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BUILDING A SAFE, JUST
AND TOLERANT SOCIETY

Mitigation of Fire Damage

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**FIRE
RESEARCH &
DEVELOPMENT
GROUP**



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Research Report Number 3/2001

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ABSTRACT

This study, conducted by the Loss Prevention Council on behalf of the Home Office Fire Experimental Unit, aimed to gain an understanding of the effectiveness of Fire Brigades in limiting property damage from fires. Loss adjusters visiting the scenes of a sample of fires were asked for technical and financial assessments of the impact of fire fighting activities. In addition, FDR1 forms for the same fires were obtained and selected fire fighters interviewed.

The results show that fire-fighting tactics are generally very effective in limiting damage, particularly fire spread. Where specific actions are taken to mitigate damage, further savings can be made. Although damage from fire-fighting water is recorded, smoke damage appears to be more significant and future development efforts might be directed at this issue.

MANAGEMENT SUMMARY

Introduction

The Loss Prevention Council (LPC) was commissioned by the Home Office Fire Research and Development Group (FRDG) to conduct a survey with the aim of estimating the current contribution (both positive and negative) made by Fire Brigade operations to fire damage losses and to assess ways in which these losses might be mitigated. It was considered that the best information on the financial impact of fire losses for individual incidents would be available from the chartered loss adjuster involved in related insurance claims. Information was sought for fires involving commercial premises and large domestic premises where the impact of damage mitigation by the Fire Brigades would be expected to be noticeable. Initially it was assumed that the attendance of the loss adjuster would automatically select this type of incident.

Data acquisition

Two postal surveys were conducted. In the first, three national firms of loss adjusters were asked to complete specially designed forms using information from active files for fires occurring during the survey period. In the event, this did not produce a sufficient number of forms with adequate data for the type of fire needed. The second survey used a modification of the first form and targeted fires that had already happened and where the loss was £50,000 or more. The fires were identified using the existing Fire Records Database of the Fire Protection Association (FPA), which at the time of the study was part of LPC (see Appendix 7). Loss adjusters were again asked for the information, but individuals within the firms were contacted directly. Copies of Fire Service FDR1 forms for the incidents were requested from Fire Brigades and a selection copied to the FRDG to enable them to directly contact fire officers involved for further details. Notes from these interviews were copied to LPC to assist in the analysis of the information. Of the 216 incidents where local authority brigades were involved, and hence FDR1 forms should be available, there were 91 (42.1%) for which FDR1 forms had been received by the end of the contract period.

The second survey produced more useful data and most of the analysis was conducted using this set of data. There were 223 records in this set, where the Local Authority Fire Brigade was confirmed as being involved. Of these, 218 had a potential loss reported.

	Total Records	LA Brigade Attended	FDR1s Received	Potential Loss Reported
Survey 1	186	151	109	51
Survey 2	228	223	91	218

Care must be taken in the interpretation of the quantitative information provided by the survey for the cost of losses. Much of this part of the data is based on a subjective assessment of the monetary value made by the loss adjusters. However, loss adjusters are trained professionals experienced in assessing the costs arising from fire and other damage, so these estimates may be taken as fairly reliable indicators. It must be emphasised that the values are estimates and should only be taken as indicators of the level of loss rather than absolute values.

Results

Several factors were assessed.

The impact of the Fire Brigade activity on reducing the overall loss was investigated. Estimates of actual losses were compared with the estimates of potential losses. There were 218 records where a potential loss was reported. These gave an average potential loss of £2.64 million with the average amount saved by Fire Brigade activity being about £2.25 million. There was a large range of potential loss values reported. The largest potential loss was £100 million and the smallest £15,000. On average 83% of the potential loss was saved. Saving of the contents of buildings was marginally less effective.

Losses attributable to water damage and smoke damage were estimated. There were 153 records with usable data on smoke damage and 89 on water damage. Losses from water damage were generally less than from smoke with, on average, water damage contributing 15.6% of losses and smoke damage contributing 32.6% of losses. There is an indicator here that consideration of ways to reduce smoke damage may provide greater mitigation of damage than considering water damage. While this is probably not viable from the conventional fire fighting perspective this could be a consideration in the application of Positive Pressure Ventilation or similar techniques. It is also a consideration to be addressed when considering building design and the nature of building contents. However water damage is still a significant contributor to losses and efforts to control this may reap benefits in some situations.

Information from FDR1 forms was used to assess the size of the fires and the impact of the number of main jets used on the cost of water damage investigated. No correlation was identified between the number of main jets used in fire fighting operations and the loss due to water damage.

There was a small number of incidents (less than 20) where Fire Brigade control of water or smoke damage was reported. In these incidents the losses due to these factors were significantly below the average loss for the data set. Although only a small sample, the indication is that where the Fire Brigade take positive damage control measures the loss reduction is significant. The small size of the sample probably reflects some of the limitations on the loss adjusters whereby they can only report on activities where evidence remains after the fire.

The survey form included a "catch-all" final question for general comments. A qualitative assessment of these responses indicated that on the whole the loss adjusters' opinion was that current Fire Brigade fire fighting approaches address damage mitigation reasonably well, taking into account the various circumstances met at fire scenes. A similar assessment of the notes from the FRDG interviews confirmed this, indicating that damage mitigation was influenced by such issues as safety and the availability of resources at the fire scene. Generally in rural areas, where response times are long and resources widely spread, the scope for conventional damage mitigation appears limited.

The survey also provides some data to support current Home Office advice to the public to "Get out and stay out and call the Fire Brigade", in that the effectiveness of first aid fire fighting with respect to loss mitigation does not appear to be high. The effectiveness of first aid fire fighting is governed by a number of factors including detection time, fire type and staff training. In commercial and industrial premises FPA recommends that at least some employees should be properly trained in the use of fire extinguishers.

CONTENTS

1	INTRODUCTION.....	1
2	BACKGROUND	1
3	PROJECT OVERVIEW	1
4	METHODOLOGY	3
4.1	Data Collection Strategy 1.....	3
4.2	Assessment of Data Collection Strategy 1	3
4.3	Data Collection Strategy 2.....	4
4.4	Assessment of Data Collection Strategy 2	4
4.5	Information from FDR1 Forms.....	5
5	SURVEY RESPONSE	7
5.1	Strategy 1 (Form LA1F and database HOFEU1).....	7
5.2	Strategy 2 (Form LA1H and database HOFEU2).....	7
6	ANALYSIS.....	9
6.1	Introduction.....	9
6.1.1	Occupancy.....	9
6.2	Size and Spread of Losses (Question 3)	10
6.3	Smoke Damage and Water Damage (Questions 3 & 12)	10
6.4	Smoke Damage	11
6.4.1	Building, contents and business interruption (BI) losses due to smoke.	11
6.4.2	Fire Brigade smoke control.....	12
6.5	Water Damage	12
6.5.1	Building, contents and business interruption (BI) losses due to water.....	12
6.5.2	Fire Brigade water control	13
6.6	Fire Damage.....	13
6.6.1	Building, contents and business interruption (BI) losses due to fire.	13
6.7	Other damage.....	14
6.7.1	Building, contents and business interruption (BI) losses due to “other” damage	14
6.8	Potential Loss (Questions 3, 4 & 11).....	14
6.8.1	Size and spread.....	14
6.8.2	Potential losses to building, contents and business interruption (BI).....	16
6.9	Extent of Damage and Fire Brigade Control of Spread (Questions 5 to 8 inclusive) 18	
6.9.1	Overall fire spread (Question 5)	18
6.9.2	Confined to compartment of origin (Question 6)	18
6.9.3	Confined to building of origin (Questions 5 & 7)	19
6.9.4	Spread beyond building of origin (Question 8)	20
6.10	Local Authority Fire Brigade Involvement and Method of Extinction (Question 9) 21	
6.11	Actions Before Fire Brigade Arrival (Question 10)	22
6.12	High Value Areas (Question 11)	27
6.12.1	High value areas – financial loss (Q11 h)	27
6.12.2	High value areas – impact of Fire Brigade fire-fighting (Q11 b)	28
6.12.3	High value areas – impact of Fire Brigade salvage activity (Q11 c)	29
6.12.4	High value areas – impact of other fire prevention methods (Q11 d).....	29
6.13	Salvage (Question 12).....	29
6.14	Environmental Damage (Question 13).....	30
6.15	Additional Comments (Question 14).....	30

6.16	Information from FDR1s.....	31
7	Information from the Combined Surveys	33
8	Qualitative Assessment - FDR1 Follow Up by FRDG.....	34
9	Conclusions.....	35
	APPENDIX 1 - Survey Form LA1F	38
	APPENDIX 2 - Survey Form LA1G	43
	APPENDIX 3 - Survey Form LA1H	48
	APPENDIX 4 - Explanation Page Accompanying Forms	53
	APPENDIX 5 - Potential Loss and Amount Saved	55
	APPENDIX 6 - Summary of Salvage (Question 12)	65
	APPENDIX 7 - Fire Protection Association Fire Records Database	68

1 INTRODUCTION

The Loss Prevention Council (LPC) was commissioned by the Home Office Fire Research and Development Group (FRDG) to conduct a survey to estimate the current contributions (both positive and negative) made by Fire Brigade fire fighting techniques to fire damage losses and to assess the extent to which the negative contributions might be mitigated. This was to be done by conducting a postal survey of firms of chartered loss adjusters in the UK. This information was to be used together with some of the data available from Fire Brigade returns via the Fire Service FDR1* system to build a database to enable an analysis of the information provided.

2 BACKGROUND

The Central Fire Brigades Advisory Council has identified the need to reduce the national cost of large fires and, in addition to fire safety initiatives, this project was initiated to try to determine the extent to which fire-fighting operations might influence this cost.

The officer in charge of a fire will always have the safety of the public and the fire-fighters at the top of their list of priorities but, when these are not dominant, it may be that other considerations such as financial losses and environmental damage could influence fire-fighting strategy.

Previous work has been done on the overall costs of fire (*The Cost of Fires, a Review of the Information Available*, by Donald Roy, published by the Home Office 1997) and the effectiveness of fire protection systems (*Fire Research Report 176/78 - The Value of Fire Protection in Buildings - Summary Report*, by R Rutstein and R A Cooke, published by the Home Office Scientific Advisory Branch.). This survey, by the LPC, forms a first step towards a better understanding of the factors involved from the point of view of property damage and the approach of fire-fighters.

3 PROJECT OVERVIEW

The project data gathering strategy was designed to build upon the existing relationship between LPC, the Fire Protection Association (FPA) and chartered loss adjusters for the collection of insurance loss data. Loss adjusters were considered to be the best source available for information on the financial aspects of the impact of fire losses for individual incidents. Initially, arrangements were made with three of the largest UK firms of chartered loss adjusters to receive and complete special survey forms. These firms were selected as they had national coverage

The LPC designed a draft survey form, the content of which was agreed with FRDG, Fire Brigade representatives and Home Office Fire Services Unit (FSsU). This was also commented on by some individual loss adjusters from the selected companies and by the Chartered Institute of Loss Adjusters (the professional body). A pilot study was conducted with ten draft forms being sent to each firm of loss adjusters. The resulting form used for the first survey was form reference LA1F (See Appendix 1). The loss adjusters were asked to complete these forms for new fire incidents and return them to LPC for analysis.

* This is a procedure whereby information on fires attended by Local Authority Fire Brigades is passed to the Home Office Fire Statistics and Research Section for collation and analysis. These forms may be made available to third parties.

A sum of £20 was allowed as reimbursement to the loss adjusters for each form completed. As the forms were received from the loss adjusters the FDR1 form for each fire was also requested from the relevant Fire Brigade. FDR1 forms are routinely completed by the Fire Brigades for Home Office statistics and copied, on request, to the FPA. Selected data from the FDR1's and all the data from the LA1F form was recorded on a database. (This database was named HOFEU1 and the process designated Strategy 1, see 4.1).

The routine requesting of FDR1 forms by the FPA is part of the data acquisition procedure for the FPA Fire Records Database, which is compiled on behalf of UK insurers to identify trends in fire losses. The bulk of the FPA Fire Records Database is compiled from information provided by loss adjusters who submit completed Loss Report Forms, usually through their instructing insurers, to the FPA. The criteria for submission of Loss Report Forms to FPA by the loss adjusters are that the fire caused one or more fatalities or resulted in an estimated loss of £50,000 or more. The FDR1 information is requested for specific fires where the estimated loss is £250,000 or more, or has caused 3 or more fatalities.

Based on the known number of fires usually occurring, it was hoped to receive 500 completed forms from the loss adjusters. At the end of the initial contract period in July 1998 this total had not been met. To enable more incidents to be reported and analysed, the timetable was extended until 1 March 1999. However it became clear in early 1999 that the total was still too low, with only 186 forms having been received from the loss adjusters. There were, however, 109 FDR1 reports on file. The project was reviewed jointly by FRDG, FSsU and LPC in February 1999 and the strategy changed.

The original intention and expectation had been that the types of incident normally visited by loss adjusters would concentrate the sampling on commercial and large domestic scenes where the impact of Fire Brigade activities might be most noticed. In the event, a significant proportion of early returns related to some quite small domestic fires and other low value losses. In view of this the criteria were changed in September 1998 and the loss adjusters asked to limit their responses to fires with losses estimated to be £50,000 or more.

The joint review by LPC, FRDG and FSsU in February 1999 therefore decided to direct the survey towards larger incidents by selecting fires that had already occurred and could be identified as satisfying the criteria. The criteria chosen were that the loss should be £50,000 or more and that the fire occurred on or after 1 June 1998. This was done by selecting incidents from the FPA Fire Records Database and for which loss adjusters had already completed a Loss Report Form. (A new database named HOFEU2 was set up and the process designated Strategy 2, see 4.3).

This LPC exercise was treated as a "follow-up" to the normal FPA process. The original LA1F form was modified to clarify some of the questions in a new form reference LA1G (See Appendix 2). A pilot study using ten forms was conducted to trial the new form. LPC and FRDG reviewed this in April 1999 and some changes were made to the form. Among these changes was the inclusion of several areas to allow free text answers and a question allowing "any other comments". This produced form reference LA1H (See Appendix 3). Some FDR1s were already on file as part of the FPA Fire Records routine. Those that were not were also requested. The new database (HOFEU2) was designed to accommodate the changes in the LA1 form but the database structure was essentially the same as HOFEU1 with a few additional data fields.

The contract timetable was extended to close on 24 September 1999.

Strategy 2 was more successful with 228 records being placed on HOFEU2. This brought the total of records on both databases up to 414. However only 91 FDR1s had been received for Strategy 2 by the end of the contract period giving a total of 200 FDR1s for both databases.

The two databases (HOFEU1 and HOFEU2) were subsequently converted to Microsoft Access format (as Damage1 and Damage2) but with details of names and addresses removed to avoid contravention of data protection legislation.

4 METHODOLOGY

4.1 Data Collection Strategy 1

The agreement of three of the UK's largest firms of loss adjusters to assist in the survey was obtained. A trial batch of ten forms was sent initially to each firm. These were followed by batches of 100 – 200 forms to each firm. The actual number depended on their own estimates of likely incidents, but ensuring that a total in excess of the 500 target was distributed. The loss adjusting firms agreed to distribute the forms within their own companies. This was primarily because the firms would have the best knowledge of their own operations and would know the most appropriate branch to which to send the forms.

Each form had a one page explanation and background to the project attached. The text of this page was agreed between LPC and FRDG. (See Appendix 4)

A database (HOFEU1) was set up by LPC using DB/TextWorks software (version 2.2).

As forms were received, the data was entered on the database and FDR1 forms were requested using the existing FPA Fire Records procedure.

When the FDR1 forms were received, data from specific sections of the form were added to HOFEU1.

4.2 Assessment of Data Collection Strategy 1

This strategy did not provide the amount of data needed and the quality of some of the information on the LA1F forms was below that which was required.

The location of a survey form within the processing system of the loss adjusting firms was not known to LPC until the completed form was returned. It was therefore difficult to monitor progress and chase up forms. LPC had little control over this aspect and had to rely on the goodwill, administration and internal communications of the participating loss adjusting firms.

A significant number of returns were for inappropriate incidents indicating that those completing the forms had not been adequately briefed, despite a concise explanation of the project and its background being attached to every form despatched. Initially LPC assumed that the types of incident attended by loss adjusters were in general of the type required being mainly commercial or large domestic fires. The sample of incidents recorded in HOFEU1 indicate that this assumption was partly flawed.

The estimate of the number of suitable fires occurring in the originally proposed time period was an overestimate, despite seeking the advice of the loss adjusters prior to the beginning of the survey.

Because of these shortfalls, some of the information, particularly for the small domestic fires, was not suitable for inclusion in the analysis. The design of the database HOFEU1 is such that the inappropriate records can be identified and excluded. However, even these records have some fields, such as “potential loss” and “actual loss”, that may be used to provide background data. Other records in HOFEU1 may also be of interest despite the shortfall in numbers, such as those relating to losses saved by Fire Brigade salvage operations.

4.3 Data Collection Strategy 2

This strategy attempted to counter some of the shortcomings of the first strategy. The incidents to be surveyed were selected from those already reported to FPA Fire Records since 1 June 1998. From FPA records it was possible (albeit by manual searching of files) to identify the individual loss adjusters who completed the FPA Loss Report Form (LRF), together with their office addresses and incident reference numbers. The LA1H forms were sent directly to named loss adjusters as a follow up to the LRF. The forms were produced with the incident identifying details (date of fire, name and address of insured and FPA reference number) printed on. Forms not returned within certain time limits were chased up, initially by letter and if necessary by telephone.

The LA1H form used in this part of the survey included space for free text responses which were reflected in the data fields of the database HOFEU2. The layout of form LA1H is shown in Appendix 3. There are 14 questions. The design of the questions is outlined in Table 1.

FDR1 forms for some of the incidents were already on file in FPA Fire Records department and were sampled directly. For incidents where FPA did not have FDR1s on file a request for a copy of the FDR1 was made using the existing Fire Records procedure.

A ten per cent sample of records where FDR1s had been received was selected and copies of the FDR1 and LA1H forms forwarded to the FRDG to enable them to approach the relevant Fire Brigade individuals involved for detailed background information. The incidents selected were large fires, based on their physical size and Fire Brigade attendance, fires with significant Fire Brigade damage control activity and large loss fires. LPC were provided with notes of these interviews to assist with the qualitative analysis of the data.

4.4 Assessment of Data Collection Strategy 2

This was more successful in that a larger number of forms were received, most of which satisfied the selection criteria (See Section 5 below). The inclusion of space for free text, especially the space for other comments, enabled more information to be given but made the inputting and interpretation of the data more onerous.

Using incidents already on file allowed a much shorter time frame for the survey.

The background interviews conducted by FRDG provided useful insight into some aspects of the incidents. However, this activity proved to be significantly time consuming and at the end of the final contract period it had only been possible to follow up fifteen incidents in this way.

4.5 Information from FDR1 Forms.

Data from the following sections of the current form (FDR1(94)) was put on the database:

3.1, 3.3	Type of premises, occupancy
3.6, 3.7	Point of origin
4.6	Activity before Fire Brigade arrived
4.8	Number of main jets used
4.9	Number of fire appliances in attendance
5.1, 5.2	Cause / source of ignition
5.4	Material responsible
5.8	Damage extent
5.9	Area affected by fire and smoke

Data from the parts of section 3 and sections 4.6, 5.1 and 5.4 inclusive were used to supplement some of the descriptive detail. Sections 4.8, 4.9 and the remaining parts of section 5 were used to gauge the size of the incidents.

Table 1 : Design of Questions – Form LA1H

Question	Text	Design Intention
1	-	This space was used to insert the incident details from FPA Fire Records files prior to despatch.
2	LOSS ADJUSTER DETAILS	Identified the loss adjuster and their contact details.
3	COST OF DAMAGE	This was intended to provide an estimated breakdown of the cause of the losses by fire, smoke or water with a space for “other” causes and relate these to the type of loss.
4	POTENTIAL LOSS	This was intended to give an indication of the loss if the Fire Brigade had not attended and the fire had burnt unchecked. This can be used as a crude indication of the overall value of Fire Brigade intervention particularly if compared with the actual losses.
5	EXTENT OF FIRE SPREAD	This was intended as a preliminary to assessing the extent of the fire and can be used to compare results with section 5.8 of the FDR1.
6	FIRE CONFINED TO COMPARTMENT OF ORIGIN	This was intended to add detail to the answer to question 5 and gain an indication as to whether or not the Fire Brigade action was the sole contribution to the control of the fire where the fire was confined to the compartment of origin.
7	FIRE CONFINED TO BUILDING OF ORIGIN	This was intended to add detail to the answer to question 5 and gain an indication as to whether or not the Fire Brigade action was the sole contribution to the control of the fire where the fire was confined to the building of origin.
8	FIRE SPREAD BEYOND BUILDING OF ORIGIN	This was intended to add detail to the answer to question 5 and gain an indication as to whether or not the Fire Brigade action or other factors contributed to the fire spreading beyond the building of origin.
9	FIRE BRIGADE ACTION	This was intended to confirm that the Local Authority Fire Brigade was involved in the incident and identify extinguishing methods.
10	ACTIONS BEFORE THE BRIGADE ARRIVED	This was intended to identify and assess the impact of any measures undertaken before the arrival of the Fire Brigade.
11	HIGH VALUE AREAS	This was intended to identify any areas of high value. These areas are where the adjusters may have more detailed information and where the impact of Fire Brigade actions might be greatest. This question was designed to assess this impact and identify any other factors that influenced the affects of the fire in these areas.
12	FIRE BRIGADE SALVAGE	This was designed to identify and assess any salvage carried out by the Fire Brigade and to compare the methods used.
13	ENVIRONMENTAL IMPACT	This was designed to identify and assess the impact of the incident on the environment and the effectiveness of any methods used to control these effects.
14	OTHER COMMENTS	This was designed as a final “catch-all” question to avoid missing any pertinent points not covered by the specific questions on the rest of the form

5 SURVEY RESPONSE

5.1 Strategy 1 (Form LA1F and database HOFEU1)

Total number of records was 186. FDR1 returns were received for 109 of these.

The quality of information on the LA1F form was not adequate or appropriate in a significant number of these due to the nature and size of the loss.

Of the 186 records only 67 (36%) related to losses reported as equal to or over £50,000.

Of the remaining 119 (those that reported losses of less than £50,000), 85 were for private dwellings.

The intention was for the survey to target commercial and larger domestic properties where the effects of fire fighting techniques would be expected to be significant. This level of information and the low response (186 returns, where 500 were required) led to a review of the project in February 1999.

5.2 Strategy 2 (Form LA1H and database HOFEU2)

Total number of records was 228. FDR1 returns were received for 91 of these.

There were 5 cases where no Local Authority Fire Brigade was involved. This was because either the fire was small, the Fire Brigade was not called but an insurance claim was still made or, as in one incident, the fire was dealt with in total by an airport Fire Brigade.

A summary of the responses to the individual questions on form LA1H is given in Table 2.

The total involving Local Authority Fire Brigades was therefore 223. The analysis in Section 6 is based on this figure.

Table 2 : Summary of Response to Questions – Form LA1H

Question	Text	Number of Forms with a Usable Response to the Question
1	-	All (228)
2	LOSS ADJUSTER DETAILS	All (228)
3	COST OF DAMAGE	226
4	POTENTIAL LOSS	218 - this number of records also had corresponding data in question 3 allowing comparisons of actual and potential loss to be made.
5	EXTENT OF FIRE SPREAD	223 records had an entry in at least one of these fields.
6	FIRE CONFINED TO COMPARTMENT OF ORIGIN	62 records had at least one entry in the sections of this question
7	FIRE CONFINED TO BUILDING OF ORIGIN	145 records had at least one entry in the sections of this question
8	FIRE SPREAD BEYOND BUILDING OF ORIGIN	30 records had at least one entry in the sections of this question
9	FIRE BRIGADE ACTION	The responses with respect to Fire Brigade involvement were: "yes" = 212, "no" = 5, remainder had no entry recorded (Those with the "no" response were not included in any further analysis.)
10	ACTIONS BEFORE THE BRIGADE ARRIVED	There was a response for this question in 178 records of which 39 indicated that some measures had been carried out before the arrival of the Fire Brigade. An assessment of the amount saved in monetary terms was given for 23 of these incidents.
11	HIGH VALUE AREAS	There were 178 records where a "high value" area was identified of which 105 indicated that the area had been affected by the fire.
12	FIRE BRIGADE SALVAGE	43 (See Table 9)
13	ENVIRONMENTAL IMPACT	8 (See Table 10).
14	OTHER COMMENTS	94

6 ANALYSIS

6.1 Introduction

For the reasons discussed above in the strategy assessments, much of the information in the first database HOFEU1 was not suitable. Therefore the analysis presented here has been performed on the data in HOFEU2 except for a comparison of potential and actual losses (see Section 7).

Care must be taken in the interpretation of the quantitative information provided by the survey for the cost of losses. It must be emphasised that the values reported are estimates rather than final costs, albeit made by trained professionals, and should be taken as indicators of the level of loss rather than absolute values. In some records the actual losses recorded are limited by the brief given to the loss adjuster by their instructing insurer. For example, losses recorded in question 3 on form LA1H (see Appendix 3) may provide only losses for buildings if the insurance policy was for buildings only and contents were insured with another insurer. Where these values are used in the analysis this will tend to lead to an underestimate of the total losses but should not significantly affect the specific totals for buildings, contents or business interruption. It should also be noted that where loss adjusters comment on the activities of the Fire Brigades the information provided is usually based on evidence at the scene after the fire has been extinguished and sometimes after the brigade has left.

Although many relevant findings emerge, it should also be appreciated that the exercise as a whole has operated within the constraints of the available data collection systems and the losses occurring during the periods analysed. The records should be treated as a series of assessed case examples rather than a statistically robust collection of data. No statistical stratification ("reality check") has been performed. Information presented on individual cases should not be generalised or used to predict likely future experience.

Selected details of all records where a potential loss was recorded are set out in Appendix 5.

6.1.1 Occupancy

The occupancy of the premises was entered into the database from both the Loss Adjuster form and from the Fire Brigade FDR1 forms. Of the 186 records, only 71 had any occupancy specifically recorded, despite requests. Only 23 records had occupancy recorded from both sources, but with good consistency.

Given the lack of information on all the records, a full numerical analysis was not possible. From an observation of the proportion of the loss saved by damage mitigation (see later), it was possible to make some general observations on a case-study basis. There appeared to be a lot of variation between cases, such that buildings with similar occupancies might have very different fire damage mitigation performances recorded. There are several possible reasons for this.

Although there was great variation between individual cases within occupancy classes, it was observed that some premises suffered greater damage, i.e., damage mitigation appeared to have lower impact (a total or substantial loss occurred in a substantial fraction of cases). These occupancy classes include retail (average proportion of potential loss saved: 52% from 21 cases) and leisure (55% from 22 cases). In a middle class are private dwellings (60% from 26 cases), restaurants (63% from 11 cases) and industrial premises (65% from 45 cases).

Premises where damage mitigation appeared to have a larger impact on the outcome include commercial premises (69% from 10 cases), educational establishments including schools (76% from 12 cases) and farms (77% from 3 cases).

6.2 Size and Spread of Losses (Question 3)

The total loss accrued by all incidents involving Local Authority Fire Brigades was £83,847,271. This loss arose from 221 incidents, there being 2 incidents where a total loss was not reported. The spread of losses reported for the relevant 223 incidents are summarised in Table 3 and illustrated in Figure 1.

Table 3: Total Loss

Total Loss Range	Number of Records	% of Total (223)
< £50,000	31	13.9
£50,000 - £250,000	134	60.1
>£250,000	58	26.0

Distribution of Total Loss - HOFEU2

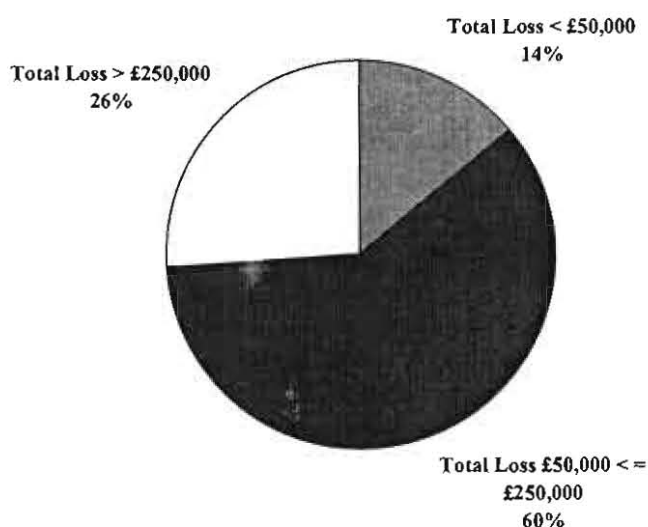


Figure 1 – Total Loss Distribution

6.3 Smoke Damage and Water Damage (Questions 3 & 12)

As far as LPC is aware, water damage is not recorded elsewhere. There is an indication of water damage on the FDR1 form at question 5.8 where the extent of “other” damage is recorded as a percentage of the total damage. This could be assumed to be water damage, as fire, heat and smoke are separately and specifically recorded. However there is no full quantification of either smoke or fire damage on the FDR1. Percentage of damage due to these factors is recorded, as is the total areas damaged directly by fire and by heat and smoke.

This survey tried to assign a monetary value to the different types of damage. Reliable information on this could be used to evaluate the impact of current fire fighting methods on losses.

An analysis of the losses broken down into “contents”, “building” or “business interruption” is provided but care should be taken in drawing conclusions from this set of data because of the variation in allocating these values between incidents. As mentioned above in 6.1 the “brief” of the loss adjuster often restricted the area in which the information was available.

6.4 Smoke Damage

This analysis uses the information from questions 3 and 12. Smoke damage contributed to at least one of the types of loss (i.e. buildings, contents and business interruption) recorded in 153 records out of the total of 223 relevant records (68.6%).

The largest individual loss due to smoke damage was £2,270,000 (record ref 407). The total loss attributed to smoke was £10,386,567, arising from all 153 fires where such a loss was recorded.

An average loss due to smoke damage was calculated, using only those fires where a loss due to smoke was reported and the Local Authority Fire Brigade was involved. This was found to be £67,886. The average percentage loss per incident where a loss for smoke damage was recorded was 32.6%.

6.4.1 Building, contents and business interruption (BI) losses due to smoke.

The number of incidents where loss due to smoke damage was identified and monetary values entered on the form is summarised by type of loss in Table 4. There were 35 responses (15.7%) where smoke damage contributed to all three types of loss.

Table 4: Smoke Damage by Type of Loss

Number of incidents where part of the loss to buildings, contents or BI was attributed to smoke.

Type of Loss	Number of Records	% of Total (223)	Total Loss £m	Loss as % All Losses
Buildings	130	58.3	3.70	4.4
Contents	104	46.6	4.94	1.2
Business Interruption	45	20.2	1.86	2.2

Some incidents will have smoke damage contributions to more than one loss type.

6.4.2 Fire Brigade smoke control

There were only nine cases where the loss adjuster had sufficient information/evidence to report that the Fire Brigade had carried out smoke control. The largest loss due to smoke damage for this sample was £95,000 (record ref. 281). The average loss due to smoke damage for this sample was £35,978 (38.3% of overall loss). Comparing this with the average loss due to smoke for all samples where smoke damage was reported (£67,886 - see 6.4 above), there is a significant reduction in the absolute loss. However this is a very small sample and the average percentage losses for each set are similar (32.6% for all incidents where smoke damage was reported and 38.3% where smoke control by brigades was reported).

6.5 Water Damage

This analysis also used the information from questions 3 and 12. Water damage contributed to at least one of the types of loss in 89 records out of the total of 223 relevant records (39.9%).

The largest individual loss due to water damage was £897,000 (record ref 297) with the total loss attributed to water damage being £3,600,413.

An average loss due to water damage was calculated using only those fires where a loss due to water damage was reported and the Local Authority Fire Brigade was involved. This was found to be £40,454. The average percentage loss per incident where a loss for water damage was recorded was 15.6%.

6.5.1 Building, contents and business interruption (BI) losses due to water

The number of incidents where loss due to water damage was identified and monetary values entered on the form is summarised by type of loss in Table 5. There were 13 responses (5.8%) where water damage contributed to all three types of loss.

Table 5: Water Damage by Type of Loss

Number of incidents where part of the loss to buildings, contents or BI was attributed to water.

Type of Loss	Number of Records	% of Total (223)	Total Loss £m	Loss as % All Losses
Buildings	66	29.6	1.979	2.4
Contents	57	25.6	1.069	1.3
Business Interruption	16	7.2	0.321	0.4

Some incidents will have water damage contributions to more than one loss type.

6.5.2 Fire Brigade water control

There were only nine cases where the loss adjuster had sufficient information/evidence to report that the Fire Brigade had carried out water damage control, and to record a loss for water damage. There were five other incidents where water damage control measures were reported but no loss was recorded for water damage. The average loss due to water damage for the sample of nine was £17,288 (13.9% of overall loss). This compares with £40,454 (15.6% of overall loss) for all fires where a loss due to water damage was reported (See 6.5 above). The largest loss due to water damage in this set of nine was £70,000, with the smallest being £3,640.

As with smoke damage, the sample is very small but the indications are that significant loss reductions are possible where positive water control measures are carried out.

An analysis of water damage losses and the number of main jets used for different sizes of fire was also carried out. This is reported later in section 6.16.

6.6 Fire Damage

Question 3 included the category fire damage. In 218 (97.8%) records out of the 223 relevant incidents fire damage contributed to at least one of the types of loss.

The largest individual loss due to fire damage was £14,067,000 (record ref.410) with the total loss attributed to fire damage being £69,530,454 arising from all 218 fires where such a loss was recorded.

An average loss due to fire damage was calculated using only those fires where a loss due to fire damage was reported and a Local Authority Fire Brigade was involved. This was found to be £318,947. The average percentage loss per incident where a loss due to fire damage was recorded was 71.0%.

6.6.1 Building, contents and business interruption (BI) losses due to fire.

The number of incidents where loss due to fire damage was identified and monetary values entered on the form is summarised by type of loss in Table 6. There were 70 responses (31.4%) where fire damage contributed to all three types of loss.

Table 6: Fire Damage by Type of Loss

Number of incidents where part of the loss to buildings, contents or BI was attributed to fire.

Type of Loss	Number of Records	% of Total (223)	Total Loss £m	Loss as % All Losses
Buildings	200	89.7	36.492	43.5
Contents	142	63.7	15.219	18.2
Business Interruption	90	40.4	17.897	21.3

Some incidents will have fire damage contributions to more than one loss type.

6.7 Other damage

Question 3 also allowed the category “other” to be used. This category was used to describe the type of damage in 17 incidents (7.6%) out of the 223 relevant reports.

6.7.1 Building, contents and business interruption (BI) losses due to “other” damage

The number of incidents where loss due to “other” damage was identified and monetary values entered on the form is summarised by type of loss in Table 7. There were no records where “other” damage was assigned to all three types of loss. The loss adjusters were asked to specify what they had classed as “other” damage. The responses were varied, with some imprecise descriptions but comments such as “asbestos ceiling tiles contaminated stock”, “livestock died due to heat stress” were notable. “Death benefits” had been paid in two fires that had caused fatalities and alternative accommodation provided in another. Loss of rent was also cited in two reports.

Table 7: Other Damage by Type of Loss

Number of incidents where part of the loss to buildings, contents or BI was attributed to “other” damage.

Type of Loss	Number of Records	% of Total (223)	Total Loss £m	Loss as % All Losses
Buildings	9	4.0	0.198	0.24
Contents	8	3.6	0.108	0.13
Business Interruption	3	1.3	0.084	0.10

Some incidents will have damage contributions to more than one loss type.

6.8 Potential Loss (Questions 3, 4 & 11)

6.8.1 Size and spread

The incidents from all forms relating to the 223 incidents where Local Authority Fire Brigades were involved can be analysed as follows.

There were 218 records where a potential loss was recorded. These can be broken down by size of potential loss as follows. It should be noted that the spread of the data is not necessarily representative of fires in general but relates to the criteria set for this study.

- There were 10 incidents where the total potential loss was less than £50,000. This corresponds to 4.6% of the total number of 218 relevant incidents.
- There were 72 incidents where the total potential loss was from £50,000 to £250,000, inclusive. This corresponds to 33.0% of the total number of 218 relevant incidents.
- There were 136 incidents where the total potential loss was greater than £250,000. This corresponds to 62.4% of total number of 216 relevant incidents.

Of those with a potential loss greater than £250,000 there were 72 where the potential loss was greater than £1 million. This included nine with a potential loss estimated at above £10 million.

This is summarised in Table 8 and Figure 2.

Table 8:

Potential Loss
(Records where a potential loss was recorded)

Potential Loss Range	Number of Records	% of Total (218)
< £50,000	10	4.6
£50,000 - £250,000	72	33.0
>£250,000 - £1,000,000	64	29.4
>£1,000,000	72	33.0

Potential Loss Distribution -HOFEU2

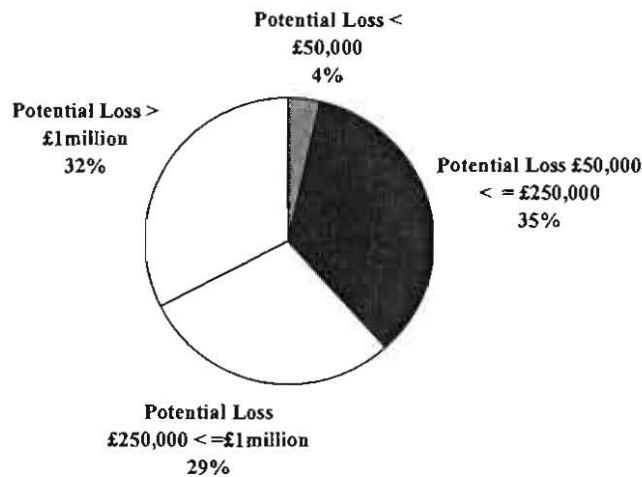


Figure 2 – Potential Loss Distribution

The overall effectiveness of Fire Brigade actions can be estimated from the values given in the answers to questions 3 and 4. The amount saved by Fire Brigade action was estimated by comparing the total loss with the total potential loss. The results for all records where a potential loss was given are displayed in Appendix 5. Of the 223 relevant records, 218 had a valid potential loss given. The amount saved is also expressed as a percentage of the potential loss in Appendix 5.

From this sample of 218, the average amount saved was £2,25 million. This is equivalent to an average percentage saving of 58% per incident. The largest amount saved was £99.8

million for record 227, which was attributed to building losses only. A higher potential loss and amount saved was given for record 207, but this was an underground coal face fire in a colliery and was not considered a normal type of fire. There were 26 records where the amount saved was recorded as zero, and one with negative value. This was record 251, where the potential loss recorded was less than the actual loss, apparently an error on the form. There were a number of other errors which made inclusion of those records impossible.

It should be remembered that some of the losses refer to insured losses and thus a total loss (i.e. where *potential loss* = *actual loss*) may not indicate total destruction of the structures on the site.

An estimate of the effectiveness of non-Fire Brigade intervention before the arrival of the Fire Brigade was attempted using the responses to question 10. The reported actions taken prior to Fire Brigade arrival and estimates of the amount saved are given in section 6.11.

6.8.2 Potential losses to building, contents and business interruption (BI).

An analysis of the losses broken down into “contents”, “building” or “business interruption” is provided but care should be taken in drawing conclusions from this set of data because of the variation in allocating these values between incidents and because of some data quality issues. As mentioned above in 6.1, the “brief” of the loss adjuster often restricted the area in which the information was available. There were 218 incidents where a potential loss was reported, including 190 where a valid saving was calculated, plus 10 incidents where invalid data entries made reliable analysis impossible for that record.

6.8.2.1 Buildings - potential losses

There were 200 (92%) valid entries where the potential loss included a part attributed to buildings. There were 58 records (27%) where a potential loss was given for buildings only. The smallest potential buildings loss was £5,000. The largest potential building loss (record 227) was £100 million. This one record was the largest reported potential loss overall, and dominated the subsequent analysis. The total potential buildings loss was £325 million, the average being £1.63 million. The average amount saved for buildings loss was £1.41 million. Fire-by-fire, the average saving for buildings loss was 60%. The largest record had an amount saved of £99.8 million (the largest amount saved overall). Of the 200 valid records, there were 30 records where the amount saved was zero.

6.8.2.2 Contents - potential losses

There were 153 (70%) valid entries where the potential loss included a part attributed to contents. There were 6 records (3%) where a potential loss was given for contents only. The smallest potential contents loss was £2,000. The largest potential contents loss was £40 million. The total potential contents loss was £155 million, the average being £1.01 million. The average amount saved for contents loss was £0.78 million. Fire-by-fire, the average saving for contents loss was 48%. Of the 153 valid records, there were 32 records where the amount saved was zero.

6.8.2.3 Business interruption (BI) - potential losses

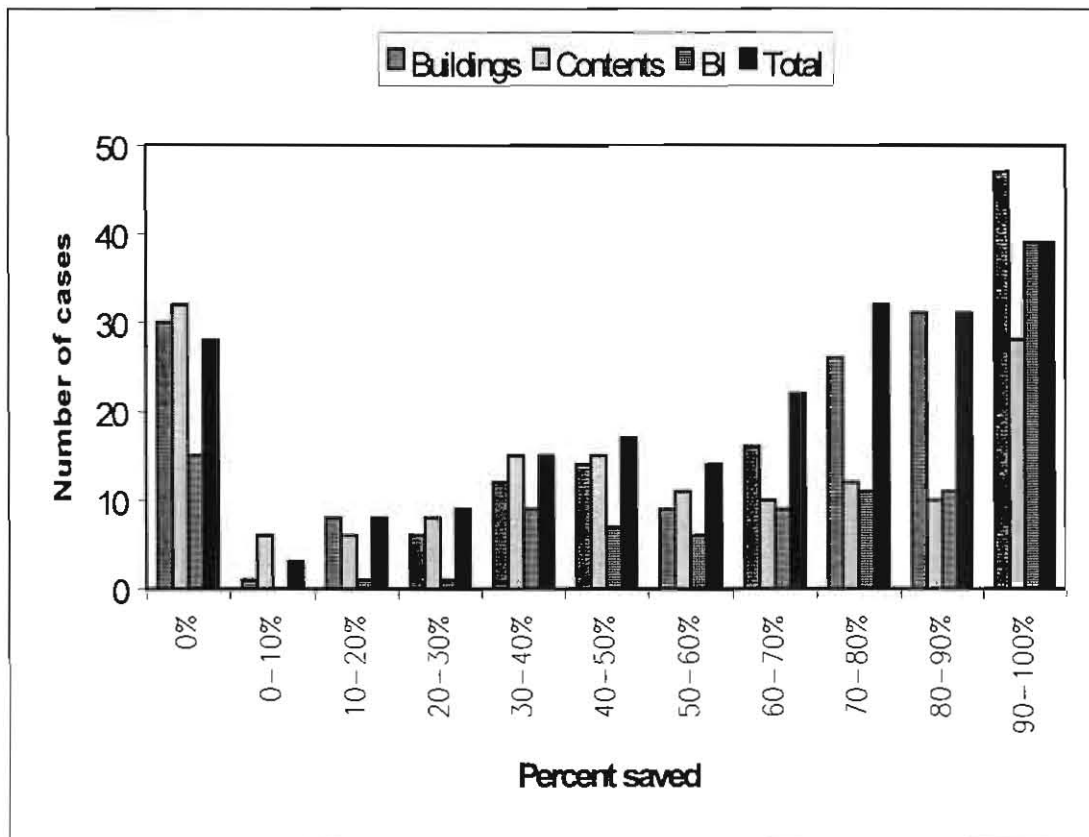
There were 109 (50%) valid entries where the potential loss included a part attributed to business interruption (BI). There were no records where a potential loss was given for BI only. The smallest potential BI loss was £2,400. The largest potential BI loss was £30 million. The total potential BI loss was £110 million, the average being £1.01 million. The average amount saved for BI loss was £0.82 million. Fire-by-fire, the average saving for BI loss was 66%. Of the 109 valid records, there were 15 records where the amount saved was zero.

Table 9: Potential Loss
Summary of Analysis by Type of Potential Loss

TYPE OF LOSS	No. of Recs	Total Pot. Loss £m	Total Saved £m	% Saved (of total)	Average Pot. Loss £m	Average Saved £m	Average % Saved
Buildings	200	325.5	281.8	87%	1.63	1.41	60%
Contents	153	155.2	119.5	77%	1.01	0.78	48%
BI	109	110.3	89.9	82%	1.01	0.82	66%
All	218	590.7	490.9	83%	2.64	2.25	58%

Some incidents will have contributions to the potential loss from more than one type of loss.

Figure 3 - Percentage Saved



6.9 Extent of Damage and Fire Brigade Control of Spread (Questions 5 to 8 inclusive)

6.9.1 Overall fire spread (Question 5)

The overall spread, based on the responses to this question is given in Table 10.

Table 10: Overall Fire Spread

Spread	Number of Records	% of Total (223)
Confined to compartment of origin	59	26.5
Confined to building of origin	128	57.4
Beyond building of origin	34	15.2
No information/evidence *	2	0.9
Total	223	100.0
Percentages are rounded to nearest 0.1%.		

The following definitions were used for the purposes of the survey and were included on the form.

“Confined to compartment of origin” means that the majority of heat and smoke damage did not extend beyond one fire compartment. This may be a small room or a whole warehouse depending on the extent of the building compartmentation.

“Confined to the building of origin” means that the fire breached the compartment where the fire originated and significant heat and smoke damage occurred in other compartments but did not spread beyond the building envelope.

*Each one of questions 6 to 8 inclusive also asked if evidence was available for the answers provided. This proviso was intended to restrict the level of subjectivity in these sections. Where the answers indicated that there was no evidence, any data arising from the rest of that particular question was not included in the rest of the analysis.

6.9.2 Confined to compartment of origin (Question 6)

The fire spread was reported as being confined to the compartment of origin in 59 records (26.7% of the total of 221 relevant records). Of these Fire Brigade action was recorded as a contributing factor to this control in 45 incidents and of these it was reported as the only contributing factor in 23 incidents. The results for this can be summarised as follows in Table 11.

“Active” means fire control measures that are triggered or activated during the fire, such as sprinkler systems, hosereels, etc. “Passive” means fire control measures that are built into the premises of origin, such as compartmentation, fire resisting doors, etc. “Other” means techniques applied or fortuitous circumstances that gave rise to fire control, such as removal of stock, physical separation of buildings etc. Together with “Fire Brigade”, there were altogether four possible controlling actions defined, which could occur in any combination.

Table 11: Fire Spread Confined to Compartment of Origin

Controlling Action	Number of Records
Fire Brigade only	23
Fire Brigade + Active only	2
Fire Brigade + Passive only	14
Fire Brigade + Other only	5
Fire Brigade + Active + Passive only	0
Fire Brigade + Active + Other only	0
Fire Brigade + Passive + Other only	1
Fire Brigade + Active + Passive + Other	0
Active only	3
Passive only	2
Other only	1
Active + Passive only	0
Active + Other only	0
Passive + Other only	1
No information	7
Total	59

In this set, where the Fire Brigade made no contribution to the control the fires were mostly very small and either self-extinguished or were dealt with before the Fire Brigade arrived.

6.9.3 Confined to building of origin (Questions 5 & 7)

The fire spread was reported as being confined to the building of origin in 128 records (57.9% of the total of 221 relevant records). Of these, Fire Brigade action was recorded as the only contributing factor to this control in 86 incidents (38.9% of total) and contributing to the control of 22 of the other fires in this set. The results for this can be broken down as follows.

Table 12: Fire Spread Confined to Building of Origin

Controlling Action	Number of Records
Fire Brigade only	86
Fire Brigade + Active only	2
Fire Brigade + Passive only	8
Fire Brigade + Other only	10
Fire Brigade + Active + Passive only	0
Fire Brigade + Active + Other only	0
Fire Brigade + Passive + Other only	2
Fire Brigade + Active + Passive + Other	0
Active only	1
Passive only	1
Other only	6
Active + Passive only	0
Active + Other only	0
Passive + Other only	0
No information	12
Total	128

6.9.4 Spread beyond building of origin (Question 8)

The fire spread was reported as spreading beyond the building of origin in 34 cases (15.4% of the total of 221 relevant records). The text of this question varied from the format of the previous two in that the reason for the spread beyond the building was sought. The main reason for spread beyond the building of origin was given as “other” and occurred in 19 incidents (8.6% of total). Fire Brigade action was recorded as a contributing factor to the degree of spread in just one incident which on investigation appeared to be due to an error in the original data on the input form. These and the other factors that were recorded as contributing to the fire spread beyond the building of origin can be broken down as follows.

Table 13: Fire Spread Beyond Building of Origin

Controlling Action	Number of Records
Fire Brigade only	0
Fire Brigade + Active only	0
Fire Brigade + Passive only	0
Fire Brigade + Other only	1
Fire Brigade + Active + Passive only	0
Fire Brigade + Active + Other only	0
Fire Brigade + Passive + Other only	0
Fire Brigade + Active + Passive + Other	0
Active only	1
Passive only	1
Other only	19
Active + Passive only	0
Active + Other only	0
Passive + Other only	0
No information	12
Total	34

Information on the nature of the “Other” category was provided for 18 incidents out of the 19 in Table 13. The majority of entries (13) in this category arose from incidents where the buildings were insufficiently detached or isolated to prevent fire spread. The other entries were mainly where fire spread had occurred by burning brands or spilt liquid fuel.

6.10 Local Authority Fire Brigade Involvement and Method of Extinction (Question 9)

The data from this question provided confirmation or otherwise of the involvement of the Local Authority Fire Brigade and information on the method of fire fighting. There were five incidents where the Local Authority Fire Brigade were not involved. Four were where the fire was small and the Fire Brigade were not called and one was at an airport where the airport authority Fire Brigade only were called.

The breakdown of fire fighting methods where the Local Authority Fire Brigade was involved is given in Table 14.

Table 14: Fire Fighting Methods

Method	Number of Records
Water only	183
Water + foam	5
Water + burn out	9
Water + "other"	5
Water + foam + burn out	1
Water + foam + other	0
Foam + burn out	0
Foam + other	0
Burn out + other	0
Foam only	2
Burn out only	2
Other only	1
No information	15
Total	223

There were 15 records where the Fire Brigades were recorded as extinguishing the fire but no indication of the method given.

The data on fire fighting methods was also intended to be used to assess whether there is any correlation between the losses and the method of extinguishment. However, as can be seen from Table 14, almost all the extinguishing methods involved used water. In fact only four incidents were where it was explicitly recorded that no water was used. These were record number 207 which was the coal face fire and nitrogen inerting was used, records 285 and 294 where a controlled burn out was recorded and 349 where "removal of fire debris from building" was recorded as the method. The other had insufficient information to determine the method.

6.11 Actions Before Fire Brigade Arrival (Question 10)

The data from this section was used to assess the contribution to the loss reduction, if any, of any actions taken by non-Fire Brigade personnel prior to the arrival of the Fire Brigade. There were 37 records where a response was provided to all or part of question 10. However only 32 of these were relevant to fire fighting. These 32 responses are summarised in Tables 15 and 16. It must be noted that the information on which the loss adjuster has based the assessment may only be available after the brigade has left the scene.

Of the techniques set out in Table 16, the use of "First Aid" fire fighting techniques appears to have had the least impact on financial loss, although in 6 out of 17 cases there was a quantified saving. Alternative approaches such as would be found in a contingency plan, such as shutting off power, closing doors, clearing access for the Fire Brigade and moving stock appear to have had a much greater financial impact in controlling loss. However, few of the actions recorded were actually the result of pre-planning, which may demonstrate a generally poor level of contingency planning in place for most premises.

Table 15: Breakdown of Actions Prior to Fire Brigade Arrival
(In descending order of amount saved.)

Ref	Potential Loss £ million	Amount Saved By Action Before Fire Brigade Arrived	Amount Saved as % of Potential Loss	Part of Pre- planning?	Action Taken
406	6.50	£6,400,000	98.5	-	Automatic sprinklers activated.
209	1.48	£1,250,000	84.5	N	Closing of internal doors
377	1.26	£1,000,000 (not formalised)	79.4	N	Water put on to overheated charcoal and quantities of material moved.
414	2.78	£500,000	18.0	N	Staff used carbon dioxide extinguisher. Sprinklers operated.
381	0.48	£100,000	20.8	N	Use of hand held extinguishers by insured.
408	0.14	£80,000	57.1	N	Shutting off power.
404	0.75	£50,000	66.7	N	Moving livestock and straw out of farm.
230	-	£30,000	-	N	Moving of livestock but no actual fire fighting measures.
188	1.00	£20,000	2.0	N	Door unlocked to allow brigade access.
233	0.60	£20,000	3.3	-	Removal of stock of timber by employees.
240	0.10	£20,000	20.0	-	Closed fume cupboard where seat of fire was located.
268	0.09	£20,000	22.2	-	Hosing down of adjoining building to prevent further spread.
400	0.09	£15,000	16.7	N	Switching off dryer unit.
211	0.99	£10,000	1.0	N	Power shut off. Doors closed.
234	2.25	£10,000	0.4	N	Insured used hose to try and extinguish.
308	1.15	£10,000	0.9	N	Employees used hand held extinguishers.
212	0.22	Minimal	0.0	N	Employee using hand held extinguisher.
238	1.40	N/K	-	N	Staff attempted extinguishment.
302	1.00	£0	0.0	N	Use of fire extinguishers.
328	0.08	£0	0.0	N	Power supply isolated.
334	40.00	£0	0.0	Y	Fire doors closed.

Ref	Potential Loss £ million	Amount Saved By Action Before Fire Brigade Arrived	Amount Saved as % of Potential Loss	Part of Pre- planning?	Action Taken
356	1.50	£0	0.0	N	Hand-held extinguishers.
360	1.79	£0	0.0	N	Fire blanket placed over ignited vegetable pan (unsuccessful).
407	73.00	£0	0.0	Y	Building evacuated and power shut off.
195	0.72	-	0.0	N	Active fire fighting by employees using powder/foam extinguishers.
236	-	-	-	-	Jugs of water thrown on fire.
257	0.30	-	0.0	N	Power and fuel tanks shut off, hand held fire extinguishers used.
259	1.45	-	0.0	N	Power switched off and doors closed.
264	1.70	-	0.0	Y	Use of fire extinguishers.
277	4.70	-	0.0	N	Hand held extinguisher.
286	21.00	-	0.0	N	Machinery shutdown.
392	1.50	-	0.0	-	Water extinguisher.

- Indicates that no information was recorded on the form for this field.

Table 16: Breakdown of Actions Prior to Fire Brigade Arrival
(Grouped by type of action)

Ref	Potential Loss £ million	Amount Saved By Action Before Fire Brigade Arrived	Amount Saved as % of Potential Loss	Part of Pre- planning?	Action Taken
“First Aid” Fire Fighting (Portable Extinguishers, Hose Reels etc.)					
377	1.26	£1,000,000.00 (not formalised)	79.4	N	Water put on to overheated charcoal and quantities of material moved.
414	2.78	£500,000.00	18.0	N	Staff used carbon dioxide extinguisher. Sprinklers operated.
381	0.48	£100,000.00	20.8	N	Use of hand held extinguishers by insured.
268	0.09	£20,000.00	22.2	-	Hosing down of adjoining building to prevent further spread.
308	1.15	£10,000.00	0.9	N	Employees used hand held extinguishers.
234	2.25	£10,000.00	0.4	N	Insured used hose to try and extinguish.
356	1.50	£0.00	0.0	N	Hand extinguishers.
302	1.00	£0.00	0.0	N	Use of fire extinguishers that had little effect.
360	1.79	£0.00	0.0	N	Fire blanket placed over ignited vegetable pan (unsuccessful).
264	1.70	-	0.0	Y	Use of fire extinguishers.
257	0.30	-	0.0	N	Power and fuel tanks shut off, hand held fire extinguishers used.
195	0.72	-	0.0	N	Active fire fighting by employees using powder/foam extinguishers.
212	0.22	Minimal	0.0	N	Employee using hand held extinguisher.
236	-	-	-	-	Jugs of water thrown on fire.
238	1.40	N/K	-	N	Staff attempted extinguishment.
392	1.50	-	0.0	-	Water extinguisher.
277	4.70	-	0.0	N	Hand held extinguisher.
Shut Down Power/ Equipment					
408	0.14	£80,000.00	57.1	N	Shutting off power.
400	0.09	£15,000.00	16.7	N	Switching off dryer unit.

Shut Down Power/ Equipment					
211	0.99	£10,000.00	1.0	N	Power shut off. Doors closed.
328	0.08	£0.00	0.0	N	Power supply isolated.
407	73.00	£0.00	0.0	Y	Building evacuated and power shut off.
257	0.30	-	0.0	N	Power and fuel tanks shut off, hand held fire extinguishers used.
286	21.00	-	0.0	N	Machinery shutdown.
Closing Doors					
209	1.48	£1,250,000.00	84.5	N	Closing of internal doors.
240	0.10	£20,000.00	20.0	-	Closed fume cupboard where seat of fire was located.
211	0.99	£10,000.00	1.0	N	Power shut off. Doors closed.
334	40.00	£0.00	0.0	Y	Fire doors closed.
259	1.45	-	0.0	N	Power switched off and doors closed.
Moving Stock					
404	0.75	£50,000.00	66.7	N	Moving livestock and straw out of farm.
230	-	£30,000.00	-	N	Moving of livestock but no actual fire fighting measures.
233	0.60	£20,000.00	3.3	-	Removal of stock of timber by employees.
Automatic Sprinklers					
406	6.50	£6,400,000.00	98.5	-	Automatic sprinklers activated.
414	2.78	£500,000.00	18.0	N	Staff used carbon dioxide extinguisher. Sprinklers operated.
Other					
188	1.00	£20,000.00	2.0	N	Door unlocked to allow brigade access.
248	0.30	-	0.0	-	-

- Indicates that no information was recorded, on the form, for this field.

Where more than one type of action was reported a separate entry is given for each different type of action and the action relevant to the section highlighted in bold text.

6.12 High Value Areas (Question 11)

High value areas (HVA) are sections of the premises where high value plant or stock is located. In a commercial context, these areas are likely to be of significant value to the business. There were 178 records where a HVA was identified by the loss adjuster, of which 105 indicated that the area had been affected by the fire. Of these there were 75 records where an estimate of the loss in value of the HVA due to the fire had been given. The identification of an area as being of high value was made by the loss adjuster in an insurance claim context, following the fire. The Fire Brigade would not have had this information at the time of the fire, though a similar assessment might have been undertaken as part of a Section 1.1.d inspection.

This section also contains parts that allow free text answers. Space for text answers was available for answers to the following questions:

11 b) *"..... please indicate what the impact of the brigade FIREFIGHTING activity was in this area."*

11 c) *"..... please indicate what the impact of the brigade SALVAGE activity was in this area."*

11 d) *"..... please indicate what the impact of ANY OTHER FIRE PREVENTION METHOD was in this area. (E.g. fire doors, compartment walls, sprinklers etc)."*

The question was designed so that this information would only be included in the cases where the HVA was affected by the fire. However in some cases there were entries in the text fields even though the screening question indicated that the area was not affected by the fire. It was decided to assess all the reports with text entries to capture as much information as was available. There were 128 such records. A qualitative assessment of the text fields in all 128 records was made. There were two records in which the information from the text indicated that there was no HVA involved in the fire. These two records were omitted from the rest of the assessment.

In the remaining set of 126 records there were 71 records in the set where the Fire Brigade fire fighting was considered to have made a positive impact on the HVA and 55 where no impact was reported.

The losses from these sets were analysed.

6.12.1 High value areas – financial loss (Q11 h)

Of the 71 records where the Fire Brigade was reported as having an impact, a usable figure for the loss to the HVA was recorded for 48 incidents.

Of the 55 records where the Fire Brigade was reported as having no impact, 29 records had usable figures given for losses to the HVA.

The loss to the HVA was expressed as a percentage of its original value and as a percentage of the total loss to the site and the two sets compared.

Where the Fire Brigade was reported as having a positive impact, the average loss to the HVA was 50.9% compared with 80.7% where no impact was reported.

When the HVA loss is expressed as a percentage of the total loss the comparison is not as striking. With assessed “Fire Brigade impact” the average loss was 36.0% of the total loss. Where no “Fire Brigade impact” was assessed the average loss was 45.2% of the total loss. The averages were calculated only for those records where a value was reported.

Thus it appears that where the Fire Brigade fire fighting is able to impact upon high value areas the damage mitigation is significant, although it is less significant as a proportion of the total loss.

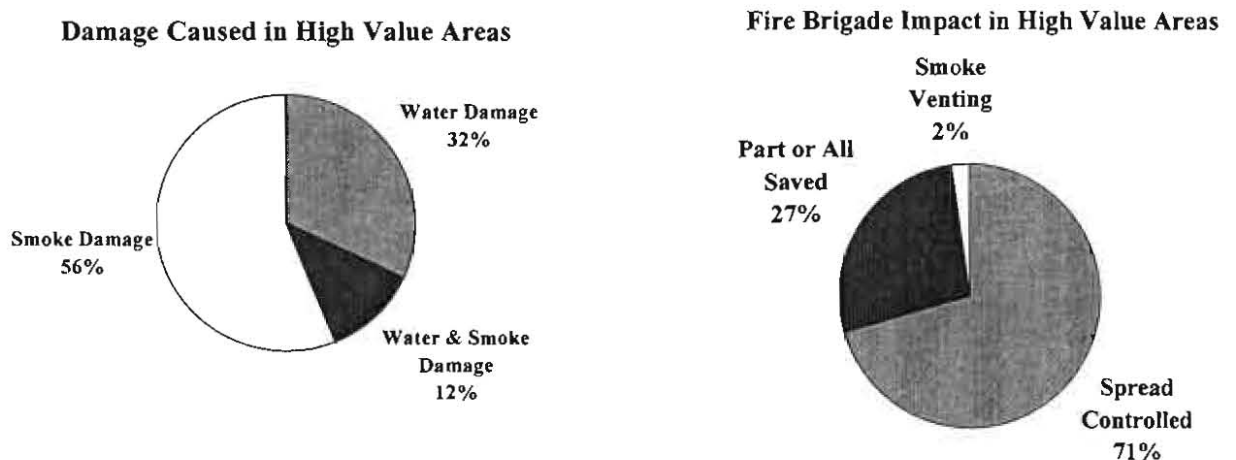
6.12.2 High value areas – impact of Fire Brigade fire-fighting (Q11 b)

From the text reports a semi-quantitative assessment of the impact on the HVA made by the fire-fighting activities of the Fire Brigade was attempted. This is shown in figure 3.

This is based on comments made in the text boxes and is a subjective summary of assessments made of these entries on the form. Broadly, there were two groups (A: protection methods used; and, B: damage caused), each of three categories that were identified. These were :

- A1. “Spread Controlled”: the fire was prevented from spreading into the HVA.
- A2. “Part or All Saved”: this is where HVA was reported as having been partly or completely protected but no information given about the methods used or type of damage caused.
- A3. “Smoke Venting”: a small percentage of responses to this question made specific mention of smoke venting having been used.
- B1. “Water Damage”: damage to the HVA was restricted to water damage only.
- B2. “Smoke Damage”: damage to the HVA was restricted to smoke damage only.
- B3. “Smoke and Water Damage”: damage to the HVA was restricted to smoke and water only with no direct fire damage.

Figure 4 - Impact of the Fire Brigade Firefighting Activity on High Value Areas



6.12.3 High value areas – impact of Fire Brigade salvage activity (Q11 c)

This part of the question allowed free text answers on the brigade salvage activity and its impact on the HVA and produced just nine usable responses. Most of the other responses indicated that no salvage had occurred in the HVA. Where salvage was reported the following observations may be made. Sheeting was used on two occasions. No loss was reported in one although sheeting was described as “minimising problems” and in the other no salvage value was realised from the sheeting operation. Stock or furniture was moved in two cases but only contributed to the loss reduction in one case. No quantification of this was given. Some debris was removed in one incident. This was of assistance to the insured but did not affect the value of the loss. Water and smoke removal was reported in two cases but no value was attributed to these actions (although an estimate of the overall salvage operation was provided in the answer to question 12 for this incident). The remaining two reports gave general information such as “reduced loss” and “little success due to type of stock”.

6.12.4 High value areas – impact of other fire prevention methods (Q11 d)

This part of the question referred to other fire protection methods and had usable answers in 39 records. A semi-quantitative analysis similar to that made in 6.12.2 above was performed on this set of data. Structural features such as compartment walls and fire doors featured in 35 of these, most with significant reduction in actual loss over potential loss. Sprinklers featured in the remaining four cases. In two of these, which were both high value of potential loss fires, the operation of the sprinkler system restricted losses to about 6% of the total potential loss. In another case (a lower value of potential loss fire) the loss was 32% of the potential total loss. In the final case the fire started in adjoining premises, severing the local water main. The sprinkler system did not operate in the premises of interest and water damage also resulted, although the total loss was only about 15% of the potential total loss.

We did not feel that there was sufficient information available from the reports to assess the influence of these other fire prevention methods on brigade activity.

6.13 Salvage (Question 12)

Part a) of this question asked if there was evidence of salvage operations carried out by the Fire Brigade. This was answered with a “yes” in 43 records, one of which did not involve a Local Authority Fire Brigade. Of the remaining 42 there were 28 (12.6% of the HOFEU2 survey) that had an estimate of the value of the items salvaged and the effectiveness in financial terms of the salvage operation. These results are listed in Appendix 6.

The survey form asked for the salvage method to be identified. Of the 42 records, 13 had no methods recorded. In the remaining 29 records the breakdown of methods was as follows:-

Table 17: Methods of Salvage Used by Fire Brigades

METHOD		NUMBER OF TIMES USED
I	Moving items	19
II	Covering	11
III	Smoke control	6
IV	Water Control	10
V	Other	0

In some incidents more than one method was used.

The effectiveness of salvage in recovering losses varied considerably within this sample. The items salvaged had no redeemable value on four occasions whereas in twelve incidents items retained their full value after salvage. There were not enough records to make a meaningful comparison of the relative effectiveness of the various salvage methods.

The average estimated amount saved by salvage was £23,000. As a proportion, the average saving was very high, 94.7%. The most significant impact made by salvage operations appears to be in an incident (reference 414) where the value of a site estimated at £500,000 was reduced by £10,000 in value to £490,000. The main contributing salvage method was water control and the loss adjuster's report indicates water use was confined to the immediate vicinity of the fire. An FDR1 has not been received concerning this fire.

6.14 Environmental Damage (Question 13)

There were only 8 records where information was recorded in this section of these only five had values estimated for the losses. The results for these five are recorded in Table 18.

Table 18: List of Types of Environmental Damage Caused

REF.	DESCRIPTION	LOSS £
211	Extinguishant run-off not controlled.	20,000
271	Unavoidable air pollution	2,000
294	Asbestos removal	12,000
305	Extinguishant run-off cost for removal by tanker	3,000
377	Crop damaged by smoke	1,000
	Total	38,000

6.15 Additional Comments (Question 14)

There were 94 records where additional comments were entered on the form. The comments were assessed and only 31 were considered to be directly relevant to the aims of the survey. The results of the assessment enabled the following breakdown of the comments.

Table 19: Summary of Comments – Question 14

CATEGORY	NUMBER OF COMMENTS
Fire Brigade stopped fire spreading to other premises.	15
Fire Brigade “did a good job”.	12
Circumstances prevented Fire Brigade from doing more.	8
Building structure inhibited the work of the Fire Brigade.	6
Long response time was detrimental to damage mitigation ¹	3
Fire Brigade methods could be improved.	2
Water supply problems affected Fire Brigade response.	1
Unruly crowd behaviour may have inhibited Fire Brigade.	1

¹The long response times were reported for isolated rural fires only. No time was given for a long response but it is assumed to be in excess of 20 minutes.

Some responses included several different comments hence the total of 48 comments for 31 reports.

The comments generally indicate that the Fire Brigade methods are as good as they can be under the circumstances. The two suggested improvements were:

- a) in a school fire an area that had initially only suffered smoke damage was further damaged by fire fighting water which in the loss adjuster’s opinion could have been prevented by the construction of a form of dam or bund. (Reference 188).
- b) in a restaurant fire the loss adjuster felt that undamaged carpets should have been covered to protect them from Fire Brigade traffic to and from the main fire.

6.16 Information from FDR1s.

Only 91 FDR1 forms relating to incidents in the survey were received by the end of the contract period. The most useful analysis was felt to be a comparison of the number of main jets used and the size of the fire, as measured by the area damaged by fire, with the losses due to water damage. There were only 42 incidents in the HOFEU2 data where information on water damage loss was available and an FDR1 had been received. The results of the analysis of these 42 incidents are shown in Figures 5 to 7.

Burnt Area <50 sqm - Loss Due to Water Damage vs. no. of Jets

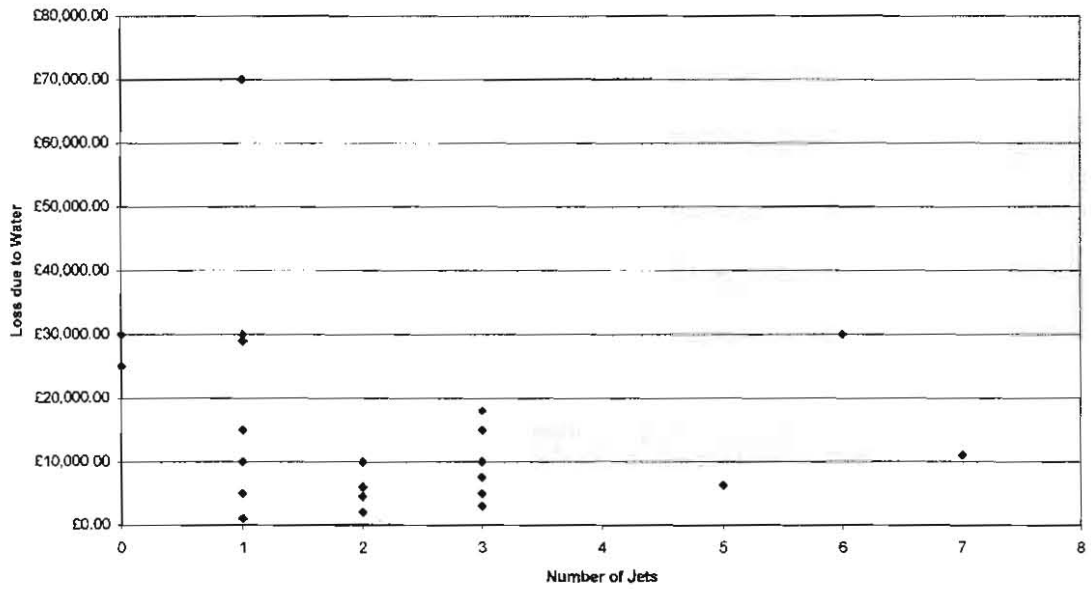


Figure 5
Comparison of Loss due to Water Damage with Number of Jets Used
For Small Fires – Burnt Area Less Than 50 m²

Burnt Area 50<200 sqm - Loss due to Water Damage vs. no. of Jets

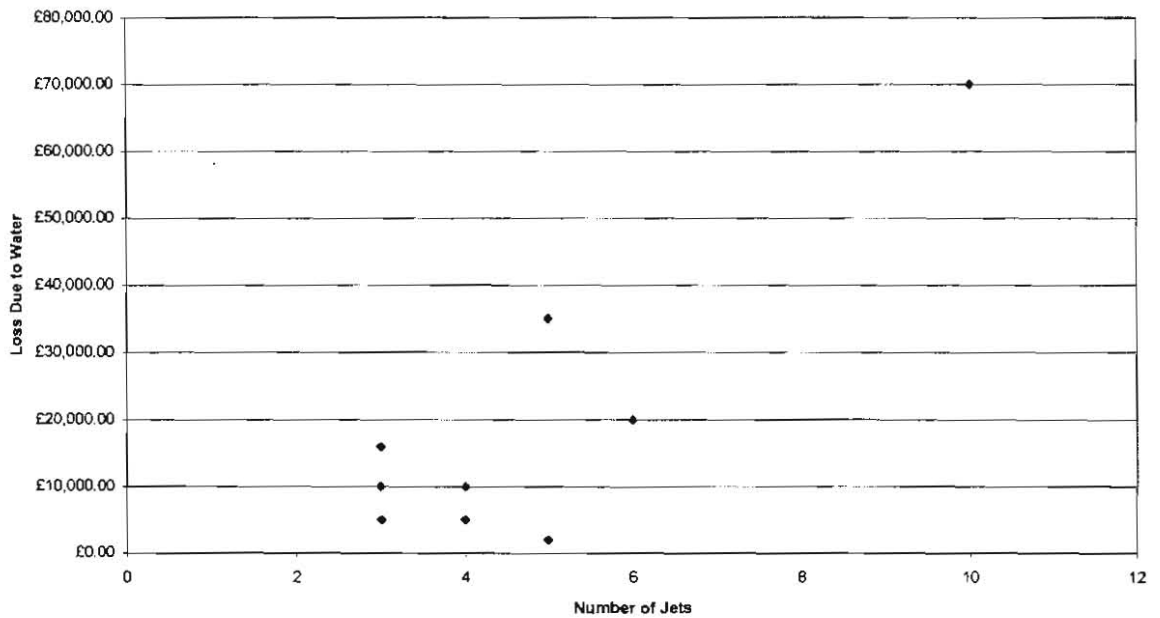


Figure 6
Comparison of Loss due to Water Damage with Number of Jets Used
For Medium Fires – Burnt Area from 50 to Less Than 200 m²

Burnt Area > 200 sqm - Loss due to Water vs. no. of Jets

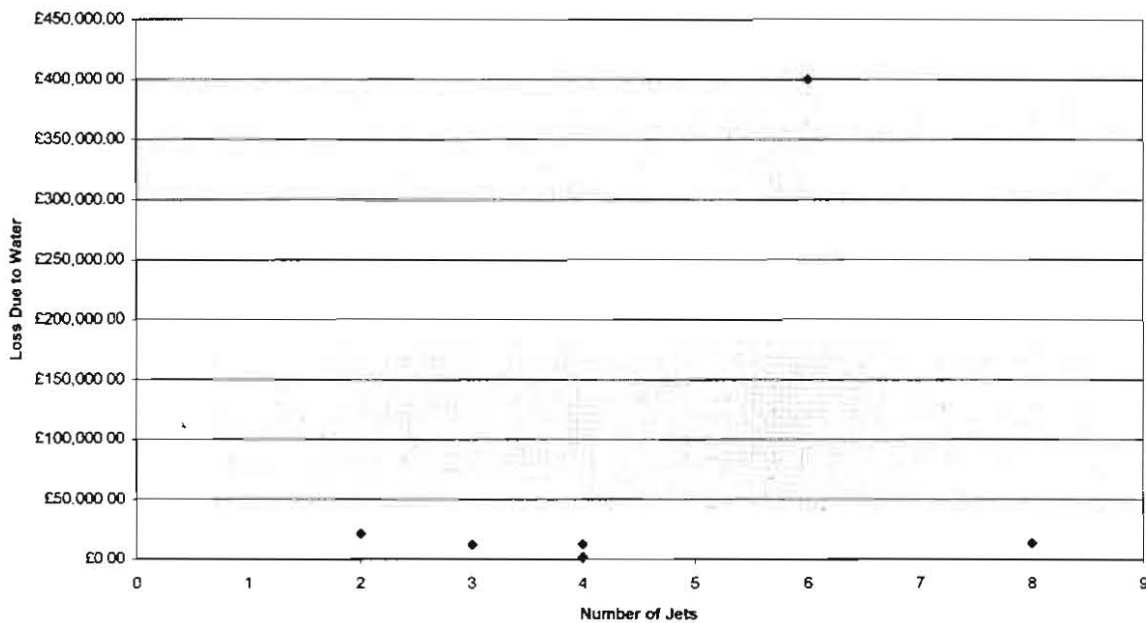


Figure 7
Comparison of Loss due to Water Damage with Number of Jets Used
For Large Fires – Burnt Area Greater Than 200 m²

The number of main jets used for the size of fire follows an expected pattern for small and medium fires. The majority of small fires required less than four jets and the majority of medium size fires required between two and six jets. There is no obvious correlation between losses due to water damage and the number of main jets used for the small fire set. The medium sized fire set does display a rough positive correlation, i.e., in general the more jets that are used the higher the loss due to water damage. To be sure of this, there are many other relevant factors that would need to be allowed for, such as the stage of development of the fire and access. The large fires set suffers from a small number of records. The six fires recorded show a wide distribution in both losses and numbers of main jets used.

7 Information from the Combined Surveys

The information concerning potential losses derived from both parts of the survey should be valid. There were 153 records out of the 186 in HOFEU1 (82.3%) with Fire Brigade involvement confirmed and where a potential loss was reported. Of these 10 had a potential loss of 0.0 reported (this is counter-intuitive and may be mis-reporting by loss adjusters). Thus a potential loss greater than zero was reported in 143 (76.9%) records. This compares with 216 (95%) such records in the whole of on HOFEU2 which contains 228 records in all.

The total potential loss for all records, where a potential loss greater than zero was reported and the Local Authority Fire Brigade was involved, in HOFEU1 (143) was £206.4 million. The average potential loss was £1.443 million. The total amount saved was £119.4 million with the average for this set being £0.835 million (57.9 % of the average potential loss).

The total potential loss for records where a potential loss was reported and the Local Authority Fire Brigade was involved, in HOFEU2 (218) was £590.7 million. The average per

record was £2.710 million. The total amount saved was £490.9 million with the average for this set being £2.252 million (83% of the average potential loss).

Combining these sets gives a total potential loss of £797.1 million for 361 records with the average potential loss being £2.208 million. The total amount saved is £610.3 million with the average per record being £1.691 million (77% of the average potential loss).

Combining data from both databases gives the breakdowns in Tables 20 and 21.

Table 20: Potential Loss for HOFEU1 and HOFEU2

Potential Loss Range	Number of Records		HOFEU1 + HOFEU2	% of Total (404)
	HOFEU1	HOFEU2		
No loss reported or loss = 0.0	43	28	71	17.6
< £50,000	20	10	30	7.4
£50,000 - £250,000	75	72	147	36.4
>£250,000	48	108	156	38.6
Total	186	218	404	100.0

Table 21: Average Savings for HOFEU1 and HOFEU2

Dataset	Average Potential Loss	Average Actual Loss	Average Saving	Average % Saving
HOFEU1	£1.443 million	£0.608 million	£0.835 million	57.9 %
HOFEU2	£2.637 million	£0.452 million	£2.185 million	82.3 %
Total	£2.208 million	£0.527 million	£1.691 million	77.0 %

8 Qualitative Assessment - FDR1 Follow Up by FRDG.

LPC was provided with the notes of interviews with the Fire Brigade officers conducted by FRDG. These were assessed in a similar way to the written comments on LA1H. There were 15 reports. In all cases salvage and damage mitigation were considered and where circumstances allowed salvage was carried out. However in several cases the fire was at an advanced stage when the Fire Brigade arrived and control of spread took priority. Some of the reports were on rural incidents where response times were in excess of 15 minutes. In these cases the fires were generally too advanced to allow useful salvage operations. In two reports it was significant to note that the Fire Brigade undertook salvage of computer equipment but commented that after the incident they expected the equipment to be written off anyway.

9 Conclusions

Although the values provided on losses were, to a large extent, subjective estimates by the loss adjusters, they can be taken as fairly reliable indicators as loss adjusters are trained professionals experienced in estimating these values. Where the loss adjusters made comments on Fire Brigade actions these were on the whole based on evidence, either physical evidence at the scene of the fire or from witnesses.

This survey shows that current fire fighting techniques used by Local Authority Fire Brigades do make a significant contribution to the control of financial losses. On average about 83% of the estimated potential loss was saved in the incidents reported. Much of this saving was observed in a relatively small number of fires where the savings were spectacular. Even for a routine fire the savings would be expected to be in the order of 50 to 70%.

Losses attributable to water damage appear to be less than those due to smoke damage. On average water damage contributed 15.6% to the total loss whereas smoke damage contributed 32.6%. There is an indicator here that consideration of ways to reduce smoke damage may provide greater improvement in mitigation of damage than considering water damage. While this is probably not viable from the conventional fire fighting perspective this could be a consideration in the application of Positive Pressure Ventilation or similar techniques. It is also a consideration to be addressed when considering building design and the nature of building contents. Water damage is still a significant contributor to damage and efforts to control this may reap benefits in some situations. (The largest loss due to water was £897,000, which formed 60% of that particular loss).

The indications are that, where Fire Brigades carry out positive damage control measures, losses are significantly reduced. This can only be a tentative conclusion due to the limited size of the sample where controls were identified.

We were unable to identify a good correlation between losses due to water damage and the number of main jets used in fire-fighting.

The current fire fighting methods and procedures adopted by Fire Brigades on the whole appear to address damage control methods reasonably well. The level of mitigation carried out is dependent on the stage reached by the fire at the time of the arrival of the Fire Brigade and on the level of resources available during the early stages of a fire. Thus the opportunity for significant damage mitigation in rural areas is inevitably less than in urban areas.

This is supported by the information collected by the follow up calls to Fire Brigades made by FRDG which indicate that fire officers on the fire ground are conscious of salvage and damage mitigation. They do what they can, when they can. This should continue and be encouraged. The type of items suitable for salvage should be borne in mind. Certain damage mitigation activities such as shutting doors and shutting down equipment, generally undertaken by the occupier before the arrival of the fire brigade, were shown to be very effective in reducing loss. In this respect, greater use of contingency planning should be encouraged.

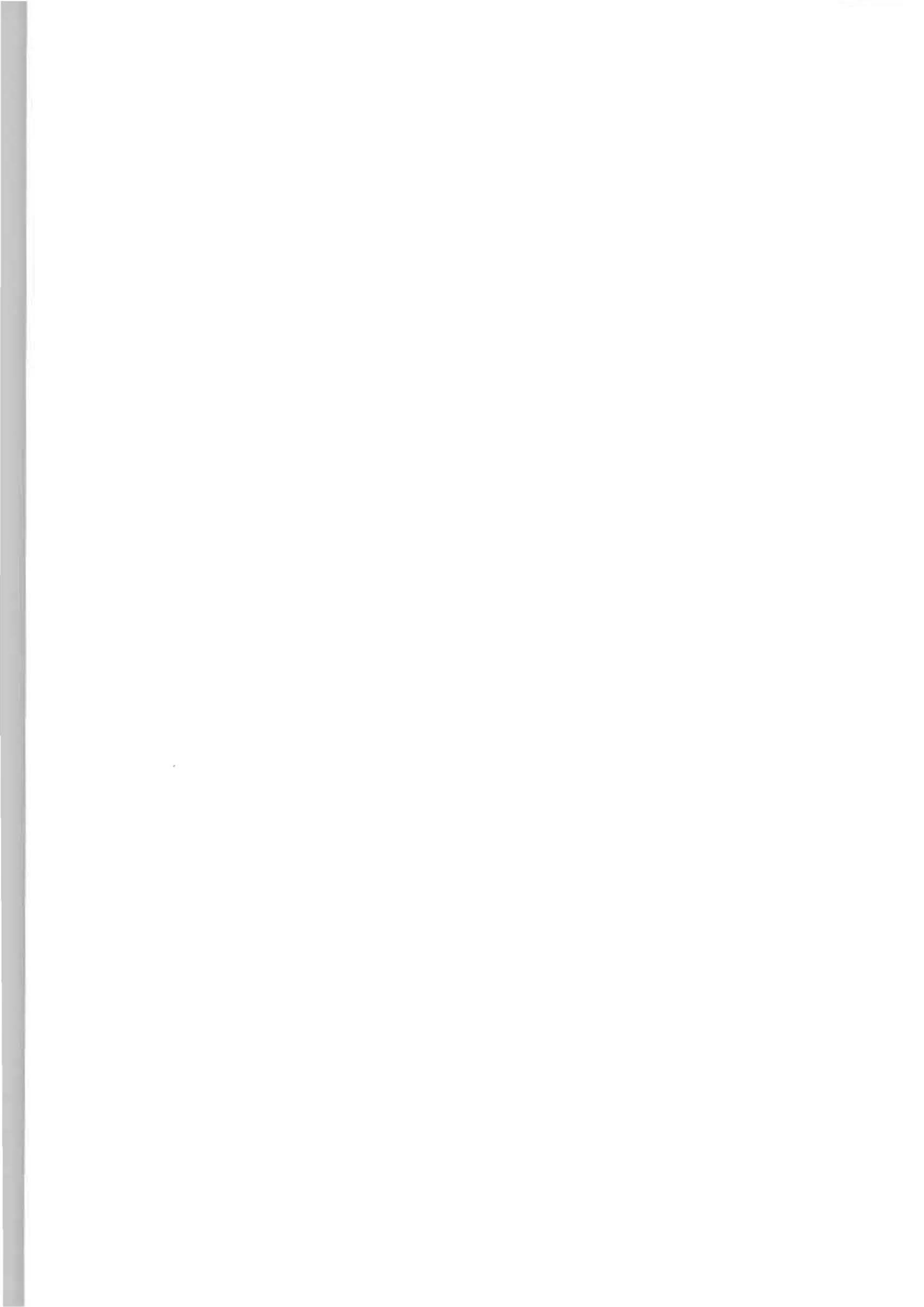
In a small number of incidents in the survey information was obtained on the use of extinguishers prior to the arrival of the Fire Brigade. In general, such First Aid fire fighting did not provide very much in savings. Taken together with the health and safety risks in undertaking such activities, the current Home Office advice to the public to "Get out, stay out and get the Fire Brigade out" should be reinforced. The effectiveness of first aid fire fighting

is governed by a number of factors including detection time, fire type and staff training. In commercial and industrial premises FPA recommends that at least some employees should be properly trained in the use of fire extinguishers.

APPENDIX 1

DATA COLLECTION STRATEGY 1

SURVEY FORM LA1F
(For Database HOFEU1)



**HOFEU SURVEY - MITIGATION OF FIRE DAMAGE
INFORMATION FROM LOSS ADJUSTERS**

1. **Incident details:**

Name of insured
Address where fire occurred
Occupancy
Date of fire
Loss adjuster's reference no.

2. **Loss adjuster details:**

Name of company
Address
Tel.
Fax.

3. **Cost of damage.** Please provide your estimate of the cost of the types of damage listed. Where possible please indicate the cost elements attributable to damage to buildings, to contents and business interruption (B I).

3. a)

Damage due to:	Estimated cost in £ thousands		
	Building	Contents	B I
Fire			
Smoke			
Water			
Other			
Please specify "other" here.			

4. **Potential loss.** Please give your estimate of the total financial loss to the site if the fire had not been controlled.

	Buildings	Contents	B I

5. Was the fire confined to the compartment of origin? **YES** - go to 5. a) **NO** - go to question 7.

5. a) Is there any evidence of how this was achieved? **YES** - go to question 6. **NO** - go to question 11.

"Confined to compartment of origin" means that the majority of heat and smoke damage did not extend beyond one fire compartment. This may be a small room or a whole warehouse depending on the extent of the building compartmentation.

6. If the answer to 5. a) is YES please indicate the type of action that controlled the spread. You may tick more than one box if necessary. **On completion please go to question 11.**

Brigade action Active protection Passive protection Other
Please specify "other" here.

7. Was the fire confined to the building of origin? **YES** - go to question 7. a). **NO** - go to question 9.

7. a) If the answer to 7 is YES is there any evidence of how this was achieved? **YES** - go to question 8. **NO** - go to question 11.

"Confined to the building of origin" means that the compartment where the fire originated was breached by the fire and significant heat and smoke damage occurred in other compartments but did not spread beyond the building envelope.

**HOFEU SURVEY - MITIGATION OF FIRE DAMAGE
INFORMATION FROM LOSS ADJUSTERS**

8. If the answer to 7. a) is *YES* please indicate the type of action that controlled the spread. *You may tick more than one box if necessary. On completion please go to question 11.*

Brigade action Active protection Passive protection Other
Please specify "other" factor here.

9. Did the fire spread beyond the building of origin? **YES** - go to 9. a) **NO** - go to question 11.

9. a) Is there any evidence of why this happened?
 YES - go to question 10. **NO** - go to question 11.

10. If the answer to 9. a) is *YES* please indicate what, in your opinion, allowed the fire to spread beyond the building of origin. *You may tick more than one box if necessary. On completion please go to question 11.*

Brigade action Active protection Passive protection Other
Please make any additional comments or specify "other" factor here.

11. **Fire Brigade action.** *Tick all boxes that are appropriate*

11. a) Was the fire extinguished by the local authority fire service? **YES** - go to 11. b) **NO** - go to 11. a)

If *NO* please indicate how the fire was extinguished. *e.g. water fire brigade.*

11. b) If *YES* to 11. Was there any evidence of how the fire was extinguished? **YES** - go to 11. c) **NO** - go to 12.

11. c) Please indicate, if possible, the extinguishing method and the evidence for it. *When complete go to question 12.*

Water Evidence:

Foam Evidence:

Controlled burn out Evidence:

Other Evidence:

Please specify "other" factor here.

**HOFEU SURVEY - MITIGATION OF FIRE DAMAGE
INFORMATION FROM LOSS ADJUSTERS**

12. **Actions before the brigade arrived. Please give any information that you may have.**
 Was action taken to mitigate damage, during the incident, YES - answer 12. a) - c) NO - go to 13.
 but before the brigade arrived?
 12. a) Please indicate the type of action taken. e.g. moving gas cylinders or shutting of power.
 12. b) Please give your estimate of the monetary value (£ thousands) saved by these actions. £
 12. c) Were these actions part of a predetermined management plan? YES NO

13. **Special risk area. For the purpose of this survey "special risk areas" are areas of high value or of strategic importance to the insured. For example computer systems, specialist plant, archives or essential power/fuel supplies. If there is more than one special risk area please restrict your answers to the area of highest value. Tick all boxes that are appropriate.**
 13. a) Was there a special risk area? YES - go to question 13. b) NO - go to question 17.
 13. b) Please indicate the type of special risk here - then go to question 13. c).
 13. c) If YES to 13. a), was it affected by the fire? YES - go to question 13. d) NO - go to question 17.
 13. d) If YES, to 13. c), please indicate the location. Tick one box only. When complete please go to question 14.
 Compartment of origin Building of origin Beyond building of origin

14. **Indicate the main methods used to control the fire for the special risk area?**
 14. a) Passive - compartmentation. (Please indicate estimated fire resistance, in hours, of compartment by ticking one box only. "None" means no compartmentation involved.)
 0 - 0.5 (I) 1 (II) 2 (III) 4 (or more) (IV) None
 14. b) Active. (You may tick more than one box if necessary.)
 Sprinklers(V) Automatic venting(VI) Gaseous flooding (VII) Other (VIII) None
 Please specify other methods here.
 14. c) Is there any evidence of Fire Brigade activity to protect these areas? YES - answer 14. d) - e) NO - go to question 15.
 14. d) What were the Fire Brigade activities? You may tick more than one box if appropriate.
 Fire fighting Salvage
 14. e) Please indicate, if possible, the type of method used and the evidence for its use.
 Natural venting (IX) Evidence:-
 Mechanical venting (X) Evidence:-
 Shut off sprinklers (XI) Evidence:-
 Other (XII) Evidence:-
 Please specify "other" method here:

**HOFEU SURVEY - MITIGATION OF FIRE DAMAGE
INFORMATION FROM LOSS ADJUSTERS**

15. **Effectiveness of special risk protection method.**

15. a)

Method of protection	Estimated value before - £ thousands	Estimated value after - £ thousands

"Method of protection" is the method indicated by 14.

Other benefits: Please describe here any other benefits arising from the protection of the special risk.

16. If a method of protection failed. Please indicate why, e.g. compartmentation failed due to fire shutter jamming open.

17. **Salvage.** We wish to use this section to try to estimate the effectiveness of salvage methods used by the brigade for the **INCIDENT AS A WHOLE**. i. e. not confined to the highest special risk area of question 13.

17. a) Was there any evidence of salvage operations carried out by the Brigade? **YES** - answer 17. b) - c) **NO** - go to 18.

17. b) If YES to 17. a), please indicate the type of salvage operation.

Moving item (I) Covering (II) Smoke control (III) Water control (IV) Other (V)

Please specify "other" here.

17. c) If possible please give an estimate of the effectiveness of the salvage operations by completing the table below.

Item/area salvaged	Method	Estimated value - £ thousands	
		Before	After

"Item/area salvaged" - please indicate type of property salvaged or protected by salvage operations. e.g. computer, printing press, raw material store or work of art. "Method" is the method indicated by I, II III & IV in 14 above.

18. **Environmental impact.**

18. a) Was there any quantifiable environmental damage beyond the site? **YES** - go to 18.b) **NO** - no more questions

e.g. toxic smoke or vapour emissions or contaminated water run off affecting rivers or potable water supplies.

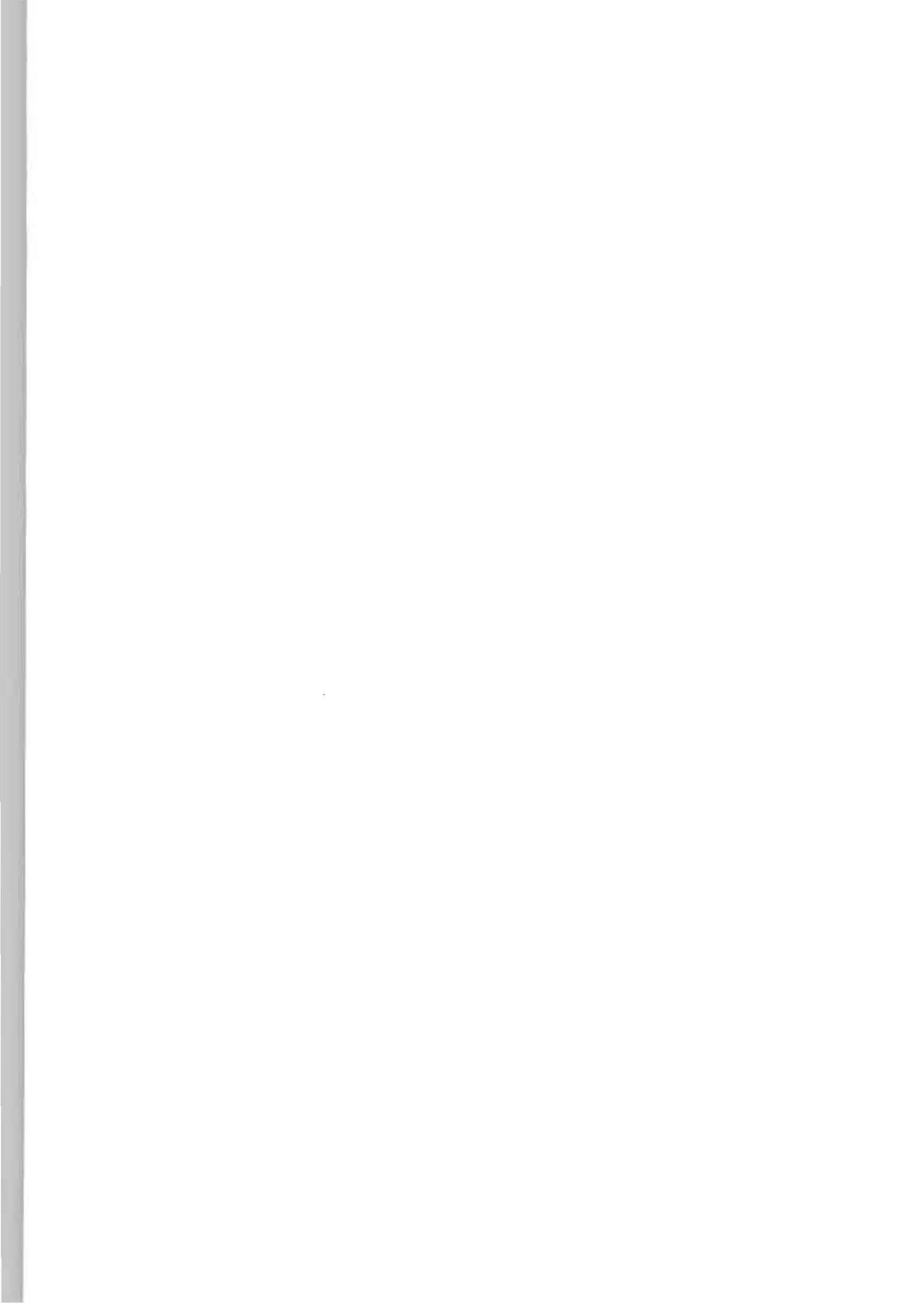
18. b) If YES to 18 a), please give an estimate of the environmental impact of the incident by completing the table below. (Indicate the type of control method used, if known e.g. damming water courses. Put "none" if none were used).

Type of damage	Yes/No	Cost £ thousands	Control method (please put "NONE" if none used)
Run off - fire extinguishant			
Run off - substances on site			
Air quality			
Soil contamination			
Other			

APPENDIX 2

DATA COLLECTION STRATEGY 2

SURVEY FORM LA1G
(Pilot Study)



**HOFEU SURVEY - MITIGATION OF FIRE DAMAGE
INFORMATION FROM LOSS ADJUSTERS**

2. LOSS ADJUSTER DETAILS:

Name of company
Address
Tel.
Fax.
Loss adjuster's reference no.

3. COST OF DAMAGE. Please estimate the contribution to total loss of the following:

3. a) Damage due to:	Estimated cost in £		
	Building	Contents	BI
Fire			
Smoke			
Water			
Other			
Please specify "other" here.			

4. POTENTIAL LOSS.

Please give your estimate of the total financial loss to the site if the fire had not been controlled.

	Buildings	Contents	BI

5. EXTENT OF FIRE SPREAD

Was the fire confined to the COMPARTMENT of origin? YES - go to 6.a)

Was the fire confined to the BUILDING of origin? YES - go to 7.a)

Did the fire spread BEYOND THE BUILDING of origin? YES - go to 8.a)

"Confined to compartment of origin" means that the majority of heat and smoke damage did not extend beyond one fire compartment. This may be a small room or a whole warehouse depending on the extent of the building compartmentation.

"Confined to the building of origin" means that the compartment where the fire originated was breached by the fire and significant heat and smoke damage occurred in other compartments but did not spread beyond the building envelope.

6. FIRE CONFINED TO COMPARTMENT OF ORIGIN

6. a) Is there any evidence of how this was achieved? YES - go to 6.b) NO - go to 9.a)

6. b) Please indicate the type of action that controlled the spread. You may tick more than one box if necessary.
 Brigade action Active protection Passive protection Other
 Please specify "other" here.

Now go to 9.a)

**HOFEU SURVEY - MITIGATION OF FIRE DAMAGE
INFORMATION FROM LOSS ADJUSTERS**

10. ACTIONS BEFORE THE BRIGADE ARRIVED.

10.a) Was action taken to mitigate damage, during the incident, YES - answer 10. b) - d) NO - go to 11.a) but before the brigade arrived?

10. b) Please indicate the type of action taken. *e.g. moving gas cylinders or shutting off power.*

10. c) Please give your estimate of the monetary value saved by these actions. £

10. d) Were these actions part of a predetermined management plan? YES NO

11. SPECIAL RISK AREA

For the purpose of this survey "special risk area" is an area of high value or of strategic importance to the insured. For example computer systems, specialist plant, archives or essential power/fuel supplies. If there is more than one special risk area please restrict your answers to the area of highest value.

11. a) Was there a special risk area? YES - go to question 11. b) NO - go to question 14 a)

11. b) Please indicate the type of special risk here - then go to question 11. c).

11. c) Was the special risk affected by the fire? YES - go to question 11. d) NO - go to question 14 a).

11. d) Please indicate the location. **Tick one box only.**
 Compartment of origin Building of origin Beyond building of origin
Now go to question 12.a).

12. SPECIAL RISK AREA - CONTROL OF FIRE SPREAD

12. a) **Please indicate the main methods used to control fire spread in the special risk area.**
 Passive i.e. compartmentation. *(Please indicate estimated fire resistance, in hours, of compartment by ticking one box only. "None" means no compartmentation involved.)*
 0 - 0.5 (I) 1 (II) 2 (III) 4 (or more) (IV) None
 Active. *(You may tick more than one box if necessary.)*
 Sprinklers(V) Automatic venting(VI) Gaseous flooding (VII) Other (VIII) None
 Please specify other methods here.

12. b) Is there any evidence of Fire Brigade activity to protect these areas? YES - answer 12. d) - e) NO - go to question 15.

12. c) What were the Fire Brigade activities? *You may tick more than one box if appropriate.*
 Fire fighting Salvage

12. d) Please indicate, if possible, the type of method used and the evidence for its use.
 Natural venting (IX) Evidence:-
 Mechanical venting (X) Evidence:-
 Shut off sprinklers (XI) Evidence:-
 Other (XII) Evidence:-
 Please specify "other" method here:

**HOFEU SURVEY - MITIGATION OF FIRE DAMAGE
INFORMATION FROM LOSS ADJUSTERS**

13. SPECIAL RISK AREA - EFFECTIVENESS OF PROTECTION			
13. a)	Method of protection *	Estimated value before - £	Estimated value after - £

* The method indicated in question 12. (IX,X,XI etc)

13. b) **Other benefits:** Please describe here any other benefits arising from the protection of the special risk.

13. c) If a method of protection failed. Please indicate why, e.g. compartmentation failed due to fire shutter jamming open.

14. **SALVAGE**
This refers to salvage methods USED BY THE BRIGADE FOR THE INCIDENT AS A WHOLE. i. e. not confined to the special risk area of question 13.

14. a) Was there any evidence of salvage operations carried out by the Brigade? YES - go to 14. b) NO - go to 16.

14. b) If YES to 14. a), please indicate the type of salvage operation.
 Moving item (I) Covering (II) Smoke control (III) Water control (IV) Other (V)
 Please specify "other" here.

15. **EFFECTIVENESS OF THE SALVAGE OPERATIONS**

15. a) *Where possible please complete the table below.*

Item/area salvaged *	Method	Estimated value - £	
		Before	After

* Please indicate type of property salvaged or protected by salvage operations. e.g. computer, printing press, raw material store or work of art. "Method" is the method indicated by I, II III & IV in 12 above.

16. **ENVIRONMENTAL IMPACT**

16. a) Was there any quantifiable environmental damage? YES - go to 16.b) NO - no more questions
 e.g. toxic smoke or vapour emissions or contaminated water run off affecting rivers or potable water supplies.

16. b) Please give an estimate of the environmental impact of the incident by completing the table below. (Indicate the type of control method used, if known e.g. damming water courses. Put "none" if none were used).

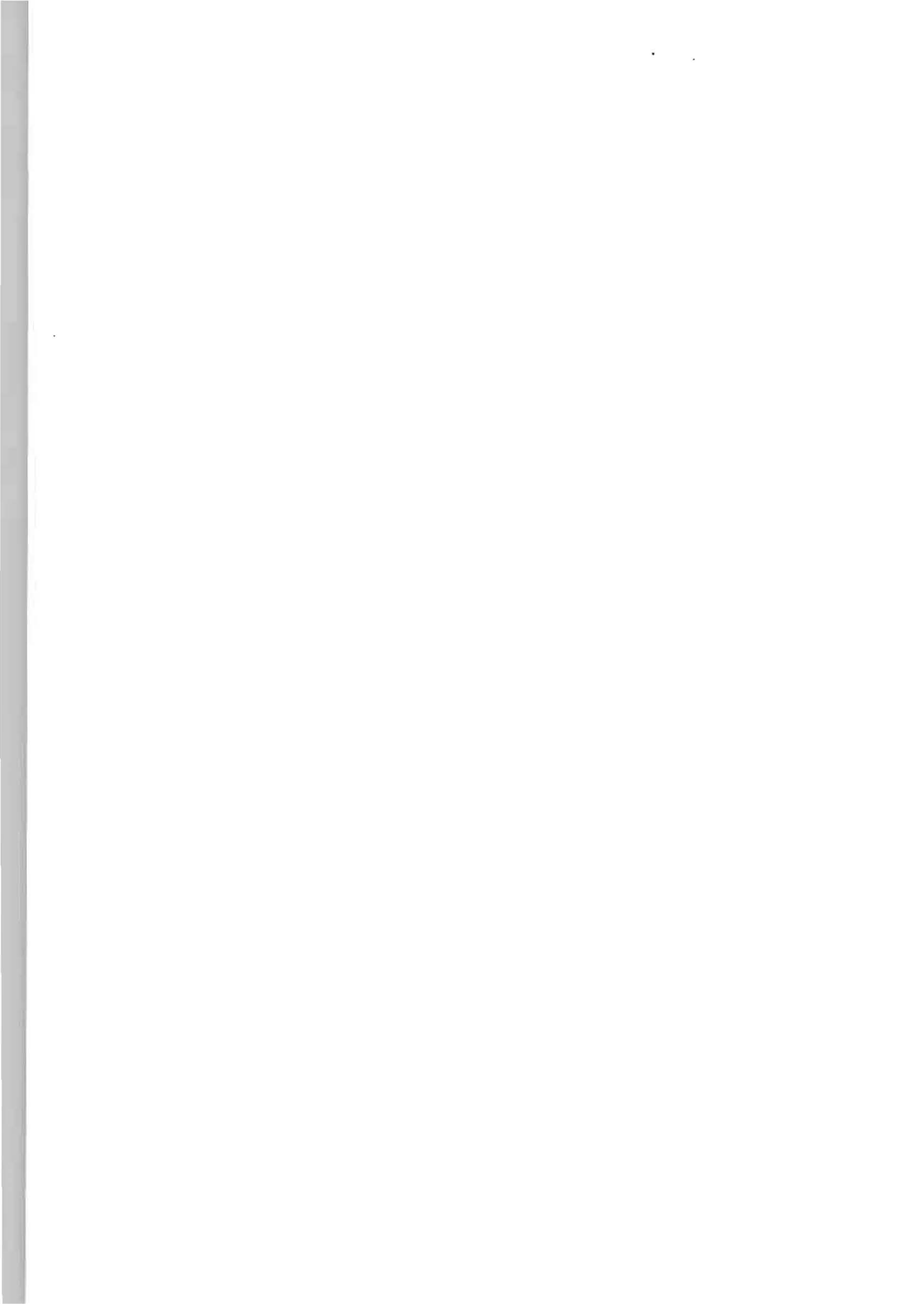
Type of damage	Yes/No	Cost £ thousands	Control method (please put "NONE" if none used)
Run off - fire extinguishant			
Run off - substances on site			
Air quality			
Soil contamination			
Other			

LA1G

APPENDIX 3

DATA COLLECTION STRATEGY 2

**SURVEY FORM LA1H
(For Database HOFEU2)**



2. **LOSS ADJUSTER DETAILS:**

Name of company
Address
Tel.
Fax.
Loss adjuster's reference no.

3. **COST OF DAMAGE.** Please estimate the contribution to total loss of the following:

Damage due to:	Estimated cost		
	Building	Contents	B I
Fire	£	£	£
Smoke	£	£	£
Water	£	£	£
Other	£	£	£

Please specify "other" here.

4. **POTENTIAL LOSS.**

Please give your estimate of the total financial loss to the site if the fire had not been controlled.

	Buildings	Contents	B I
	£	£	£

5. **EXTENT OF FIRE SPREAD**

Was the fire confined to the COMPARTMENT of origin? YES - go to 6.a)

Was the fire confined to the BUILDING of origin? YES - go to 7.a)

Did the fire spread BEYOND THE BUILDING of origin? YES - go to 8.a)

"Confined to compartment of origin" means that the majority of heat and smoke damage did not extend beyond one fire compartment. This may be a small room or a whole warehouse depending on the extent of the building compartmentation.

"Confined to the building of origin" means that the compartment where the fire originated was breached by the fire and significant heat and smoke damage occurred in other compartments but did not spread beyond the building envelope.

6. **FIRE CONFINED TO COMPARTMENT OF ORIGIN**

6. a) Is there any evidence of how this was achieved? YES - go to 6.b) NO - go to 9.a)

6. b) Please indicate the type of action that controlled the spread. You may tick more than one box if necessary.

Brigade action Active protection Passive protection Other

Please specify "other" here.

Now go to 9.a)

FIRE CONFINED TO BUILDING OF ORIGIN

7. a) Is there any evidence of how this was achieved? **YES** - go to question 7. b. **NO** -go to question 9.a).
7. b) Please indicate the type of action that controlled the spread. *You may tick more than one box if necessary.*
 Brigade action Active protection Passive protection Other
Please specify "other" factor here.

Now go to question 9.a)

FIRE SPREAD BEYOND BUILDING OF ORIGIN

8. a) Is there any evidence of why this happened? **YES** - go to question 8.b). **NO** - go to question 9.a)
8. b) Please indicate what, in your opinion, allowed the fire to spread beyond the building of origin. *You may tick more than one box if necessary.*
 Brigade action Active protection Passive protection Other
Please make any additional comments or specify "other" factor here.

Now go to question 9. a).

FIRE BRIGADE ACTION..

(Tick all boxes that are appropriate)

9. a) Was the fire extinguished by the local authority fire service? **YES** - go to 9. c) **NO** - go to 9. b)
9. b) If **NO** please indicate how the fire was extinguished. *e.g. works fire brigade. Then go to 10. a)*
9. c) If **YES** to 9.a) Was there any evidence of how the fire was extinguished? **YES** - go to 9. d) **NO** - go to 10.a)
9. d) Please indicate, if possible, the extinguishing method and the evidence for it..
- | | |
|--|-----------|
| <input type="checkbox"/> Water | Evidence: |
| <input type="checkbox"/> Foam | Evidence: |
| <input type="checkbox"/> Controlled burn out | Evidence: |
| <input type="checkbox"/> Other | Evidence: |
- Please specify "other" factor here.

10. ACTIONS BEFORE THE BRIGADE ARRIVED.

- 10.a) Was action taken to mitigate damage, during the incident, YES - answer 10. b) - d) NO - go to 11.a) but before the brigade arrived?
10. b) Please indicate the type of action taken. e.g. moving gas cylinders or shutting off power.
10. c) Please give your estimate of the monetary value saved by these actions.
10. d) Were these actions part of a predetermined management plan? YES NO

HIGH VALUE AREAS

11. Please identify the area of highest value (e.g. stock, computer suite, special plant or equipment):
11. a) Was this HIGH VALUE area affected by the fire? YES - answer 11 b) to 11d) NO - go to 11e)
11. b) If the answer to 11 a) is YES, please indicate what the impact of the brigade FIREFIGHTING activity was in this area.
-
11. c) If the answer to 11 a) is YES, please indicate what the impact of the brigade SALVAGE activity was in this area.
-
- 11.d) If the answer to 11 a) is YES, please indicate what the impact of ANY OTHER FIRE PREVENTION METHOD was in this area. (E.g. fire doors, compartment walls, sprinklers etc.)
-
11. e) If the answer to 11 a) is NO, did the actions of the YES - go to 11.f) NO - go to 11.f) brigade prevent the fire affecting the high value area?
11. f) Were there any other fire protection methods which YES - go to 11 g) NO - go to 11 h) prevented the fire affecting the high value area?(e.g. fire doors, compartment walls, sprinklers etc.)
11. g) If the answer to 11.f) is YES please indicate the methods of protection.
11. h) What is your estimate of the value of this area before and after the fire?
- | BEFORE | AFTER |
|--------|-------|
| £ | £ |
- Now go to question 12.a).*

12.

FIRE BRIGADE SALVAGE

*This question deals with the **SALVAGE METHODS USED BY THE BRIGADE FOR THE INCIDENT AS A WHOLE. It is NOT confined to the HIGH VALUE area of question 11.***

12. a) Was there any evidence of salvage operations carried out by the Brigade? **YES** - go to 12. b) **NO** - go to 13.

12. b) If YES to 12. a), please indicate the type of salvage operation.
 Moving item (I) Covering (II) Smoke control (III) Water control (IV) Other (V)
 Please specify "other" here.

12. c) *Where possible please complete the table below.*

Item/area salvaged *	Method <i>As assigned in 12.b)</i>					ESTIMATED VALUE	
	I	II	III	IV	V	BEFORE	AFTER
						£	£
						£	£
						£	£

* Please indicate type of property salvaged or protected by salvage operations. e.g. computer, printing press, raw material store or work of art.

13.

ENVIRONMENTAL IMPACT

13. a) Was there any quantifiable environmental damage? **YES** - go to 13.b) **NO** - no more questions e.g. toxic smoke or vapour emissions or contaminated water run off affecting rivers or potable water supplies.

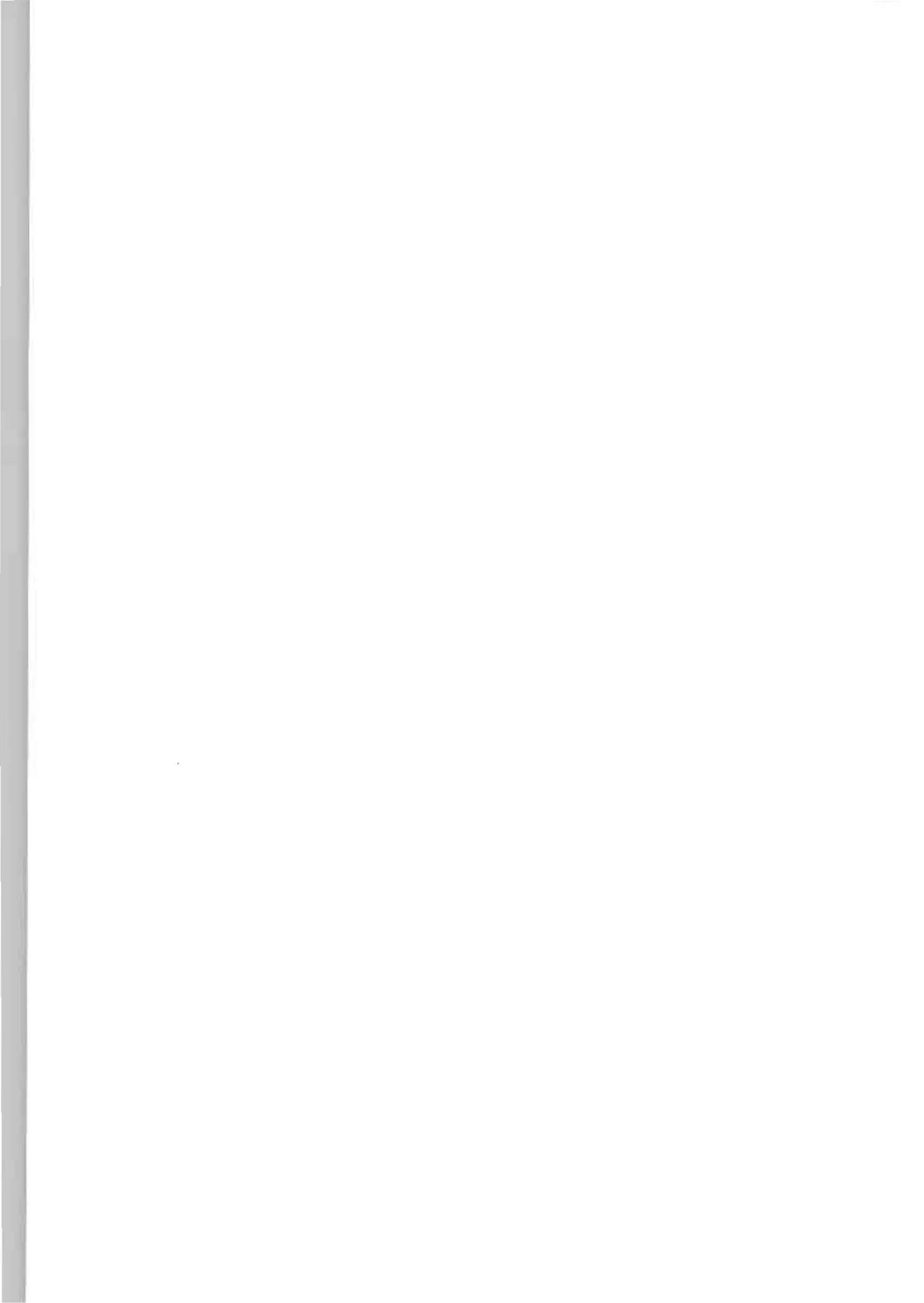
13. b) Please give an estimate of the environmental impact of the incident by completing the table below. (Indicate the type of control method used, if known e.g. damming water courses. Put "none" if none were used).

Type of damage	Yes/No	Cost £ thousands	Control method (please put "NONE" if none used)
Run off - fire extinguishant			
Run off - substances on site			
Air quality			
Soil contamination			
Other			

OTHER COMMENTS

14. Bearing in mind the objectives of this survey please enter any comments you have on this incident.

APPENDIX 4
EXPLANATION PAGE
ACCOMPANYING FORMS



**MITIGATION OF FIRE DAMAGE
HOME OFFICE FIRE EXPERIMENTAL UNIT (HOFEU)
PROJECT CONDUCTED BY LPC**

The Central Fire Brigades Advisory Council have identified the need to reduce the national cost of large fires and, in addition to fire safety initiatives, this project has been initiated to try to determine the extent to which fire-fighting operations influence this cost.

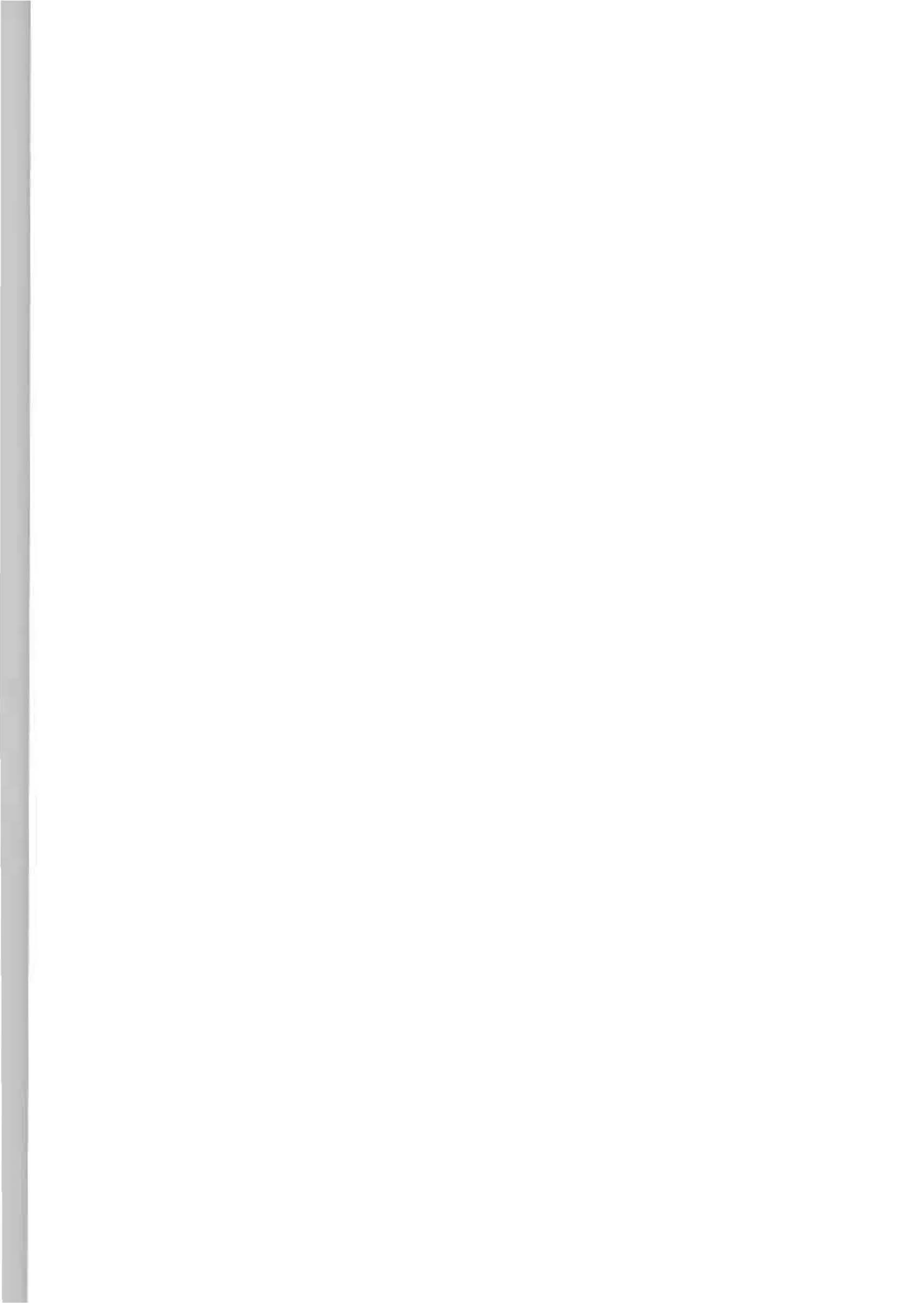
The officer in charge of a fire will always have the safety of the public and the fire-fighters at the top of their list of priorities but, when these are not dominant, it may be that cost considerations could influence fire-fighting strategy.

As a first step, a better understanding of the factors involved from a property damage viewpoint is needed. It is our opinion that loss adjusters are those best placed to provide the most accurate information on this topic.

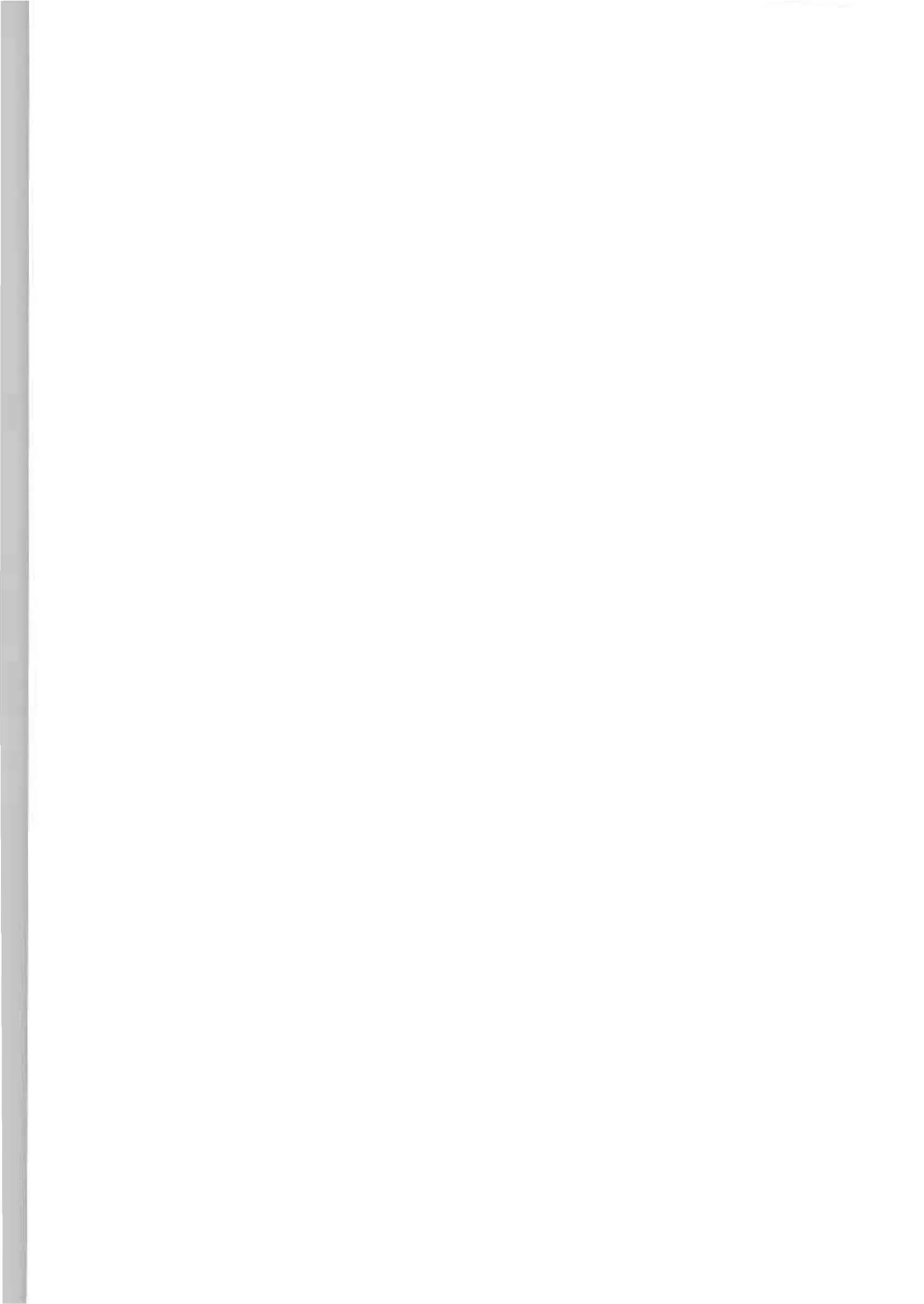
To this end we ask you to complete the attached questionnaire and return it to Ian Jerome, Project Manager Chemical Risks and Information, Loss prevention Council, Melrose Avenue, Borehamwood, Herts WD6 2BJ (address labels supplied). A fee based on the number of forms completed, payable centrally to your company, has been agreed to cover the time taken by the loss adjuster to complete this form.

This project is being conducted by LPC under contract from the Home Office Fire Experimental Unit. The intention is to obtain data on about 500 new fire scenes throughout the UK. We accept that not all the information requested on the form may be typically available to loss adjusters in the field and that some of the valuations required are subjective. We stress that in several questions we seek a professional opinion rather than facts as the precise information may not be available.

All the information provided will be treated as confidential.



APPENDIX 5
POTENTIAL LOSS
AND AMOUNT SAVED
(From Database HOFEU2)



Report from HOFEU2 Database

Amount saved for all fires where a potential loss was reported

Reference	Fire Records Reference	Potential Loss	Actual Loss	Amount Saved as % of Potential Loss
213	98110103	£15,000.00	£5,300.00	64.7 %
366	98100402	£20,000.00	£5,143.00	74.3 %
250	98101902	£23,000.00	£13,000.00	43.5 %
201	98110501	£25,000.00	£4,200.00	83.2 %
225	98080303	£30,000.00	£15,000.00	50.0 %
372	99011503	£30,000.00	£23,204.00	22.7 %
219	99011702	£45,000.00	£10,000.00	77.8 %
279	98071602	£48,600.00	£27,000.00	44.4 %
364	98112303	£50,000.00	£50,000.00	0.0 %
399	98101401	£50,000.00	£50,000.00	0.0 %
289	99020501	£55,000.00	£41,000.00	25.5 %
382	98070102	£55,000.00	£46,774.00	15.0 %
222	98071103	£55,706.00	£55,460.00	0.4 %
196	98112801	£60,000.00	£5,640.00	90.6 %
405	98120602	£60,000.00	£40,000.00	33.3 %
301	98112702	£65,000.00	£65,000.00	0.0 %
313	98111602	£65,000.00	£20,000.00	69.2 %
401	98092202	£65,000.00	£52,500.00	19.2 %
200	99022801	£70,000.00	£70,000.00	0.0 %
358	98080201	£70,000.00	£35,000.00	50.0 %
254	99030902	£75,000.00	£30,000.00	60.0 %
228	99033101	£80,000.00	£55,000.00	31.3 %
328	98102101	£80,000.00	£30,000.00	62.5 %
255	98090506	£81,000.00	£81,000.00	0.0 %
400	98080402	£85,000.00	£66,000.00	22.4 %

Reference	Fire Records Reference	Potential Loss	Actual Loss	Amount Saved as % of Potential Loss
384	99010701	£90,000.00	£40,000.00	55.6 %
258	98082701	£93,000.00	£93,000.00	0.0 %
268	98060101	£94,000.00	£77,500.00	17.6 %
341	98101101	£96,000.00	£96,000.00	0.0 %
321	98081404	£99,400.00	£29,212.00	70.6 %
240	99021502	£100,000.00	£60,000.00	40.0 %
314	98080101	£100,000.00	£100,000.00	0.0 %
393	99012301	£100,000.00	£100,000.00	0.0 %
242	98062201	£107,000.00	£96,000.00	10.3 %
315	98123004	£110,000.00	£110,000.00	0.0 %
383	98061302	£110,000.00	£43,200.00	60.7 %
263	98121801	£111,500.00	£111,500.00	0.0 %
235	98072002	£114,900.00	£114,900.00	0.0 %
272	99021601	£117,903.00	£117,903.00	0.0 %
287	98082102	£120,000.00	£70,000.00	41.7 %
402	98082802	£125,000.00	£56,000.00	55.2 %
318	98082902	£129,000.00	£60,000.00	53.5 %
357	98082904	£130,000.00	£130,000.00	0.0 %
408	98091601	£138,000.00	£28,100.00	79.6 %
284	98091702	£140,000.00	£80,000.00	42.9 %
229	98082702	£150,000.00	£30,000.00	80.0 %
237	98101601	£150,000.00	£100,000.00	33.3 %
290	99021703	£150,000.00	£89,000.00	40.7 %
355	98102701	£150,000.00	£87,000.00	42.0 %
375	98081402	£150,000.00	£150,000.00	0.0 %
380	99011001	£150,000.00	£145,000.00	3.3 %

Reference	Fire Records Reference	Potential Loss	Actual Loss	Amount Saved as % of Potential Loss
189	98120801	£154,000.00	£74,000.00	52.0 %
266	99010401	£157,000.00	£157,000.00	0.0 %
306	98101301	£165,000.00	£65,000.00	60.6 %
192	98063001	£166,000.00	£166,000.00	0.0 %
197	98092601	£166,000.00	£161,000.00	3.0 %
398	98111301	£168,211.00	£22,379.00	86.7 %
403	99030901	£170,000.00	£78,000.00	54.1 %
394	98112201	£180,000.00	£180,000.00	0.0 %
215	99011401	£185,000.00	£97,000.00	47.6 %
243	98112601	£185,000.00	£22,119.00	88.0 %
409	99010301	£197,190.00	£136,000.00	31.0 %
203	98073101	£200,000.00	£100,000.00	50.0 %
204	98072102	£200,000.00	£55,000.00	72.5 %
224	98072305	£200,000.00	£70,000.00	65.0 %
232	98073002	£200,000.00	£175,000.00	12.5 %
330	98120101	£200,000.00	£95,000.00	52.5 %
348	98062802	£200,000.00	£42,381.00	78.8 %
369	98060601	£200,000.00	£50,000.00	75.0 %
292	99011501	£205,000.00	£75,000.00	63.4 %
256	98060503	£210,000.00	£90,000.00	57.1 %
212	98120401	£214,500.00	£154,500.00	28.0 %
373	99021204	£218,000.00	£218,000.00	0.0 %
241	98082004	£220,000.00	£150,000.00	31.8 %
288	98112701	£235,000.00	£152,500.00	35.1 %
343	99031801	£240,000.00	£180,000.00	25.0 %
320	98123101	£240,500.00	£170,000.00	29.3 %

Reference	Fire Records Reference	Potential Loss	Actual Loss	Amount Saved as % of Potential Loss
339	98062501	£248,000.00	£47,000.00	81.1 %
319	98062101	£250,000.00	£166,000.00	33.6 %
340	98100301	£250,000.00	£190,000.00	24.0 %
371	99031001	£250,000.00	£155,000.00	38.0 %
412	98121301	£250,000.00	£90,000.00	64.0 %
415	98091501	£250,000.00	£150,000.00	40.0 %
218	99012902	£295,000.00	£70,000.00	76.3 %
327	98062701	£295,000.00	£145,000.00	50.9 %
216	98103101	£300,000.00	£175,000.00	41.7 %
248	98101901	£300,000.00	£300,000.00	0.0 %
323	98101402	£300,000.00	£116,103.00	61.3 %
352	98121802	£300,000.00	£80,000.00	73.3 %
257	98092501	£303,000.00	£205,000.00	32.3 %
353	98112302	£325,000.00	£74,300.00	77.1 %
376	98092502	£330,000.00	£222,000.00	32.7 %
385	98122701	£330,000.00	£110,000.00	66.7 %
269	99012701	£345,000.00	£185,000.00	46.4 %
395	99020702	£345,000.00	£195,000.00	43.5 %
349	98061303	£350,000.00	£125,000.00	64.3 %
246	99021501	£380,000.00	£79,000.00	79.2 %
261	98112501	£400,000.00	£68,000.00	83.0 %
342	98112502	£400,000.00	£184,000.00	54.0 %
304	99021002	£450,000.00	£111,500.00	75.2 %
332	99021002	£450,000.00	£111,500.00	75.2 %
361	98121102	£450,000.00	£120,000.00	73.3 %
381	99020802	£475,000.00	£77,133.00	83.8 %

Reference	Fire Records Reference	Potential Loss	Actual Loss	Amount Saved as % of Potential Loss
260	98062002	£492,000.00	£442,000.00	10.2 %
202	98092002	£500,000.00	£75,000.00	85.0 %
226	98061101	£500,000.00	£110,000.00	78.0 %
251	98080503	£500,000.00	£1,000,000.00	100.0 %
280	99021206	£500,000.00	£160,000.00	68.0 %
312	98080601	£500,000.00	£65,000.00	87.0 %
345	98060801	£500,000.00	£400,000.00	20.0 %
347	99010601	£500,000.00	£225,000.00	55.0 %
367	98110301	£500,000.00	£175,000.00	65.0 %
303	98091101	£510,000.00	£70,000.00	86.3 %
307	98092302	£510,000.00	£196,720.00	61.4 %
278	99011601	£530,000.00	£100,751.00	81.0 %
295	98060701	£550,000.00	£150,000.00	72.7 %
386	98112101	£550,000.00	£215,000.00	60.9 %
208	98121101	£568,697.00	£356,777.00	37.3 %
274	99031501	£575,000.00	£400,000.00	30.4 %
316	99021201	£590,000.00	£395,000.00	33.1 %
233	99013101	£600,000.00	£76,000.00	87.3 %
359	99033102	£600,000.00	£240,000.00	60.0 %
199	99020703	£680,000.00	£216,500.00	68.2 %
194	98071604	£700,000.00	£255,000.00	63.6 %
193	99011701	£720,000.00	£117,000.00	83.8 %
195	98100701	£720,000.00	£153,000.00	78.8 %
389	98102502	£727,000.00	£672,000.00	7.6 %
217	98122401	£750,000.00	£175,000.00	76.7 %
378	98121803	£750,000.00	£500,000.00	33.3 %

Reference	Fire Records Reference	Potential Loss	Actual Loss	Amount Saved as % of Potential Loss
404	99031102	£750,000.00	£32,000.00	95.7 %
265	99031302	£800,000.00	£30,000.00	96.3 %
317	98090503	£800,000.00	£115,000.00	85.6 %
391	98090603	£800,000.00	£800,000.00	0.0 %
296	98120601	£805,000.00	£230,000.00	71.4 %
291	99021701	£810,000.00	£185,000.00	77.2 %
221	98072603	£850,000.00	£15,000.00	98.2 %
331	98101201	£850,000.00	£175,000.00	79.4 %
338	98111101	£870,000.00	£130,000.00	85.1 %
354	98082403	£880,000.00	£175,000.00	80.1 %
325	98061701	£900,200.00	£300,000.00	66.7 %
387	99031003	£975,000.00	£300,000.00	69.2 %
211	99021003	£992,000.00	£812,000.00	18.2 %
188	98122301	£1,000,000.00	£120,000.00	88.0 %
302	99012001	£1,000,000.00	£260,000.00	74.0 %
322	98120502	£1,000,000.00	£275,000.00	72.5 %
368	99012302	£1,000,000.00	£60,500.00	94.0 %
344	99011002	£1,025,000.00	£575,000.00	43.9 %
324	99031301	£1,050,000.00	£85,000.00	91.9 %
262	98112002	£1,070,000.00	£100,000.00	90.7 %
346	98122101	£1,075,000.00	£842,000.00	21.7 %
396	99032601	£1,080,000.00	£550,000.00	49.1 %
308	99022302	£1,150,000.00	£272,500.00	76.3 %
298	98102301	£1,175,000.00	£300,000.00	74.5 %
214	98122501	£1,200,000.00	£277,000.00	76.9 %
377	98121804	£1,260,000.00	£560,000.00	55.6 %

Reference	Fire Records Reference	Potential Loss	Actual Loss	Amount Saved as % of Potential Loss
238	98092201	£1,400,000.00	£192,000.00	86.3 %
282	98060802	£1,400,000.00	£30,000.00	97.9 %
259	98101501	£1,450,000.00	£250,000.00	82.8 %
333	98110101	£1,450,000.00	£115,000.00	92.1 %
209	98120501	£1,475,000.00	£225,000.00	84.8 %
191	98111601	£1,500,000.00	£1,500,000.00	0.0 %
273	98090601	£1,500,000.00	£90,000.00	94.0 %
356	99011901	£1,500,000.00	£335,000.00	77.7 %
392	98082101	£1,500,000.00	£282,000.00	81.2 %
239	98091202	£1,508,000.00	£182,000.00	87.9 %
363	98123001	£1,555,000.00	£1,555,000.00	0.0 %
276	98121501	£1,600,000.00	£510,000.00	68.1 %
336	99010901	£1,650,000.00	£320,000.00	80.6 %
264	98072803	£1,700,000.00	£81,000.00	95.2 %
283	99022601	£1,750,000.00	£54,000.00	96.9 %
360	98082104	£1,790,000.00	£351,000.00	80.4 %
310	98101202	£1,800,000.00	£90,000.00	95.0 %
350	99011101	£1,840,000.00	£555,000.00	69.8 %
326	98110302	£1,860,000.00	£175,000.00	90.6 %
223	98071702	£2,000,000.00	£60,000.00	97.0 %
275	98121103	£2,000,000.00	£70,000.00	96.5 %
311	98112301	£2,000,000.00	£180,000.00	91.0 %
299	98120102	£2,049,000.00	£449,000.00	78.1 %
234	98102801	£2,250,000.00	£140,000.00	93.8 %
190	98102802	£2,275,000.00	£235,750.00	89.6 %
281	98081801	£2,275,000.00	£115,000.00	95.0 %

Reference	Fire Records Reference	Potential Loss	Actual Loss	Amount Saved as % of Potential Loss
247	98071304	£2,400,000.00	£319,000.00	86.7 %
205	98071805	£2,500,000.00	£435,000.00	82.6 %
220	98111201	£2,500,000.00	£163,000.00	93.5 %
245	98111705	£2,500,000.00	£2,500,000.00	0.0 %
249	98081101	£2,500,000.00	£298,500.00	88.1 %
305	98080302	£2,500,000.00	£176,000.00	93.0 %
297	99021401	£2,560,000.00	£1,480,000.00	42.2 %
414	98102401	£2,775,000.00	£162,000.00	94.2 %
370	99040201	£2,795,000.00	£2,795,000.00	0.0 %
335	99012901	£2,800,000.00	£290,000.00	89.6 %
271	99022102	£2,922,161.00	£1,300,000.00	55.5 %
252	98123103	£3,142,000.00	£340,000.00	89.2 %
388	99051801	£3,400,000.00	£760,000.00	77.7 %
293	99030801	£3,750,000.00	£650,000.00	82.7 %
351	98073001	£4,000,000.00	£3,100,000.00	22.5 %
397	99032601	£4,030,000.00	£1,030,000.00	74.4 %
270	99013103	£4,500,000.00	£110,005.00	97.6 %
277	98091201	£4,700,000.00	£330,000.00	93.0 %
413	98093001	£4,800,000.00	£3,800,000.00	20.8 %
337	98121402	£5,500,000.00	£355,000.00	93.6 %
198	98072001	£6,200,000.00	£251,000.00	96.0 %
362	98082605	£6,500,000.00	£111,000.00	98.3 %
406	99032303	£6,500,000.00	£94,232.00	98.6 %
267	98111103	£6,650,000.00	£146,600.00	97.8 %
210	98112501	£7,000,000.00	£2,000,000.00	71.4 %
206	98091901	£9,000,000.00	£120,500.00	98.7 %

Reference	Fire Records Reference	Potential Loss	Actual Loss	Amount Saved as % of Potential Loss
411	98110102	£9,106,000.00	£216,000.00	97.6 %
379	98081602	£10,100,000.00	£5,800,000.00	42.6 %
410	98111102	£14,067,000.00	£14,067,000.00	0.0 %
365	98101502	£19,200,000.00	£318,000.00	98.3 %
253	99040601	£21,000,000.00	£240,000.00	98.9 %
286	98072804	£21,000,000.00	£43,000.00	99.8 %
334	99011801	£40,000,000.00	£500,000.00	98.8 %
407	99042902	£73,000,000.00	£4,520,000.00	93.8 %
227	98100901	£100,000,000.00	£165,000.00	99.8 %

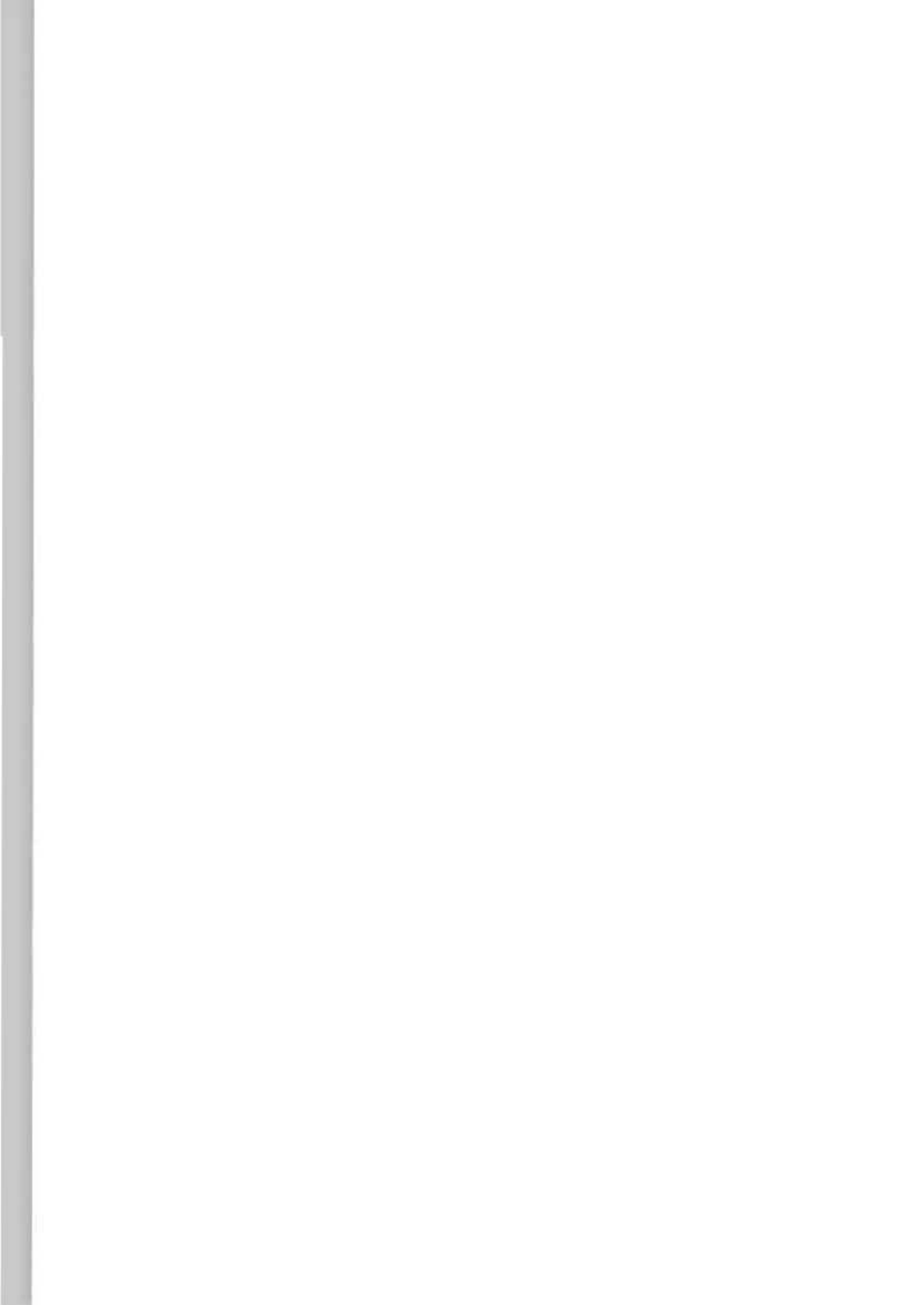
Total potential loss for all records listed above = £519,445,468.00

Average potential loss = £2,404,840.13

Total number of records = 216

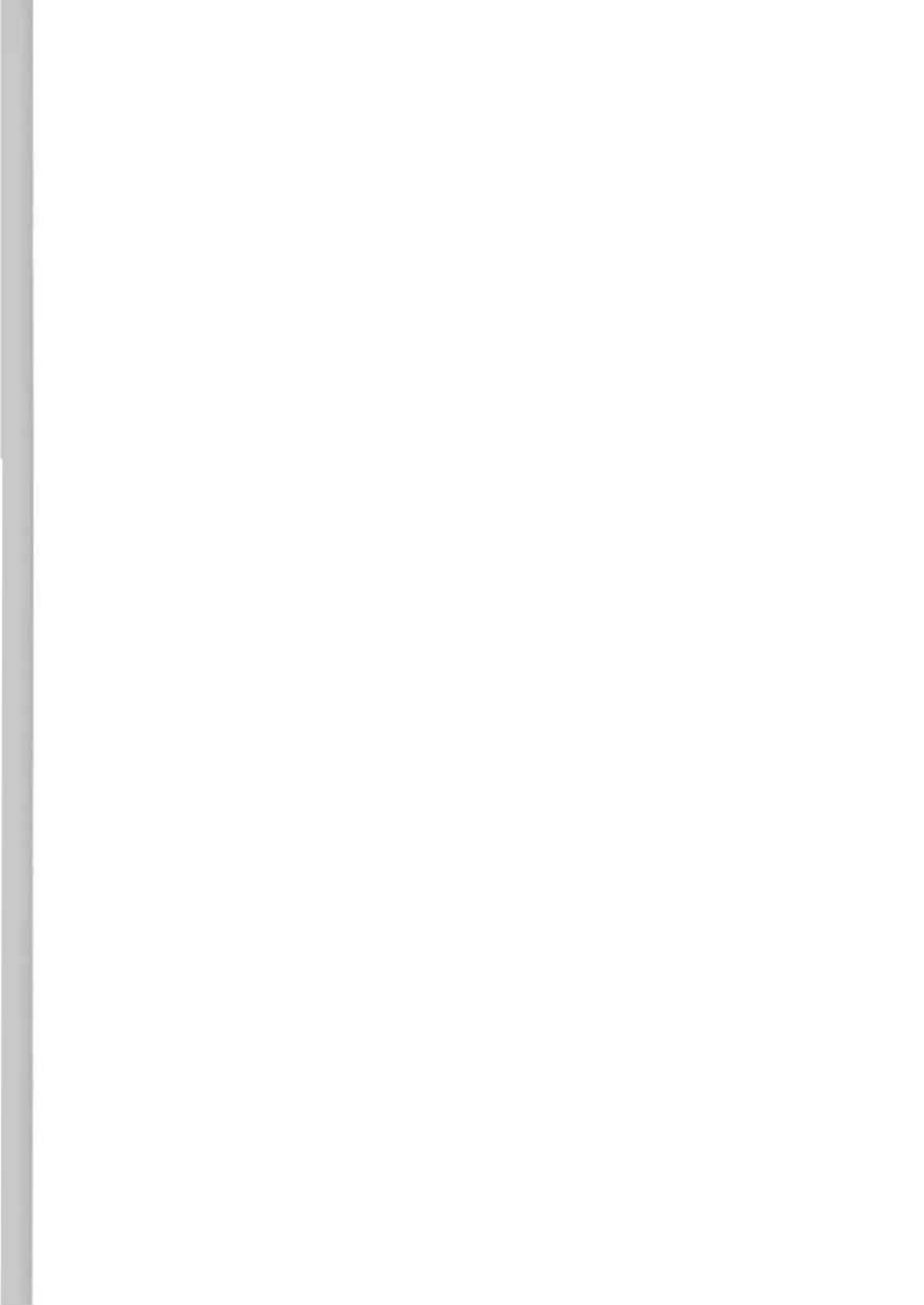
Average value saved = £2,033,348.06

Average % of potential loss saved = 57.5%



APPENDIX 6
SUMMARY OF SALVAGE
(QUESTION 12)
(From Database HOFEU2)

Note: This appendix is a report formatted directly from the database. The formula used to calculate the "Amount Saved as % of Potential Loss" gives an anomalous "100%" value when the "Value before the fire" is zero or unknown. This occurs for seven entries only.



Reference	Fire Records Reference	Type of Item Salvaged	Method of Salvage	Value after fire	Value before fire	Value saved as % of value before fire
196	98112801	Rest of house	III	£50,000	£60,000	83.3
198	98072001	Bakery machinery	II	£400,000	£750,000	53.3
220	98111201	Charity shop stock	I	£0	£20,000	0
226	98061101	Household contents	I & II	£15,000	£45,000	33.3
234	98102801	Office equipment & furnishings	II	£20,000	£25,000	80
236	98080701	Furniture etc	I	£2,000	£3,000	66.7
240	99021502	Computers	I & II	£50,000	£60,000	83.3
		Scientific equipment	I & II	£50,000	£60,000	83.3
241	98082004	Household furnishings	I	£5,000	£10,000	50
249	98081101	Amusement gaming machines	II & III	£140,000	£161,000	87
265	99031302	Stock mainly of foodstuffs	II	£92,000	£100,000	92
279	98071602	Uninsured contents	II	£5,000	£10,000	50
281	98081801	Organ & timber furnishings	III	£450,000	£500,000	90
296	98120601	Machinery	I & II	£15,000	£20,000	75
		Stock	II	£0	£85,000	0
342	98112502	Furniture stock & other contents	I, II, IV	£50,000	£70,000	71.4
349	98061303	Stock	I	£0	£1,000	0
354	98082403	Furniture/Furnishings	III, IV	£15,000	£30,000	50
372	99011503	Upper floor carpets & soft furnishings	I, III, IV	£5,000	£10,000	50
373	99021204	Household goods	I, IV	Uninsured	Not Known	100
383	98061302	Stock of designer clothes	I	£2,000	£10,000	20
402	98082802	Machinery	IV	£3,000	£5,000	60
403	99030901	Toilets & building structure	IV	£66,000	£66,000	100
404	99031102	Straw	I	£50,000	£50,000	100
		Livestock	I	£50,000	£50,000	100
409	99010301	West extension	IV	£20,000	£25,000	80
410	98111102	Computer	I	£0	£100,000	0

Reference	Fire Records Reference	Type of Item Salvaged	Method of Salvage	Value after fire	Value before fire	Value saved as % of value before fire
		Furniture	I	£0	£20,000	0
411	98110102	Minimum water used	IV	£28,000	£57,000	49.1
414	98102401	Water not used in all areas	IV	£450,000	£500,000	90
		Appliances in kitchen moved	I	£40,000	£60,000	66.7
415	98091501	Stock items	I	£23,000	£25,000	92

Methods of Salvage:

Moving item	I
Covering	II
Smoke control	III
Water control	IV
Other	V

Total amount saved through salvage, assuming total loss without salvage operations (Value after fire) = £2,096,000.00

Total number of records = 27

Average value saved through salvage, assuming total loss without salvage operations = £23,000.00

Average value saved as % of value before fire = 94.7%

APPENDIX 7

FIRE PROTECTION ASSOCIATION

FIRE RECORDS DATABASE

At the time this study was undertaken the Fire Protection Association (FPA) was a constituent part of the Loss Prevention Council (LPC), which undertook the study. From January 2000 the FPA was separated from LPC and directly parented to the Association of British Insurers and Lloyd's.

The FPA Fire Records Database, which is referred to in this report and to which LPC had access during the study, moved to FPA and continues to be maintained and added to by FPA.

Project files, originals of completed forms and other information concerning this particular project are retained by LPC.

FPA is now occupying separate premises. Questions concerning the FPA Fire Records Database may be directed to:

The Fire Protection Association
Bastille Court
2 Paris Garden
London
SE1 8ND

Tel: 020 7902 5300

Fax: 020 7902 5301

E-mail: fpa@thefpa.co.uk

Web: <http://www.thefpa.co.uk>

