Director Ozone Cell on May 20, 2003**Participants:**

- 1. Ch. Zahoor Sardar, Project Director**
- 2. Dr. Irshad Ahmad, Clean Production Promoter**

Dr. Irshad Discussed the road map with the Director and requested for the guidelines that how to proceed with the survey. The Director has provided the Authority Letter to NCPC Foundation to conduct the survey on the behalf of Government of Pakistan and also provided the following lists.

- List of the CFC importers
- List of the industries
- Freez Level list



National Cleaner Production Center Foundation

Registered under Section 42 of the Companies Ordinance, 1984

ANNEX 3.2. Meeting at Ministry of Industries, Commerce and CBR

Ministry of Industries and Production

Meeting with **Mr. M. Usman (Assistant Chief)**
Ministry of Industries and Production
on May 21, 2003

Participants:

1. **Mr. M. Usman, Assistant Chief, MoI&P**
2. **Mr. Waqar Ahmad, Marketing Promoter**

Mr. M. Usman informed that there is no data of Halons available with Ministry of Industries and Production. Their working parameters are specifically to suggest the Pre budget and post budget situation regarding tariff and customs for the different industries in Pakistan. As Halons are not manufactured in the country therefore he referred to CBR for the needful because CBR deals with the customs and imported materials.

Meeting with **Mr. Zaidi (Joint Secretary)**
Ministry of Industries and Production
on June 7th, 2003

Participants:

1. **Mr. Zaidi, Joint Secretary**
2. **Dr. Irshad Ahmad, Clean Production Promoter**

Mr. Zaidi, the Joint Secretary MOI informed that although, MOI has no concern with the imported chemicals, but a section in MOI, look after the chemicals/products having impacts on Environment. No information was available.

Ministry of Commerce and Trade

Meeting with **Miss Khalida Bashir (Section Incharge)**
Ministry of Commerce and Trade
on May 21, 2003

Participants:

1. **Miss Khalida Bashir, Section Incharge, MoC&T**
2. **Mr. Waqar Ahmad, Marketing Promoter**

Miss Khalida Bashir informed that MOC is still working on Halons phase out survey infact the whole data is not compiled yet and it would take some time for the finalization of all the data. MOC don't have the list of Halons Importer list. She provided the Pakistan Customs Tariff Code of Halons i.e. **2903.4600**.

data. MOC don't have the list of Halons Importer list. She provided the Pakistan Customs Tariff Code of Halons i.e. 2903.4600.

Central Board of Revenue

Meeting with Mr Gul Rehman
Central Board of Revenue
on May 21, 2003

Participants:

3. **Mr. Gul Rehman,**
4. **Mr. Waqar Ahmad, Marketing Promoter**

Both Miss Khalida (MOC) as well as Mr. Usman (MOI) suggested to visit CBR for the collection of data and emphasized that the required information will only be obtained through the CBR because it wholly deals with the customs and also to get the importers list of Halons and its customers/Users.

Mr. Gul Rehman informed that due to the preparation of upcoming **Annual Budget 2003-04**, nobody can enter the office without the **permission of Member.**

Meeting with Member CBR
on May 26, 2003

Participants:

2. **Dr. Athar Masood, Member CBR**
3. **Dr. Irshad Ahmad, Clean Production Promter**

Discussion:

- Dr. Irshad explained the objectives of the study and briefed about the Terms of Reference and Scope of work for the Phase Out Survey for Halons in Pakistan and requested the support of the concerned Govt. department to obtain the true data.
- Dr. Athar asked about the NCPC activities and its role for environmental protection. He also asked about the ODS phase our activities in Pakistan. Dr. Irshad explained in detail the role of NCPC and also informed about the ODS phase out activities already being carried out in presently in progress.
- Dr. Irshad provided the PCT Code for Halons for the info. PCT Code for Halons is 2903-4600. Dr Athar confirmed the code from the code book and informed that the code comprise the following three chemicals:
 - l. Bromochlorodifluoromethane
 - m. Bromotrifluoromethane
 - n. Dibromotetrafluroethane
- Dr. Athar informed that the import data under this code would be available only in total for the three chemicals nor individual.

Decisions:

Dr. Athar promised to provide the relevant data with in couple of Days:



National Cleaner Production Center Foundation

Registered under Section 42 of the Companies Ordinance, 1984

ANNEX 3.3. Meeting at Bureau of Statistics

Meeting on June 07, 2003

at

Federal Bureau of Statistics,
Publication Section, 1-B, SMCH, Society, Karachi-3

Participants:

3. Dr. Noor Muhammad Larik Director General
4. Syed Zawar Haider Zaidi Deputy Director General
5. Mr. Ghulam Mohi-uddin Awan, Chief Scientific Officer
6. Mr. Khalid Mahmood Scientific Officer
7. Mr. Zeeshan Librarian
8. Mr. Malik Zafar Iqbal Khan, SO National Accounts Islamabad
9. Dr. Irshad Ahmad, Clean Production promoter

Discussions:

- Pakistan Customs Tariff (PCT) Code for Halons = 2903-4600, under the Code following three chemicals are allocated:
 - i. Bromochlorofluoromethane (Halon 1211)
 - ii. Bromotrifluoromethane (Halon 1301)
 - iii. Dibromotetrafluoroethane (Halon 2402)
- The above mentioned PCT Code is based on the following, Bureau of Statistics Code for organic chemicals = 5113800 Halogenated derivatives of a-cyclic hydrocarbons containing two or more halogens, which includes the following.
 - i. 5113805 pentachlorofluoroethane
 - ii. 5113811 bromochlorodifluoromethane (Halon 1211)
 - iii. 5113812 bromotrifluoromethane (Halon 1301)
 - iv. 5113813 dibromotetrafluoromethane (Halon 2402)
 - v. 5113819 chlorotrifluoromethane
 - vi. heptachlorofluoropropane
 - vii. hexachlorodifluoropropane
 - viii. dichlorohexafluoropropane
 - ix. difluoromethane
 - x. bromochlorodifluoromethane and other derivatives
- According to Pakistan Statistical Year Book 2003, Page 636-637, Under Trade, 18.6 Imports by Commodity Group, the imported chemicals are reported under the following heads.
 - V. Organic Chemicals
 - VI. Inorganic Chemicals, elements, oxides and Halogen salts.
 - VII. Other inorganic chemicals

VIII. Radio active and associated materials

- The data for the code 5113800 is given as follows;¹²

5113800; Halogenated derivatives of a-cyclic hydrocarbons containing two or more halogens		
Year	Quantity (M.Tons)	Cost (Million Rupees)
2001-02	418.145	33.938
2000-01	395.107	34.199
1999-2000	993.507	92.630
1998-99	957.656	85.506
1997-98	533.950	48.076
1996-97	1177.046	93.718
1995-96	361.046	28.877
1994-95	182.820	08.427
1993-94	274.254	17.681
1992-93	258.107	12.632
1991-92	348.104	24.730
1990-91	309.158	11.278

- The Bureau of Statistics has also compiled data for the import of Halons 1211 fire extinguishers being imported from 1991-2002.

5113800; Halogenated derivatives of a-cyclic hydrocarbons containing two or more halogens		
Year	Quantity (M.Tons)	No. of Portable Extinguishers
		8424.1000
2002-03 (Jul-Mar)	117	34,126
2001-02	100	35,494
2000-01	25	42,854
1999-2000	-	34,393
1998-99	-	28,898
1997-98	10	26,663
1996-97	-	43,294
1995-96	104	50,259
1994-95	159	52,971
1993-94	-	28,760
1992-93	-	34,434
1991-92	102	33,015

¹² FTS; Foreign Trade Statistics of Pakistan 1990 - 2002



National Cleaner Production Center Foundation

Registered under Section 42 of the Companies Ordinance, 1984

ANNEX 3.4. Meeting with Fire Fighting Equipment Suppliers

MEETING WITH TYCO FIRE AND SECURITY, MAY 30, 2003

Participants:

1. Mr. Mohammad Sikandar Hayat, Safety Engineer
2. Dr. Irshad Ahmad, Clean Production Promter

Discussion:

A. The Halons data can be obtained through:

- i. CBR- Legal Import
- ii. Dealers - Illegal Susat border China
- iii. With different name plate – smuggling
- iv. Ship breaking - Gadani

B. Potential users:

- i. Mobile phones - User switching station Each station have one container (Halons 1211=22kgs)
 - a. Paktil 35 stations = 770 kgs, **around 1000 kg**
 - b. Mobilink 40 stations = 800 kgs **around 1000 kgs**
- ii. PINSTECH and KRL
- iii. HIT – Manufacturer of Tanks 100
 - a. Crew Halons 1211; 100x2.2=220 kg
 - b. Ammunition Halons 1301; 100x4.0=400 kg
 APC 100
 - a. Crew Halons 1211; 100x2.2=220 kg
 - b. Ammunition Halons 1301; 100x4.0=400 kg
- iv. Defence; each vehicle have one portable cylinder of Halon 1211 **1.0 Kg**
- v. Navey
- vi. Air Force
- vii. Kamra Aeronautical Complex 1999 Minhas Corp. ?
- viii. PIA and other airlines
- ix. Banks:
 - a. Alfalah Rwp. Halon 1301 = 22 Kg
 - b. Faisal Bank Rwp; Halon 1301 = 22 kg
 - c. Emmirat Islamabad 1301 = 22 kg

Fir Authorities – FPAP Fire Protection Association of Pakistan (Mr. Aurang Zeb 2274261)
- Karachi office

Fir Safety Codes and Standards (Dr. Rizwan UNDP- Saudi Pak Towerr)
- Codes of National Fire Protection Association (NFPA) USA

Fire Equipment – inspection

- Civil defense authority
- commercial inspection monthly

- Pak National Institute of Fire Technology
- Hafiz Zafar Sr. Instructor Training Phone 9213486

Price of Halon Rs. 2200 per Kg. – Saffaco Sandi Arab
 CTC Rs. 500 – German
 CTC Rs. 55 /kg Local

Decisions:

4. **Mr. Sikander will provide information about Navy and address of Dr. Rizwan.**

ANNEXURE-4.0; Halons Installed Capacity

Area	Halons-1211 Kgs	Halons-1301 Kgs	Halons-Others* Kgs	Multiplicier	Halons-Total Kgs	Grand Total
I. PIA; 6x6x18+2	594	5260	450	1	6305	6305
II. Shaheen; 6x6x6	216	1700		1	1916	1916
III. Aeroaisia; 6x6x6	216	1700		1	1916	1916
IV. C-130 10#	70		160	30	230	6900
V. Civil Aviation	1850	164		6	2014	12084
Total	2946	8824	610		12381	29121

Area	Halons-1211 Kgs	Halons-1301 Kgs	Halons-Others* Kgs	Multiplicier	Halons-Total Kgs	Grand Total
I. Paktel; 22x35+4x2	1008			1	1008	1008
II. Moblilink; 22x40+15x3	1445			1	1445	1445
III. Instaphone; 22x30+10x6	960	30		1	990	990
IV. U-Phone; 22x51	1122			1	1122	1122
V. STA; 4x13	52			4	52	208
VI. Hello; 22x31	660			1	660	660
VII. Mobile Zone; 4x2	25			4	25	100
VIII. Telecard 17x 30	510			1	510	510
IX. PTCL 22x100	2200			4	2200	8800
X. TIP Haripur 75x4	300			1	300	300
XI. Cello Phone		700		1	700	700
XII. CTI	500	100		1	600	600
Total	8782	830	0		9612	16443

Area	Halons-1211 Kgs	Halons-1301 Kgs	Halons-Others* Kgs	Multiplicier	Halons-Total Kgs	Grand Total
I. PBC 25x4x30	3000			1	3000	3000
II. PTV 50x4x4	4000			1	4000	4000
Total	7000	0	0		7000	7000

Area	Halons-1211 Kgs	Halons-1301 Kgs	Halons-Others* Kgs	Multiplicier	Halons-Total Kgs	Grand Total
1. Cigerates	25			20	25	500
2. Fertilizer	1000			8	1000	8000
3. NSD	0	600		1	600	600
4. Textile small	24			50	24	1200
5. ICI 1000x6	6000			1	6000	6000
6. DH 16x6	96			1	96	96
7. Ittihad Chemicals 30x6	180			1	180	180
8. Polyester	360			5	360	1800
9. Ghee Mills	60			25	60	1500
10. Paper Mills	100			15	100	1500
11. Packages 10x2+10x4	60			1	60	60
12. Pharamaceuticals	300			10	300	3000
13. Tea Factories	72			5	72	360
14. Refrigeration	60			5	60	300
15. Aluminum Process	500			3	500	1500
16. Metals	500			5	500	2500
17. Textile Medium	100			50	100	5000
18. SSGC GE Lab	2500			1	2500	2500
19. Textile Large	500			5	500	2500
20. TOKAI Elect.	2000			1	2000	2000
21. Dowlence	3000			1	3000	3000
22. Latif Textile	6000			1	6000	6000
23. Liberty Textile	2000			1	2000	2000
24. General Tyre	2000			2	2000	4000
25. Cement	1000			10	1000	10000
26. Javedan Cement	2000			1	2000	2000
27. Muller & Phips	1000			3	1000	3000
28. KW	1500			1	1500	1500
29. Suger Mills	500			8	500	4000
30. Lakhani Silk	1000			5	1000	5000
31. Gul Ahmad 17 Units	1500			1	1500	1500
32. Pakistan Steel Mills	7499	1030		2	8529	17058
33. PSE	5000			1	5000	5000
34. Novartis Pharma	376			1	376	376
35. Thatta Cement	60			1	60	60
36. Pak Suzuki	100			8	100	800
Total	48972	1630	0		50602	106390

Area	Halons-1211 Kgs	Halons-1301 Kgs	Halons-Others* Kgs	Multiplier	Halons-Total Kgs	Grand Total
I. OGDC 6x25	150	1165		1	1315	1315
II. ARL 6x16	96			1	96	96
III. PPL		300		1	300	300
IV. Sui Norhtern 500x6	3000			1	3000	3000
V. Mari Gas	3205	60		1	3265	3265
VI. BOC		50		1	50	50
VII. Asia Petroleum	18			1	18	18
VIII. PSO	12	60		100	72	7200
IX. Sui Southern	4000			1	4000	4000
Total	10481	1635	0		12116	19244

Area	Halons-1211 Kgs	Halons-1301 Kgs	Halons-Others* Kgs	Multiplier	Halons-Total Kgs	Grand Total
I. Lakhra Power Plant 200x6	1200			1	1200	1200
II. Jamshoro Power Plant 100x6	600			1	600	600
III. Gudu Power Plant 100x6	1300			1	1300	1300
IV. KAPCO Kot Adu 70x6	1200			1	1200	1200
V. Hubco	60	164		1	224	224
VI. Hub Power dadu		3000		1	3000	3000
VII. Other Power Plants	1000	500		1	1500	1500
VII. WAPDA 45x200	25000	1000		1	26000	26000
VIII. WAPDA House 70x6	420			1	420	420
IX. Lal Pir	1200			1	1200	1200
X. Muzzafar Garh	600			1	600	600
Total	32580	4664	0		37244	37244

Area	Halons-1211 Kgs	Halons-1301 Kgs	Halons-Others* Kgs	Multiplier	Halons-Total Kgs	Grand Total
I. Ziauddin Kaarchi4x20	80			5	80	400
II. Agha Khan Hospital	500			5	500	2500
III. Other Hospitals	300			10	300	3000
Total	880	0	0		880	5900

Area	Halons-1211 Kgs	Halons-1301 Kgs	Halons-Others* Kgs	Multiplicier	Halons-Total Kgs	Grand Total
Faisal		22		5	22	110
Alfalah		22		5	22	110
Emirat	100			4	100	400
Oman 6x9+2x8	70			3	70	210
Habib Bank 36x4 (planning to rep)	144			10	144	1440
First Women Bank 5x2	10			10	10	100
Standard Chartered 10x3	30	2000		3	2030	6090
State Bank	800			3	800	2400
National Bank	500			5	500	2500
City		300		5	300	1500
UBL		300		5	300	1500
MCB	500			10	500	5000
Total	2154	2644	0		4798	21360

Area	Halons-1211 Kgs	Halons-1301 Kgs	Halons-Others* Kgs	Multiplicier	Halons-Total Kgs	Grand Total
Holiday Inn 13x6	78			3	78	234
Reagent Plaza 6x6	36			2	36	72
Piza Hut 8x6	48			4	48	192
Serena 6x4x	24			3	24	72
Others	20			50	20	1000
Total	206	0	0		206	1570

Area	Halons-1211 Kgs	Halons-1301 Kgs	Halons-Others* Kgs	Multiplicier	Halons-Total Kgs	Grand Total
Jang Lahore (News Paper)	48	500		3	548	1644
Others	1000			1	1000	1000
Total	1048	500	0		1548	2644

Area	Halons-1211 Kgs	Halons-1301 Kgs	Halons-Others* Kgs	Multiplicier	Halons-Total Kgs	Grand Total
I. HIT 2.2+4x200x5	10000	1000		1	11000	11000
II. Gujranwala Cantt	500	400		20	900	18000
III. PNS		500		1	500	500
IV. Transport 2x1000	2000			1	2000	2000
V. Pak Navy	2000	5000		10	7000	70000
VI. NSD	800			1	800	800
VII. PINSTECH	3000			1	3000	3000
VIII. KRL	200			1	200	200
IX. Air Force	50000	600		1	50600	50600
X. AEC 37x6+13x1	235			1	235	235
Total	68735	7500	0		76235	156335

Table-12; Electronics

Area	Halons-1211 Kgs	Halons-1301 Kgs	Halons-Others* Kgs	Multiplicier	Halons-Total Kgs	Grand Total
I. Samsung 4x2x30	240			5	240	1200
II. Computer Organizations	96	30		20	126	2520
Total	336	30	0		366	3720

Table-13; Miscellaneous

Area	Halons-1211 Kgs	Halons-1301 Kgs	Halons-Others* Kgs	Multiplicier	Halons-Total Kgs	Grand Total
I. GAC Shipping 6+8+2	16			5	16	80
II. Lahore Stock Exchange 5x4	20			5	20	100
III. Punjab Public Service Commi	180			5	180	900
IV. American School 8x4	32			3	32	96
V. Private Homes	1			10	1	10
VI. MAB (Supply)	2391			1	2391	2391
VII. Other sources not explored (10% of Total)	50000			1	50000	50000
Total	52640	0	0		52640	53577

Table-14; Maritime						
Area	Halons-1211 Kgs	Halons-1301 Kgs	Halons-Others* Kgs	Multiplicier	Halons-Total Kgs	Grand Total
I. KPT	600	600		1	1200	1200
II. Port Qasim	2000			1	2000	2000
Total	2600	600	0	2	3200	3200

Table-15; Communication						
Area	Halons-1211 Kgs	Halons-1301 Kgs	Halons-Others* Kgs	Multiplicier	Halons-Total Kgs	53577
I. Railway	500			1	500	500
II. NHA 50x30	1500			1	1500	1500
Total	2000	0	0		2000	2000