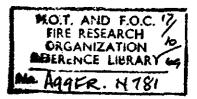# Fire Research Note

No.781

MEMO ON POTENTIAL SAVING THAT MIGHT BE
EFFECTED BY RAPID FIRE DETECTION

by

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FIRE

RESEARCH

STATION

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.SUMMARY

From the records of over a thousand large fires the numbers which became large through delay in discovery is known. From these the proportion which would have probably become large through faulty building design etc., has been discounted and it has been assumed that the rest could have been prevented from becoming large by the provision of an automatic detection system.

Keywords

Detector, fire ; Loss ; Prevention.

MINISTRY OF TECHNOLOGY AND FIRE OFFICES' COMMITTEE

JOINT FIRE RESEARCH ORGANIZATION

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The annual fire loss is currently £100M per annum and of this about £50M is accounted for by large fires, individually costing over £20,000. Roughly, these correspond to fires fought with five or more jets.

According to Dunn and Fry[1], delay in discovery is the most important factor in determining whether a fire becomes large. In a sample of 1210 fires which had become large, the effect of delay can be seen from the following table:-

No delay	376 fires
Building unoccupied at time of fire	609 fires
Other reason for delay	80 fires
Unknown delay	145 fires
	1210

Ignoring the cases of 'unknown delay'; in 376 fires there was no delay and in 689 fires there was delay for some reason or other. In a proportion $\frac{376}{376 + 689}$ of all fires, the fire would become large even though there was no no delay in discovery. In assessing the potential savings as a result of installing fire detectors, this fraction should be discounted from the fires involving delay to allow for those fires which must inevitably become large through such factors as building design, presence of flammable materials, etc.

The number of fires that could be prevented from becoming large by rapid detection would be

$$689(1 - \frac{376}{376 + 689}) \text{ or about } 440$$

Roughly, therefore $2/5$ of all the fires that become large might be saved by an automatic detection system directly connected to the brigade and this would mean a potential saving of $2/5$ of £50M, say £20M. This estimation ignores any savings that might be effected in small fires by using fire detectors and this is probably correct.

Reference

1. DUNN, Jennifer E. and FRY, J.F. Fires fought with five or more
    jets. Ministry of Technology and Fire Offices' Committee Joint
    Fire Research Organization Fire Research Technical Paper No. 16.
    HMSO. 1966.