

NATIONAL HALON MANAGEMENT STRATEGY

○ Present State of Related Works in Japan:

1. Halon is being used as fire extinguisher in fire-fighting equipment and devices, etc. installed at buildings, hazardous materials handling facilities, ships, aircraft, etc.
2. The control of production, etc. of certain types of halon are being carried out since January 1, 1992 under the domestic law (Law on Protection of Ozone Layer through Control of Certain Substances) based on the resolutions of the Second Meeting of the Parties to the Montreal Protocol of June, 1990.
3. In 1991, an investigation was made by the Fire and Disaster Management Agency mainly on the places of installation, amount used, etc. of halon fire extinguishing equipment and devices, etc. which were installed at buildings and hazardous materials handling facilities, and the data base thereof has been formed.
Also, since January 1, 1992, control measures have been taken on use of halon fire extinguishing equipment and devices, etc. to be newly installed, with consideration being paid to their necessity for securing fire safety.
4. Following the resolution of the Fourth Meeting of the Parties to the Montreal Protocol held in November, 1992, the Halon Recycling and Banking Support Committee was established in 1993 for carrying out the collection and reuse, etc. of halon.
5. In view of the fact that the production of halon was totally discontinued after January 1, 1994, the supply of necessary quantities of halon has been made, as voluntary actions by the parties related, by appropriate management of halon, its collection & reuse, and effective use of recycled halon, with the Halon Recycling and Banking Support Committee working as the core of the activities.

○ Fundamental Policy in the Strategy:

In Japan, appropriate installation and maintenance of halon fire extinguishing equipment and devices are secured and a prevention of inadvertent emission and restraint of discharge are effectively carried out by the Fire Service Law.

Further, correct and successful measures and actions have been taken on the management, collection & reuse of halon, as well as for making it harmless through the voluntary works of people concerned and with the Halon Recycling and Banking Support Committee serving as the core, thus sufficient and the optimum control of halon emission are being made in the standpoint of protection of the ozone layer, therefore while what is presently being done shall be continued as the basic scheme, works shall be focused in the following matters:

1. The reliability of the Halon Data Base is maintained successively, and at the same time appropriate management of halon control will be promoted.
2. Inadvertent emission taking place in relation to installation, maintenance & upkeep, and collection etc. is prevented.
3. New installation of halon fire extinguishing equipment and devices is approved only for the use which is necessary for securing the fire safety.
4. For existing halon fire extinguishing equipment and devices, replenishing of halon is continued with due consideration paid to the life cycle of the buildings involved.
5. When existing halon fire extinguishing equipment and devices are abolished and/or removed, halon is collected without fail.
6. The halon which needs to be reused from the standpoint of fire protection safety as well as control of halon emission will be managed as feedstocks after confirming its quality.
7. The halon which becomes unnecessary or surplus will be made harmless (destroyed) and discarded. In this connection, every effort shall be made to develop and establish the effective technology for collection and destruction from the technical and systematic standpoint.
8. Effective measures will be promoted to obtain alternative substance for halon with the fire protection safety being secured, from the standpoint of environmental protection and practical utility.

○ Concrete Measures:

Chapter 1: Trend of Halon in Japan

1. Present state:

(1) Main fields requiring installation:

Halon (Halon 1211, Halon 1301 and Halon 2402) is fire extinguishant having advantages of high insulation properties, low toxicity, high permeability, low staining properties, etc. and are widely used in fire extinguishing equipment, fire extinguishers for the objects requiring fire protection such as computer rooms, communication equipment rooms, parking lot, etc. and as automatic fire extinguishing equipment in kitchen, etc.

The amount of Halon (as of January, 2000) is as indicated below:

Type of halon	Buildings (t)	Moviles (t)	Total (t)
1211	69	2	71
2402	377	1	378
1301	16,908	1,417	18,325
Total	17,354	1,420	18,774

(2) Characteristics of halon fire extinguishing equipment and devices in buildings:

- a. In Japan, an installation and maintenance of fire extinguishing equipment and other fire fighting facilities, etc. are the obligations one must observe under the Fire Service Law, depending on the use, scale, structure, number of persons that can be housed, etc. of the buildings requiring fire protection. Also, concerning the method of installation and maintenance of the same, the Fire Service Law prescribes the technical standards, inspection standards, qualification system for persons engaging in installation and inspection.
- b. An installation of halon fire extinguishing equipment is one of the fire extinguishing equipment that is approved for installation for objects for which fire extinguishing with water is less suitable, and persons in charge are to select the equipment out of those that can be used in the objects for fire protection involved and install the same.
- c. It is customarily done that halon fire extinguishing equipment and devices are installed as an optional action, the same procedures are followed as in the places, where the installation is an obligation.
- d. For 90% or more of halon fire extinguishing equipment and devices in Japan, halon 1301 is used, the majority of which is in the equipment where fixed piping is installed from a storage container provided outside of the protective

zone.

(3) Restraint of use:

The Fire and Disaster Management Agency has established " Study Commission for Control Measures on Halon, etc. " in July, 1990, in response to the Montreal Protocol, and made studies on the way to operate a halon bank. Based on the results of such studies, the Agency issued a notification entitled as " Restraint on Use of Halide Fire Extinguishing Equipment and Devices " in 1991, for reducing an amount of halon in newly installed equipment by limiting the use of halon to applications where the necessity for fire protection safety is high.

The Ministry of Transport has prohibited newly Installation of Halon fire extinguishing equipment at ships since October, 1994. After that, carbon dioxide fire extinguish equipment are installed at new ships.

While the halon demand in Japan reached about 3,000 tons at its peak period of 1991, the net amount of halon supplied in the past 5 years has dropped down to 100 to 120 tons a year, which represented less than 4 percent of the peak amount due to such measures as the restraint of halon usage in 1992 and the discontinuation of halon production in 1994, etc.

(4) Halon bank:

The Halon Recycling and Banking Support Committee was established by manufacturers of fire extinguishing equipment and other organizations concerned on July 19, 1993 (its activities started on March 1, 1994. Refer to Enclosure 1), for appropriately carrying out the collection, recycling and reuse of halon and preventing accidental discharge of halon into the atmosphere and at the same time for effectively utilizing existing halon, in view of the decision by the Fourth Meeting of the Parties to the Montreal Protocol. The activities performed by the Halon Recycling and Banking Support Committee are as follows:

- Preparation and management of data base related to halon;
- Adjustment of collection, storage of halon;
- Adjustment of supply of halon;
- Communication with government agencies and coordination;
- Public relations with parties concerned; and
- Other necessary works.

At present appropriate management, collection and reuse of halon, and supply of necessary amount of halon are being carried out through autonomous actions by people concerned, with the Halon Recycling and Banking Support Committee

serving as the core organization.

2. Prospected demand and supply:

Fire extinguishing equipment and devices using halon are widely used in the buildings requiring fire protection and hazardous materials handling facilities. These equipment and devices are installed for securing fire safety of the facilities involved including what are used as the critical use, and there has been no alternatives, which have necessary fire extinguishing performance and safety features for replacing the halon equipment, are available at the present stage. Also, to replace what is presently installed with other types of fire extinguishing equipment and devices, etc. is not only technically difficult, but substantially high economical burden is unavoidable. Therefore, in Japan it is intended to continue the use of such equipment according to the fundamental policy mentioned above with the future demand and supply estimated as indicated in the Enclosure 2.

Chapter 2: Concrete Actions based on the Fundamental Principle:

Systematic measures will be taken relative to the subjects described in the paragraphs 1 to 6 below, which constitute main works from both of technical standpoint and standpoint of social system among the use of halon and its disposition, cyclic use, etc., for enforcing out the effective halon management in view of the ozone layer protection.

Also, persons involved in the life cycle of halon fire extinguishing equipment and devices (manufacturers of fire extinguishing equipment, those engaged in design, installation and inspection thereof, persons involved in facilities requiring fire protection safety, and firms engaging in collection and disposal of the same) are to take appropriate actions, corresponding to the respective positions at each level of activities including enterprisers, associations of specific industries and communities, etc., as well as nationwide level, etc., based on the causers principle and the benefit principle, in order to implement the halon management in the reasonable and efficient manner.

Further, periodic review and correction will be made on overall halon management strategy including the fundamental policy and target levels, etc., so that successive improvements can be made.

1. Management of halon:

The management of halon (what is installed, collection, supply, destruction, etc.) which is used in Japan shall be carried out with the Halon Recycling and Banking

Support Committee serving as the core.

(1) Management based on the halon data base:

Buildings and hazardous materials handling facilities which use halon fire extinguishing equipment and devices, etc. have been consolidated into data base including the place of installation, types of halon used, amount used, etc., and are managed in a unified manner by the Halon Recycling and Banking Support Committee, and appropriate management will be made in the future also.

Also, concerning halon fire extinguishing equipment installed at mobiles (aircrafts, ships, vehicles), halon installed at national mobiles will be managed by government, halon installed at private aircrafts will be managed by each enterprises voluntarily under governmental control and halon installed at private ships will be managed with Halon Recycling and Banking Support Committee as much as possible.

(2) Prevention of inadvertent discharge:

The following measures shall be taken continuously for preventing halon from inadvertently being discharged during the installation, maintenance and upkeep, collection ,etc., and further measures will be taken as necessary to insure the prevention of inadvertent discharge:

Thorough going maintenance management by implementation of periodic inspections and checks, etc.;

Thoroughly disseminating the information on the effects of halon on the ozone layer;

Display on halon containers of the method of collection and the identity of contacts for collection; and

Thoroughly implementing the collection of halon which has become unnecessary.

2. Supply of halon:

(1) Critical use:

Under the present state where no alternative fire extinguishant having the fire-extinguishing properties and safety characteristics comparable to those of halon has been developed, a new installation of the equipment is allowed as a critical use only in the cases where the necessity of halon is high for fire safety, in view of the hazards to human life at a time of fire, influence over surrounding areas, protective value of the properties involved, social influence, etc., where no alternatives are available as fire extinguishing equipment and devices, etc. at

the parts involved.

(2) Handling of existing halon fire extinguishing equipment and devices:

Existing halon fire extinguishing equipment and devices are spread and used in comparatively extensive way, and the majority of them have been installed as obligations under the Fire Service Law ordinances thereto, where their management and maintenance are being done properly. Therefore, these equipment will be managed in the following ways, as a forced prohibition of use of such halon fire extinguishing equipment is technically and economically difficult because no alternatives having similar function as halon are not available and because of the way they are installed:

Appropriate maintenance and management will be thoroughly implemented for existing halon fire extinguishing equipment and devices, and at the same time, when the halon is discharged by fire, etc., the replenishing of halon is made as requested by those involved.

Coordination with the life cycle of building will be made (particularly for other than critical use), and the continued use of the equipment and devices, and a selection of other equipment and devices, etc. will be studied.

(3) Supply plan:

The prospect for demand and supply of halon is as described above, and the supply shall be made in the manner shown below in principle during the period till 2017 based on such prospect:

Supply of halon will be continued to new installations limited to critical uses, until alternative fire extinguisher which has the fire extinguishing performance and safety features comparable to those of halon is developed and spread.

As to the existing equipment and devices, supply of halon will be continued, but the supply will be reviewed from time to time depending on changes in social circumstances.

3. Collection of halon:

When halon fire extinguishing equipment and devices are replaced or removed, the halon shall be collected properly by those related to the equipment, specialists for disposal process, etc. In these cases, collection data will be managed by the Halon Recycling and Banking Support Committee.

Also, the halon containers installed at buildings and hazardous materials

handling facilities shall have the following caution labels stuck thereto in continuation so that the collection of halon can be made properly.

“ CAUTION ”

The Halon Recycling and Banking Support Committee is exercising the control of storage containers of halon fire extinguishing equipment, etc. from the standpoint of protection of the ozone layers. When this container is to be disposed, please notify the fire department in charge or the Halon Recycling and Banking Support Committee indicated below by 10 days before the disposal.

The Halon Recycling and Banking Support Committee

TEL 03-3832-2402 FAX 03-3832-3353

4. Cyclic use of halon:

The collected halon shall be used, where demand for supply exists, after confirming its quality for replenishing the existing halon fire extinguishing equipment and devices and in new installation for critical use.

5. Appropriate disposal (destruction) of halon:

The collected halon, which will not be reused or will become surplus, etc. shall be destroyed. For destruction, the technology for destruction will be established and at the same time facilities where destruction can be done properly will be provided.

As the substances to be disposed of properly mentioned above, halon 1211 and halon 2402 for which no demand for supply exists may be named as such at the present stage.

6. Works for alternatives for halon:

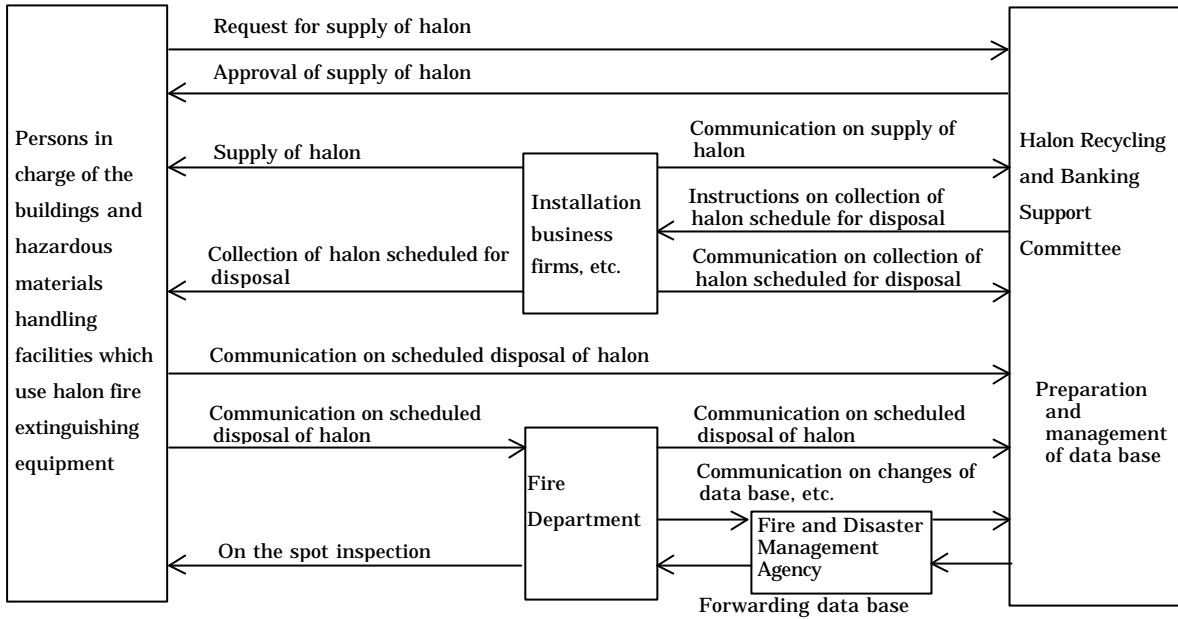
(1) Concerning the substitute substances replacing halon, an effective use of the halon alternative fire-extinguisher which has been developed recently could work in addition to conventional fire extinguishing equipment and devices (powder, etc.).

(2) Of such substitute substances, halon alternative fire-extinguisher which has

exactly same fire extinguishing properties and safety characteristics, etc. as those of halon has not been developed yet. On the other hand, each one of fire extinguishers newly developed has different physical properties, fire extinguishing performance, toxicity, etc. respectively, thus it will be necessary to make a consolidated judgment including the application in the place of installation and way of usage, etc., and the basic way of thinking and method of appraisal have been prepared in 1995 by the Fire-fighting Institute.

- (3) As the follow-up, it was decided to confirm the safety and proper installation of the fire extinguishing equipment which utilizes the halon alternative fire extinguisher, based on the method of appraisal for the fire extinguishing performance and toxicity, etc., and the instructions, " Handling of gas type fire extinguishing equipment, etc. " were issued in 1995 and have been applied since then.
- (4) At present, what is domestically distributed as halon alternative fire extinguishant are halogenide(halide) type and inert gas type, and fire extinguishing equipment which uses halon alternative fire extinguishant are gradually getting known and are installed depending on the application of the place of installation.
- (5) Also, for the halon alternative fire extinguisher, data base will be prepared by the Halon Recycling and Banking Support Committee, and the technical foundation based on the technical development and its achievements will be built.

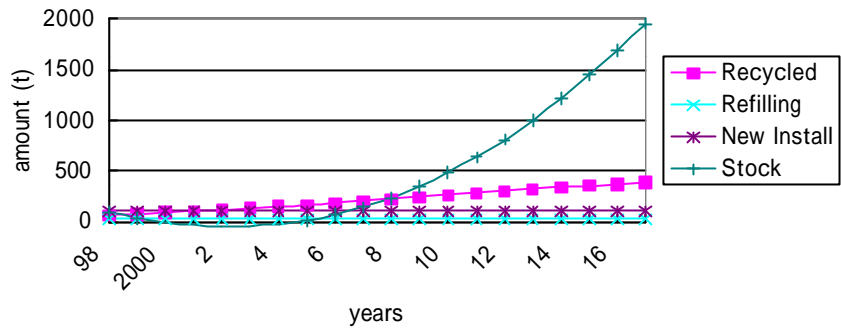
Operating Flow of the Halon Bank



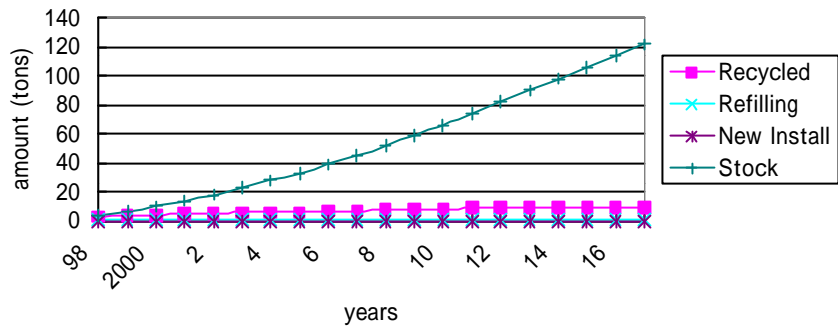
Matters related to supply of halon	Request for supply of halon	Request for approval of new installation, transfer or replenishing of (hereinafter called as "Supply of Halon") halon storage containers (hereinafter called as "Halon") is submitted.
	Approval of supply of halon	Matters required such as amount of halon to be supplied, amount required, etc. are examined for approval of the request.
	Supply of halon	Halon is supplied.
Matters related to collection of halon	Communication on supply of halon	Communication is made to the Committee of the supply of halon made.
	Communication on scheduled disposal of halon	Communication is made directly or through the fire-fighting organizations on the scheduled disposal of halon.
	Instructions on collection of halon schedule for disposal	Instructions are given to firms specialized in installation, etc. to collect the halon.
	Collection of halon scheduled for disposal	The collection of halon which is scheduled for disposal is made.
Matters related to data base	Communication on collection of halon scheduled for disposal	Communication that the halon scheduled for disposal has been collected is made.
	On the spot inspection	On the spot inspection is made from time to time to confirm the state of installation of Halon is as stated in the data base or not.
	Communication on changes of data base, etc.	When the on the spot inspection reveals a deviation of the state of installation of Halon from the data base, a communication is made to that effect.
	Preparation and management of data base	Data base is prepared based on , and , and is managed
	Forwarding data base	A report on the state of installation of Halon is prepared from the data base and is forwarded to each fire fighting organization concerned.

								Enclosure 2	
5-1 Halon 1301									
Year	Stock(1)	Recycled	Supply Cap.	Refilling	New Install	CriticalUse	Stock(1)	Recovered	
1997							152	68	
98	152	68	220	25	105	130	90	78	
99	90	78	168	25	105	130	38	90	
2000	38	90	128	25	105	130	-2	103	
1	-2	103	101	25	105	130	-29	117	
2	-29	117	88	25	105	130	-42	133	
3	-42	133	91	25	105	130	-39	149	
4	-39	149	110	25	105	130	-20	165	
5	-20	165	145	25	105	130	15	185	
6	15	185	200	25	105	130	70	204	
7	70	204	274	25	105	130	144	223	
8	144	223	367	25	105	130	237	243	
9	237	243	480	25	105	130	350	264	
10	350	264	614	25	105	130	484	284	
11	484	284	768	25	105	130	638	304	
12	638	304	942	25	105	130	812	323	
13	812	323	1135	25	105	130	1005	342	
14	1005	342	1347	25	105	130	1217	359	
15	1217	359	1576	25	105	130	1446	376	
16	1446	376	1822	25	105	130	1692	390	
17	1692	390	2082	25	105	130	1952	402	
5-2 Halon 2402									
Year	Stock(1)	Recycled	Supply Cap.	Refilling	New Install	CriticalUse	Stock(1)	Recovered	
1997							2	3	
98	2	3	5	1	0	1	4	4	
99	4	4	8	1	0	1	7	4	
2000	7	4	11	1	0	1	10	5	
1	10	5	15	1	0	1	14	5	
2	14	5	19	1	0	1	18	6	
3	18	6	24	1	0	1	23	6	
4	23	6	29	1	0	1	28	6	
5	28	6	34	1	0	1	33	7	
6	33	7	40	1	0	1	39	7	
7	39	7	46	1	0	1	45	8	
8	45	8	53	1	0	1	52	8	
9	52	8	60	1	0	1	59	8	
10	59	8	67	1	0	1	66	9	
11	66	9	75	1	0	1	74	9	
12	74	9	83	1	0	1	82	9	
13	82	9	91	1	0	1	90	9	
14	90	9	99	1	0	1	98	9	
15	98	9	107	1	0	1	106	9	
16	106	9	115	1	0	1	114	9	
17	114	9	123	1	0	1	122	9	
5-3 Halon 1211									
Year	Stock(1)	Recycled	Supply Cap.	Refilling	New Install	CriticalUse	Stock(1)	Recovered	
1997							8	3	
98	8	3	11	1	0	1	10	2	
99	10	2	12	1	0	1	11	2	
2000	11	2	13	1	0	1	12	2	
1	12	2	14	1	0	1	13	1	
2	13	1	14	1	0	1	13	1	
3	13	1	14	1	0	1	13	1	
4	13	1	14	1	0	1	13	1	
5	13	1	14	1	0	1	13	1	
6	13	1	14	1	0	1	13	1	
7	13	1	14	1	0	1	13	1	
8	13	1	14	1	0	1	13	1	
9	13	1	14	1	0	1	13	1	
10	13	1	14	1	0	1	13	1	
11	13	1	14	1	0	1	13	1	
12	13	1	14	1	0	1	13	1	
13	13	1	14	1	0	1	13	1	
14	13	1	14	1	0	1	13	1	
15	13	1	14	1	0	1	13	1	
16	13	1	14	1	0	1	13	1	
17	13	1	14	1	0	1	13	1	

Halon 1301 future demand and supply estimated



Halon 2402 future demand and supply estimated



Halon 1211 future demand and supply estimated

