

# KEYNOTE



## *Halons Phaseout in Countries In Transition*

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by

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## 1. INTRODUCTION

Since the identification of a correlation between the recorded reduction in the ozone layer and the wide use of man-made chemicals, such as CFC and halons, the international community has undertaken consolidated actions targeted at stopping this phenomenon. As an outcome, the Vienna Convention for the Protection of the Ozone Layer was signed in 1985, followed by the Montreal Protocol on Substances that Deplete the Ozone Layer (MP) signed in June, 1987.

The key elements of the MP *are* schedules for reducing in production and use of ozone depleting substances (ODS), called the controlled substances. At the subsequent meetings of the Parties in London (1990) and Copenhagen (1992) control measures were strengthened, the schedules accelerated and the list of the controlled substances expanded (i.e. HCFC's and methyl bromide were added to the list).

The obligatory Decisions IV/2 on halon production ban in developed countries were adopted at the IVth Meeting of the Parties to the MP in Copenhagen and became effective as of January 1st, 1994. The decision about stopping production from 1994 was based on the following assumptions:

\* existing world stocks are sufficient to satisfy critical needs up to the years 2020-2030;

This requires the organisation of halon recovery and recycling (Decision IV/24) and unrestricted international trade in recycled halons.

\* retaining the option for limited production to satisfy "essential use" needs (Art.2B of MP, decision IV/25).

The environmental repercussions, new scientific facts and observations on the effects of increased UV, radiation have led many countries to call for further actions to protect the ozone layer by expanding and strengthening the original control provisions of the Montreal Protocol. The VIIIth meeting of the Parties held in Vienna on the anniversary of signing the Vienna Convention has not produced any new mandatory regulations on halons. However, on the initiative of a group of countries and the EU decision VII/12 was formulated, whose implementation is voluntary. It recommends to the Parties (article 2 countries) stepping up

control measures to limit the emission of halons by: acceleration of phasing out halons from applications which are not critically needed, limitation of recycled halon use and destruction of any surplus.

However, the implementation of this decision is a very complex and difficult issue, for technical and economic reasons. It is not yet clear whether there is an excess of halons in the bank over the needed for critical uses. There are also doubts about the destruction of halons by non - article 5 countries, while they are still produced by article 5 countries under the MP. On the request of the Parties, the Halon Technical Options Committee (HTOC-UNEP) has developed guidelines on each of the voluntary measures proposed in Decision VII/12. In concluding remarks the Committee expressed its opinion that although part of the halon 1211 resources could be destroyed, such action cannot be recommended with regard to halon 1301. Possible difficulties in the implementation of those voluntary measures by CITs was also expressed by HTOC.

The pace of the phase out of ozone depleting substances has placed tremendous pressure on many governments, authorities and industries, including the fire protection industry.

## 2. BASIC FACTS ON COUNTRIES IN TRANSITION

The term "Countries in Transition - CIT" or "Countries with Economy in Transition - CEIT" has been used in many international documents. However, it has not been clearly defined anywhere and the accompanying roster of the countries it covers differs somewhat depending on circumstances. Also the term "Central and Eastern European Countries - CEEC" is used alternatively. Generally it can be said that the term CIT is used for European countries, which before 1990 had been under strong political and economic influence of the USSR and countries which emerged following its disintegration.

Those countries are at present undergoing serious structural, economic and social changes. They have been granted separate status in most European agreements signed after 1990. European Union (EU) has set up special funds supporting their development. Poland-Hungary Aid for Reconstruction of the Economy (PHARE) and Technical Assistance for Community of Independent States (TACIS) can serve as a case in point. Today the PHARE Program covers 11 states such as: Hungary, Poland, the Czech Republic, Slovakia, Slovenia, Estonia, Latvia, Lithuania, Bulgaria, Romania and Albania. The TACIS Program covers 12 countries which have emerged in Europe following the disintegration of the USSR i.e. the Russian Federation, Ukraine and Belarus.

The following CIT are Parties to the MP: Belarus, Bulgaria, Croatia, the Czech Republic, Hungary, Latvia, Lithuania, Poland, Romania, the Russian Federation, Slovakia, Slovenia, Ukraine and New Yugoslavia. The volume of production/consumption of halons in CIT in 1986 (the base year for control measures of the MP) and in 1993 is presented in Table 1. For comparison, the data for the USA and certain Western European Countries (WEC) are

also given. The data for the Russian Federation and the countries which have emerged following disintegration of the USSR apply mainly to halon 2402. The data from the other CITs refer to halons 1301 and 1211.

Table I. Consumption/Production of halons in CITs, the USA and some WEC  
(UNEP/OzL Pro. 7/6), 1995

COUNTRY	PRODUCTION		CONSUMPTION		CHANGE %	POPULATION [ millions]
	YEAR	BASE	YEAR	BASE		
1. Belarus		0	<u>271.2</u>	<u>278.4</u>	-3	10.3
2. Bulgaria		0	15	40	-63	8.93
3. Czech Rep.		0	49	91.8	-47	10.4
4. Hungary		0	390	<u>1 880</u>	<u>-79</u>	10.5
5. Croatia		0	102	280	-64	5.52
6. Poland		0	33	<u>3 900</u>	<u>-99</u>	38.5
7. Romania		0	12	N.R.	-	23.38
8. Russian F.*	<u>2 400</u>	<u>24 000</u>	-	-	- 90	149
9. Slovakia		0	20	47	-57	5.31
10. Slovenia		0	0	19	-100	1.99
11. Ukraine**		0	<u>18</u>	<u>0</u>	?	52
12 USA	1 892	58 760	18 070	57 800	- 69	257.8
13 Germany	0	18 130	-	-	- 100	80.6
14 UK	4,180	16 500	-	-	- 75	57.8
15 France	20 840	34 460	-	-	- 40	57.38

DATA FROM UNEP/OzL. Pro. 7/6 (1995): base 1986; year: 1993

\* HTOC REPORT 1996;

data for the year is the RF request for essential use nomination. for 1994, 1996 and 1997

\*\* year: 1992

Consumption/production data are multiplied by the appropriate ODP value

It should be observed that under the Montreal Protocol CITs are not granted special status. However, in the course of working meetings, some understanding was reached with respect to the CIT group. In the Montreal Protocol separate programs were established for two groups of Parties. Developed countries (non - Article 5 Parties under the MP) have adopted restrictive schedule for ozone depleting substances phaseout including a ban on halons production and consumption starting from January 1994, and have undertaken to pay a contribution to Multilateral Funds assisting the implementation process. Developing

countries (Article 5 Parties under the *MP*) have accepted a schedule of ODS phaseout with a delay time and with special access to financial (Multilateral Fund) and in kind assistance. Croatia and Romania belongs to the last group. The rest of CIT's belongs to the group of non - Article 5 Parties, and like the more developed countries they are obliged to carry out more demanding programs of ODS phaseout. However it should be taken into account that their economic, technical and organisational/structural conditions are generally more difficult than those of a typical Western country and thus the implementation of the programs is much more difficult. Granting those countries separate status was discussed extensively at the Parties' Vienna meeting and is reflected in the Report of the Seventh Meeting of the Parties to *MP* (UNEP/OzI Pro 7/12).

**CITs** differ significantly from each other, both as regards the level of economic and technical development and that of the infrastructure. Countries in the process of integration with the European Union and which have embarked on the procedure of accession to the Organisation for Economic Co-operation and Development (OECD), have different problems in halons phaseout than the countries which came into existence after the disintegration of the USSR, and which are in the process of building their infrastructures, including an ecological one. The other factor with a strong influence on the phaseout is whether a country was a producer of halons. Therefore the reasons why the countries of Central and Eastern Europe are applying for a special status differ. Some of them only seek some lowering of their contribution to the Multilateral Fund for the implementation of *MP* or permission to use some of the means for implementation of the *MP* objectives in their country. The others apply for a delay in implementation of control measures as is the case of Article 5 countries. The adopted strategies of halons phaseout and the related problems will be discussed below illustrated by the example of states:

- \* Poland and Hungary - largest consumers among the CITs
- \* the Russian Federation - the only producer.

### **3. HALONS PHASEOUT STRATEGY IN POLAND AND HUNGARY**

In recent years very serious political, economic and social changes have taken place in the CITs. **An** opinion prevails that the Czech Republic, Hungary and Poland have taken the lead in the process of changes and integration with the European Union (EU). The three countries have also made an effort to join the Organisation for Economic Co-operation and Development (OECD). Czech Republic has been a full-fledged member since 1995. Poland and Hungary have achieved partner status and are expected to become full members in mid 1996. Membership in OECD and EU requires harmonisation of the law with the directives, decisions and recommendations of these bodies. The process of harmonisation of legal regulations in the area of environmental protection in these countries is well advanced.

Among the CIT which were not halon producers Hungary and Poland were their largest users. Thus one can assume that these countries will face more tasks and problems to resolve when implementing control measures related to halons and for this reason the adopted solutions will be discussed. In both countries the use of halons commenced relatively late, in mid - seventies, and has never reached the level of that in most Western Countries. Table 2 presents data illustrating halon use in Poland and Hungary, in 1986 and: for comparison purposes, the production and consumption data from several Western European Countries (WEC). Generally it can be said that halon consumption, allowing for population differences, was lower in CITs.

Table II Consumption/Production of halons in Hungary, Poland and some WEC in 1986 (UNEP/OzL Pro. 7/6)

COUNTRY	POPULATION	CONSUMPTION/
Hungary	10.5	1 883 (C)
Poland	38.5	3 900 (C)
Germany	80.6	18 134 (P)
Norway	4.3	1411 (C)
Sweden	8.7	1 831 (C)
U.K.	57.8	16 500 (P)

\* The consumption/production data are multiplied by ozone depleting potential (ODP)  
 C - consumption  
 P - production

It should be emphasised that the level of halon consumption in 1986 in Hungary and Poland does not reflect the true demand in the period. This was the time of economic recession and the volume of halon imports was determined by economic limitations rather than technical needs. The end of the eighties marked by the beginning of intensive economic development and opening of the markets of both countries to western products. The rising trend coincided with signing of the MP and hence the import of halons was gradually stopped while the demand for halon-type fire-fighting equipment was on the increase. That was a result of intensive technical development, the influx of modern technology, development in industry, electronics, transportation (including air and maritime), military equipment and many other areas.

One can say that both countries' needs in the area of halon-type fire-fighting protection continue to remain unsatisfied and the market stays "absorptive".

In many countries the use of halons was "excessive", over and above genuine need for this type of extinguisher because of high effectiveness and ease of application.

Poland and Hungary have never produced halons and halon systems. There are a few distributors of foreign equipment and extinguishing media and several installation and servicing companies. Their number continually increases. However, they are not organised into any kind of industrial association and therefore there is no strong group which could promote activities related to environmentally sound halon management during the transitional period. Also, the new companies do not have any obligations related to the old ones that imported the halons and related equipment. Consequently, the authorities and national institutions have to take on obligations related to halons phaseout.

### 3.1 Poland

Ministry of Environmental Protection, Natural Resources and Forestry (MEPNRJ?) is responsible for the implementation of the MP recommendations in Poland. The leading institution in the area of developing halon phaseout strategy is the State Fire Service Headquarters. SFSHQ co-operates with MEPNRF and other units.

The estimated amount of halon 1301 and 1211 in fixed halon systems is approximately 180-200 tons, and 2-3 tons of halon 2402 in military equipment from the former Soviet Union. The main users and systems are registered with State Fire Service Headquarters (SHSHq) and the Science and Research Centre for Fire Protection. There are no estimates of the amount of halon 1211 and 1301 in portable fire extinguishers.

**Main tasks** carried out in Poland are: (A) limitation of halon use; (B) introduction of alternative solutions; (C) satisfying critical needs of the users; (D) limitation of emission.

**(A)** Three stages in halon use limitation have been introduced

- \* Limiting halon imports

The Council of Ministers Decision of 1994 on limiting ODS imports introduced an obligation to secure an import license. Import of recycled halons is allowed only for critical uses, upon consultation with the fire protection experts.

- \* Requirement to receive a certification of the equipment and extinguishing media.

Under the Fire Protection Act (1992) all fire equipment and extinguishing media must be certified prior to being put on the market. The only institution authorised to carry out tests and issue certificates is the Science and Research Centre for Fire Protection (SRCFP) which is supervised by SFSHQ. Owing to the policy pursued (no certificates for portable extinguishers have been issued since 1992), the import and domestic production of portable extinguishers was eliminated. Halon use in new fixed systems has been drastically curtailed. Certificates for fixed halon systems are only granted if the essential/critical halon use criterion is met. Since 1994 an approval was granted for only one fixed system.



\* Passing opinion on fire-fighting installations for new facilities by experts/fire protection engineers.

All new construction designs must be reviewed by **experts** with regard to fire safety regulations. Limitation in halon use is one of the many criteria for the evaluation of the solution to be adopted.

(B) Promotion **of** an adequate hazard protection and environmentally friendly **alternative technologies** as well as *safe* halon systems maintenance is one of the most important issues in regard to halon phaseout. Introduction **of** new solutions requires dissemination of competently prepared information among *the* potential decision-makers, users, designers and fire protection experts. The fact that Poland is represented on the Halon Technical Options Committee helps in carrying out the task. It provides access to the latest information about possible replacements and technologies and about specific solutions adequate for various sectors. The information is transferred directly to the interested parties.

SFSHq has organised several seminars and training in this area. In 1994 SFSHq hosted Halons Technical Options Committee Meeting in Warsaw. Taking the advantage of having some of world experts on the problem in Poland it organised an international workshop on the Montreal Protocol and Problems Related to Halons Phase-out. The workshop held in Warsaw, sponsored by UNEP, State Fire Service Headquarters and Environmental Protection, Natural Resources and Forestry Ministry was attended by 137 participants including 105 from Poland and 16 from the other CIT countries, 2 experts from a developing country (India). **A** guideline had been prepared and published on the occasion of the workshop in two languages (Polish and Russian). Thus the information was passed on to decision-makers in the field in such countries **as**: Bulgaria, Croatia, Czech Republic, Hungary, Latvia Lithuania, Russian Federation, Ukraine, Slovakia and Slovenia.

In the current year a training course is planned on fire protection alternatives to the halon based technologies. The course will be offered to different target groups involved in fire protection in different sectors, including fire protection system designers, fire engineers-system reviewers, representatives of the certifying authority responsible for fire protection equipment and extinguishing media approval, servicing and distributing companies, the biggest halon users. The project is financed by Global Environmental Funds.

**An** important element in introducing alternative solutions is the above-mentioned certification system.

Among the new solutions the certificates have been granted in Poland to: FM-200, CEA-410, CEA 614 and Inergen and Argonite - inert gases. Continuous increase of non - in - kind replacements (water, CO<sub>2</sub>, dry powder and foam) has been observed since 1994.

(C) At present **securing the critical needs of the users** is provided by a "clearing house" type organisation. A consumer who wishes to purchase halon is advised by the SFSHQ on the existing European halon banks and the halon bank clearing house service of UNEP IE/PAC in Paris. Additionally, every consumer is informed about the consequences of halon use, in particular:

- an obligation to meet critical **use** criteria and obtain a certificate;
- an obligation to confirm that the halon purchased is recycled and meets the relevant standards:
- problems relating to potential halon destruction.

Poland has prepared a project for a network of freon and halon recycling to be co-financing by the Global Environmental Fund. Starting up the halon bank could be expected at the turn of 1997/1998.

(3) **Limitation of emissions** is enforced by limitation of use (see items A and B) as well as by *the* control of the technical status of halon installations. **This** is, inter alia, the subject of periodic inspections carried out by the Fire Service representatives. There is also a ban on halon use in testing and training

### 3.2 Hungary

The institution in charge of the implementation of the MP control measures is *the* Ministry of Environmental Safety and Area Development. Fire Service and its Fire Protection and Civil Defence Research Institute are leading in developing halons phaseout strategy.

In Hungary halons have been in use mainly in portable extinguishers. Estimated quantities of existing stocks are as follows: 2000-2200 tons of halon 1211, 20-30 tons of halon 1301 and approximately 10 tons of halon 2402 in military equipment.

As is the case with Poland, there are limitations on halon imports and their application in new installations.

Introduction of new solutions to the market requires a procedure made up of several steps. Official supervision of licensed fire-fighting gases is carried out by the Ministry of Environmental Safety and Area Development. Certification procedure in regard to fire fighting performance is realised by the Fire Protection and Civil Defence Research Institute. Approval is then granted by the Commander of State Fire Service.

Among alternative solutions for halon type fire protection permitted in Hungary are: Halotron I (for portable extinguishers); Halotron 11, FM-200 and NAF S III for fire extinguishing systems. Some more agents are undergoing the certification procedure.

Hungary is at the stage of launching a halon recovery and recycling station which is expected to recycle about 200 tons per year of halon 1211 and 10 tons per year of halon 1301. This project is co-financed by Global Environmental Fund.

#### MAIN PROBLEMS TO BE SOLVED IN POLAND AND HUNGARY IN THE FUTURE ARE:

- \* organising the recovery system;
- \* implementing halon systems decommissioning;
- \* preparation for potential halon destruction.

#### 4. RUSSIAN FEDERATION

Just as in case of the other Countries in Transition considerable structural, economic and social changes have been going on in the Russian Federation. Because of the complex starting point situation and the country's size the changes have been proceeding at a slower pace than in the Central European countries. Russia continues to remain in the *state of* economic crisis. This is the key factor determining the problems involved in the implementation of the Montreal Protocol control measures. The Russian Federation applied for a postponement of the time-limits for the fulfillment of their countries obligations under the Protocol as well assistance through Global Environmental Fund. The motion was a consequence of a delay in the modernization of industry and its transformation towards the production of ozone-friendly substances due to lack of means to accelerate the process. The problem was discussed at the recent Vienna meeting of the Parties to the *MP*

The Russian Federation has been the only halon producer among the CIT. For over 20 years halon 2402 has been produced and was commonly used before 1990 in the USSR and then in the Russian Federation and Community of Independent States, has been manufactured there. Prior to 1990 this halon was also supplied to the Eastern bloc countries together with military equipment.

Although the Russian Federation has significantly reduced the production of halon 2402 it has not given it up totally. The current needs for production is about 400 tons per annum (2 400 in ODP weight - the ODP value for halon 2404 is 6.0) which constitutes about 10% of the 1986 output. Many use areas depend on halon 2402, especially military equipment. Halon 2404 was not mass produced or used in other countries and is not available in existing halon banks. In Russia the chief use of halon 2402 has been for critical military applications and thus its recovery and recycling cannot support current needs. For this reason the Russian Federation is seeking a nomination for an essential use production exemption according to the Decision IV/25 (*Art. 2B of the MP*). At the same time the

Russian Federation has been undertaking steps with a view to implementing a halon phaseout strategy, including: halon 2404 recovery and recycling system, halon bank management, introduction of environmentally friendly replacements and emission control. This steps should be accelerated.

By the Russian Federation Governmental directive an Ozone Layer Protection Joint Committee was set up in 1993 to coordinate the activities related to the MP decisions. The Fire Extinguishing Halons Subcommittee is the key forum that develops the halon phaseout strategy. The Committee is a consultative body, where representatives from State Fire Service, ministries, major halon users, fire equipment designers and halon manufacturers raise issues and work on solutions by collectively developing plans and exchanging information.

Also the other sectors, especially the military one in the Community of Independent States depend on halon 2404. The solutions adopted must also take into account critical needs of the constituent countries. Speeding up halon 2402 phaseout process in the Russian Federation is a priority task relevant to halon phaseout and requires both financial and in kind support (know-how transfer, training, information exchange). In their decision VII/18 the Parties to the MP recommended international assistance to the Russian Federation in the implementation of control measures, at the same time requesting the submission of the annual progress reports.

HTOC session was held in Moscow in 1995 with a view to discussing, inter alia, the problems relevant to halon production and use phaseout in the Russian Federation and advice to Russian experts on the technical points, in their solution. In April of this year a seminar on ODS phaseout was held in St. Petersburg with the participation of the HTOC experts.

## 5. CONCLUSIONS

1. Despite economic difficulties many Central and Eastern European countries have implemented effective strategies of halons phaseout including such elements as: limiting the use to critical cases only, limiting emission from existing sources, introduction and promotion of environmentally friendly substitutes and satisfying the critical needs of users.
2. Taking follow-up steps such as: halons phaseout from existing installations (non critical uses), organization of recycling and destruction of surplus (Decision VII/12), may turn out impossible to implement without outside support.
3. Speeding up the end of halon 2402 production and introduction ozone-friendly substitutes to fire protection in the Russian Federation requires international support, both financial and in-kind. However, the effort should be made by the competent organs of

the Russian Federation. Halon 2402 phaseout in the Russian Federation will determine progress in the Community of Independent States (Ukraine, Belarus).

4. Granting CITs an independent status under the MP would give them easier access to international assistance and release them excessive dues to the Multilateral Funds. The funds could then be diverted to **tasks** in the individual countries, which would enhance their ability to implement control measures of the **MP** and ODS phaseout including the halons.

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