HOME OFFICE
HORSEFERRY HOUSE, DEAN RYLE STREET
LONDON SW1P 2AW

To: All Chief Officers

9 November 1993

Dear Chief Officer

DEAR CHIEF OFFICER LETTER 11/1993

Items

1. Replacement of fire service mobilising and communications systems: Supplementary Credit Approvals (1994-95).

2. The toxicity of the combustion products of polytetrafluoro-ethylene (PTFE).

3. The Planning (Hazardous Substances) Regulations 1992.

4. An assessment of personal dosimeters for fire service use (Research Report No 55).

5. Amendment to Technical Bulletin 2/1993: Incidents involving radioactive materials.

Yours faithfully

SIR REGINALD DOYLE
Her Majesty's Chief
Inspector of Fire Services

ITEM 1
DCOL 11/1993

REPLACEMENT OF FIRE SERVICE MOBILISING AND COMMUNICATIONS SYSTEMS : SUPPLEMENTARY CREDIT APPROVALS (1994-95)

1. Item 1 of Dear Chief Officer Letter 3/1993 dated 15 March gave details of a Home Office proposal to issue a total of £14.9m additional provision for 1993-94 by way of Supplementary Credit Approvals (SCAs) for the specific purpose of capital expenditure on replacement mobilisation and communications systems. Those Approvals have now been allocated to brigades.

2. This item invites bids for SCA's in 1994-95. As with bids in previous years approval will be confined to the replacement of mobilisation and communications systems, the associated line concentrator systems in control rooms and the adaption, extension or rebuilding of control rooms to accommodate the replacement equipment. Radio or line bearers, including radio control systems, and consultancy fees are excluded.

3. Brigades should note, however, that at this stage the Home Office is unable to provide an unqualified commitment that additional provision for SCAs in 1994-95 will be available.

4. The basic criteria against which applications will be assessed are as follows :

- the date by which replacement is needed;

- whether the scheme proposed is consistent with the recently produced Home Office Standard Technical Specifications (referenced in DCOL 8/1992) and with the principles of 'open systems architecture' to secure supplier independence, inter-operability, ready adaptability to future changes in fire service areas and full compliance with the EC Supplies Directive (88/295) and the EC Directive on IT Standards (87/95);

- whether the scheme represents good value for money and has been or is being procured via a competitive tendering mechanism.

5. In the interim, Chief Officers should ensure that equipment proposed by companies, including those who are likely to supply equipment under the Home Office Framework Agreements, complies with the latest Home Office specification (in the series GD - 92/1003).

6. Brigades wishing to bid for an SCA for 1994-95 are asked to do so by **18 February 1994** at the latest. If additional provision is made available for SCAs in 1994-95, the Home Office will be in a position to consider applications and approve those which meet the agreed criteria, at the beginning of the financial year.

7. Applications will need to be accompanied by a fully substantiated case for incurring the expenditure. A model application is attached at Annex A. Brigades are asked that wherever possible they adopt this format. Failure to do so may delay consideration of the case.

8. Brigades whose applications for 1993-94 included an element for 1994-95, will need to re-apply.

9. Any queries regarding the above should be addressed as follows:

Mr Mantle (G1 Division) 071 217 8743 SCAs
Mr Meakin (G1 Division) 071 217 8290 Home Office Specifications
HMI Phillips (Fire Service Inspectorate) 071 217 8519 General

Annex A
Item 1
DCOL 11/1993

MODEL APPLICATION FOR SUPPLEMENTARY CREDIT APPROVAL

1. Details of Brigade

Brigade:
Address:

Telephone Number:
Fax Number:

CONTACT OFFICER:

2. Details of Current system(s)

Supplier:

Communications sub-system:

Mobilising sub-system:

Type of Line Concentrator:

Elements of system being replaced:

Mobilising sub-system: Yes / No

Communications sub-system: Yes / No

Line concentrator equipment Yes / No

Other - explain:

3. Details of New system

Date when replacement systems are expected to be operational:

Has a contract been let:

If Yes, to whom

If not, state at what stage of procurement:

Provide timescales:

For what elements:

4. Is the system procurement in accordance with the principles of open competition and the EC supply and IT Strategy Directives. If not, state reason:

5. State shortlisted tenderers (maximum of 4):

6. If the lowest compliant tender was not selected, give reason for this decision:

7. Does the specification for the communications sub-system comply with the Home Office standard technical specification referred to in Dear Chief Officer Letter 8/1992. If not, state reason:

8. Is the Authority willing to provide relevant documentation if requested?

9. Does the brigade intend to take or has it taken advantage of the Home Office Framework Agreements in respect of the above? If not, state reason:

NOTE: a no answer does not disqualify.

10. Is the Authority willing to allow Home Office officials to validate the foregoing by inspection, test and/or discussion with suppliers, officials etc.?

11. (a) Amount of SCA issued in 1992-93:
(b) Amount of SCA issued in 1993-94:

Please provide payment profile (give details of actual/estimated expenditure throughout life of procurement and implementation cycle).

	92-93	93-94	94-95	95-96	TOTAL COST	SCA BID 94-95
Communications sub system						
Mobilising sub system						
Line concentrator						
Station end equipment						
Essential building works						
Others (please specify)						
TOTAL						

12. Date of Application

13. Chief Fire Officer's signature

ITEM 2
DCOL 11/1993

THE TOXICITY OF THE COMBUSTION PRODUCTS OF POLYTETRAFLUOROETHYLENE (PTFE)

1. This item gives details of a recently completed research project into the potential toxic hazards from fires involving materials based on polytetrafluoroethylene (PTFE).

2. Background

2.1 The high thermal stability of PTFE has been recognised for several years but uncertainty has more recently been aroused about the toxicity of the decomposition products when PTFE eventually thermally degrades. Such doubts resulted from a claim by scientists mainly in the United States that in laboratory scale studies, PTFE emitted products up to a thousand times more toxic than any other known toxic chemical species (sometimes referred to as supertoxic products).

2.2 This claim caused concern because of the increased use of PTFE membranes as roof covering for large complexes such as shopping malls and sports stadia. Therefore it was decided to investigate whether there were potential hazards, both to the firefighter and the general public in the vicinity of such complexes, should decomposition of the PTFE membrane occur as a result of fire.

2.3 Research was undertaken in collaboration with the Fire Research Station, the Thames Polytechnic and the Huntingdon Research Centre. A combined approach, involving the disciplines of physical chemistry, analytical chemistry and toxicology, was used.

3. Experimental Work

3.1 A series of small-scale experiments confirmed that, although PTFE has good fire resistance properties, when eventually combusted it always evolves products that are approximately ten times more toxic than those from other materials, ie the 'normal' toxic products and, under certain conditions the so-called 'supertoxic' products may be formed. In order to produce these 'supertoxic' products small samples of PTFE had first to be thermally decomposed within a critical temperature range of 450°C to 800°C (with an optimum temperature of 585°C). The decomposition products then had to be re-circulated at a temperature of between 450°C and 650°C, termed secondary heating, and the products generated only had a lifetime of between ten and sixty seconds.

3.2 In order to ascertain whether these 'supertoxic' products are likely to be produced in real fire situations, a second phase of research was undertaken. This involved the use of an intermediate scale test chamber some thirty times larger than that used in the first phase; the amount of PTFE used was also

scaled up accordingly. This equipment was used to gain a fuller understanding of the mechanism of the formation of the products, their lifetime, the effect of other fire products on their toxic potency (when such other materials are combined with the PTFE products) and the effect of the type of heat source, ie flaming or non-flaming.

3.3 The data obtained from this series of experiments using the intermediate scale chamber confirmed and extended the knowledge gained from the previous work. The products were again formed as in the laboratory-scale equipment and it is considered likely that they could also be formed, under certain conditions, in full-scale fires. However, the fact that high temperatures (800°C+) destroyed the 'supertoxic' products and the presence of other fire products reduced their formation, (as did other materials such as glass fibre and polythene) when used as a composite with PTFE, means that the potential hazard resulting from the use of PTFE is likely to be significantly less than originally feared. It now seems likely that if a large fire were to occur in a structure roofed with a PTFE-based material, the thermal decomposition products likely to be given off would contain only low yields of the 'supertoxic' products, if any. Therefore, it is considered unlikely that, by the time it was inhaled by anyone remote from the fire, any such products would contribute to the overall toxic potency of the smoke.

3.4 Where the primary fire products are vented rapidly away from the hot zone, such as a fire in the open or in a well ventilated room/corridor, it is unlikely that significant amounts of supertoxic products would be formed and the toxic potency of any that are formed would be much reduced after travelling a few metres from the fire. However, there remains a possibility that if a fire is confined to a room-sized compartment any primary products formed may be able to pass through a region at the required temperature for secondary heating, so that conversion of the products to supertoxic state may occur.

3.5 All the questions concerning the toxic hazard from PTFE have not yet been answered but based on this research it is now possible to say with reasonable confidence that:-

a. 'supertoxicity' is associated with the particulate matter released when PTFE is decomposed under non-flaming conditions (450°C to 800°C, optimum 585°C) rather than with a gas;

b. the particles formed are of the optimum size to enter deep into the lung during respiration and by some mechanism not yet understood cause oedema (a possible life threatening condition);

c. re-circulation of the decomposition products of PTFE within the temperature range of 450°C to 650°C is necessary in order to attain 'supertoxicity' - which, if formed will last between ten to sixty seconds;

d. the presence of other fire products, including wood smoke, reduces the toxic potency of PTFE decomposition

products; and

e. the combination of PTFE with other materials, eg polythene, also reduces its toxic potency.

4. Special Considerations for Firefighters

4.1 During fires involving substantial amounts of PTFE-based materials, such as those in buildings roofed with PTFE/glass fibre or stores of such materials, toxic gases will always be evolved. There is also the added danger that in certain situations supertoxic products could be released. Inhalation of smoke and fumes emanating from fires known to involve PTFE-based materials should therefore be strenuously avoided. Breathing apparatus should be worn. Personnel should also be aware that, in common with other fires involving plastics, combustion products from PTFE may be acidic and prolonged skin exposure may cause irritation.

4.2 With regard to the area surrounding a burning building roofed with PTFE-based material, it was thought originally that large amounts of supertoxic fumes might be released, causing a hazard to the surrounding locality. It is now considered that this is unlikely. However, acid gases would be present in the smoke in addition to the other more 'usual' toxic products, so that the normal precautions should be taken to keep the public away from affected areas.

4.3 Supertoxic products are considered to age rapidly, and the acid gases are water soluble as well as being absorbed by wall linings etc. Thus there should be no special problems during damping down periods following such fires. However, it is recommended that breathing apparatus should also be worn during damping down in order to avoid intoxication by carbon monoxide and other fire products.

4.4 In kitchen fires which might involve PTFE-coated cookware, it is considered that there should be no special hazard to firefighters entering the compartment for short periods. The highest risk would be to anyone remaining in a compartment where PTFE-coated cookware has been overheated for several hours, but where no actual fire has occurred.

5. Further Guidance

5.1 Guidance on the use of PTFE-based materials in buildings, which draws on the results of this research project, has been produced jointly with the Department of the Environment for use by Building Control Officers. This is to be issued as a Building Research Establishment publication.

FEP/92 20/144/1
Telephone number of contact: 071-217-8043 (policy)
071-217-8020 (technical)
071-217-8408 (operations)

ITEM 3
DCOL 11/1993

THE PLANNING (HAZARDOUS SUBSTANCES) REGULATIONS 1992

1. This item advises Chief Officers in England and Wales of their rights of consultation under the above regulations before consent is given by a local authority for the use of land for the presence of a hazardous substance in an amount at or above its controlled quantity.

The Regulations

2. The Planning (Hazardous Substances) Regulations 1992, made under the Planning (Hazardous Substances) Act 1990, came into force on 1 June 1992 and are designed to ensure that hazardous substances can be stored and used only after local planning authorities have had the opportunity to assess the associated degree of residual off-site risk which remains after health and safety controls have been complied with. The Regulations do not duplicate Health and Safety controls or other specific forms of control eg Fire Precautions Act.

3. The responsibility for determining applications and enforcing the Regulations rests with the 'Hazardous Substances Authority'(HSA), which is usually the local planning authority.

4. The main requirement of the Regulations is that 'Hazardous Substances Consent'(HSC) is obtained from the HSA before the presence of certain listed substances at or above specific amounts known as 'Controlled Quantities' is allowed.

5. The Regulations require the HSA to consult with a number of organisations, including Fire and Civil Defence Authorities, before consent is given.

6. The HSA has a period of 8 weeks from the date when an application is received to consider it and give the applicant written notice of their decision. Brigades should receive a copy of the application within 7 days of its receipt and will have a further 28 days in which to make their comments. The application will normally consist of:

(a) Application Forms

(b) Site Map

(c) Substances Location Plan/Change of Location Plan/Change of Control Plan - as required.

7. As well as being able to refuse or grant consent, local authorities also have the power to impose suitable conditions.

Actions by brigades

8. It is suggested that the Brigade Hazardous Materials Officer (HMO) acts as co-ordinating officer for these Regulations by

maintaining records of all premises, consultative documents, deemed consents, reports and replies and also checks information received against current information such as operational COSHH information and Brigade Control information. The Brigade HMO may also wish to check whether information received has implications regarding:-

(a) Control of Industrial Major Accident Hazards Regulations - CIMAH.

(b) Dangerous Substances (Notification and Marking of Sites) Regulations - NMS.

(c) Notification of Installations Handling Hazardous Substances Regulations - NIHHS.

9. In considering the residual off-site risks presented by the storage and use of a particular hazardous material and the measures necessary to counteract them, brigades should take into account such matters as access for emergency service vehicles; availability of water supplies for fire fighting; need for special equipment and; the potential for fire to spread to nearby premises etc.

10. In each case the Brigade's Report should be forwarded to the HSA before the 28 day consultation expiry date.

Telephone number of contact: 071 217 8745

ITEM 4
DCOL 11/1993

AN ASSESSMENT OF PERSONAL DOSIMETERS FOR FIRE SERVICE USE

This item informs Chief Officers and Firemasters of the results of an assessment of personal dosimeters and advises on the future replacement of quartz fibre electroscope (QFE) dosimeters.

Background

2. In 1989 the Working Group on Incidents Involving Radioactivity highlighted the main deficiencies of the QFE dosimeters as their poor low dose sensitivity, lack of audible or visual alarms and difficulty in reading whilst wearing breathing apparatus. The Working Group recommended that research be undertaken into electronic integrated dose rate alarm meters suitable for use by the fire service in two stages. The first phase being aimed at producing a "Which" type report covering all of the devices currently available, with, subject to the outcome of phase one, the second phase concentrating upon the development of suitable instrumentation.

3. Following that recommendation, the Emergency Planning Department Research Group commissioned the National Radiological Protection Board to produce a specification for personal dosimeters for use in the fire service and to carry out a survey of commercially available devices to determine which might be suitable replacements for the QFE.

4. A copy of the Summary Report "An Assessment of Personal Dosimeters for Fire Service Use", which includes a suggested specification for a fire service dosimeter, is attached.

Results of the Assessment

5. Of the four dosimeters assessed, the Merlin Gerin DM90 FS and the Stephens Gammacomm 4200M, modified for fire service use, both meet the suggested specification. The Appleford DMFS meets only the essential requirements of the specification. It does not display dose-rate, although it does give an audible dose-rate indication.

Recommendations

6. As recommended in the "Report of the Joint Working Group on Chernobyl" there should be sufficient personal dosimeters carried on all first line appliances for each member of the crew. Replacement of the current QFEs can be undertaken by Chief Fire Officers and Firemasters piecemeal or in total according to their operational needs and financial resources.

Telephone number of contact: 071 217 8745

ITEM 5
DCOL 11/1993

AMENDMENT TO TECHNICAL BULLETIN 2/1993:
INCIDENTS INVOLVING RADIOACTIVE MATERIALS

1. This item advises of an amendment to Technical Bulletin 2/1993 (Incidents involving radioactive materials), circulated under cover of item 6 of Dear Chief Officer Letter (DCOL) 7/1993.

2. Figure 1 on page 25 of the Technical Bulletin should be shown as all white i.e. the top half of the figure should not be yellow.

File Reference: FEP/92 23/71/2

Telephone number of contact: 071 217 8745