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F.R. Note No. 311/1957.
Research Programme
Objective

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH AND FIRE OFFICES' COMMITTEE
JOINT FIRE RESEARCH ORGANIZATION.

PROGRAMME OF FIRE RESEARCH

April, 1957.

Fire Research Station,
Boreham Wood,
Herts.

PROGRAMME OF FIRE RESEARCH

Many requests are received for information about the programme of research that is carried out by the Joint Fire Research Organization. Particulars of the Station and its work are given in the publications listed at the end of this note, which is confined to a general description of the aims and scope of the programme itself and without any reference to the manner in which it is carried out or to the results.

The work of the Station is of three categories:-

- (a) Advisory and ad hoc work.
- (b) Applied research.
- (c) Basic investigations.

The Research Programme covers the second and third categories. The broad structure of the programme is simple, and is based on the view that the first concern is to know how many and what kinds of fire occur, and then successively the causes, how ignition occurs, how small fires develop and become large ones, how different materials and buildings behave in fires, and how fires may be put out.

The following items are receiving attention at the present moment:

(a) Current fires:

With the co-operation of the Home Office and the Fire Brigades of the Local Authorities a standard report is obtained on every fire attended by the Fire Brigades, and a special research report is made by Fire Protection Officers on fires of special interest (i.e. large fires, or fires of types that are currently the subject of special investigations at the Fire Research Station). Annual national fire statistics are prepared; brief particulars of these are published in the Annual Report of the Station, and fuller details are available on application. The statistics, and fuller details that are available in the reports, are used as a basis for operational research in connexion with problems in other sections of the Research Programme, as mentioned below.

(b) Initiation and growth of fire:

Precise measurements are made of the conditions under which various materials can be ignited. The following special aspects are being studied:

Effect of preheating on the ignition of wood

Ignition of suspensions of industrial dusts by small igniting sources, and of dust layers by heated surfaces.

Propagation of combustion in dust suspensions

Effect of gauzes and other means of arresting propagation of flame in flammable vapour/air mixtures. Conditions under which flames will spread across the surface of combustible materials. Upward velocity of gases in fire.

(o) Suppression and extinction of fire:

Water: Large-scale tests are being arranged to check the conclusions of earlier laboratory experiments about the relative merits of low and high pressure sprays.

Foam: Optimum dimensions of equipment at aircraft crash fires.

Vaporising liquids: Mechanism of extinction (extra-mural contracts for universities).

(d) Effect of fire on properties of materials:

Effect of high temperature on the crushing strength of concrete: spalling of concrete in fires.

(e) Structural aspects of fires in buildings: Investigation of the development of fire in single compartments and in groups of buildings, using model techniques.

(a) Effect of fire load and ventilation and venting on the development and maximum intensity of fires in buildings.

(b) Operational research study on fires in dwellings, both to provide information about houses, and to develop a measure for the efficacy of Fire Brigade cover and for the practical effect of building construction on the development of fire.

(c) It is hoped to complete full-scale tests on prestressed concrete and to prepare a bulletin summarising all the information now available.

It is hoped to complete background research on a roof test, a flammability test, and on an improved test to assess the "Reaction to fire" of combustible lining materials.

(f) Special fire hazards:

(a) Operational research studies of the conditions that make the principle contribution to the development of large fires.

(b) Study of the factors mainly responsible for casualties through the ignition of clothing.

(g) Firefighting equipment and techniques:

Work will continue on the development of a test procedure for fire detectors.

(h) Firefighting hazards:

No special objectives during 1957-58.

(i) General instrumentation:

Work will continue on the examination of flammable gas detectors, and on the improvement of apparatus for measuring the temperature of the surface of specimens submitted to fire-resistance tests.

It should be emphasized that this note is intended for readers who have some knowledge of the work of the Organization, and it does not go into the reasons for undertaking any of the work; these are wide and varied. The following publications will give a general idea of the

purpose of the work, and some idea of the way in which it is carried out; further particulars, including a complete list of publications, can be obtained on application.

References

FIRE RESEARCH 1947 1956. Reports of the Fire Research Board with the Reports of the Director of Fire Research for the years 1947 to 1956. Department of Scientific and Industrial Research and Fire Offices' Committee. London. H.M. Stationery Office.

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