

# **THE HALON SECTOR**

**2006 ANNUAL PROGRAM**

**September 2005**

## Data Sheet

Country	China
Year of plan	2006
# of years completed	8
# of years remaining under the plan	4
Ceiling of Halon 1211 and halon 1301 consumption of the 2005 Annual Program	Halon 1211: 1,890MT Halon 1301: 150MT
Ceiling of Halon 1211 and Halon 1301 consumption of 2006 Annual Program	Halon 1211: 0 MT Halon 1301: 100 MT
Ceiling of halon 1211 and halon 1301 production of 2005 Annual Program	Halon 1211: 1,990 MT Halon 1301: 200 MT
Ceiling of halon 1211 and halon 1301 Production of 2006 Annual Program	Halon 1211: 0 MT Halon 1301: 100 MT
Total MLF funding approved in principle (November 1998)	US\$ 62 million
Total MLF funding released to the Bank by September 2005	\$ 49.8 million
Total MLF funding released from the World Bank to China	\$ 39 million
Funding requested for the 2006 Annual program	\$ 11.4 million

National Implementing operating agency	State Environmental Protection Administration
International implementing agency	The World Bank

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## **The Halon Sector 2006 Annual Program**

### **BACKGROUND**

1. In accordance with the Executive Committee's approval of the Sector Plan for Halon Phaseout in China (UNEP/OzL.Pro/ExCom/23/68) and the CFC/CTC/Halon Accelerated Phaseout Plan in China (UNEP/OzL.Pro/Excom/44/73) (hereinafter referred to as "APP"), China is hereby requesting release of the ninth tranche of US\$11.4 million for implementation of the year 2006 Annual Program. With this funding, China's halon 1211 production and consumption will be reduced to 0 MT in 2006. The halon 1301 production will be reduced to a maximum of 100 MT and consumption to a maximum of 100 MT in 2006. Details of the annual program are in Part B. As per the phase-out target of halon 1301, China agrees to phase-out the production and consumption of halon 1301 in compliance with APP instead of the China Halon Sector Strategy. Details are in Table 2.

2. After the approval of the China Halon Sector Strategy at the 23<sup>rd</sup> meeting of the ExCom and release of funds for the first (1998) Annual Program, China began implementation of the Halon Sector Strategy. Since the start of the program, China has developed supporting policies and regulations. Out of the initial number of 14 Halon-1211 production plants, 12 have been closed and dismantled their production lines completely, and production capacity has been reduced to two remaining halon 1211 production plants. Only one halon 1301 producer in China continues to retain its production capacity. Actual production has consistently remained within the program limits.

3. Out of a total of 72 halon fire fighting extinguisher manufacturers originally identified as potential beneficiaries, 14 enterprises have signed contracts to close their extinguisher production, and 47 enterprises have signed contracts to convert their manufacturing lines for fire extinguishers from halon to non-ODS fire extinguishers. 58 of the 61 enterprises have completed their closure/conversions projects, and three companies are presently implementing their closure/conversion projects. Four additional equipment manufacturers were identified and located in 2001 to be operating without valid licenses. They were accordingly shut down in 2001 by administrative measure without any funding. Out of a total of 22 originally identified halon fire fighting systems manufacturers, 14 enterprises have signed contracts to convert their manufacturing of halon fire extinguishing systems from halon to non-ODS extinguishing systems; 11 of these have been completed, and the other three are presently implementing their conversions. Based on review of the status of licensed halon fire equipment companies, it has been found that the remaining eligible 11 fire extinguisher manufacturing enterprises and 8 halon 1211 fire extinguishing system enterprises has either closed down or merged with other companies.

4. A total of 61 technical assistance activities have been planned as of the 2005 annual program. These TA activities include activities for strengthening implementation capacity for the Sector Plan, and preparing standards to ensure quality and reliability of halon substitute fire extinguishers and fire extinguishing systems. 37 out of 61 TA activities have been completed, 14 are ongoing and 10 cancelled of various reasons.

5. The national halon 1211 production level allowed for 2005 is 1,990 MT. Compared to the actual production level of 11,644 MT in 1997, the baseline year for the halon sector, the annual halon 1211 production has been reduced to 1,990MT by the end of 2004. A total reduction of 9,654 MT. The ceiling allowed for halon 1301 production for 2005 is 200 MT, a reduction of 418 MT from 1997 baseline level of 618 MT. It is estimated that at least a total production of 55,185 tonnes of halon 1211 of 2,729 tonnes of halon 1301 have been prevented from 1998 to 2004 through the halon phase-out program. A detailed implementation status is provided in Part A.

6. Despite the higher costs of halon 1301 substitutes, the reduction in demand for halon 1301 can be assigned to the policies introduced and availability of new substitutes now available in China. Some of the chemical producers have invested in the development of HFC-227ea production facilities and now has started production and sale of HFC-227ea. The introductions of new, but more costly substitutes are supported by a number of TA activities.

7. As far as the other halons are concerned, halon 1202 is generated as a by-product during the production of halon 1211. According to information provided by the larger halon 1211 producers, the amount of halon 1202 generated averages between 20 and 30 kg per ton of halon 1211 produced. This halon 1202 is neither vented, nor sold, but is recycled into halon 1211 production. A ban on sales of halon 1202 in the market has been promulgated by the Ministry of Public Security (MPS) in February 1998. Based on its regulations and monitoring measures, China is confident that there is no halon 1202 sold in the market. China has never produced halon 2402, and has never had plans to do so. In accordance with national regulations, a new halon 2402 production facility would require a new production license, and such a license can no longer be obtained because of the ban on setting up new halon production facilities or expanding existing halon production facilities effective on November of 1997.

8. These phaseout results have been achieved through close cooperation between the State Environmental Protection Administration (SEPA), the Ministry of Public Security (MPS), China National Chemical Construction Corporation (CNCCC), and the concerned enterprises. The experience from the implementation has confirmed the necessity of strong policy enforcement and monitoring of the halon phaseout program. Because of the number and geographical distribution of the enterprises involved, the success of the program depends to a large extent on the cooperation and support from provincial and local Environmental Protection Bureaus and Fire Fighting Bureaus. Training and public awareness therefore continue to be key elements in the halon sector plan implementation.

9. The rapid reduction of halon 1211 makes it imperative and important for fostering the supply of alternative fire extinguishing agents and fire fighting equipment in order to maintain the national fire protection and fire fighting capability. Special initiatives have been taken up to strengthen the supply of light-weight high pressure CO<sub>2</sub> cylinders, ABC powder, and vegetable protein foam. A halon bank was established in Guangdong. Details of these initiatives are provided in Part A.

10. The production and consumption of halons in China since the start of the halon sector plan is described in Table 1 below. Consumption in this table was determined in accordance with the ExCom approval conditions as total annual production plus imports, minus exports. As indicated above, China has reported that no other halons were produced in China, including halon 1202 and halon 2402.

11. It is noted that halon 1301 is used for producing pesticide, pesticide intermediate and pharmaceutical intermediate starting from 2003. The status of a feedstock halon 1301 use has been verified and confirmed as a feedstock application. It is also noted that a total of 162.9 **tons** of halon 1301 were procured from ZCRI in 2004 and 168.3 tons used as feedstock for the first seven months in 2005. The demand for the feedstock is climbing during past several years.

12. All production and consumption data as of the year of 2004 has been verified by an annual international audit commissioned by the World Bank.

**Table 1: Annual Production and Consumption of Halons under the Sector Plan**

	Halon 1211				Halon 1301			
	Production		Consumption		Production		Consumption	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
1997 (baseline year)	9,950	11,644	NA	10,849	618	618	NA	NA
1998	7,960	7,842	7,160	7218	618	450	300	-152 <sup>1/</sup>
1999	5,970	5,965	5,370	5280	618	484	300	304
2000	3,980	3,978	3,580	3650 <sup>2/</sup>	618	428	300	377 <sup>2/</sup>
2001	3,317	3,117	3,117	2,832	618	213	300	180
2002	2,654	2,469	2,654	2,284	600	0	150	-36
2003	1,990	1,884	1,890	1,692	600	0	150	-26
2004	1,990	1,068	1,890	833	200	22	150	-26
2005	1,990		1,890		200		150	
2006	0				100		100	
2007	0				100		100	
2008	0				100		100	
2009	0				100		100	
2010	0				0			

<sup>1/</sup> The negative consumption of Halon 1301 in 1998 (-152 MT) reflects the export of 602 MT, which included part of the stock (328MT) from the previous year's production. Therefore, the total consumption in 1998 (Consumption=Production +Import - Export) is negative.

<sup>2/</sup> Remedial action for the excess consumption in 2000 was taken by appropriately reducing consumption quota in 2001.

**Table 2: Halon 1301 phase-out targets under the Sector Plan**

In ODS tones		2004	2005	2006	2007	2008	2009	2010
APP	Max allowable halon 1301 production	200	200	100	100	100	100	0
	Max allowable halon 1301 consumption and export	150	150	100	100	100	100	0
China Halon Sector Strategy	Halon 1301 production	600	600	150	150	150	150	0
	Halon 1301 consumption	150	150	100	100	100	100	0

## Part A

### Implementation Status of Previous Annual Programs

#### 1998-2004 Annual Programs

1. ***Phaseout targets and objectives.*** As described in Table 1, production and consumption of halons has been reduced annually under the halon sector agreement. While production has consistently been retained below the agreement levels, the consumption of halons (production adjusted for net export) exceeded the targets twice (for 1998 and 2000) as exports of halons turned out to be lower than expected. This was only discovered when the final export figure became available to SEPA in the beginning of the following year. These developments were promptly reported to the ExCom, and corrective measures were taken as follows:

- (a) reduction of excess consumption from the next year's consumption limit (for 2000);
- (b) confiscation of excess production to not allow its consumption within the following year (described in detail in the 2001 annual program); and
- (c) strengthening of the controls on the national consumption target from 2001 onwards by limiting the initial total national production quota to the consumption target for the year. Any additional production quota (for export) can only be requested retroactively, so that an enterprise requesting such additional quota would have to provide documentation to prove that the export has already taken place.

2. The consumption data for 2001, 2002, 2003 and 2004 confirms the effectiveness of this arrangement.

3. ***Implementation of policy instruments.*** The production quota regulations became effective in December, 1997. National annual halon production quotas are issued to individual producers for halon 1211 and halon 1301.

4. The quota system is the main tool for the implementing the halon phaseout and is supported and enforced fully by Ministry of Public Security (MPS). The production data reported by the producers is periodically verified by SEPA and MPS. MPS has simultaneously strengthened its enforcement of the regulation on use of halon 1211 fire extinguishers, which has further reduced the demand for halon 1211. As described above, the halon quotas are now administratively split up into production quotas for domestic consumption and for export. Utilization of the export component is only allowed retroactively, and requires proof of export orders having been carried out. Licensing is another important control measure. Only licensed enterprises are allowed to produce and/or sell halon and/or halon containing products. After a halon closure/conversion project is completed, the enterprise's production license for halon and/or halon containing products is withdrawn by MPS.

5. There is also a ban on production and sale of halon and/or halon-containing products



to enterprises that have been funded and completed projects under previous annual programs. When the conversion is completed and the project is commissioned by MPS and SEPA, the license to produce and sell halon fire extinguishers and systems are withdrawn.

### **Other enterprise-level phaseout activities**

6. ***Closure of halon production facilities.*** Full closure contracts were signed with bid winning halon producers in various annual programs. Their production facilities were dismantled and halon-producing equipment was completely dismantled and disposed. Partial closure contracts were also signed with some bid winners and their production quota, and in some cases, capacity was reduced accordingly. Details by year are provided in Annex II.
7. ***Closure and conversion of halon fire extinguisher manufacturers.*** Likewise, contracts were signed under each annual program with fire extinguisher and fire extinguishing system manufacturers for reducing halon 1211 consumption to match the declining supply of halons. Some extinguisher manufacturers selected closure and the other selected conversion. 58 of 61 closure and conversion activities have been completed on schedule and were commissioned by SEPA and MPS. The rest are presently implementing their closure/conversions. Details are provided in Annex III.

### **Technical assistance (TA) activities**

8. All activities under TA projects of 1998 to 2001 have been completed. The others are under implementation. Details of all these activities are in Annex V (A-E).

### **Special Initiatives**

9. Another main objective of the Halon Sector Plan is to ensure that the level of fire protection capability in China is not compromised as a result of halon phaseout activities, and that adequate quantities of suitable quality substitutes are available. Special initiatives have been taken up under various annual programs to address this requirement. The special initiatives undertaken so far are summarized in Annex VI and described below. In addition, fire equipment companies and chemical producers has at own costs introduced new halon alternatives and substitutes for both halon 1211 and halon 1301 which are now available in China.
10. ***ABC dry chemical powder.*** To maintain the required level of fire fighting capacity in China and promote the use of ABC powder, the Foshan Electro-chemical General Plant was selected to establish an ABC dry powder production line with an annual capacity of 3000 MT. The grant contract was signed in May 1999 and the project has been completed and commissioned in November 2001. Commercial production has already started and the production of ABC powder was 1544.75 MT in 2002, 3013.9 MT in 2003 and 3406.85MT in 2004.
11. ***Light weight high pressure CO<sub>2</sub> cylinders.*** Weifang Dongming Fire-fighting Equipment Co., Ltd was selected as the beneficiary for manufacture of light weight CO<sub>2</sub> cylinders with the capacity of 600,000 units per year. The contract was signed in November

2000 and the project has been completed in beginning of 2004 and commissioned by SEPA in September 2004. The production started in 2004. The semi-annual production in the first half of 2005 is 180,000 units of cylinder for CO<sub>2</sub> fire extinguishers.

12. ***Halon banking (Establishment of Guangdong Halon Recycling Center)***. The Panyu Shengjie Fire-fighting Equipment Co., Ltd. was selected as the beneficiary to set up a halon recycling center for Guangdong Halon Bank with an annual recycling capacity as 500 MT. The grant contract was signed in August 2000 and the project has been completed and commissioned in July 2004.

13. ***Establishing the laboratory for plant-protein based foam***. The Honsen Fire-fighting Hi-tech company was selected as the beneficiary to establish a test laboratory for plant-protein-based foam. The contract was signed in August 31, 2000. The project has been completed & commissioned in October 2002.

14. ***National conference***. A national halon conference was held in November, 2000, and was attended by various institutions and entities related to halon phaseout activities. The conference provided a valuable opportunity to look back on experiences and lessons, look forward to future tasks, and to share the lessons of successful experience.

15. ***Development of 3,600 MT plant-protein foam fire fighting agent production line*** Langfang Yida Technology Co., Ltd. was selected as the beneficiary to set up the production line of 3,600 MT Honsen L119 plant-protein based foam in Langfang. The contract was signed in October 2003. While the overall designed plant capacity is larger at 10,000 MT, the special initiative will only support this limited capacity in keeping with the requirement in the agreement between China and the Excom “China understands, consistent with Executive Committee rules, that it has a responsibility to ensure that it will not use Fund resources to build aggregate capacity for the production of substitute chemicals or substitute extinguishers that exceeds that capacity (for Halon 1211, 17,800 tonnes; for Halon 1301, 1000 tonnes; and for halon fire extinguisher production capacity of 7.71 million units.” All the procured equipment has been delivered to the plant site and stored in a rental warehouse. The construction of the factory workshop started from April of 2005 and expected to be finished in November of 2005. The pilot production of plant-protein foam fire fighting agent is expected to start in early 2006.

16. ***Survey for CO<sub>2</sub> extinguisher production***. A new special initiative project was added into the 2003 annual program. This project focused on obtaining the information of exact production capacity and sales of CO<sub>2</sub> extinguisher and other extinguishers with clean fire extinguishing agent in China at present. Shanghai Fire Research Institute finished the survey in September 2003.

17. ***Establishment of a national/trade standard of hexafluorapane extinguishing agent and its testing methodology***. This project aims to establish a national/trade standard of HFC-236fa extinguishing agents and establish testing method of HFC-236fa extinguishing agents. The TOR of the project has been agreed by World Bank. The bidding was finished and the evaluation report was submitted to WB in Aug. 2004. Tianjin Fire Research Institute has been selected to carry out the project. The contract was signed in August 2005.

18. ***Development of Hexafluoropropane Fire Extinguishers.*** Hexafluoropropane (HFC-236fa) is a halon 1211 substitute, it has a good fire extinguishing performance, its ODP is 0 and it is already marketed internationally by abroad companies. This project aims to develop a portable Hexafluoropropane fire extinguishers as one of halon substitutes and to give out the parameters such as the kind and mass or pressure of propellant, fill density, designing data of the cylinder, operating temperature ranges, effective discharge time, bulk range and class of fire. The TOR of the project has been agreed by the World Bank. The bidding process was finished and the evaluation report was submitted to WB in Aug. 2004. Shanghai Fire Research Institute has been selected to carry out the project. The contract was signed in August 2005.

19. The implementation status of the special initiative projects are summarized in Annex VI.

## 2005 Annual Program

20. ***Phaseout targets and objectives.*** The phaseout target is (see Annex I) to reduce halon 1211 production to a maximum of 1,990 MT; to reduce halon 1211 consumption to a maximum of 1,890 MT; to maintain halon 1301 production to a maximum of 200 MT; and halon 1301 consumption to a maximum of 150 MT as per the revised APP phase-out schedule. Production quotas have been issued consistent with these ceilings.

21. ***Implementation of policy instruments.*** The quota system continued to be the main tool for the implementing the halon phaseout and is supported fully by MPS. A catalogue of ban on production and sale for the phased out products including halon extinguishers and agents was issued by SETC. The deadline for halon and halon extinguisher production is in line with the sector plan timetable. Like previous years, a ban on sales and production of Halon for the commissioned project enterprises was issued.

### Enterprise-level phaseout activities

22. ***Closure of halon production.*** No any quota reduction contract was signed with the remaining two halon 1211 producers and one halon 1301 producer. The national targets for halon production level in 2005 are the same as that in 2004. Details are in Annex II.

23. ***Closure & conversion of halon fire extinguisher manufacturers.*** China has conducted an assessment of the number of contracts that have already been signed in the first three years for closure and conversion of equipment manufacturers to review whether the pace of conversion is appropriate, given the projected availability of halon 1211 in the next three years. This assessment has been concluded. 3 conversion contracts were signed in November 2004 and the remaining 11 enterprises were closed down without funding. Further investigation based on the fire extinguisher licensing system will be conducted to ensure that all remaining halon extinguisher manufacturers are addressed in the last year of halon 1211 production.

24. ***Closure & conversion of halon system manufacturers.*** China has conducted a survey on the halon 1211 consumption amount of all the remaining 18 fire system manufacturers. 1 contract was signed in November 2004 and the remaining 8 enterprises were closed down without funding. Details are in Annex IV.

### Special initiatives

25. ***Expansion of the production of CO<sub>2</sub> extinguisher.*** In order to encourage the extinguisher producers to produce clean extinguishers to replace Halon extinguishers, SEPA will use some of the funds from the Halon sector plan to encourage the CO<sub>2</sub> extinguisher producers to expand their capacity of CO<sub>2</sub> extinguisher production. Agreement have been signed with three CO<sub>2</sub> cylinder and CO<sub>2</sub> fire extinguisher manufactures. This activity is based on the survey of CO<sub>2</sub> extinguishing producers conducted in 2003.

26. The implementation status of 2005 special initiative projects is summarized in Annex VI.

## Technical assistance activities

27. **Verification of the actual production of CO2 and clean agent extinguisher as per the agreement between the Executive Committee of the multilateral fund and China.** Since the production of CO2 extinguishers and other clean agent fire extinguishers under the program is one of the performance indicators for the implementation of the Halon Sector Plan. China will start preparation of the survey for CO2 extinguisher in 2005 consistent with the requirement. The work is planned to be completed in the first half of 2006 and the TOR is under review by World Bank.

28. **Research on Assessing Halons' Essential usages.** There are fire/explosion risk scenarios for which current fire protection technology cannot provide adequate protection without the use of halon, in such case, use of halons will be considered essential and allowed. In order to establish a proper approval procedure and criteria in assessing an essential use for the purpose of control halon application.

29. **Establishment the Monitoring & Management Mechanism of Guangdong Halon Recycling Center.** Guangdong Halon Recycling Center has been established and will start to operate soon, to work out the monitoring & management mechanism for halon recycling is crucial for ensuring halon recycling center proper running. The TOR was prepared and under review of World Bank.

30. **Training of Personnel Involved in Phaseout Activities** 2004 halon performance Audit training was carried out in April 4-6, 2005. Enterprise training will be held in the last quarter of 2005.

31. **Survey on producers of halon 1301 extinguishing system** Since halon 1301 system will to be phased out after 2005, a survey on halon 1301 consumption data of each system enterprises will be carried out in the second half of 2005.

32. **Performance Audit for 2004 Annual Program** As in previous years, CNAO conducts a performance audit for halon sector plan activities in 2004 to ensure the effective implementation of the annual program. The project has been completed.

33. The implementation statuses of 2005 technical assistant projects are summarized in Annex VII.

## **PART B**

### **2006 ANNUAL PROGRAM**

#### **Objectives**

1. The phaseout target for the 2006 annual program is (a) to reduce halon 1211 production and consumption to 0 MT and (b) to reduce halon 1301 production at a maximum of 100 MT and the consumption at a maximum of 100 MT. The 2006 program will also continue actions to ensure that the fire fighting capacity is not undermined as the result of an insufficient supply of substitutes of satisfactory quality.
2. China is requesting the release of the approved amount of US\$ 11.4 million for the 2006 annual program as agreed in the overall Halon Sector Phaseout Plan. To achieve these goals, the following activity is envisioned:
  - a. US\$ 6 million to be used for buying back halon 1211 quotas and for complete dismantling and closure of the two halon 1211 agent production facilities;
  - b. US\$ 3.2 million to be used for buying back halon 1301 quotas consistent with the allowed halon 1301 production in 2006;
  - c. US\$ 1.8 million to be used for closing and converting 5-10 of the remaining halon 1301 fire system manufacturers;
  - d. US\$0.4 million to be used for technical assistance activities in order to support the halon phaseout program and ensure that existing fire protection requirements can be met.

#### **Policy instruments during the year**

3. *Policies to be continued.* In 2006, the following policies and measures will continue to be implemented by the Government. These policies are considered necessary for the success of a total halon phaseout in China.
  - a. Production quota license system -- The system will be continuously implemented in 2006 to ensure halon production below agreed annual ceiling amount.
  - b. The ban on new installations of halon extinguishers for non-essential uses and a gradual tightening of the definition of essential uses will continue.
4. In order to support local enforcement of the ban on non-essential uses of halons in the most effective manner, the Government will ensure that:
  - a. SEPA/MPS will disseminate details of the ban to all prospective consumers through various channels (news media, bulletins, propaganda, etc.);
  - b. Local fire bureaus and environmental protection bureaus will jointly inspect consumers on a regular basis. If any consumer is found to use the newly-installed halon fire extinguishers in non-essential areas, the consumer will be required to change to non-halon systems within a defined time.
  - c. Joint inspection teams of the local fire bureaus and environmental protection bureaus will be required to submit regular reports to MPS and SEPA about the situation and measures in implementation of the ban.

- d. Stricter control the sales of halon will be enforced by making use of the output of projects for four demonstration centers (that is Beijing, Shanghai, Guangdong province and Liaoning province) and replicating the experience to other provinces in order to reach phaseout goals.
5. As usual MPS will withdraw production licenses for manufacturing halon and halon-containing products from beneficiaries after their projects are completed.
  6. In order to support the halon recovering and recycling activities and prevent unnecessary emission of halon 1211, China plans to take the following actions:
    - a. Halon 1211 fire extinguishers from non essential applications have been collected in a number of cities and municipalities. In order to prevent leakage from such extinguishers, halon 1211 from such obsolete halon 1211 fire extinguishers will be recovered and safely stored for essential uses as per Chinese criteria;
    - b. As per Chinese standards, halon fire extinguishers are required to be hydrostatic tested after 7 to 10 years. Due to the high risk of leakage from such old fire extinguishers, China will ban the refill and reuse of such fire halon extinguishers, and halon 1211 in these extinguishers will be recovered and stored for essential uses, .

### **Enterprise-level activities**

7. Through a combination of production quotas and administrative measures, enterprises will be granted funds for closure and conversion activities..
  - a) 2 contracts for complete closure of halon 1211 will be signed by the end of 2005.
  - b) 1 contract for partial closure of halon 1301 will be signed by the end of 2005.
  - c) 5-10 contracts for conversion of halon 1301 system will be signed in the second half of 2006.

### **Technical assistance (TA) activities**

8. ***Training of Personnel Involved in Phaseout Activities*** As in the previous year, it is considered necessary to train staff of local environmental protection bureaus, local fire fighting bureaus and halon enterprises in order to implement the phaseout plan effectively. Training will be also conducted to the enterprises to learn halon phaseout approach and take part in related phaseout activities. In addition, as the sector approach requires financial and performance audits, training has to be provided for audit agencies on the sector approach and the annual plan. Training workshops for the implementation of the ban on halon extinguisher uses in non-essential areas for local fire fighting bureaus are planned and will be held to maintain halon consumption phaseout achievements.
9. ***Performance Audit for 2005 Annual Program.*** As in previous years, CNAO will conduct a performance audit for sector plan activities in 2005 to ensure the effective implementation of the annual program.
10. Additional TA activities might be added during the year as needed.

**Table BI. 2006 Annual Program**

<b>Halon phaseout targets &amp; policy instruments</b>				
	Start of program (MT)	End of program (MT)	Key Actions Required	Key Dates
<b>Halon 1211</b> Production ceiling	1,990	0	1. Complete closure of 2 halon agent producers 2. TA activities to support introduction of substitutes and alternatives to help phaseout	1. Jan-Dec. 2006
Export	100	0		
Consumption ceiling	1,890	0	1. Financial support for introduction of substitutes and alternatives 2. TA activities	1. Jan-Dec. 2006
<b>Halon 1301</b> Production ceiling	200	100	1. Partial closure of halon producer 2. Production quota and TA activities to support introduction of substitutes.	1. Jan-Dec. 2006
Export	50	20		
Consumption ceiling	150	100	1. Conversion of halon fire-fighting system to non-halon system 2. Financial assistance to fire system manufacturers and TA activities to support introduction of alternatives.	1. Jan-Dec. 2006
<b>Continuation of policy instruments</b>				
Policy Instruments	Actions Required		Key Dates	
1. Production quota license system	1. Closure/reduction production contracts will be signed. 2. Annual production quota issued to the one halon 1301 producer. 3. Production reporting by producer and monitored by SEPA.		1. By end of 2005 2. First quarter of 2006 3. Through 2006	
2. The ban on halon extinguisher uses in non-essential areas	1. Promotional campaign on the ban, through various channels; 2. Joint supervision of ban by local Fire Fighting Bureaus and Environmental Protection Bureaus.		1. Through 2006 2. Through 2006	



**Table BI: 2006 Annual Program (Contd.)**

<b>Enterprise-level Activities</b>						
	Funding Requested (US\$ mill)	Existing Enterprises	# of enterprise targeted	# of enterprises at end of 2006	Key Actions Required	Key Dates
1. Reduction of halon 1211 production	6	2	2	0		1. Contracts to be signed by the end of 2005 2. Completed in 12 months.
2. Closure & conversion of halon extinguisher manufacturer	0	0	0	0		
3. Conversion of halon 1211 fire extinguishing system manufacturers	0	0	0	0		
4. Reduction of halon 1301 production	3.2	1	1	1		1. Contract to be signed by the end of 2005 2. Completed in 12 months
5. Conversion of halon 1301 fire extinguishing system manufacturers	1.8	22	5-10	12-17		1. Contracts to be signed in 2006 2. Completed in 24 months
Subtotal	11					

**Table BII: 2006 Annual Program-Technical Assistance Activities**

<b>TECHNICAL ASSISTANCE ACTIVITIES</b>			
Activities	MLF funding requested (US\$ million)	Actions Required	Key Dates
1. Training	0.13	Training workshops will be carried out	Training will be carried out through the 2006.
2. Performance Audit for 2005 Halon sector performance	0.07	Training of the performance auditors from CNAO and conduct the audits.	1. Contract signed by March 2006. 2. Complete by end of June 2006
3. Reserved for possible additional TA activities	0.2	Identification of additional TA activities and preparation of TORs	
Subtotal	0.4		
<b>TOTAL for phaseout activities</b>	<b>\$11.4 million</b>		

**Table BIII: 2006 Annual Program - Proposed Performance Indicators**

<b>Halon Phaseout Targets</b>					
Halon sector	Start of program (MT)	End of program (MT)	Performance Indicators		
<b>Halon 1211</b>	1,990	0	<ul style="list-style-type: none"> <li>• Production levels (national aggregate halon 1211)</li> </ul>		
Production ceiling					
Exports	100	0			
Consumption ceiling	1,890	0	<ul style="list-style-type: none"> <li>• Consumption levels (national halon production plus import minus export)</li> </ul>		
<b>Halon 1301</b>	200	100	<ul style="list-style-type: none"> <li>• Production levels (national aggregate halon 1301 production )</li> </ul>		
Production ceiling					
Exports	50	20			
Consumption ceiling	150	100	<ul style="list-style-type: none"> <li>• Consumption levels (production plus imports minus exports)</li> </ul>		
<b>Continuation of Policy Instruments</b>					
Initiatives	Performance Indicators				
Bidding system for TA projects					
The ban on halon extinguisher uses in non-essential areas	Training workshops conducted throughout the year in key provinces				
<b>Enterprise-level activities</b>					
Activities	Funding requested (US\$ mill)	Existing Enterprises	# of enterprises at end of 2006	Performance Indicators	
Reduced Halon 1211 production	6	2	0		
Reduction of halon 1301 production	3.2	1	1		
Conversion of halon 1301 fire extinguishing system manufacturers	1.8	22	12-17		
Subtotal	11				

**Table BIII: 2006 Annual Program - Proposed Performance Indicators (Contd.)**

<b>Technical assistance activities</b>		
Activities	Amount in US\$ million	Performance Indicators
1. Training	0.13	Complete by end of June 2006
2. Audit for 2005 Halon Sector Performance	0.07	Audit training and enterprise training in 2006
3. Reserved for possible additional TA activities	0.20	To be established
Subtotal	0.4	
<b>TOTAL for Phaseout Activities</b>	<b>\$11.4million</b>	

## ANNEX I: Halon Phaseout Action Plan, January 1, 1998 to January 1, 2010

CHINA															
Halon Sector Phaseout Action Plan, January 1,1998 to January 1,2010															
		First Stage			Second Stage					Third Stage					Total Funding Request
Year	Base line production	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
<b>Halon 1211 (MT)</b>															
Production target	9,950	7,960	5,970	3,980	3,317	2,654	1,990	1,990	1,990	0	0	0	0	0	
o.w. Export		800	600	400	200	0	100	100	0	0	0	0	0	0	
Import		0	0	0	0	0	0	0	0	0	0	0	0	0	
Domestic Consumption		7,160	5,370	3,580	3,117	2,654	1,890	1,890	1,890	0	0	0	0	0	
Production phaseout target		1,990	1,990	1,990	663	663	664	0	0	1,990	0	0	0	0	
Consumption phaseout target		1,790	1,790	1790	463	463	764	0	0	1,990	0	0	0	0	
<b>Halon 1301 (MT)</b>															
Production target <sup>3/</sup>	618	618	618	618	618	600	600	200	200	100	100	100	100	0	
o.w. Export		318	318	318	318	450	450	50	50	20	20	10	10	0	
Import		0	0	0	0	0	0	0	0	0	0	0	0	0	
Domestic Consumption		300	300	300	300	150	150	150	150	100	100	100	100	0	
Production phaseout target		0	0	0	0	150	0	400	0	100	0	0	0	100	
Consumption phaseout target		0	0	0	0	150	0	0	0	50	0	0	0	100	
<b>Required funding from MLF (\$'000)</b>		12400	9700	10600	4500	3700	5900	1200	1800	11400	400	300	100		62000

## ANNEX II

### Closures of halon production facilities and lines

#### A. 1998 Annual Program

*Table 1: Closure of Halon 1211 Plants with 1998 Production Quotas*

Name of the plant	Halon phaseout (MT)	Closure date	Implementation status	Remarks
1.Zhedong No.1 Chemical Plant	347	January 1, 1998	Project completed. Equipment dismantled completely	Plant closure
2.Zhejiang Dongyang No.2 Chemical Plant	1,004	January 1, 1998	Project completed. Equipment dismantled completely	Plant closure
3.Zhejiang Xiaoshan Fire-fighting Chemical Plant	387	January 1, 1998	Project completed. Equipment for one production plant dismantled completely	Partial closure. One out of two production plant closed.
4.Foshan Electro-Chemical General Plant	300	January 1, 1998	Project completed. Production within reduced production quota.	Partial closure. Reactor pipes dismantled.
<b>Total (Quotas sold back to Gvt.):</b>	<b>2,038</b>			

*Table 2: Closure of Halon 1211 plants not assigned 1998 production quotas*

Name of the plant	Halon phaseout (MT)	Year of stop production	Implementation status	Remarks
1. Dalian Fire-extinguishing Agent Plant	165.9	1997	Project completed and equipment dismantled completely	Dismantling and destruction of equipment verified
2. Zigong Fijian Chemical Plant	54.0	1997	Project completed and equipment dismantled completely	Dismantling and destruction of equipment verified
3. Guangdong Don guan Fire-fighting Equipment Plant	320.0	1997	Project completed and equipment dismantled completely	Dismantling and destruction of equipment verified
4. Guangxi Bihar Ocean Chemical Plant	40.0	1997	Project completed and equipment dismantled completely	Dismantling and destruction of equipment verified
5. Wenling Salt Farm Chemical Plant	70.5	1997	Project completed and equipment dismantled completely	Dismantling and destruction of equipment verified
<b>Total</b>	<b>650.4</b>			

### B. 1999 Annual Program

Name of the plant	Halon phaseout (MT)	Closure date	Implementation status	Remarks
1. Hewing Xiaoshan Fire-fighting Chemical Plant	400	January 1, 1999	Project completed and equipment dismantled completely	Plant closure
2. Shandong Hahira Group Shogun Fire-fighting Chemical Plant	500	January 1, 1999	Project completed Reactor pipes dismantled	Partial closure.
3. Wuxian Chemical Plant	388	January 1, 1999	Project completed Reactor pipes dismantled	Partial closure.
4. Hewing Dongyang Chemical Plant	654	January 1, 1999	Project completed Reactor pipes dismantled	Partial closure.
<b>Total (Quotas sold back to Gvt.)</b>	<b>1,942</b>			

### C. 2000 Annual Program

Name of the plant	Halon phaseout (MT)	Closure date	Implementation status	Remarks
1. Zhejiang Dongyang Chemical Plant	779	January 1, 2000	Production based on reduced production quota	Partial closure.
2. Shandong Hahira Group Shogun Fire-fighting Chemical Plant	451	January 1, 2000	Production based on reduced production quota	Partial closure.
3. Wuxian Chemical Plant	170	January 1, 2000	Production based on reduced production quota	Partial closure.
4. Zhejiang fire-fighting Chemical Plant	130	January 1, 2000	Producing basing on reduced quota	Partial closure.
5. Foshan electro-chem. general plant	381	January 1, 2000	Production based on reduced production quota	Partial closure.
6. Zhejiang chemical research institute	79	January 1, 2000	Production based on reduced production quota	Partial closure.
<b>Total (Quotas sold back to Gvt.)</b>	<b>1,990</b>			

### D. 2001 Annual Program

Name of the plant	Halon phaseout (MT)	Closure date	Implementation status	Remarks
1.Wuxian Chemical Plant	330	January 1, 2001	Project completed and equipment dismantled completely	Plant closure.
2. Zhejiang fire-fighting Chemical Plant	250	January 1, 2001	Project completed and equipment dismantled completely	Plant closure.
3.Zhejiang chemical research institute	150	January 1, 2001	Production quota for Halon 1211 cancelled and production line adjusted to disable ability to produce halon 1211.	Plant closure.
<b>Total (Quotas sold back to Gvt.)</b>	<b>730</b>			

### E. 2002 Annual Program

Name of the plant	Halon phaseout (MT)	Closure date	Implementation status	Remarks
1. Foshan electro-chem general plant	780 (halon 1211)	January 1, 2002	Project completed and equipment dismantled completely	Plant closure.
2.Zhejiang chemical research institute	18 (halon 1301)	January 1, 2002	Production based on the reduced halon 1301 production quota.	Partial closure.

### F. 2003 Annual Program

Name of the plant	Halon phaseout (MT)	Closure date	Implementation status	Remarks
1. Zhejiang Dongyang Chemical Plant	240	January 1, 2003	Production based on the reduced production quota.	Partial closure.
2.Shandong Haihua Group Shouguang Fire-fighting Chemical Plant	240	January 1, 2003	Production based on the reduced production quota.	Partial closure.

## ANNEX III

### List of beneficiary fire extinguisher manufacturers

#### A. 1998 Annual Program

Name of the manufacturer	Project starting date	Phaseout amount (MT)	Implementation Status	Completion date#	Remarks
1.Zhejiang Xiangshan No.1 Fire-fighting Equipment Plant	1998.03.14	223.0	Project completed and commissioned Equipment dismantled.	1999.12.21	Plant closure
2.Zhejiang Yiwu Fire-fighting Extinguisher Plant	1998.03.14	162.2	Project completed and commissioned. Equipment dismantled.	1999.06.24	Plant closure
3.Changzhou Fire-fighting Equipment Plant	1998.03.14	47.5	Project completed and Commissioned	1999.12.26	Conversion
4.Dalian Jinzhou Fire-fighting Equipment Plant	1998.03.14	105.7	Project completed and Commissioned	2000.01.05	Conversion
5.Guangxi Wuzhou Fire-fighting Equipment Plant	1998.03.14	52.4	Project completed and Commissioned	2000.01.06	Conversion
6.Guangzhou Zhujiang Fire-fighting Equipment Plant	1998.03.14	138.4	Project completed and Commissioned	2000.01.04	Conversion
7.Jiangxi No.1 Fire-fighting Equipment Plant	1998.03.14	220.8	Project completed and Commissioned	2000.01.07	Conversion
8.Nanjing Heli Fire-fighting Equipment Plant	1998.03.14	146.4	Project completed and Commissioned	1999.12.27	Conversion
9.Ningxia Yongning Fire-fighting Equipment Plant	1998.03.14	23.0	Project completed and Commissioned	2000.01.08	Conversion
10.Panyu Shengjie Fire-fighting Equipment Plant	1998.03.14	435.1	Project completed and Commissioned	2000.01.05	Conversion
11.Shanghai Haishen Fire-fighting Equipment Plant	1998.03.14	149.6	Project completed and Commissioned	1999.12.23	Conversion
12.Shanghai Punan Fire-fighting Equipment Plant	1998.03.14	268.4	Project completed and Commissioned	1999.12.24	Conversion
13.Shanghai Qingpu Fire-fighting Equipment Plant	1998.03.14	169.9	Project completed and Commissioned	1999.12.25	Conversion
14.Shenyang Fire-fighting Equipment Plant	1998.03.14	153.7	Project completed and Commissioned	2000.01.07	Conversion
15.Xiangshan Fire-fighting Equipment Plant	1998.03.14	270.6	Project completed and Commissioned	1999.12.23	Conversion
<b>Total</b> (Average halon 1211 consumption 1995 to1997):		<b>2,566.7</b>			

#: **Completion date** means the date of commissioning the project by SEPA.

#### B. 1999 Annual Program

Name of the manufacturer	Project starting date	Phaseout amount (MT)	Implementation Status	Completion date	Remarks
1.Zhejiang Dongyang Fire-fighting Equipment Plant	1999.03.16	131.88	Project complete and commissioned. Equipment dismantled.	1999.12.24	Plant closure
2.Shanghai Global Fire-fighting Extinguisher Plant	1999.03.16	32.66	Project complete and commissioned. Equipment dismantled.	1999.12.22	Plant closure



3.Helongjiang Fire-fighting Equipment Plant	1999.03.16	23.4	Project completed and commissioned.	2001.03.23	Conversion
4.Guangzhou Fire-fighting Equipment Plant	1999.03.16	83.431	Project completed and commissioned.	2001.04.18	Conversion
5.Jiangsu Taixin Fire-fighting Equipment Plant	1999.03.16	336.6	Project completed and commissioned .	2001.03.01	Conversion
6.Chongqing Zhendao Fire-fighting Equipment Plant	1999.03.16	60.77	Project completed and commissioned.	2001.03.12	Conversion
7.Heilongjiang Shangzhi Fire-fighting Equipment Plant	1999.03.16	78.4	Project completed and commissioned.	2001.02.24	Conversion
8.Hubei jiangling Fire-fighting Equipment Plant	1999.03.16	194.78	Project completed and commissioned.	2001.02.26	Conversion
9.Shandong Weifang Fire-fighting Equipment Plant	1999.03.16	153.116	Project completed and commissioned.	2001.04.25	Conversion
10.Shunde Fire-fighting Equipment Plant	1999.03.16	192.72	Project completed and commissioned.	2001.04.19	Conversion
<b>Total</b> (Average halon 1211 consumption 1995 to1997):		<b>1287.734</b>			

### C. 2000 Annual Program

Name of the manufacturer	Project starting date	Phaseout amount (MT)	Implementation Status	Completion date	Remarks
1.Guangzhou Baiyun luoyang Fire-fighting Equipment Plant	2000.02.24	183.608	Project complete and commissioned. Equipment dismantled..	2000.12.23	Plant closure
2.Zhejiang Linhai Fire-fighting Equipment Plant	2000.02.24	57.5	Project complete and commissioned. Equipment dismantled.	2000.12.09	Plant closure
3.Anhui Bengbu Fire-fighting Equipment Plant	2000.02.24	142.124	Project complete and commissioned. Equipment dismantled.	2000.12.06	Plant closure
4.Suzhou Fire-fighting Equipment Plant	2000.02.24	14.2677	Project completed and commissioned.	2001.07.30	Conversion
5.Shanghai No. 4 Fire-fighting Equipment Plant	2000.02.24	74.762	Project completed and/ commissioned	2001.07.29	Conversion
6.Lianyungang Tianyi Fire-fighting Equipment Plant	2000.02.24	52.35	Project complete and commissioned.	2001.08.01	Conversion
7.Tianjin Tanggu Fire-fighting Equipment Plant	2000.02.24	45.64	Project completed and commissioned.	2001.09.21	Conversion
8.Zhejiang Wananda Fire-fighting Equipment Plant	2000.02.24	56.5	Project complete and commissioned.	2001.07.28	Conversion
9.Zhenzhou Huanghe Fire-fighting Equipment Plant	2000.02.24	25.153	Project complete and commissioned.	2001.10.28	Conversion
10.Nanjing Honghu Fire-fighting Equipment Plant	2000.02.24	81.818	Project complete and commissioned.	2001.07.31	Conversion
11.Zhuhai Zhuzhou Fire-fighting Equipment Plant	2000.02.24	80	Project completed and commissioned.	2001.10.29	Conversion
12.Fujian Changle Fire-fighting Equipment Plant	2000.02.24	284.2	Project completed and commissioned.	2001.07.11	Conversion
<b>Total</b> (Average halon 1211 consumption 1995 to1997):		<b>1097.923</b>			

**D. 2001 Annual Program**

Name of the manufacturer	Project starting date	Phaseout amount (MT)	Implementation Status	Planned completion date	Remarks
1.Fuzhou fire-fighting equipment plant	2001.07.10	22.52	Project complete and commissioned.	2002.12.04	Closure
2.Zhenjiang fire-fighting equipment plant	2001.07.10	17.463	Project complete and commissioned.	2002.09.17	Conversion
3. Nanjing jiangpu fire-fighting equipment plant	2001.07.10	84	Project complete and commissioned.	2002.09.16	Conversion
4.Jiangsan fire-fighting equipment co.	2001.07.10	41	Project complete and commissioned.	2002.12.03	Conversion
5.Wuhan jiangnan fire-fighting equipment plant	2001.07.10	16.8	Project complete and commissioned.	2002.11.13	Conversion
<b>Total</b> (Average halon 1211 consumption 1995 to1997):		<b>181.783</b>			

**E. 2002 Annual Program**

Name of the manufacturer	Project starting date	Phaseout amount (MT)	Implementation Status	Completion date	Remarks
1. Ningbo Yongjiang Fire Equipment Manufacturer	2002.10.28	4.2	Project complete and commissioned.	2003.10.28	Closure
2. Anhui Wuhu Wanjiang Fire Equipment Manufacturer	2002.10.28	1.17	Project complete and commissioned.	2003.10.28	Closure
3. Haerbin Longquan Fire Tools Manufacturer	2002.10.28	3.42	Project complete and commissioned.	2003.10.28	Conversion
4. Beijing Yanqing Changcheng Fire Equipment Manufacturer	2002.10.28	4.43	Project complete and commissioned.	2003.10.28	Conversion
5. Guangdong Shantou Fire Equipment Manufacturer	2002.10.28	9.12	Project complete and commissioned.	2003.10.28	Closure
6. Zigong Jianfei Fire Equipment Co. Ltd.	2002.10.28	9.177	Project complete and commissioned.	2003.10.28	Conversion
7. Bengang Fire Equipment Manufacturer	2002.10.28	17.77	Project complete and commissioned.	2003.10.28	Closure
8. Zhejiang Huzhou Meihua Group Co. Fire Equipment Manufacturer	2002.10.28	16.50	Project complete and commissioned.	2003.10.28	Closure
9. Daqin Fire Equipment Manufacturer	2002.10.28	17.63	Project complete and commissioned.	2004.04.28	Conversion
10. Ningbo Yinghai Fire Equipment Co. Ltd.	2002.10.28	104.39	Project complete and commissioned.	2004.04.28	Conversion
<b>Total</b> (Average halon 1211 consumption 1995 to1997):		<b>187.807</b>			

**F. 2003 Annual Program**

Name of the manufacturer	Project starting date	Phaseout amount (MT)	Implementation Status	Completion date	Remarks
1. Haerbin Fire Equipment Manufacturer	2003.11.04	6.07	Project complete and commissioned.	2005.06.08	Conversion
2. Jizhou City Wulu Fire Equipment Manufacturer	2003.11.04	5.43	Project complete and commissioned.	2005.06.08	Conversion
3. Leqing City Donghai Fire Equipment Manufacturer	2003.11.04	1.36	Project complete and commissioned.	2005.06.08	Closure
4. Kunming City Fire Equipment Manufacturer	2003.11.04	38.87	Project complete and commissioned.	2005.04.20	Conversion
5. Zhejiang Jindun Fire Equipment Co.; Ltd.	2003.11.04	48.674	Project complete and commissioned.	2005.03.30	Conversion
6. Hongzhou Fire Equipment Manufacturer	2003.11.04	313.2	Project complete and commissioned.	2005.03.29	Conversion
<b>Total</b> (Average halon 1211 consumption 1995 to1997):		<b>413.604</b>			

**G. 2004 Annual Program**

Name of the manufacturer	Project starting date	Phaseout amount (MT)	Implementation Status	Completion date	Remarks
1. Ningbo Fire Equipment Co., Ltd.	2004.11.11	108.52	Ongoing	2005.12.31	Conversion
2. Shenyang No. 2 Fire Equipment Manufacturer	2004.11.11	0	Ongoing	2005.12.31	Conversion
3. Zhejiang Qingyuan Fire Equipment Manufacturer	2004.11.11	10.24	Ongoing	2005.12.31	Conversion
<b>Total</b> (Average halon 1211 consumption 1995 to1997):		<b>118.76</b>			

## ANNEX IV

### List of beneficiary fire fix system manufacturers

#### A. 1998 Annual Program

Name of the manufacturer	Project starting date	Phaseout amount (MT)	Implementation Status	Completion date	Remarks
1.Ningbo Sanyou Fire-fighting Equipment Ltd.	1998.03.14	50	Project completed and Commissioned	1999.12.24	conversion

#### B. 1999 Annual Program

Name of the manufacturer	Project starting date	Phaseout amount (MT)	Implementation Status	Completion date	Remarks
1.Guangzhou Fire-fighting Equipment Plant	1999.03.16	29.697	Project completed and commissioned.	2001.04.19	Conversion

#### C. 2000 Annual Program

Name of the manufacturer	Project starting date	Phaseout amount (MT)	Implementation Status	Completion date	Remarks
1. Zhuhai Zhuzhou Fire-fighting Equipment Plant	2000.02.24	40.5	Project completed and commissioned.	2001.10.29	Conversion

#### D. 2001 Annual Program

Name of the manufacturer	Project starting date	Phaseout amount (MT)	Implementation Status	Completion date	Remarks
1. Jiangxi ship's valve plant	2001.07.10	40	Project complete and commissioned.	2002.11.14	Conversion

#### E. 2003 Annual Program

Name of the manufacturer	Project starting date	Phaseout amount (MT)	Implementation Status	Completion date	Remarks
1. Chendu Engine Company Chenghua Fire Equipment Plant	2003.10.30	15.913	Project complete and commissioned.	2005.04.08	Conversion
2.Tianjin Shengda Security Science Industry Company	2003.10.30	9.23	Project complete and commissioned.	2005.04.29	Conversion
3.Foshan City Yuan Fire Equipment Plant	2003.10.30	11.821	Ongoing	2005.10.31 (planned)	Conversion
4. Guangzhou City Yuanhua Electrical Appliance General Plant	2003.10.30	46.026	Project complete and commissioned.	2005.04.18	Conversion
5. Tianjin Fire Equipment General Plant	2003.10.30	16.06	Project complete and commissioned.	2005.04.28	Conversion

6. Tianjin Minan Fire Co., Ltd.	2003.10.30	18	Project complete and commissioned.	2005.04.28	Conversion
7. Nanjing Fire Equipment Co., Ltd.	2003.10.30	77.48	Project complete and commissioned.	2005.03.28	Conversion
8. Xi'an Nucleus Equipment Co., Ltd. Weishi Fire Company	2003.10.30	27.503	Project complete and commissioned.	2005.04.10	Conversion
9. Baoji Fire Equipment General Plant	2003.10.30	1.12	Ongoing	2005.10.31 (planned)	Conversion
<b>Total</b> (Average halon 1211 consumption 1995 to1997):		<b>223.153</b>			

### F. 2004 Annual Program

Name of the manufacturer	Project starting date	Phaseout amount (MT)	Implementation Status	Completion date	Remarks
1. Fujian Changle Minguang Fire Equipment Co., Ltd.	2004.11.11	73.21	Ongoing	2005.12.31	Conversion

## ANNEX V

## A. Implementation of Technical Assistance Activities in the 1998 Annual Program

Name of TA Projects	Implementing Agencies	Contract Date	Implementation Status	Completion Date	Remarks
1. HAL-98-TA-1 Export/Import study	Beijing University	1998.09.28	Completed and commissioned	1999.11.30	Completed
2. HAL-98-TA-2 Revision of Standards for ABC Powder	Tianjin Fire Research Institute	1998.04.28	Completed and commissioned	2001.6.30	Completed
3. HAL-98-TA-3 Design Codes for Gaseous Fire Extinguishing Systems	Tianjin Fire Research Institute	1998.04.28	Completed and commissioned	2002.09.28	Completed
4. HAL-98-TA-4 Standards for Components of Gaseous Fire Extinguishing Systems	Tianjin Fire Research Institute	1998.04.28	Completed and commissioned	2001.6.30	Completed
5. HAL-98-TA-5 Halon Management Plan-Overall Management	Shanghai Fire Research Institute	1998.04.28	Completed and commissioned	1999.12.31	Completed
6. HAL-98-TA-6 Halon Management Plan-Training Courses and Propaganda Materials	Shanghai Fire Research Institute	1998.04.28	Completed and commissioned	2000.12.07	Completed
7. HAL-98-TA-7 Halon Management Plan-Provincial Promotions and Demonstration Centers	Shanghai Fire Fighting Bureau	1998.04.28	Completed and commissioned	1999.10.31	Completed
8. HAL-98-TA-8 Halon Management Plan-Provincial Promotions and Demonstration Centers	Guangdong Fire Fighting Bureau	1998.04.28	Completed and commissioned	1999.08.31	Completed
9. HAL-98-TA-9 Development of halon Management Database and Data collection System	Qinghua University	1998.04.28	Completed and commissioned	1998.09.28	Completed
10. HAL-98-TA-10 Management Information System	Qinghua University	1998.04.28	Completed and MIS accepted by SEPA	1998.04.02	Completed
11. Training	SEPA		Four training workshops have been conducted	1998.12.10	Completed

## B. Implementation of Technical Assistance Activities in the 1999 Annual Program

Name of TA Projects	Implementing Agencies	Contract Date	Implementation Status	Completion Date	Remarks
1. HAL-99-TA-1 Revision of national standard for CO <sub>2</sub> fire extinguishing agent	Tianjin Fire Research Institute	1999.11.10	1) Test equipment has been installed; 2) Information on similar international standards collected & reviewed. 3) Project completed and commissioned	2002.06.01	Completed
2. HAL-99-TA-2 Study on test method and test equipment for CO <sub>2</sub> fire extinguishing agent	Tianjin Fire Research Institute	1999.11.10	1) Test equipment has been installed; 2) Information on similar international standards collected & reviewed. 3) Project completed and commissioned	2002.06.01	Completed
3. HAL-99-TA-3 Revision of the design code of CO <sub>2</sub> fire extinguishing systems	Tianjin Fire Research Institute	1999.11.10	1) Test equipment has been installed; 2) Information on similar international standards collected & reviewed. 3) Project completed and commissioned	2002.06.01	Completed
4. HAL-99-TA-4 Formulation of national standard for HFC227 agent	Tianjin Fire Research Institute	1999.11.10	Project completed and commissioned	2002.06.01	Completed
5. HAL-99-TA-5 Study on the standard and test method of CO <sub>2</sub> extinguishers with light cylinders	Shanghai Fire Research Institute	1999.11.10	PCR submitted , Project completed and commissioned	2002.06.01	Completed
6. HAL-99-TA-6 Study on the scope of use of CO <sub>2</sub> extinguishers	Shanghai Fire Research Institute	1999.11.10	PCR submitted , Project completed and commissioned	2002.06.01	Completed
7. HAL-99-TA-7 Study on the disposal standard for Halon 1211 extinguishers	Shanghai Fire Research Institute	1999.11.10	Project completed and commissioned	2002.06.01	Completed
8. HAL-99-TA-8 Halon management plan--establishment of demonstration centers	Beijing Fire Fighting Bureau	1999.11.10	1) The demonstration center has been established and are now in operation 1) A series of local policies have been formulated and issued. 2) Halon consumption survey has been carried out. 3) Propaganda has been launched on newspaper, magazines and TV 5) Project completed and commissioned.	2001.10.10	Completed
9. HAL-99-TA-9 Policy study of demonstrative halon bank	Guangdong Fire Fighting Bureau	1999.11.10	1) International Information on halon bank policies have been collected and reviewed; 2) The framework of Guangdong demonstrative halon bank has been formulated. 3) Recycle and reclaim procedure has been studying and testing. 4) Project completed and commissioned	2001.10.10	Completed
10. Training	SEPA		Four training workshops have been conducted activities completed	1999.31.12	Completed

### C. Implementation of Technical Assistance Activities in the 2000 Annual Program

Name of TA Projects	Implementing Agencies	Contract Date	Implementation Status	Planned /Actual Completion Date	Remarks
1. HAL-00-TA-1 Design code for Water Mist Fire extinguishing System					Cancelled
2. HAL-00-TA-2 Performance test Method of Components for Water Mist Fire Extinguishing Systems					Cancelled (Postpone to 2004)
3. HAL-00-TA-3 Propaganda for Halon Sector Approach and Halon Alternative Technology	Shanghai Aozhen Technology Development Company	2000.10.15	The book was finished, published and handed out to relevant parties. Project completed and commissioned	2000.12.31	Completed.
4. HAL-00-TA-4 Design Code for Dry Powder Fire Extinguishing System					Cancelled (Postpone to 2004)
5. HAL-00-TA-5 Tests equipment for light weight CO2 Cylinders	Shanghai Fire Research Institute	Oct. 2001	Completed and commissioned	2003.12.31	Completed
6. HAL-00-TA-6 Future requirements for essential uses, Special places					Cancelled
7. HAL-00-TA-7 Standards for Mechanic foam extinguishers					Cancelled
8. HAL-00-TA-8 Standards for portable dry powder extinguishers					Cancelled
9. HAL-00-TA-9 Nitrogen system					Cancelled
10. Training	DIA		Four training workshops were carried out	Within 2000	Completed



**D. Implementation of Technical Assistance Activities in the 2001 Annual Program**

<b>Name of TA Projects</b>	<b>Implementing Agencies</b>	<b>Contract Date</b>	<b>Implementation Status</b>	<b>Planned /Actual Completion Date</b>	<b>Remarks</b>
1. HAL-01-TA-1 Formulating Design Code for Mist Water Fire Extinguishing System					Cancelled
2. HAL-01-TA-2 Revision of Design Code for Installation of Fire Extinguishers for Buildings					Cancelled
3. HAL-01-TA-3 Feasibility Study on Substitutes for Halon Fixed Fire Extinguishing Systems					Cancelled
4. HAL-01-TA-4 Studies of Market Prospect for Closure Enterprises	Seven enterprises were chosen to carry out the project	2001.4.10	Completed	December 2002	Completed
5. Training	DIA		Four training courses were carried out	2001.12.31	Completed

### E. Implementation of Technical Assistance Activities in the 2002 Annual Program

Name of TA Projects	Implementing Agencies	Contract Date	Implementation Status	Planned Completion Date	Remarks
1. HAL-02-TA-1 Study on Evaluation Method of Engineering Application of Inert Gases Fire-fighting System	Tianjin Fire Research Institute	2003.9.30	1. Contract signed in Sep. 2003 2. the project implementing plan was revised in Nov. 2004 3. the project is ongoing	2007-02-29	Ongoing
2. HAL-02-TA-2 Evaluation Method of Engineering Application of Heptfluoride Propane Fire-fighting System	Tianjin Fire Research Institute	2003.9.30	1. Contract signed in Sep. 2003 2. the project implementing plan was revised in Nov. 2004 3. the project is ongoing	2007-04-30	ongoing
3. HAL-02-TA-3 National Standard Formulation for General Specifications of Low-pressure Carbon Dioxide Fire-fighting System and Parts	Tianjin Fire Research Institute	2002.12.31	Completed and commissioned	2005-4-28	Completed
4. HAL-02-TA-4 Study on the Testing Equipment and Technology of Aerosol Fire Extinguishing Agent	Tianjin Fire Research Institute	2002.12.31	1. Collected information 2. Established test equipment and test method, carried out tests and submitted PCR 3. Prepared for commission.	2004-12-31	ongoing
5. HAL-02-TA-5 Standard Formulation for Aerosol Fire Extinguishing Agent	Tianjin Fire Research Institute	2002.12.31	completed and commissioned	2004-10-31	completed
6. HAL-02-TA-6 Study on Testing Equipment and Technology of Heptfluorid Propane Fire Extinguishing Agent	Tianjin Fire Research Institute	2002.12.31	1. Collected information 2. Established test equipment and test method, carried out tests and submitted PCR 3. Prepared for commission.	2004-10-31	ongoing
7. HAL-02-TA-7 National Standards Formulation for Inert Gas Fire Extinguishing Agent	Tianjin Fire Research Institute	2002.12.31	completed and commissioned	2005-4-28	completed
8. HAL-02-TA-8 Study on the Testing Equipment and Technology of Inert Gas Fire Extinguishing Agent	Tianjin Fire Research Institute	2002.12.31	1. Collected information 2. Established test equipment and test method, carried out tests and submitted PCR 3. Prepared for commission.	2004-10-31	ongoing
9. HAL-02-TA-9 Liaoning Halon Management Plan	Liaoning Fire Bureau	2002.11.06	Completed and commissioned	2005-5-20	completed
10. HAL-02-TA-10 Performance Audit 2001	CNAO		Performance audit was conducted in April-June, 2002	2002.10.31	Completed
11. Training	DIA		three training courses were carried out	2002.12.31	Completed

### F. Implementation of Technical Assistance Activities in the 2003 Annual Program

Name of TA Projects	Implementing Agencies	Contract Date	Implementation Status	Planned Completion Date	Remarks
1. HAL-03-TA-1 Standard of "General Specifications of Aerosol Fire Extinguishing Equipment"	Tianjin Fire Research Institute	2003.12	1. collect information 2. the standard was draft and reviewed. 3. prepare for PCR	2005.06	ongoing
2. HAL-03-TA-2 Testing Equipment and Technology for Aerosol Fire Extinguishing Equipment	Tianjin Fire Research Institute	2003.12	1. collect information 2. established testing equipment 3. carried out tests	2005.12	ongoing
3. HAL-03-TA-3 Performance Audit 2002	CNAO	2003.03	Performance audit was conducted from March-June, 2003	2003.09	completed
4. Training	DIA		Two training courses have been carried out in the second half of 2003	2003.12.31	completed

### G. Implementation of Technical Assistance Activities in the 2004 Annual Program

Name of TA Projects	Implementing Agencies	Contract Date	Implementation Status	Planned Completion Date	Remarks
1. HAL-04-TA-1 Standard for Performance Requirements and Test Methods of Components for Water Mist Fire Extinguishing Systems	Tianjin Fire Research Institute	2005-3-31	1. The contract was signed on March 31, 2005 2. the project is ongoing	2007.04	ongoing
2. HAL-04-TA-2 Design Code for Dry Powder Fire Extinguishing Systems	Tianjin Fire Research Institute	2005-3-31	1. The contract was signed on March 31, 2005 2. the project is ongoing	2006.04	ongoing
3. HAL-04-TA-3 Performance Audit 2003	CNAO	2004.03	Performance audit was conducted from March-June, 2004	2004.09	completed
4. Training	DIA		Two training workshops will be carried out in the second half of 2004, one in the early of 2005	2005. 3.31	completed

### H .Implementation of Technical Assistance Activities in the 2005 Annual Program

Name of TA Projects	Implementing Agencies	Contract Date	Implementation Status	Planned Completion Date	Remarks
1 .HAL-05-TA-1 Verification of the actual production of CO <sub>2</sub> extinguisher of 2005	Select qualified consultant	In the second half of 2005	The TOR is under World Bank's review	Before June 30, 2006	
2.. HAL-05-TA-2 Research on assessing halons' essential usages	Select qualified consultant by bidding	In the second half of 2005	TOR is under preparation	24 months after contract signed	
3. HAL-05-TA-3 Establishment the management and Monitoring mechanism of Guangdong halon recycling center	Select qualified consultant	In the second half of 2005	The TOR is under World Bank's review	12 months after contract signed	
4. HAL-05-TA-4 Survey on producers of halon 1301 system	SEPA		The survey will be conducted in the second half of 2005	Before the end of 2005	
5. HAL-05-TA-5 Performance Audit 2004	CNAO	2005.03	Performance audit was conducted from March-June, 2004	2005-7-20	completed
6.Training	DIA		1. Audit performance training was carried out in April 4-6, 2005; 2. enterprise training will be in the second half of 2005	Before the end of 2005	ongoing

## ANNEX VI

### Special Initiatives

Special initiative	Name of the manufacturer	Project starting date	Implementation Status	Completion date	Remarks
HAL-99-SI-01 ABC Dry Powder Production Line	Foshan Electro- Chem General Plant	1999.05.12	Project completed and commissioned.	2001. 10.12	Completed
HAL-00-SI-02 National Halon Phaseout Conference	SEPA	2000.08.01	The conference was held on Nov. 22, 2000. Activity completed	2000.12.31.	Completed
HAL-00-SI-03 Halon Bank (Establishment of Guangdong Halon Recycling Center)	Panyu Shengjie Fire Fighting Equipment Plant	2000.08.05	Project completed and commissioned.	2004.07.21	Completed
HAL-00-SI-04 Light Weight CO <sub>2</sub> Cylinders	Weifang Dongming Fire-fighting Equipment Co., Ltd.	2000.11.18	Project completed and commissioned.	2004.09.11	Completed
HAL-01-SI-01 Plant Protein Foam test laboratory Project	Honsen Fire- fighting Hi-tech Co., Ltd.	2000.08.31	Project Completed and commissioned.	2002.10.29	Completed
HAL-02-SI-02 Development of a 3,600 MT Production Line of Honsen L119 Vegetable -protein Foam Extinguishing Agent	Dalian Honsen Hi- tech Fire-fighting Co., Ltd.	2003.10.09	All the procurement equipment has been delivered to the plant site. The construction of the factory started in April of 2005.	2005.10.09 (planned)	Ongoing
HAL-03-SI-01 Survey for CO <sub>2</sub> Extinguisher Production	Shanghai Fire Research Institute	2003.06	completed and commissioned	2003.09.30	Completed
HAL-04-SI-01 Establishment of hexafluorapane agent standard and testing technology	Tianjin Fire Research Institute	2005.08	The contract was signed on Aug. 30 , 2005	2006.08.30	Ongoing
HAL-04-SI-02 Development of Hexafluoropropane Fire Extinguishers.	Shanghai Fire Research Institute	2005.08	The contract was signed on Aug. 30 , 2005	2006.08.30	Ongoing
HAL-05-SI-03 Expand the production of CO <sub>2</sub> extinguisher	3 producers were selected	2005.06.16	The contracts were signed with 3 CO <sub>2</sub> extinguisher producers in June 16, 2005.	2006.11.16	Ongoing