File

10 DOWNING STREET

From the Private Secretary

1 November 1984

ANTI-MISTING KEROSENE

The Prime Minister has seen and noted your Minister's minute to her of 26 October on the above subject. Mrs. Thatcher is grateful to Mr. Pattie for drawing this development to her attention.

I am copying this letter to Colin Budd (Foreign and Commonwealth Office), Nick Evans (Ministry of Defence), Sarah Straight (Department of Transport) and Richard Hatfield (Cabinet Office).

David Barclay

Neil McMillan, Esq.,
Office of the Minister of State,
Department of Trade and Industry.

cc Mr Ingham

Prime Minister (2)

PRIME MINISTER

ANTI-MISTING KEROSENE

I felt that you would wish to know of an event due to take place in the USA shortly which is the subject of widespread press and TV interest and in which a promising British scientific development will play a leading role.

A US/UK collaborative programme proceeding under a Memorandum of Understanding of 1978 (though work in the UK started as long ago as 1967) to develop a fuel additive which will prevent aircraft crash fires has led to the development by ICI, with assistance from RAE Farnborough and funding from both DTI and MOD, of a chemical called FM9 which has proved very successful as a fire suppressant when dissolved in kerosene to give a mixture known as "anti-misting kerosene" (AMK). The capabilities of the additive are to be the subject of a major demonstration scheduled for 10 November, when a Boeing 720 airliner fuelled with AMK will be radio-controlled to crash at NASA's Dryden facility in California. Following this "controlled impact demonstration" the FAA expect to issue a Notice of Proposed Rule-Making (NPRM) about the adoption of AMK for commercial airline service in the USA. At present the ICI additive has no serious competitor.

Although the demonstration is likely to demonstrate graphically the success of the additive as a fire suppressant, there is much work to be done before we know whether AMK can in fact be used commercially. In particular, we do not yet know what effect the long-term use of AMK will have on the safe operation of aircraft fuel systems. Answering this and other outstanding questions will be costly.

My officials have already briefed selected journalists on this topic and will be assisting MOD and CAA officials to brief the BBC TV "Newsnight" team on Tuesday 30 October. I attach a background note and some notes suggesting the line to take if Press Officers are questioned about AMK.

I am copying this to Geoffrey Howe, Michael Heseltine, Nicholas Ridley and Sir Robert Armstrong.

GEOFFREY PATTIE

26 October 1984

OC4/OC4AAR

(FLAG A)

ANTI-MISTING KEROSENE (AMK) - Background Note

1 In a significant number of aircraft crashes, particularly those which occur on or near the airport, the impact forces are survivable but large quantities of fuel are released from the aircraft's tanks and pose a severe fire hazard. Since the 1960's research has been under way in the UK and the USA with the aim of developing a "safety fuel" which would reduce or eliminate this hazard.

2 Piston-engined aircraft use gasolene fuel: spillage of this fuel rapidly results in the spread of highly inflammable vapour and there is little that can be done to prevent this from igniting. However, the introduction of turbine-powered aircraft using kerosene fuel, which does not produce this inflammable vapour and thus is in any case substantially safer than gasolene, provided an opportunity to see if post-crash fires could be prevented altogether by modifying the fuel so that it would not ignite rapidly following an accident.

3 Although a match dropped into a bowl of kerosene simply goes out, if the fuel is ejected violently from fuel tanks and pipes ruptured by a crash, a mist of small fuel droplets is formed which readily ignites. Work in the UK focussed on the objective of producing an additive which, when mixed in small quantities with kerosene, prevented the formation of small droplets - hence "anti-misting kerosene" (AMK). Work by the Royal Aircraft Establishment (RAE) at Farnborough and ICI Paints Division at Slough eventually resulted in the production by ICI of the additive called FM9 (Fuel Modifier 9).

4 During the 1970's, the authorities in both the UK and the USA recognised that FM9 provided the best hope of achieving a major reduction in post-crash fire deaths and both concentrated their research effort on confirming its fire-suppression potential and attempting to determine whether the introduction of AMK into airline service was a practical proposition. Collaboration between the two countries was made formal by the signature in the summer of 1978 of a Memorandum of Understanding (MOU) between the Federal Aviation Administration (FAA) and the National Aeronautics and Space Administration (NASA) on the US side and MOD(PE) for the UK, representing also DTI and CAA.

5 Events in the United States have since moved ahead and FAA are committed to Congress not only to pursue the programme vigorously but later this year to conduct a public Controlled Impact Deomstration (CID) in which a Boeing 720 airliner fuelled with AMK will be flown into the ground under radio control to simulate a typical approach accident. The latest indications are that the CID, originally scheduled for late July, will take place on 10 November. There is every reason to believe that the CID will provide a successful demonstration of the potential benefits of using AMK and will raise American and possibly European public expectations of an early introduction of this "safety fuel" into airline service.

6 The expected subsequent declaration by the FAA of a timetable for the introduction of legislation will focus the attention of the aircraft and airline industries on both sides of the Atlantic on the very real problems which remain to be solved. In particular, the long-term effect of AMK on aircraft engines and fuel systems is at present unknown and is crucial to airworthiness certification and to the cost-effective operational use of AMK on civil aircraft. The endurance testing which will be needed to build up confidence that the exceptional safety record of present aircraft fuel systems can be matched by systems using AMK will be expensive, and the costs will fall on the industry and ultimately on airline passengers.

Note on Funding

7 The AMK research programme at ICI Paints Division at Slough was funded jointly by MOD and DTI from 1967 until September 1980. Since September 1980 this programme has received no HMG funding. DTI has, however, maintained close contact with ICI and indeed our participation in the Memorandum of Understanding has been largely in support of ICI's interests. At the same time we have sought to discourage ICI from investing heavily in AMK development on the basis of an over-optimistic assessment of the prospects of achieving an eventual commercial return. With the principal requirement for FM9 now being in the US, ICI Americas have become the centre of production of the additive but we understand that control of the programme remains with Paints Division in the UK.

Role of the Royal Aircraft Establishment

8 Some DTI funds have continued to be used since 1980 to support the RAE in a monitoring role. In addition to their sponsorship and management of the AMK programme, RAE have made a very considerable input in terms of the chemistry of the additive, of developing and carrying out test techniques for the fire suppression and of work on the fuel system problems.

Relationship with the USA

9 The collaboration with the FAA and NASA has been of great value to us, because we lack the resources to mount the big test and development effort characterising the last few years, especially in terms of tests such as that on the Boeing 720. In addition, we have been able to influence American thinking in a way impossible to achieve were we not formally tied into the programme: this will become even more important when the NPRM stage is reached. The benefit to the American side has been the provision by the UK of an additive which performs its primary task extremely well, several major US companies having failed to equal ICI's achievement in spite of many years of trying.

Air Division/DTI
October 1984

(FLAG C)

ANTI-MISTING KEROSENE (AMK) - Suggested line

1 This promising development is the result of the pioneering efforts of ICI and the Royal Aircraft Establishment and their collaborators including the Civil Aviation Authority in the UK and the Federation Aviation Administration and the National Aeronautics and Space Administration in the USA.

2 In its earlier stages, substantial funding to support the UK programme was provided both by the Department of Trade and Industry and by the Ministry of Defence. I'm glad to say that almost all funding now comes from ICI.

3 Whilst the prospect of eliminating aircraft crash fires is an exciting one, we must be certain that the introduction of anti-misting kerosene does not impair in other ways the excellent safety record of civil aviation, for example by causing problems in aircraft fuel systems. This is a matter to which the airworthiness authorities on both sides of the Atlantic are giving the most careful consideration in consultation with the Royal Aircraft Establishment and the American research establishments.