Halons Phaseout and Halon Banking

Erik Pedersen

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Global halon production is now limited to halon 1301 production in China and halon 1211 and 1301 in South Korea.

China exported around 30 MT of halon 1301 and 25 MT of halon 1211 in 2007. As per the A7 reporting, South Korea did not export any halons in 2006 (2007 data not yet available).

Sufficient stockpiles of newly produced halons available in China to supply halons for many years. Actual significant surplus based on 2007 sales.
Availability of halon substitutes - portable fire extinguishers

- Portable fire extinguishers are defined as extinguishers with weight less than 12 kg. An extinguisher normally contains from 1-10 kg of halons or other substitute fire extinguishing agents.
- Performance of manually operated fire extinguisher the main issue, toxicity only a concern in e.g. small enclosed spaces (CO₂).
- The fire protection industry in general is promoting ABC and BC powder, CO₂ and foam. HCFCs and HFCs have been introduced as fire extinguishing agents for a few special applications, but due to high cost and GWP concerns, the role of those chemicals is very limited in the portable fire extinguisher business.
- Some countries have requirements regarding periodic pressure testing of cylinders or maximum lifetime of cylinders. For halon fire extinguishers, recycling equipment can be used for preventing losses and emission during the process.
- HTOC does not support the use of HCFCs (e.g. HCFC-123, HCFC-124 and HCFC blends) for portable fire extinguishers.
Availability of halon substitutes - Fixed installed fire extinguishing systems

- Fire Extinguishing Systems (FES) normally contain from 5 kg to up to several 100 kgs of halons (halon 1211 and 1301) or substitute fire extinguishing agents depending on size of room/volume protected and allowed concentration. The aim of a FES is to control a fire in its very early stage to prevent interruption of operation and to allow people to remain in the area.

- Extinguishing concentration and toxicity of the fire extinguishing agent an issue.

- The fire protection industry has promoted HFC-227ea and nitrogen (and blends of nitrogen and argons) as substitutes for halons in fixed fire extinguishing systems. Both are now well established in the market. Niche market exists for various other solutions, e.g. water mist systems.

- As the cylinders used for fixed systems are larger volume and under higher pressure than portable fire extinguishers, regular pressure checking and testing of the cylinders are required. In order to prevent releases, recycling equipment is used during the servicing process.
The HTOC uses the following definitions:

**Halon Management:** The activities normally include introduction of halon phase-out policies, strategy on how to manage existing halons in the country, introduction and promotion of halon substitutes, halon recycling, collection of unwanted halons and eventually destruction of surplus halons when not longer needed globally.

**Halon Bank:** All halons installed in existing fire equipment and stored at owners, fire equipment manufacturers, service shops, halon recycling centers and at halon producers, i.e. all existing halons. As per the Decisions of the Parties to the MP, country has carried out surveys to identify the amount of halons installed in their country.

**Halon Banking** is the activities of halon recycling centers, i.e. recovering halons from existing halon fire equipment, recycling, reclaiming and selling of recycled halons.

**Critical uses** are uses/applications where it is difficult to identify an equally efficient substitute fire extinguishing agents due to health and safety concerns, where replacement is not technically possible due to weight and space, or where the cost would be too high to justify a replacement. (Best example is civil aviation.)

**Essential uses:** Cases where the Parties have allowed new production and consumption of halons to meet a specific need for fire protection.
Bank implemented halon management and banking activities

- Argentina
- China
- Indonesia
- Malaysia
- Thailand
- Tunisia
- Turkey
- Vietnam
A halon recycling center normally consists of the following components:

- **A recycling and reclamation unit**, which allows recovering halons from fire extinguisher cylinders without loss and emission of halons, separating the halons from the e.g. nitrogens used for pressurizing the cylinders, and removal of moisture and particles from the halons. It does not separate halons from other chemicals, which might be mixed with the halons.

- **Storage tanks and cylinders** for storing recovered and reclaimed halons

- **Balance/scale** to check incoming halons, ensure that tanks are only filled to a certain level during recovering and recycling, and to keep track of amount stored in cylinders and tanks at the center

- **Gas chromatograph** to check the composition of ‘halons’ received and halons after recycling and reclaiming

- **Portable halon detectors** for quick check of halons received and check for leakages from cylinders stored at the recycling center

- **Computer and software** to keep track of halon received (source of halons, amount received), present stock of halons and halons sold (buyer, use and amount)

- **An operational manual** for the recycling center and its operation.
Halon banking operation

- A halon recycling center should have a very clear business plan showing
  - expected annual income from sales of reclaimed halons and other services provided, e.g. checking and testing of halon cylinders,
  - annual cost of operating the center, staff cost, space for the recycling facility, operational expenses, etc.
- Halons would come from halon users when they no longer need the halons, e.g. fire equipment companies.
- Halons would normally be sold through fire extinguishing companies so they can serve their customers, and sold directly to some users.
- The recycling center would normally be the focal point for export and import of recycled halons.
Problems faced by halon banking operation

- National regulations have banned the use of halons, hence none or very limited demand for recycled halons
- Halons stockpiled by some critical users and fire equipment companies
- Fire equipment companies not willing to use the halon recycling center
  - fear the center will take away their business and customers
  - believe they can make money more out of their halons
  - Would prefer to sell a new fire extinguishing system instead of dealing with the halons
- Owners not willing to give up their halons and expect to be paid for the halons
- Two of the main critical users, the military and civil aviation, seem to be taking care of their own needs and do not use national recycling centers
- Received halons are contaminated and the equipment cannot clean it up (i.e. cannot separate the chemicals).
What can be done

- Reconsider changing national regulations, allowing use of recycled halons.
  - Difficult to go back, NOUs reluctant to do that

- Find a way to get the fire equipment companies on board and cooperating on how to handle and manage halons in general.

- Change users’ perceptions and expectations.

- Contaminated halons might have to be shipped to someone who can handle their destruction.
For consideration

- Increase global cooperation between halon and CFC recycling centers.
- Combine CFC and halon recycling centers into one center, which might be more cost-effective and sustainable.
- Focus on collection of obsolete halons and CFCs and CFC- and halon-based equipment (which might also result in future liabilities and destruction cost).