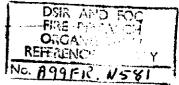
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DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH

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FIRE OFFICES' COMMITTEE

JOINT FIRE RESEARCH ORGANIZATION

FIRE RESEARCH NOTE

NO. 581

RANKINGS OF INDIVIDUAL INDUSTRIES BY THEIR RELATIVE FIRE HAZARD

by

JANE M. HOGG

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December, 1964

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Fire Research Station. Boreham Wood. Herts. ('phone ELStree 1341)

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F. R. Note No. 581

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

> RANKINGS OF INDIVIDUAL INDUSTRIES BY THEIR RELATIVE FIRE HAZARD

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Jane M. Hogg

SUMMARY

Two lists ranking industries by their relative fire hazard have been drawn up. The first is concerned with fires which originated in areas of production, the second with fires which originated in storage areas.

December, 1964.

RANKINGS OF INDIVIDUAL INDUSTRIES BY THEIR RELATIVE FIRE HAZARD

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Jane M. Hogg

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Introduction

For the purposes of fire legislation it would be useful to be able to assess the relative hazard of different industries. In this note the industries are defined in accordance with the Central Statistical Office's Standard Industrial Classification (1958). Fires in industrial buildings in Great Britain which were attended by fire brigades during the period 1957-61 inclusive have been classified according to the industry in which they occurred.

The method of ranking

It has been shown elsewhere⁽¹⁾ that the frequency of fires in industrial premises during the period 1957-61 inclusive was dependent upon a component of industry. This component has been assumed to represent the size of the industry since it was derived from factors of industry which are related to size, for example, the number of establishments and the average number employed, the annual output etc. The dependence of fires upon this component of industry is stronger than any dependence which can be observed with the individual factors that went into this composite index.

Since a component of industry has been found to affect the frequency of fires in industrial premises it is not possible to evaluate the relative fire hazard of different industries by simply comparing the number of fires which occurred in those industries over a period of time. The number of fires expected at any given component value has also to be taken into account, and this is most conveniently achieved by standardizing upon the average value of the component. Ranking lists have thus been arrived at by estimating the number of fires which would have occurred in the period 1957-61 inclusive on the assumption that each industry was of average industry size as measured by the component of industry (the index of fires).

The index is calculated as the logarithm of the number of fires attributed to each industry because the law relating the fire frequencies to the component of industry is of logarithmic form.

All the reports of fires attended by brigades in 1957 were examined; in the other years, however, only samples of the reports have been used. In order that the fire experience of each year would be given the same weight, the total number of fires recorded for each industry over the five year period is, in fact, a weighted total of the fires examined in the yearly samples.

Two ranking lists are shown in the Appendix. The first is concerned with fires which originated in areas of production, the other with fires which originated in storage areas. In general, in both areas the timber, furniture, etc. industries are the most hazardous, and the engineering and electrical goods industries are the least hazardous. Too much emphasis should not be placed on the difference between industries close to each other on the ranking list since this difference could have occurred by chance. The further apart industries are on the ranking list the more likely are they to have a different fire hazard.

Conclusion

The number of fires which occurred in industrial premises during 1957-61 inclusive have elsewhere been found to be dependent upon a component of industry. This component has been assumed to represent industry size. Fire frequencies have been standardized on this average industry size, and industries have been ranked according to the standardized frequencies. Two ranking lists have been drawn up. The first is concerned with fires which originated in areas of production, the second with fires which originated in storage areas. The further apart industries are on these ranking lists the more likely are they to differ from each other in their relative fire hazard.

Reference

(1) HOGG, Jane M. and FIRTH, J.M. The ranking of some industries in Great Britain in accordance with their relative fire hazard. F.R. Note No. 558. June 1964.

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Index of fires		
at the average	Industry	
industry size* .		
	· · · · · · · · · · · · · · · · · · ·	
2.56	Miscellaneous wood and cork manufacturers	
2.42	Linoleum, leather cloth, etc.	
		•
2.41	Furniture and upholstery	
2.41	Wooden containers and baskets	
2.33	Gas	
2.32	Miscellaneous manufacturing industries	
2.31	Textile finishing	•
2.28	Woollen and worsted	
2.23	Timber	
2.23	Bedding, etc.	
2.21	Iron castings, etc.	
2.20	Jute	
2.20	Synthetic resins and plastics materials	•
2.19	Other textile industries	
2.18	Plastics moulding and fabricating	
2.16	Cans and metal boxes	·
2.16	Paint and printing ink	
2.16	Shop and office fitting	
2.15		
-	Electricity	
2.15	Domestic electric appliances	
2.12	Leather (tanning and dressing) and fellmongery	
2.12	Other chemicals	
2.11	Tools and implements	
2.11 2.11	Paper and board	
2.11	Paper and board Corsets, umbrellas and walking sticks, and other fires	
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Fires in areas of production

*Logarithm of the weighted total of fires obtained from samples of reports from the fire year period 1957-61.

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Fires in areas of production (Cont'd.)

Index of fires	je za je Industry
1.89	Steel tubes
1.89	Hats, caps and millinery
1.87	Other printing, publishing, bookbinding, engraving, etc.
1.86	Glass
1.85	Brushes and brooms
1.84	Polishes
1.83	Shipbuilding and marine engineering
1.82	Aircraft manufacturing and repairing
1.78	Soap, detergents, candles and glycerine
1.75	Weatherproof outerwear
1.75	Radio and other electronic apparatus
1.74	Cardboard boxes, cartons and fibre-board packing cases
1.74	Lubricating oils and greases
1.73	Grain milling
1.73	Ordnance and small arms
1.72	Locomotives and railway track equipment
1.71	Household textiles and handkerchiefs
1.71	Mineral oil refining
1.70	Bacon curing, meat and fish products
1.69 1.68	Hosiery and other knitted goods
1.67	Gelatine, adhesives, etc.
1.67	Motor vehicle manufacturing
1.67	Building materials etc. not elsewhere specified Manufacturers of paper and board not elsewhere specified
1,66	Motor cycle, three-wheel vehicles and pedal cycle manufacturing
1.64	Printing, publishing of newspapers and periodicals
1.63	
	Narrow fabrics Man's and hove tailored outerwear
1.60	Men's and boys' tailored outerwear
1.60 1.60	Men's and boys' tailored outerwear Fertilizers and chemicals for pest control
1.60 1.60 1.60	Men's and boys' tailored outerwear Fertilizers and chemicals for pest control Explosives and fireworks
1.60 1.60 1.60 1.58	Men's and boys' tailored outerwear Fertilizers and chemicals for pest control Explosives and fireworks Bread and flour confectionery
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1.60 1.60 1.60 1.58 1.58 1.58	Men's and boys' tailored outerwear Fertilizers and chemicals for pest control Explosives and fireworks Bread and flour confectionery
1.60 1.60 1.58 1.58 1.58 1.57 1.57	Men's and boys' tailored outerwear Fertilizers and chemicals for pest control Explosives and fireworks Bread and flour confectionery Scientific, surgical and photographic instruments, etc. Agricultural machinery (except tractors) Asbestos
1.60 1.60 1.58 1.58 1.58 1.57 1.56 1.56	Men's and boys' tailored outerwear Fertilizers and chemicals for pest control Explosives and fireworks Bread and flour confectionery Scientific, surgical and photographic instruments, etc. Agricultural machinery (except tractors)
1.60 1.60 1.58 1.58 1.58 1.57 1.57	Men's and boys' tailored outerwear Fertilizers and chemicals for pest control Explosives and fireworks Bread and flour confectionery Scientific, surgical and photographic instruments, etc. Agricultural machinery (except tractors) Asbestos Toilet preparations
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1.60 1.60 1.58 1.58 1.57 1.56 1.56 1.55 1.55 1.55	Men's and boys' tailored outerwear Fertilizers and chemicals for pest control Explosives and fireworks Bread and flour confectionery Scientific, surgical and photographic instruments, etc. Agricultural machinery (except tractors) Asbestos Toilet preparations Women's and girls' tailored outerwear Pharmaceutical preparations Biscuits
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1.60 1.60 1.58 1.555 1.555 1.555 1.555 1.44 1.42 1.49 1.33 1.37 1.36	Men's and boys'tailored outerwear Fertilizers and chemicals for pest control Explosives and fireworks Bread and flour confectionery Scientific, surgical and photographic instruments, etc. Agricultural machinery (except tractors) Asbestos Toilet preparations Women's and girls' tailored outerwear Pharmaceutical preparations Biscuits Other mechanical engineering not elsewhere specified Abrasives Insulated wires and cables Miscellaneous stationers' goods Fruit and vegetable products Lace Milk products Other machinery Gloves Metal-working machine tools Cement Office machinery Brewing and melting Water supply Snirit distilling and commounding
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1.60 1.60 1.58 1.555 1.555 1.555 1.555 1.44 1.42 1.49 1.33 1.37 1.36	Men's and boys'tailored outerwear Fertilizers and chemicals for pest control Explosives and fireworks Bread and flour confectionery Scientific, surgical and photographic instruments, etc. Agricultural machinery (except tractors) Asbestos Toilet preparations Women's and girls' tailored outerwear Pharmaceutical preparations Biscuits Other mechanical engineering not elsewhere specified Abrasives Insulated wires and cables Miscellaneous stationers' goods Fruit and vegetable products Lace Milk products Other machinery Gloves Metal-working machine tools Cement Office machinery Brewing and melting Water supply Snirit distilling and commounding

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Fires in areas of production (Cont'd).

Index of fires	Industry
1.28	Cocoa, chocolate and sugar confectionery
1.27	Margarine
1.21	Tobacco
1.17	Engineers' small tools and gauges
1.13	Electrical machinery
1.11	Mechanical handling equipment
1.10	Coke ovens and manufactured fuel
1.06	Industrial engines
1.05	Contractors' plant and quarrying machinery
0.90	Industrial plant and steelwork
0.68	Telegraph and telephone apparatus

Fires in storage areas

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Index of fires	Industry
1.89	Wooden containers and baskets
1.85	Bedding, etc.
1.83	Pottery
1.79	Furniture and upholstery
1.79	Miscellaneous wood and cork manufacturers
1.73	Canvas goods and sacks
1.65	Jute
1.61	Miscellaneous manufacturing industries
1.58	Timber
1.58	
	Toys, games and sports' equipment
1.55	Plastics moulding and fabricating
1.54	Brushes and brooms
1.52	Other textile industries
1.52	Electricity
1.51	Footwear
1.50	Gas
1.50	Paper and board
1.50	Gelatine, adhesives, etc.
1.48	Bricks, fireclay and refractory goods
1.48	Manufacturers of paper and board not elsewhere specified
1.47	Abrasives
1.46	Rope, twine and net
1.45	Textile finishing
1.45	Cans and metal boxes
1.43	Woollen and worsted
1.42	Glass
1.41	Other printing, publishing, bookbinding, engraving, etc.
1.41	Paint and printing ink
1.40	Shipbuilding and marine engineering
1.38	Carpets
1.37	Sugar
1.35	Domestic electric appliances
1.34	Watches and clocks
1.33	Narrow fabrics
1.33	Cardboard boxes, cartons and fibre-board packing cases
1.33	Corsets, umbrellas and walking sticks, and other dress industries not elsewhere specified
1.33	Metal industries not elsewhere specified
1.32	Leather goods
1.31	Margarine
1.28	Soap, detergents, candles and glycerine
1.25	Leather (tanning and dressing) and fellmongery
1.25	Other electrical goods
1.23	Fur
1.23	Light and base metals
1.23	Insulated wires and cables
1.22	Household textiles and handkerchiefs
1.22	Steel tubes
1.22	Perambulators, hand-trucks, etc.
1.21	
	Hats, caps and millinery
1.21	Tools and implements
1.21	Wire and wire manufactures

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Fires in storage areas (Cont'd.)

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Index of fires	Industry	- •·
ilres		<u> </u>
1.20	Toilet preparations	-
1.20	Brewing and malting	1
1.18	Fertilizers and chemicals for pest control	
1.18	Explosives and fireworks	
1.18	Scientific, surgical and photographic instruments	
1.17	Shop and office fitting	
	-	
1.15	Iron castings, etc.	
1.15	Lubricating oils and greases	
1.14	Dresses, lingerie, infant's wear etc.	
1.14	Radio and other electronic apparatus	
1.13	Synthetic resins and plastics materials	
1.12	Overall's and men's shirts, underwear, etc.	
1.12	Grain milling	
1.11	Mineral oil refining	
1.11	Other chemicals	
1.09	Linoleum, leather cloth, etc.	
1.08	Production of man-made fibres	
1.08	Cutlery	
1.07	Jewellery, plate and refining of precious metals	
1.06	Building materials, etc., not elsewhere specified	
1.06	Motor cycle, three wheel vehicles and pedal cycle	
	manufacturing	
1,06	Milk products	
1.04	Bolts, nuts, screws, rivets etc.	
1.04	Animal and poultry foods	
1.03	Fruit and vegetable products	
1.03	Wines, cider, perry and soft drinks	
0.99	Railway carriages and wagons and trans	
0.98	Miscellaneous stationers' goods	
0.98	Bacon curing, meat and fish products	
0.97	Iron and steel (general)	
0.97	Textile machinery and accessories	
0.95	Polishes	
0.95	Bread and flour confectionery	
0.95	Other machinery	
0.93	Asbestos	
0.92	Motor vehicle manufacturing	
0.92	Dyestuffs	
0.89	Pharmaceutical preparations	
0.89	Other mechanical engineering not elsewhere specified	
0.88	Hosiery and other knitted goods	
0.88	Women's and girls' tailored outerwear	
0.85	Gloves	
0.85	Coke ovens and manufactured fuel	
0.85	Cocoa, chocolate and sugar confectionery	
0.83	Printing, publishing of newspapers and periodicals	
0.82	Cement	
0.81	Weatherproof outerwear	
0.79	Biscuits	
0.78	Telegraph and telephone apparatus	
0.76	Office machinery	
0.75	Water supply	
0.75	Locomotives and railway track equipment	
0.72	Men's and boys' tailored outerwear	
0.70	Mechanical handling equipment	
0.67	Vegetable and animal oils and fats	
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Fires in storage areas (Cont'd.)

Index of fires	Industry
0.64	Aircraft manufacturing and repairing
0.62	Industrial engines
0.59	Ordnance and small arms
0.47	Spirit distilling and compounding
0.39	Electrical machinery
0.29	Industrial plant and steelwork
0.26	Lace
0.10	Agricultural machinery (except tractors)
0.09	Tobacco
0.04	Contractors' plant and quarrying machinery
<u> </u>	Metal-working machine tools
-	Engineers' small tools and gauges

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