DISPARITIES IN ENVIRONMENTAL REGULATIONS AND THEIR EFFECT ON AGENT SELECTION

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Introduction

In recent years a number of International Agreements have been reached which have affected the use of halon and its potential replacements. These include the Vienna Convention for the Protection of the Ozone Layer of March 1985, and, perhaps more importantly, its Montreal Protocol on Substances that Deplete the Ozone Layer, which was agreed in September 1987 and which came into force in January 1989. It was amended in London in June 1990, and in Copenhagen in November 1992, in each case tightening the phase-out schedule. The next review is due late in 1995, and as this is the tenth anniversary of the original Convention, the meeting will return to Vienna. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was adopted in March 1989. The Framework Convention on Climate Change (FCCC) was agreed in Rio de Janeiro in June 1992 and there was a recent follow-on meeting in Berlin. Other Agreements already in existence which affect specific applications of fire protection include the Chicago Convention on International Civil Aviation of 1944, which forms the basis of the UN International Civil Aviation Organisation (ICAO); and the International Convention on the Safety of Life at Sea (SOLAS) of 1974.

There are significant disparities in national interpretations of these various Agreements, and there also exists at least the possibility of conflict between them. Examples of current national regulatory positions on the use of halon and its gaseous replacements will be reviewed, and an attempt made to assess some of the implications for agent selection in the future.

International Reaulatorv Positions

Under the provisions of the Montreal Protocol, production of new halon ceased in the developed countries at the end of **1993,** but there is a wide spectrum of national regulatory positions on the use of existing halon. At one extreme is Australia, whose regulations already mandate decommissioning of existing systems, where the plan is to complete phase-out of all but a short list of "essential" uses by the end of **1995,** and where provision is made in the regulations for destruction of agent. Within the European Community (EC) there is growing pressure towards the introduction of Use Controls, and a proposal to introduce such Controls is expected before the end of **1995.** Meanwhile, in many countries including the USA and the UK there is currently no restriction on the use of recycled agent. And at the other extreme, in China and India production of halon continues under the Protocol's ten year exemption for developing countries and, at least in China, is expected to continue to expand.

Positions on transitional substances, such as hydrochlorofluorocarbons (HCFCs) also show significant variations. In the USA the Significant New Alternatives Program (SNAP) states that "while HCFCs can serve only as an interim halon substitute .... they serve an important transitional rôle ....". In contrast, in the EC, Regulation 3093/94 prohibits the use of HCFCs in fire fighting with effect from June **1995.**

Various chemical agents have been put forward which, with a zero ODP, are unaffected by the Protocol. Some of these, however, have significant Global Warming Potential and Atmospheric Lifetime, and these factors, too, are becoming increasingly important, particularly as a result of the commitments made in the FCCC. For instance, on hydrofluorocarbons (HFCs) SNAP "recommend[s] that users limit testing, ... recover .... and recycle, ... [and] prevent unnecessary emissions ....". In the UK, there is a move towards an industry Voluntary Code of Practice limiting the use of HFCs to " .... applications where they can be shown to be the best choice [considering] space, weight, personal safety ....", and a recent report issued by the Prime Minister's Panel on Sustainable Development has proposed the introduction of phase-out targets for these materials. Switzerland has recently proposed a ban on fire fighting agents with an Atmospheric Lifetime in excess of five years. Affected even more strongly are perfluorocarbons (PFCs) which SNAP finds only "acceptable where other alternatives are not technically possible ....". In the UK a Voluntary Code of Practice similar to that for HFCs is under consideration, and elsewhere in the EC there is growing pressure for regulation, while national initiatives are being taken by individual member countries including Germany and Denmark.

The international regulatory position is thus both inconsistent and potentially conflicting. There is significant pressure towards ***tighter*** regulations under the Vienna Convention and the Montreal Protocol. Moves are being seen towards Use Controls on both halon and its potential replacements, and towards the removal and destruction of halon from existing systems. There is also movement towards ***wider*** regulation, and the FCCC, for instance, is likely to increase the pressure on all atmospherically accumulating manmade chemicals.

Implications for Aaent Selection

The implications of the situation are determined to some extent by the type of installation. Fixed installations must obviously comply with local regulations, which are more or less onerous and restrictive depending on the site of the installation. More intractable problems may arise in the case of mobile installations such as aircraft, ships and land vehicles which are required to operate in more than one territory, and thus potentially to comply with the perhaps conflicting requirements of each.

In some cases, this position may be mitigated by the effect of other treaties. ICAO provides that signatory countries who declare that compliance with their national Airworthiness Regulations will result in meeting at least ICAO minimum requirements, and that their aircraft are indeed in compliance with these Regulations, may make use of the air space and ground facilities of other signatories. **SOLAS** similarly lays down minimum safety standards, although, in at least some cases, signatories with "higher" standards may demand that these are met by visiting vessels. Another category of user which may require to operate outside its national boundaries is military vehicles. The NATO Committee on Challenges to Modern Society at its conference in January 1994 recommended to NATO that it should actively encourage its member states to "interpret host regulations applied to guest forces in ways that allow reasonable and necessary use and transport of ozone depleting substances". None of these agreements involve any obligations for host countries to provide, or even to permit the availability of, agent for recharging systems. Furthermore, the transboundary shipment of such agent may be affected by the Basel Convention.

The aim of the Basel Convention is to prevent the dumping of hazardous wastes on developing nations. Unintentionally, it is a potential impediment to the international shipment of halons if any party to the shipment - the consignor, any transit territory or the recipient - considers halon a "hazardous waste". It is unclear whether this applies to bulk agent ***for recycling;*** less likely, to bulk ***recycled*** agent; or, much less likely, to charged extinguishers. The Montreal Protocol's Halon Technical Options Committee has established contact with the equivalent technical authorities of the Basel Convention and is seeking the explicit exclusion of halon which meets internationally recognised purity specifications. It is not yet clear which nations are likely to consider halon hazardous, but these may include Australia, Canada, Estonia, Holland and Switzerland, amongst others.

Summary and Response

It must probably be accepted that increasing pressure will be brought to bear on all atmospherically accumulating manmade chemicals. It is also increasingly unlikely that any gaseous agent will be able to comply with all national requirements worldwide.

I suggest that the first response of the fire protection industry should be to use non gaseous agents where they can be shown to be technically effective. As an example, one of Kidde Graviner's specialist fields is the protection of armoured vehicle engine compartments. Our test work has investigated a wide variety of potential replacements, both conventional and novel, and replacement systems based either on dry chemical agents or on halocarbons can be designed to be comparably effective to halon in terms both of space and weight (references 1, 2); however, because of the environmental considerations, the company's invariable recommendation would always be in favour of dry chemical.

In contrast, in the protection of the crew compartments of the same military vehicles, no agent other than a halocarbon has yet been shown to be technically acceptable in all respects (references 2, 3). Numbers of other applications face the same difficulty. It remains the overriding responsibility of the fire protection community to provide the highest possible standards of fire safety for people and property. An entirely proper activity of that community is therefore to resist the imposition of inappropriate restrictions on the availability or use of gaseous fire extinguishing agents where they can be shown to be the only means of achieving optimum safety standards. The disciplines already introduced by the industry in response to the Montreal Protocol mean that fire protection can now be regarded as a substantially non-emissive use. Unavailability, or non-use because of uncertainties as to the continued availability, of these agents resulting from inappropriate regulation will lead to a serious reduction in safety standards and will quite possibly result in loss of life. We should have no hesitation in making this clear to those responsible for regulatory decisions.

References

1 D N Ball and M S Russell; "Pyrotechnic Aerosol Extinguishing for AFV Engine Bays", Halon Options Technical Working Conference, May 1994

2 D N Ball; "Alternatives and Replacements for Halon in AFV Protection", NATO CCMS Conference, January 1994

3 J A Senecal, D N Ball and A Chattaway; "Explosion Suppression in Occupied Spaces", Halon Options Technical Working Conference, May 1994