



Office of the
Deputy Prime Minister

Creating sustainable communities

*FSEC Toolkit Review
Manual*



Office of the
Deputy Prime Minister

Creating sustainable communities

FSEC Toolkit Review Manual

March 2006

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CONTENTS

INTRODUCTION	9
Purpose of this document	9
Scope and approach to reviewing the FSEC Toolkit	9
Overview of the FSEC Toolkit Review process	11
SECTION 1:	
Stage 1: Pre Review Checks and Preparation	13
1.1 F&RS FSEC Toolkit Review Preparation	13
1.2 Self-reporting of Progress and Project Management	13
1.3 Pre-Review Text Queries	13
1.3.1 Copying Pre Review files to the FSEC Machine	13
1.3.2 Exporting Summary Statistics and Performance Predictors	14
1.3.3 Exporting Resource Definitions	14
1.3.4 Exporting Risk Assessment Definitions	14
1.4 Returning the Pre-Review Information to FSEC Help Desk	15
1.5 Returning the Data Set and Data Files	15
SECTION 2:	
Stage 2: F&RS Review Qualification	16
2.1 Qualification for a Review	16
2.2 Possible Project Management Issues	21
2.3 Output of Stage 2	22
SECTION 3:	
Stage 3: Review Team Load and Run Text Queries and Save Exports	23
3.1 Introduction	23
3.2 Copying Review files to the FSEC Machine	23
3.3 Stage 1 Results Review	23
3.4 Road Network	24
3.5 Stations, Crews, Vehicles and Planning Scenarios	25
3.6 Dwellings	26
3.7 Special Services	27
3.8 Other Buildings	28
3.9 Major Incidents	29

SECTION 4:

Stage 4: Review Team Desk Top Interrogation of FSEC Text Queries and Exports	30
4.1 Introduction	30
4.2 Checking Read Only Risk Assessment Definitions	30
4.2.1 Introduction	30
4.2.2 Macro for checking read only RADS	31
4.3 Checking the Road Network	31
4.3.1 Introduction	31
4.3.2 TQ011, TQ013, TQ012 & TQ017 – road links and dead ends	34
4.3.3 TQ018, TQ019 and TQ020 - General tests of arrival times	34
4.3.4 TQ024 – Risk Assessment Definitions; Road speeds	35
4.3.5 TQ025 – Vehicle speeds	36
4.3.6 TQ026 & TQ027 – Road link specific road speeds	37
4.4 Creating Stations, Crews, Vehicles and Planning Scenarios	38
4.4.1 Introduction	38
4.4.2 Resource definitions	41
4.4.3 TQ100: Fire station, vehicles, crews and costs	42
4.4.4 TQ104 – Vehicle and crewing cost	44
4.4.5 TQ105: Vehicles without crews	46
4.4.6 TQ106: Turn out times	46
4.4.7 StationJunction.txt: Station not connected to road network	46
4.4.8 TQ107 to TQ109: Stations connected to vehicles	46
4.4.9 TQ115 to TQ118: Alignment of planning scenarios and vehicle types	47
4.4.10 TQ120 to TQ123: Are planning scenarios selected for each risk area?	48
4.5 Processing Dwellings	49
4.5.1 Introduction	49
4.5.2 TQ150, TQ152, TQ160, TQ162, TQ163: Dwelling incidents	51
4.5.3 TQ153: population multipliers	53
4.5.4 TQ164: Population count	53
4.5.5 TQ165: Missing output areas	53
4.5.6 TQ166: Dwelling risk areas missing from a dwelling risk group	54
4.5.7 TQ167: Dwelling risk group robustness	54
4.6 Processing Special Services	55
4.6.1 Introduction	55
4.6.2 TQ200, TQ202 & TQ206: Data inputs	56
4.6.3 TQ203: Missing output areas	58
4.6.4 TQ205: Missing risk areas	58

4.7	Processing Other Buildings Data	59
4.7.1	Introduction	59
4.7.2	Data inputs, TQ250-252	62
4.7.3	Site assessments	63
4.7.4	TQ260 – Output areas overlooked	67
4.7.5	TQ261 – Risk areas overlooked	67
4.7.6	TQ263 – TGOBRA for all high and very high risk areas	67
4.7.7	TQ273 – HMOs or flats with ‘wrong’ number of storeys	67
4.8	Major Incidents	67
4.8.1	Possible errors	67
4.8.2	TQ300: Major incidents data	68
4.8.3	TQ302: Output areas linked to major incident risk areas	68
4.9	FSEC Outputs (performance predictors)	68
4.9.1	Introduction	68
4.9.2	TQ152 & TQ200 – Dwellings and special services predicted deaths	68
4.9.3	Other buildings performance predictors	70

SECTION 5:

Stage 5:	Reviewer Visit to F&RS for Philosophy Checks and Follow Up to Stage 4	73
5.1	Introduction	73
5.2	Possible Project Management Issues	73
5.3	Dataset	74
5.4	Road Network and Vehicle Speeds	74
5.4.1	Review discussions	74
5.4.2	Guidance on road network changes	75
5.4.3	Guidance on road speed changes	76
5.4.4	Overlays: Road network	76
5.4.5	Overlays: Dead ends	77
5.4.6	Overlays: Road continuity check	78
5.4.7	Overlays: False junctions	78
5.4.8	Overlays: One way	79
5.4.9	Overlays: Check for output areas with no junction	80
5.4.10	Overlays: General test of arrival times	80
5.4.11	Overlays: Road link specific road speeds	82
5.5	Stations, Crews and Vehicles	82
5.5.1	Review discussions	82
5.5.2	Overlays: Fire station and vehicles	84
5.5.3	Overlay: Stations	84
5.5.4	Overlay: Correct crew	84

5.5.5	Overlay: Vehicle crewing cost/vehicle speeds	84
5.5.6	Overlay: Vehicle type/vehicle cost/turn out times	85
5.5.7	Overlay: Stations not connected to road network	85
5.6	Planning Scenarios	86
5.6.1	Review discussions	86
5.6.2	Do planning scenarios cover all risks?	87
5.6.3	Are the vehicle combinations specified for each scenario reasonable and evidence based?	88
5.6.4	Phasing	90
5.6.5	Overlay: Spot checks on assignment of planning scenarios to dwelling risk areas	90
5.7	Dwellings	92
5.7.1	Review discussions	92
5.7.2	Overlay: Location status of incidents	93
5.7.3	Overlay: Risk areas and groups– implementation of potential risk factor (PRF) in creating dwelling risk areas	94
5.7.4	Overlay: Risk areas – missing output areas and planning scenarios	95
5.7.5	Overlay: Risk groups – missing dwelling risk areas & planning scenarios	95
5.8	Special Services	96
5.8.1	Review discussions	96
5.8.2	Overlay: Incident location	97
5.8.3	Overlay: Risk areas – missing output areas and check on planning scenarios	98
5.8.4	General process check	99
5.8.5	Linear features	99
5.8.6	City, town and village risk areas	100
5.8.7	Background risk areas	100
5.8.8	Overlay: Risk groups – missing risk areas	101
5.9	Other Buildings	101
5.9.1	Review discussions	101
5.9.2	Overlay: Missing site assessments	102
5.9.3	Adding in HMOs and purpose built flats	103
5.9.4	Philosophy checks of data reconciliation	104
5.9.5	Amending site assessments	104
5.9.6	Creating risk areas, groups and TGOBRAs	105
5.9.7	Overlay: Missing output areas	106
5.9.8	Overlay: Missing risk areas	106
5.9.9	Overlay to spot gaps in TGOBRAs	107
5.9.10	Check on other building planning scenarios	108

5.10	Major Incidents	108
5.10.1	Review discussions	108
5.10.2	Creation of risk areas	108
5.10.3	Major incident planning scenarios and risk areas	110
5.11	FSEC Outputs	111
5.11.1	Review discussions	111
SECTION 6:		
	Stage 6: Rating of Modules	113
6.1	Guidance	113
APPENDIX A		
	Loading Data, Running Text Queries, Exports and Overlays	114
7.1	Loading the FSEC Datasets	114
7.2	Using Text Queries To Examine Results	116
7.3	Exporting WINGS data	120
7.3.1	Exporting Risk Assessment Definition Data	120
7.4	Running Review Overlays	121
APPENDIX B		
	How to import files into MS-Excel and run the Review Macros	123
8.1	Importing Text Query Results into MS-Excel	123
8.2	How to Load and Run MS-Excel Review Macros	125
8.3	How to Run Specific Macros	126
8.3.1	Table comparisons macro	126
8.3.2	Incidents	128
8.3.3	Other building assessments	132
8.4	Risk Area Planning Scenarios	133
APPENDIX C		
	Standard review worksheets	135
APPENDIX D		
	Standard review worksheets	138
APPENDIX E		
	Reference Data	139
APPENDIX F		
	Glossary	144

LIST OF TABLES

Table 1:	Checks on pre-review text queries	19
Table 2:	Summary guidance on road network text queries	33
Table 3:	Defaults provided in Risk Assessment definitions	35
Table 4:	Road speeds given in Appendix A of FSEC manual	37
Table 5:	Summary guidance on station/vehicle text queries	39
Table 6:	‘Typical’ costs	45
Table 7:	Typical turn out times	46
Table 8:	Summary of dwelling text queries	50
Table 9:	Summary of dwelling fire data used in FSEC	53
Table 10:	Summary of special service text queries	56
Table 11:	Ratio of deaths, rescues and casualty per “life risk” special service incidents in FSEC, for comparison with TQ202	58
Table 12:	Summary of other building text queries	61
Table 13:	Site assessment defaults (user modified)	64
Table 14:	Maximum loss (societal risk defaults)	65
Table 15:	Expected property loss and societal risk deaths per annum in English F&RS	72
Table 16:	Incident types and typical vehicle combinations (Pre-determined attendances)	89
Table 17:	Progress checklist	135
Table 18:	Project Management checklist	137
Table 19:	Number of of fire stations in England at 31 March 2004	139
Table 20:	Population Count English F&RS Areas 2001	140
Table 21:	Dwelling Deaths per Year	141
Table 22:	F&RS Vehicles (March 2003)	142
Table 23:	Incident Types	143

LIST OF FIGURES

Figure 1:	Overview of the FSEC Toolkit	10
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Introduction

Purpose of this document

This document provides an overview of the FSEC Toolkit review process and describes the detailed checks to be undertaken by the review team when undertaking a review of the F&RS configuration of the FSEC Toolkit.

Scope and approach to reviewing the FSEC Toolkit

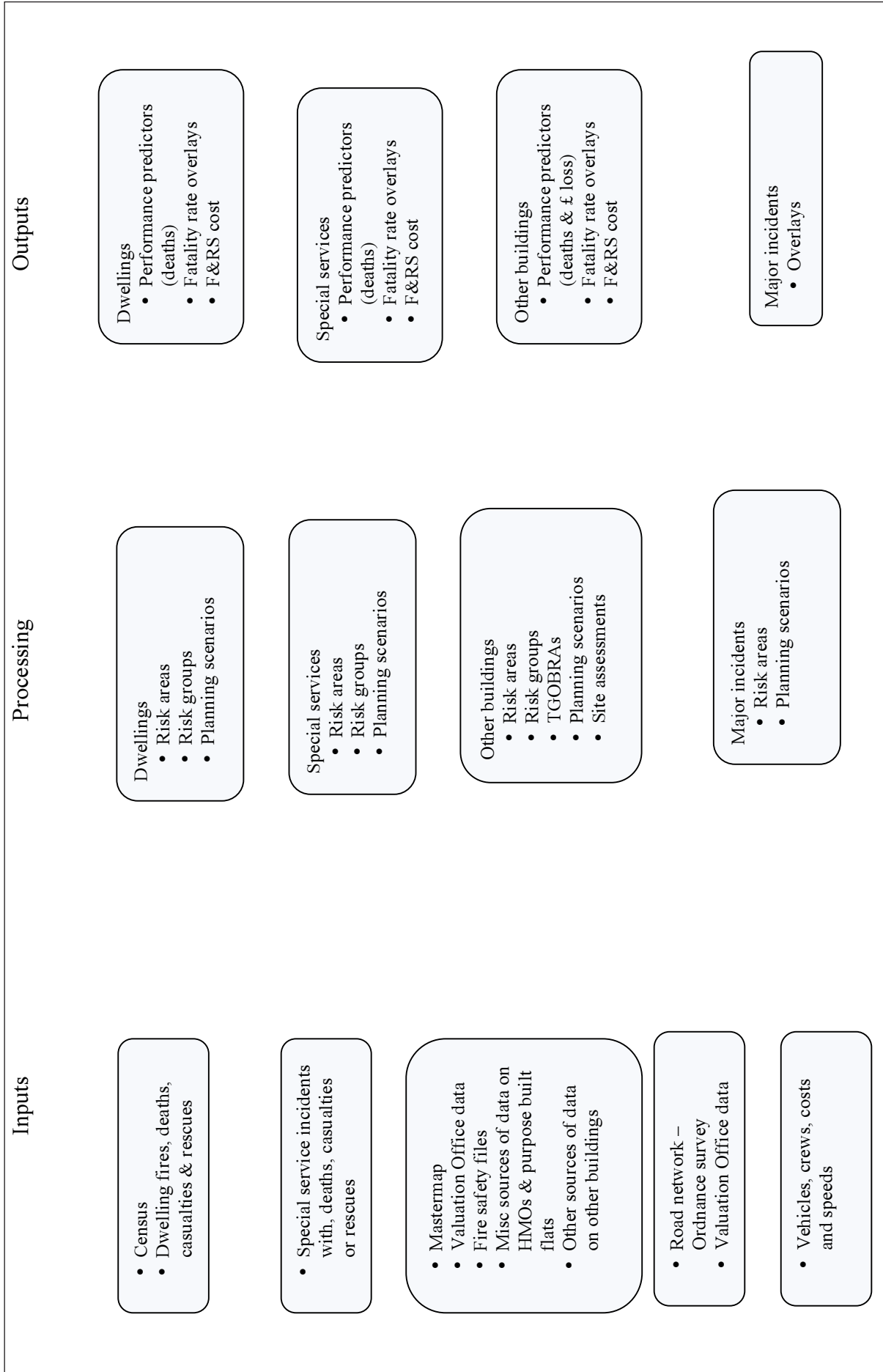
The review is limited to the 'as-is' base case. It does not cover any strategy datasets or the application of the FSEC Toolkit to the assessment of new F&RS resource changes.

The approach is to:

- First check that the read only (Risk Assessment Definitions) settings are unaltered
- Check those elements of FSEC that are common to all risk assessment modules, namely road network and resources (stations, vehicles, crews and planning scenarios)
- Then check the process of using the incident and other data for the risk assessment of dwellings, special services, other buildings and major incidents, and then
- Check the FSEC results (Performance Predictors) to see if the results are valid.

Thus, as illustrated in Figure 1, the approach is to review the Inputs, the Processing and the Outputs.

Figure 1: Overview of the FSEC Toolkit



Overview of the FSEC Toolkit Review process

Requesting a Review

A review can be requested from the FSEC helpdesk. The request from the F&RS needs to be confirmed by the CFO or DCFO of the respective F&RS.

Before the request is confirmed the F&RS should be aware that, although guided, they will need to commit significant effort themselves to the review. Also they should note that in order to qualify for a review the F&RS needs to have, as a minimum, completed:

- The preparation of the road network, creation of crews, vehicles, stations and costs
- At least one* of dwelling, special services or other buildings modules
- The running of the travel time matrix (all 3 stages), re-linked the areas and have run FSEC

*It is possible to review one module at a time, such as reviewing dwelling first and then special services. However, the F&RS should note that second or third reviews will not be funded by the ODPM.

Review Process

Stage 1: Pre-review checks and preparation by the F&RS (Section 1)

Before the review is scheduled the F&RS needs to:

- Complete the review preparation tasks
- Complete the progress and project management checklists
- Run the pre-review text queries
- Send the output back to the FSEC helpdesk

Stage 2: F&RS Review qualification (Section 2)

The status of FSEC work will be checked to assess readiness for a review, such as whether there is evidence that sufficient data has been loaded and sufficient progress made in the FSEC analysis to justify a review.

Once the F&RS has been accepted for review, the ODPM will issue a confirmation letter to the FSEC project manager and the CFO. In response the F&RS needs to confirm that the FSEC team and project manager will be available at the agreed time of the review for the Stage 5 work. At this point the F&RS should:

- Clone the dataset to be reviewed and name it '(F&RS name) FSEC review dataset 1'

Stage 3: Load and run text queries (Section 3)

Once the F&RS has been accepted for a review and has confirmed the availability of its team, the text queries should be loaded and run on the F&RSs' cloned dataset.

Stage 4: Reviewers desk top interrogation of FSEC text queries & exports (Section 4)

The review team will complete a desk top check of F&RS data and prepare F&RS specific review queries.

The review team will confirm at this stage whether the FSEC analysis has been progressed to a stage that justifies an F&RS visit, and then confirm a site visit(s) with the F&RS project/ team manager.

Stage 5: Review Team visits to F&RS for process and philosophy checks and follow up to Stage 4 (Section 5)

During the visit the reviewer(s) will:

- Carry out process and philosophy checks
- Review the FSEC project management arrangements.
- Discuss any anomalies found in the FSEC text queries and exports, confirming or eliminating them as appropriate

Stage 6: Review Team reporting and rating of modules (Section 6)

On completion of the review, a standardised review report will be copied to:

- The ODPM FSEC manager
- The F&RS CFO
- The F&RS FSEC team/project manager

Stage 1 – Pre Review Checks and Preparation

1.1 F&RS FSEC Toolkit Review Preparation

After the request for a review is confirmed the helpdesk will supply pre-review text queries to run. At the time of requesting a review the F&RS should:

1. Identify the correct data set to be reviewed
2. Ensure all three stages of the travel time matrix have been run
3. Ensure all risk areas and risk groups have been linked
4. Run FSEC

The review is to be run on the 'Base Case' only. The Base Case is meant to have all existing F&RS resources, planning scenarios based on current Pre-Determined Attendances and census/ other building data representing the current position (rather than projections of future population etc).

1.2 Self-reporting of Progress and Project Management

The F&RS should complete the progress checklist and the project management check list (presented in Appendix C as Table 17 and Table 18 respectively). These will be provided separately to the F&RS once the request for a review has been confirmed.

1.3 Pre-Review Text Queries

These text queries cover the summary statistics and performance predictors for dwellings, other buildings, special services and major incidents. They include risk assessment and resources definitions.

The pre-review text queries should be loaded, run and then the data produced saved as detailed below:

1.3.1 Copying Pre Review files to the FSEC Machine

The file 'FSEC Toolkit Review Stage 1 Installation.exe' supplied by the FSEC Help Desk should be run. This will copy a few files to the FSEC machine that are required to run the pre review text queries.

1.3.2 Exporting Summary Statistics and Performance Predictors

The summary statistics and performance predictors should be exported to a text file using the Action ► Text Query option from the menu at the top of the screen and selecting the following criteria (the ‘all’ button should be highlighted for the date range):

Feature	Layout ► Get	Save as file name
Multiple Features	Summary Statistics	SummaryStatistics.txt
Multiple Features	Performance Predictors	PerformancePredictors.txt

1.3.3 Exporting Resource Definitions

The resource definitions should be exported to a text file using the Action ► Text Query option from the menu at the top of the screen and selecting the following criteria (the ‘all’ button should be highlighted for the date range):

Feature	Layout ► Get	Save as file name
Resource Definitions	L003 Resource Definitions	TQ003 ResourceDefinitions.text

Note The Resource Definitions feature is available under the ‘FSEC features 1 to 499’ list. Click on the ‘+’ at the side of the feature to expand the list.

1.3.4 Exporting Risk Assessment Definitions

The Risk Assessment Definitions should also be exported. This can be done as follows:

From within FSEC:

- click on Overlay ► Risk Assessment Definitions
- click on File ► Export
- enter the file name RAD.imp
- ensure ‘whole record’ option is selected
- click on ok button

1.4 Returning the Pre-Review Information to FSEC Help Desk

The following data should be returned to the FSEC Help Desk:

Data Required
Completed progress checklist
Completed project management checklist
SummaryStatistics.txt
PerformancePredictors.txt
RAD.imp
TQ003_ResourceDefinitions.txt

1.5 Returning the Data Set and Data Files

Once accepted for a review, and a date agreed, the F&RS should Clone the dataset to be reviewed and call it “*F&RS name* review data set 1”. This should be copied onto a CD and returned to the FSEC help desk along with the files indicated below (which can be found in the C:\FSEC\Brigade\Tables folder).

The following data should be returned at this stage:

File Name	
<i>F&RS name</i> review data set 1 (the cloned dataset)	
brosdb.txt	ranks.TAB
BPS.TAB	RISK.TAB
crewing.TAB	VCOST.TAB
PSPEED.TAB	VTYPE.TAB

Stage 2 – F&RS review qualification

2.1 Qualification for a Review

Once the F&RS has completed the first part of Stage 1, Stage 2 will help to determine whether the F&RS meets the minimum qualification criteria for a review. These criteria are intended only to ensure that the F&RS can benefit from the review.

In order to qualify for a review the F&RS needs to have, as a minimum, completed:

- The preparation of the road network, creation of crews, vehicles, stations and costs
- At least one* of dwelling, special services or other buildings modules
- The running of the travel time matrix (all 3 stages), re-linked the areas and run FSEC

*It is possible to review one module at a time, such as reviewing dwelling first and then special services. However, the F&RS should note that second or third reviews will not be funded by the ODPM.

Before the dwelling module is reviewed the F&RS should have:

- Checked location of dwellings incidents that involve deaths, casualties or rescues
- Created risk areas and groups
- Defined and assigned planning scenarios
- Run FSEC and derived dwelling performance predictors.

Before the special service module is reviewed the F&RS should have:

- Identified and checked the location of all special service incidents involving one or more ROF/ROC/ROR (Category A incidents)
- Created risk areas and groups for all at least RTAs and preferably also for extrications and other special services and ideally for all types of special service (and any re-linking)
- Defined special service planning scenarios for all special service risk areas
- Run FSEC to get special service performance predictors

It should be noted that if any module's summary statistics output contains all zeroes (0.0) but the F&RS indicate that they have completed work on at least one part of this module on their returned progress checksheet then this may indicate that part of the FSEC model has not been correctly re-run. The F&RS should be advised (through the FSEC Helpdesk) to re-run FSEC and return a revised summary statistics file.

In the summary statistics file for special services, if there are no entries in the ‘Cat A incidents OAs classed as...’ for RTAs it is unlikely that the F&RS qualify for a review of special services. Also it is recommended that at least RTAs should have entries for an FSEC review to be done. Preferably RTAs, Extrications and other special services will have been completed before the special service module is reviewed. Ideally water rescues, line rescues and HAZCHEM will have also been done before the special services module is reviewed, although this guideline may be varied from if the F&RS does not attend water or line rescues or can confirm they do not occur in their F&RS. Ladder rescues, lock in and lift releases are not essential, and indeed some F&RS may not attend or record these types of incidents.

Before the other building module is reviewed the F&RS should have:

- Identified and checked the location (for example ensuring that they are on the correct footprint) of all hospitals, hotels, care homes and hostels
- Identified and checked location of all other types of other buildings that are certificated
- Identified the majority of HMOs and bed sits of three or more storeys and purpose built flats of 4 or more storeys and located them
- Created risk areas, risk groups and TGOBRAs
- Defined planning scenarios for each risk area
- Run FSEC and derived performance predictors

Before reviewing the major incident module the F&RS should have:

- Created risk areas for all major incident types
- Defined planning scenarios for each major incident risk areas

The F&RS does not need to have completed:

- Modification of the road speeds
- Modification of the site assessments of other buildings
- Loading of additional years incident data
- Checking location of incidents other than dwelling and special service ROF/ROC/ROR
- Comparisons with alternative resource strategies
- Recorded CFS (Community Fire Safety) activity in dwelling output areas

It is recommended (but is not essential) that the F&RS undertake the:

- Modification of the 'default' site assessments for hospitals, hotels, care homes and hostels and other very large other buildings (as appropriate) before reviewing
- Modification of the default road speeds using F&RS data

The state of progress can be checked using the progress checklist and the pre-review text queries. The output of these queries is in the files returned by the F&RS called SummaryStatistics.txt and PerformancePredictors.txt.

The text query provides two sets of data, namely summary statistics (these are a summary of the 'input' data) and performance predictors (the 'results'). The key questions are shown in Table 1.

Table 1: Checks on pre-review text queries

	No	Yes	Comment
Summary statistics			
Is there an entry for dwelling fatalities?			
Are there entries in the count of Other Buildings where there is >20 people for:			
Hospitals, care homes, hotels, hostels, HMOs, houses converted to flats, schools, Other sleeping accommodation, licensed accommodation			
Shops, offices, factories, other places of work			
Is the population count consistent with ODPM records? ¹			
Is the total count of actual dwelling casualties and deaths consistent with ODPM records? ²			
Are there entries in the ‘Total actual incidents in OAs classed as....’ for:			
RTAs			
Extrications			
Other Special services			
Water rescues			
Line Rescues			
HAZCHEM			
Lift releases			
Ladder rescues			
Lock in / out			
Performance predictors			
Are there predicted deaths for dwellings?			
Are there predicted deaths in Other Buildings?			
Are there predicted deaths for special services?			
Are there big differences (e.g. +/- 50% error) between the actual and predicted number of dwelling deaths?			

¹ Comparison may be made with Table 20 but note that data is not from the same source as FSEC is based on so there may be minor differences.

² Comparison may be made with Table 21 but note data are for deaths only and is not from the same source as FSEC is based on so there may be minor differences.

Checking Defaults and Planning Scenarios

Additional checks can be done to review the default Risk Assessment Definitions, Resource Definitions and the planning scenario details. This information can be reviewed using the following input files and macros. For further details on how to run these please refer to Appendix B.

Input File	MS-Excel File	Macro	Save as Filename
RAD.IMP	FSEC GetColumndata.xls	RetreiveColumnData	RAD.xls
TQ003_ResourceDefinitions.TXT	Macros.xls	ImportData	TQ003_RD.xls
Brosdb.TXT	Table_Comparison.xls	Macros.xls UpdateTableComparison	PSResources.xls

Note: Please refer to Appendix B for detailed instructions on running the macros, in particular for the Update Table Comparison macro.

The following checks should be made:

RAD.xls

The RAD.xls file highlights in red any information that has been changed by the F&RS. Some of this information can be changed and some of it must not be. At this stage a note should be made as to whether any of the data has been highlighted. Any items highlighted yellow in column 'C' can be changed.

The RADs in the RAD.xls spreadsheet should be unaltered in the following cases:

- Dwellings (risk category criteria, socio-demographic benchmarks, fatality rates per dwelling fire casualty – see figure 5 in Background section of FSEC manual)
- Special services (attendance time fatality rate per category A incident, frequency categories, predicted deaths per km² – see figure 6 in the background section of the FSEC manual)
- Societal Fire frequencies, rates of societal risk per TGOBRA per year or societal risk rate categories – (see figure 8 in the background section of the FSEC manual)
- Property fire frequencies (see figure 9 in the background section of the FSEC manual)
- Societal Maximum Probable Loss of life or % of potential deaths which may be saved (see figure 7 in the background section of the FSEC manual)
- Other Risk Multipliers (see figure 10 in the background section of the FSEC manual)

TQ003_RD.xls

The TQ003_RD.xls file highlights in red any fire fighter costs information that has been changed by the F&RS. It also identifies the percentage change between the FSEC defaults and the actual F&RS values. At this stage a note should be made if there are any missing values, or if the values are more than +/-50% of the FSEC default (the Lothian values are presented in the spreadsheet). It should be noted that anomalies apparent from this query may not be significant unless the F&RS has used this data in their calculation of costs.

There should be no blanks in the costs entered in the resource definitions sheet.

PSResources.xls

The PSResources.xls file cross checks the planning scenarios and vehicles defined by the F&RS. At this stage checks are only required on the following:

- There should be entries in the BPS, Crewing, VCOST, VTYPE, and PSPEED sheets of the PSResource sheet
- Have planning scenarios been defined and do they have unique names? The scenarios are listed on the 'BPS' sheet. Column 'C' should not contain any blank values (incomplete scenario definitions) or red highlights (duplicate scenario names)
- Have vehicles been associated to planning scenarios? The scenario and vehicle combinations are listed on the 'brosdb' sheet. Column 'b' shows the entry type, 0 is the scenario, 1 is the vehicle used in a scenario and 2 is the vehicle details. There should be at least one type 1 entry after each type 0. If not then a scenario does not have any vehicles associated with it
- Have the speeds been defined for the vehicles? The PSPEED sheet shows the speed for each vehicle. Check that column 'B' shows values for most vehicles. Note that this is a percentage speed and pumps are generally classed as 100%
- Have the vehicles been given a cost? The VCOST sheet shows the vehicle costs. Check that column 'B' contains values for most vehicles

2.2 Possible Project Management Issues

The entries in the project management checklist do not necessarily impact the decision on whether to complete a review. They are required at this stage to provide background for the reviewers and to flag up possible issues for further scrutiny. In the event that:

- (1) there is little progress in completing FSEC and
- (2) evidence of little project management

then the entries in the project management checklist may be used to reinforce the decision on whether or not to proceed with a review.

2.3 Output of Stage 2

The output of this stage of the review process is a decision regarding whether it is appropriate to proceed with the review given the progress made by the F&RS and the outcome of the checks outlined in this section. This decision is to be made in consultation with the FEU.

If the review is to proceed, the F&RS should complete the second part of Stage 1, namely returning a dataset and some associated files to the FSEC Helpdesk (see Section 1.5).

Stage 3 – Review team load and run text queries and save exports

3.1 Introduction

Once the decision has been taken to proceed with the review, the review team will load and run text queries to generate exports on the cloned dataset provided by the F&RS. The text queries and exports required are designed to interrogate all the key aspects FSEC and how it is set up at the F&RS review candidate.

The following sections outline how to load the review files and run the text queries along how the results of the text queries should be saved. For detailed guidance on running the text queries please refer to Appendix A.

Section 7.1 (in Appendix A) presents instructions about how to load the candidate review F&RS data onto the FSEC review PC.

3.2 Copying Review files to the FSEC Machine

The 'FSEC Toolkit Review Stage 3 Installation.exe' should be run. This will copy a few files to the FSEC machine that are required to run the review text queries. Note that if the machine has been previously used for reviewing a FSEC dataset, these files should already be present and this stage may be ignored.

3.3 Stage 1 Results Review

The queries returned as part of Stage 1 and those run in Stage 2 should be re-run once the F&RS dataset is loaded onto the review machine and the results briefly compared with those obtained during the analysis of Stage 2 to ensure that there are no significant differences between the dataset on which the Stage 1 and 2 queries were run, and the one returned for review purposes. It should be noted that the F&RS may have made some changes to their data in the interim period. However, if any changes in results are noted at this stage which are of such a magnitude that they would have jeopardised the decision to proceed with the review at Stage 2 the review should be halted and the suitability of the data questioned with the FSEC Helpdesk and/or the F&RS.

The queries which should be re-run at this stage are therefore:

- Summary Statistics
- Performance Predictors
- TQ003
- RAD.xls
- PSResources

3.4 Road Network

The following queries should be run to evaluate the road network (remember to ensure that the 'all' button is clicked for the date range before executing the query):

Feature	Criteria Name	Layout Name	Save as file name
Road Junction	Q011 Missing Road Info – Map	L011 Road Junction Info	TQ011_MissingRoadInfo.txt
Road Junction	Q012 Dead Ends	L011 Road Junction Info	TQ012_DeadEnds.txt
Road Junction	Q018 First Junction Arrivals 120 min Plus	L011 Road Junction Info	TQ018_FirstArrivalRJ120.txt
Road Junction	Q019 First Junction Arrivals 60 min Plus	L011 Road Junction Info	TQ019_FirstArrivalRJ60.txt
Road Junction	Q020 First Junction Arrivals 30 min Plus	L011 Road Junction Info	TQ020_FirstArrivalRJ30.txt
Road Link	Q013 Missing Road Link Info	L013 Road Link Info	TQ013_MissingRoadLinkInfo.txt
Road Link	Q027 Road Speeds Changed by more than 50%	L013 Road Link Info	TQ027_RoadSpeeds50.txt
Road Link	Q026 Road Speeds Changed by more than 10%Note 1	L026 Road Link Speeds	TQ026_RoadSpeeds10.txt
Output Area	Q017 Missing Output Area Info	Output Areas	TQ017_MissingOutputAreaInfo.txt
Risk Assessment Definitions	Q024 Road Speed Defaults	L024 Risk Assessment Definitions Other	TQ024_RoadSpeedDefaults.txt
Vehicle	Q025 Vehicle Speeds not 100%	L104 Vehicle Details	TQ025_VehicleSpeeds.txt

Note(s) 1. The output for Q026 will only produce a single line saying how many records have been changed.

3.5 Stations, Crews, Vehicles and Planning Scenarios

The following queries should be run to evaluate how stations, crews, vehicles and planning scenarios have been set up.

Feature	Criteria Name	Layout Name	Save as file name
Vehicle	None required	L104 Vehicle Details	TQ104_VehicleDetails.txt
Vehicle	Q108 Vehicles Away from Stations	L104 Vehicle Details	TQ108_VehiclesNotInStations.txt
Vehicle	Q109 Vehicles East/North don't match station	L104 Vehicles Details	TQ109_VehiclesNotMatched.txt
Vehicle	Q103 Vehicle Not in PS's	L103 Vehicles Not in PS's	TQ103_VehicleNotInPS.txt
Vehicle	Q105 Vehicle Crews and Turnout Time	L105 Vehicles Crew and Turnout Times	TQ105_VehicleTT.txt
Vehicle	Q106 Vehicles Turnout Time Reasonable	L105 Vehicles Crew and Turnout Times	TQ106_VehicleTTReasonable.txt
Fire Station	None required	L100 Fire Station and Vehicles	TQ100_FireStationCosts.txt
Fire Station	StationJunction	StationJunction (Report)	StationJunction.txt
Fire Station	Q101 Missing Station Info	L107 Fire Stations Details	TQ101_FireStationDetails.txt
Fire Station	Q107 Stations Without Vehicles	L107 Fire Stations Details	TQ107_FireStationWithoutVehicles.txt
Output Area ^{Note 4}	None required	L127 OA PS Vehicles – Exclude OB	TQ127_ALIOAPSNotBuilding
Output Area ^{Note 4}	None required	L117 OA PS Vehicles OB	TQ130_ALIOAPSBuilding
Output Area	Q115 OA Vehicles Not Satisfied – Dwellings	L115 OA PS Vehicles Dwellings	TQ115_OAVehiclesDwellings.txt
Output Area	Q116 OA Vehicles Not Satisfied – For Major Incident ^{Note 1}	L116 OA PS Vehicles MI	TQ116_OAVehiclesMI.txt
Output Area	Q117 OA Vehicles Not Satisfied – Other Buildings ^{Note 2}	Q117 OA Vehicles Not Satisfied – Other Buildings ^{Note 2}	TQ117_OAVehiclesOB.txt
Output Area ^{Note 4}	Q118 OA Vehicles Not Satisfied – Special Services ^{Note 3}	L118 OA PS Vehicles SS	TQ118_OAVehiclesSS.txt
Dwelling Risk Area	Q120 Risk Area Missing PS – Dwellings	L120 Dwelling Risk Area	TQ120_DRA_PS.txt
Major Incident Risk Area	Q121 Risk Area Missing PS – Major Incidents ^{Note 1}	L121 Major Incidents Risk Area – PS	TQ121_MIRA_PS.txt
Other Buildings Risk Area	Q122 Risk Area Missing PS – OBs ^{Note 2}	L122 OB Planning Scenarios for RA	TQ122_OBRA_PS.txt
Special Services Risk Area	Q123 Risk Area Missing PS – Special Services ^{Note 3}	L123 Special Service Risk Areas	TQ123_SSRAPanning.txt

Note(s)

1. This query can be omitted if the F&RS has not completed major incidents
2. This query can be omitted if the F&RS has not completed Other Buildings
3. This query can be omitted if the F&RS has not completed special services
4. These queries can take a long time to run

3.6 Dwellings

The following queries should be run to evaluate how dwellings, including dwelling incidents have been set up.

Feature	Criteria Name	Layout Name	Save as file name
Incident	Q150 Incidents in Dwellings	L150 Incidents – With IPCL Reason	TQ150_IncidentsDwellings.txt
Incident	Q152 Incidents Fires ^{Note 1}	L150 Incidents – With IPCL Reason	TQ152_IncidentsFires.txt
Incident	Q160 Incidents Not Checked - Casualties	L150 Incidents – With IPCL Reason	TQ160_AllIncidentsNotChecked.txt
Incident	Q162 Dwelling Fires Casualties Note 2	L150 Incidents – With IPCL Reason	TQ162_DwellingFireCasualties.txt
Incident	Q163 Dwelling Fires Casualties – Not Checked	L150 Incidents – With IPCL Reason	TQ163_DwellingFiresNotChecked.txt
Risk Assessment Definitions	None required	L024 Risk Assessment Definitions Other	TQ153_RADOther.txt
Output Area	None required	R164 OA Census Data	TQ164_CensusData.txt
Output Area	Q165 Output Area Missing DRA	Output Areas	TQ165_OAMissingDRA.txt
Dwelling Risk Area	Q166 DRA Missing DRG	L120 Dwelling Risk Area	TQ166_DRAMissingDRG.txt
Dwelling Risk Area	Q170 DRA Fire Safety	L120 Dwelling Risk Area	TQ170_DRAFireSafety
Dwelling Risk Group	None required	L167 Dwelling Risks Groups	TQ167_DRG.txt

Note(s)

1. This query can be omitted if don't want to look at all fire incidents.
2. This query can be omitted if using the pivot table with Q150 to check on dwelling fires.

3.7 Special Services

The following queries should be run to evaluate how special services, including incidents have been set up. This section can be omitted if the F&RS has not completed the special services module.

Feature	Criteria Name	Layout Name	Save as file name
Incident	Q200 Incidents – Special Services	L150 Incidents - With IPCL Reason	TQ200_IncidentsSS.txt
Incident	Q202 Incidents – Special Services Life Risk	L150 Incidents – With IPCL Reason	TQ202_IncidentsSS_LR.txt
Incident	Q206 Incidents – Special Service Casualties	L150 Incidents – With IPCL Reason	TQ206_IncidentsSS_CAS.txt
Output Area	Q203 OAs without Special Services Risk Area	Output Areas	TQ203_OAsWithoutSSRA.txt
Special Services Risk Area	Q205 SS Risk Area not in SS Risk Group	L123 Special Services Risk Areas	TQ205_SSRAMissingSSRG.txt

3.8 Other Buildings

The following queries should be run to evaluate how other buildings (including locations, site assessments and incidents) have been set up. This section can be omitted if the F&RS has not completed the other buildings module.

Feature	Criteria Name	Layout Name	Save as file name
Other Building Site Assessment	None required	L255 OB Site Assessment People	TQ255_OBSAPeople.txt
Other Building Site Assessment	Q250 OB Site Assessments with no Valuation Reference	L250 OB Site Asst Valuation Check	TQ250_OBSiteAssessment.txt
Other Building Site Assessment	Q251 OB Without Footprint	L250 OB Site Asst Valuation Check	TQ251_OBWithoutFootprint.txt
Other Building Site Assessment	Q252 OB Site Assessment Moved	L252 OBSite Ass Location	TQ252_ObsMoved.txt
Other Building Site Assessment	Q254 OB Sites Not Changed	L254 OB Site Defaults Changed	TQ254_OBDefaultsNotChanged.txt
Other Building Site Assessment	Q256 OBSite Visits	L256 OBSites Visit Dates	TQ256_OBSiteVisits.txt
Other Building Site Assessment	Q257 – OB Less than 20 People at all times	L255 OB Site Assessment People	TQ257_OBSALess20.txt
Other Building Site Assessment	Q258 OB More than 20 People between 08:00 and 20:00	L255 OB Site Assessment People	TQ258_OB>20
Other Building Site Assessment	Q259 OB at least 20 people in one time	L255 OB Site Assessment People	TQ259_OB>20onetimeperiod
Other Building Site Assessment	Q275 OB 20 to 50 people from 08:00 to 20:00	L255 OB Site Assessment People	TQ275_OB20to50
Other Building Site Assessment	Q276 OB 50 to 100 people from 08:00 to 20:00	L255 OB Site Assessment People	TQ276_OB50to100
Other Building Site Assessment	Q277 OB 20 to 50 People from 12:00 to 24:00	L255 OB Site Assessment People	TQ277_OB20to50_12to24
Other Building Site Assessment	Q260 OA Missing OBRA	Output Areas	TQ260_OANotinOBRA.txt
Output Area	Q263 TGOBRA Missing H/VH Risk	L263 TGOBRA Missing H/VH Risk	TQ263_TGOBRAMissingH_VHRisk.txt
Other Buildings Risk Area	Q261 OB Risk Area not in Risk Group	L261 Other Building Risk Area Details	TQ261_OBRANotInOBRG.txt
Other Building Site Assessment	Q273 HMO or Flats with Wrong Storeys	L273 OBSA Storeys	TQ273 HMO or Flats with Wrong Storeys
Other Building Site Assessment	Q274 Environment and Heritage Risk	L274 Environment and Heritage Risk	TQ274 EnvironmentandHeritageRisk

3.9 Major Incidents

The following queries should be run to evaluate how major incidents have been set up. This section may be omitted if the F&RS has not completed the major incidents module.

Feature	Criteria Name	Layout Name	Save as file name
Incident	Q300 Incidents – Major Incidents	L150 Incidents - With IPCL Reason	TQ300_IncidentsMI.txt
Output Area	Q302 OAs with Major Incident Risk Area	Output Areas	TQ302_OAsWithMIRA.txt

Stage 4 – Review team desk top interrogation of FSEC text queries and exports

4.1 Introduction

Once the Stage 3 queries have been run, the review team should complete Stage 4, a desk top review of the data they generated during Stage 3. The purpose here is both to identify any apparent issues with the F&RSs FSEC configuration and also to make a detailed plan of what should be explored during the site visit (Stage 5).

The review team should assess the data against criteria given in this section. This will determine where there are possible errors and where the reasons for changes made by the F&RS should be explored further during the site visit. Section 5 can be used to plan the site visit and investigate apparent issues further using overlays and further queries if necessary.

4.2 Checking Read Only Risk Assessment Definitions

4.2.1 Introduction

FSEC contains Risk Assessment Definitions (RADS). These can be split into ‘Read Only’ RADS and those that can legitimately be revised by the users.

The ‘Read Only’ RADS should be checked to see if the read only protection has been intentionally or unintentionally circumvented.

4.2.2 Macro for checking read only RADS

The aim here is to check whether the read only protection has been defeated for the ‘fixed defaults’, specifically the Risk Assessment Definitions (figures 5 to 10 in FSEC Background User Guide), by checking the values used by the F&RS with the default values.

The default Risk Assessment Definitions are checked using the following input files and macro to pull the information into MS-Excel. For further details on how to run these please refer to Appendix A.

Input File	MS-Excel File	Macro	Save as Filename
RAD.IMP	FSEC GetColumndata.xls	RetreiveColumnData	TQ03_RD.xls
TQ003_ResourceDefinitions.TXT	Macros.xls	ImportData	TQ003_RD.xls

RAD.xls

The macro highlights in red the values in column E that have been changed from the defaults (values in column D). Column B shows the field descriptions, which are highlighted in yellow if the value can be changed by the F&RS.

The following Risk Assessment Definitions in FSEC should be compared with the ‘pre-loaded’ values:

- Dwellings
- Special services
- Societal fire frequencies
- Property fire frequencies
- Societal MPL
- Other risk multipliers

These defaults should be unaltered, i.e. value in column E should not be highlighted in red after running the RetrieveColumnData macro. Refer to FSEC Background User Guide (Part 1 of the FSEC Manual) pages 5 to 9 for further details on the read only values.

The remaining Risk Assessment Definitions are not fixed and may be altered by the F&RS. It should be noted whether the F&RS has changed the vehicle speeds for different times of day (rows 147 to 152) as this can be used to inform the Stage 5 discussions regarding vehicle speed calibration.

4.3 Checking the Road Network

4.3.1 Introduction

FSEC uses a road network comprising road junctions and road links. Road links are designated by type (motorway, A road etc) and each type has a default road speed. Every output area requires a road junction in order for an appliance to attend it. The default road speeds may, or indeed, should be altered by use of local data. A number of errors are possible:

- Output areas may not have a road junction, and hence can never be attended
- Road links may be lost, such as a gap in an A road, increasing the time taken to reach an output area – as the vehicle would need to take an indirect route around the missing road link
- The F&RS may have incorrectly changed the default road speeds, or failed to modify the defaults to match local data
- Junctions and parts of road network can be lost if the road network has been re-loaded and this would require manual correction which might have been overlooked

The text queries for checking the road network are summarised in Table 2.

In the case of TQ011, TQ013, TQ012 and TQ017, there should be no records. If there are any records, there is an error that needs to be corrected.

In the case of TQ018, TQ019, TQ020, TQ024, TQ025, Q026 and TQ027, it is necessary to scrutinise the output as per the guidance laid out below.

In addition the reviewer should undertake spot checks on the road network including the following checks (as outlined in Section 5.4.2):

- A check for spurious junctions (especially on motorways and dual carriageways, particularly for flyovers)
- A check that one way streets have been appropriately defined

Table 2: Summary guidance on road network text queries

File name	Purpose	Guidance
TQ011_MissingRoadInfo.txt	This query checks whether there are any roads that do not have a first arrival time, and hence are not linked to the road network.	There should be no records reported. Refer to Section 4.3.2
TQ013_MissingRoadLinkInfo.txt	This query identifies road links without a road type (e.g. motorway, A Road etc) identified.	There should be no records reported. Refer to Section 4.3.2
TQ012_DeadEnds.txt	This query is only useful if the F&RS has checked their dead ends or followed earlier FSEC guidance and added a loop back at dead ends. If they have, this query checks whether there are any remaining, false, dead ends.	If dead ends have been identified or loop backs added, there should be no records. Refer to Section 4.3.2
TQ017_MissingOutputAreaInfo.txt	This query checks whether there are any output areas without a road junction, which means it cannot be attended by the FS	There should be no records reported. Refer to Section 4.3.2
TQ018_FirstArrivalRJ120.txt	This is a 'catch all' test of the road network that spots output areas which have, for an unknown reason, an extremely protracted response time of >120 minutes	.In general there should be no records, however it is possible, but very unlikely, that there will be some. Refer to Section 4.3.3
TQ019_FirstArrivalRJ60.txt	As above but looks for junctions where the first arrival time is between 60 and 119 minutes.	It is possible but unlikely that there will be some records. Refer to Section 4.3.3
TQ020_FirstArrivalRJ30.txt	As above but looks for junctions where the first arrival time is between 30 and 59 minutes.	It is possible that there will be some records. Refer to Section 4.3.3
TQ024_RoadSpeedDefaults.txt	The F&RS may legitimately change the default road speeds. This query checks if they have.	There will be no records if the defaults have not been changed, and a single record if the defaults have. Refer to Section 4.3.4
TQ025_VehicleSpeeds.txt	The F&RS should change vehicle speeds, especially for any that is not a pump, from 100%. The file lists any vehicles whose percentage speed has been changed.	The file should contain records. Refer to Section 4.3.5
TQ026_RoadSpeeds10.txt	The F&RS may legitimately change the default road speeds for individual road links. This query checks if they have been changed by more than 10%.	The file reports the total number of road links that have been changed. If zero records then no road links speeds have been changed by more than 10%. Refer to Section 4.3.6
TQ027_RoadLinkSpeeds50.txt	The F&RS may legitimately change the default road speeds for individual road links. This query checks if they have been changed by more than 50%.	If zero records then no road links speeds have been changed by more than 50%. If records are reported these should be queried with the F&RS in Stage 5. Refer to Section 4.3.

4.3.2 TQ011, TQ013, TQ012 & TQ017 – road links and dead ends

In the case of TQ011, TQ013, TQ012 and TQ017, there should be no records. If there are any records, there is an error that needs to be corrected.

Any errors can be explored at Stage 5 as follows:

- If records are reported in TQ011 these can be reviewed using the 'Linked to Network Check' overlay
- If records are reported in TQ012 (and the F&RS has defined dead ends or used loop backs) these can be reviewed using the 'O012 Dead Ends' overlay. If the F&RS has not defined dead ends or loop backs then this report may contain a large number of records
- If records are reported in TQ013 these can be reviewed in MS-Excel. The report includes all road links that do not have a road type. The report can be examined in MS-Excel (refer to Appendix B on opening a query file in excel) and the Road Type column (Column 5(E)) examined. Any blank road types are errors that should be corrected by the F&RS. Note that blank road types default to 30 mph in FSEC
- If records are reported in TQ017 these must be corrected by the F&RS for the system to function properly. A vehicle will not be able to get into the output area unless it has a junction on the road network

4.3.3 TQ018, TQ019 and TQ020 - General tests of arrival times

These three queries provide a 'general' test of the response times as follows:

- TQ018_.txt Indicates any junctions with a first arrival over 120 minutes
- TQ019_.txt Indicates any junctions with a first arrival between 60 and 120 minutes
- TQ020_.txt Indicates any junctions with a first arrival between 30 and 60 minutes.

It is expected that arrival times will be less than 60 minutes with the exception of islands lacking fire stations, mountain ranges and moorland/ heathland/ forestry. Thus, in the vast majority of F&RS, there should not be any records for TQ018 or TQ019.

Arrivals times in Cities, Towns and Villages that have fire stations are expected to be less than 30 minutes, i.e. no output areas in Cities, Towns or Villages with a fire station should be listed for TQ020 for Cities, Towns and Villages that have fire stations. If they are, it is likely that there is an error in one of: the road network, location of the fire station, omitted vehicles, no vehicle mobilisation times or failure to connect the vehicle to the station.

It is possible, although still infrequent, for output areas outside of Cities, Towns or Villages to take over 30 minutes to reach. These are exceptional. If TQ020 cites some output areas, these should be noted and checked using an overlay at Stage 5, to check the validity of their arrival time.

Any junctions reported should be reviewed and discussed in Stage 5.

4.3.4 TQ024 – Risk Assessment Definitions; Road speeds

FSEC provides a set of ‘suggested’ default road speeds in the Risk Assessment Definitions: Road Speeds. These may be altered by the F&RS. Indeed, if the F&RS has not changed them this can be challenged on the basis that the default road speeds may not be valid for that F&RS.

The settings used by the F&RS should be checked and compared with the default settings to identify changes for further scrutiny. If the output from TQ024_.txt cites a record the defaults have been changed.

The output file for TQ024 shows the speeds in the following order:

- Motorway column 16 (or P when imported into Excel)
- B Roads column 18 (s)
- C Roads column 19 (T)
- Unclassified column 20 (U)

The following should be explored, and any issues raised in Stage 5:

- Are the RADS: road speeds significantly different from the defaults shown in Table 3
- Are the F&RS specific changes (1) intentional and (2) based on F&RS specific evidence/calibrated?
- If the defaults have not been changed, why not?

Table 3: Defaults provided in Risk Assessment definitions

Road Type	Default speeds (mph)
Motorway	60
A roads	40
B roads	30
C roads	25
Unclassified	20
All vehicle speeds are set at 100% for each time period	

It is also possible to check the defaults using the Risk Assessment Definition Data returned previously by the F&RS. Either by viewing the RAD.xls file created in Stage 2 or re-running the macro using the RAD.imp file from Stage 1.

Input File	MS-Excel File	Macro	Save as Filename
RAD.IMP	FSEC GetColumndata.xls	RetreiveColumnData	RAD.xls

The spreadsheet includes the default road speeds in rows 90 to 97. The values in column D will be highlighted in Red if the default values have been changed.

The values can be checked using the FSEC Overlay for Risk Assessment Definitions.

4.3.5 TQ025 – Vehicle speeds

Vehicle speeds are expressed (as a %) relative to the speed of a standard (old) pumping appliance. It is expected that speeds for other types of appliance will be different. TQ025_.txt shows vehicles where the speed has been changed from 100%. The vehicle speed is shown in the PSP column (D) and is specified as a percentage of the pump speed. It is expected that the following types of vehicles will have speeds less than 100%:

- Command units
- Heavy rescue units
- Aerials and other height appliances
- Foam tankers

It is possible that an F&RS will have both old standard and new types of pumps. The newer pump may be faster than the older pump with which the appliance speed is compared (therefore the speed may be over 100%).

If the query cites all vehicles as 100% this should be queried, as it may mean that speeds for some types of vehicles are unaltered and hence could be too fast. Where vehicle speeds are changed from 100%, the logic for this should also be checked at Stage 5.

It is also possible to check this using the macro, as below, to process the PS Resources.

Input File	MS-Excel File	Macro	Save Output
BROSD.TXT	MS-Excel File	Macro.xls UpdateTableComparisons	PSResources.xls

The PSPEED sheet shows the percentage speed for each vehicle type.

4.3.6 TQ026 & TQ027 – Road link specific road speeds

F&RS may legitimately alter road speeds on specific road links through use of local data such as timed runs and response time data drawn from command and control records. The road link has a road type associated with it. Therefore, it is possible to check if the road speed used is reasonable for the road type, such as by comparison with Table 4.

Table 4: Road speeds given in Appendix A of FSEC manual

Road Type	Default speeds (mph)
Cities	
A roads	27
B roads	23
C roads	20
Unclassified	20
Towns and villages – all road classifications	20
Dual carriage ways:	
Carriageways	55
Slip roads on/off	40
Roundabouts	25

The check is run in two steps:

- TQ026.txt file reports the total number of road links where the road speed has been changed by more than 10%. It is expected that a significant number of road link speeds will have been changed by more than 10%, especially if TCheck has been used. Indeed, the F&RS should be challenged if they have not calibrated their specific road link speeds
- The output file TQ027_.txt reports the number of road links with the speed changed by more than 50%. It is possible that road speeds have legitimately been changed by more than 50%. However, this is a significant change that should be noted for scrutiny at Stage 5

In all cases, it is necessary to note the result and explore the process of calibration applied by the F&RS or its justification for not calibrating road link speeds.

4.4 Creating Stations, Crews, Vehicles and Planning Scenarios

4.4.1 Introduction

The F&RS needs a complete and accurate set of entries for their stations, vehicles, crews, costs and planning scenarios. This includes:

- Locating each station and noting its cost
- The type of each vehicle is defined and its cost is entered
- The crewing system (e.g. whole time, retained or day/night crewed) is defined along with the crew cost – made up of the cost of each crewmember

As part of this it is necessary for F&RSs to include those stations and vehicles in neighbouring F&RSs, which attend incidents within the F&RS area.

Each risk area requires a planning scenario, where the planning scenario entails specifying the type and number of vehicles required for incidents in that area. This planning scenario is then applied to all output areas within that risk area.

The types of errors that can occur include:

- Omitting stations and vehicles, especially stations and vehicles in neighbouring F&RSs
- Entering the wrong costs, either due to data entry errors such as entering 22 instead of 22000, or due to an invalid process being used for estimating costs
- Assigning wrong costs to vehicles or crews, such as costing a whole time crew as if it were a retained crew
- Specifying vehicles within planning scenarios that do not exist –which means the planning scenario cannot be satisfied
- Using different terms to define vehicles than the terms within planning scenarios – which means the vehicles are not used
- Vehicles or crews are added that do not exist, such as by mixing up datasets.
- The wrong turn out time is assigned to a vehicle, such as treating a whole time appliance as if it were a retained appliance
- Fail to specify a planning scenario for a risk area, which means it will never be attended

The pertinent text queries are summarised in Table 5.

Table 5: Summary guidance on station/vehicle text queries

File Name	Purpose	Guidance
TQ100_FireStationCosts.txt	It is necessary to check that all stations, vehicles and crews have a cost and that these costs are reasonable by comparison with 'guideline' costs.	All stations, vehicles and crews should have a cost. The costs should be compared with guidelines to ensure (1) no data entry errors, such as entered 22 instead of 22000, and (2) costs are credible when compared with guidelines. Refer to Section 4.4.3 This query also identifies stations where there is no junction within 50m, or where the junction is not the nearest one.
TQ101_FireStationDetails	Used to list all fire stations which are missing station cost information	All stations within the F&RS area require a cost to be entered. Stations outside of the F&RS area do not require a cost.
TQ103_Vehicle NotInPS	Used to list all vehicles that are not used in any of the planning scenarios	The vehicles listed are not used by any of the planning scenarios, this may be because the vehicle details are incomplete, or because the vehicle type has not been specified as part of a planning scenario. This list should contain very few if not zero records.
TQ104_VehicleDetails.txt	It is necessary to check that each crew and vehicle has the correct cost and that these costs are reasonable by comparison with 'guideline' costs.	Does each vehicle have a cost? Has the correct cost for the type of vehicle / crew been applied? Refer to Section 4.4.4.
TQ105_VehicleTT.txt	All vehicles and crews require a turnout time, otherwise it cannot be mobilised. Also the turnout time should be valid.	The file lists any vehicles that don't have a turnout time. There should be no records in the file. Refer to Section 4.4.5
TQ106_VehicleTTRreasonable.txt	All vehicles and crews require a turnout time, otherwise it cannot be mobilised. Also the turnout time should be valid.	The file lists all vehicles where the turnout time for the crew is outside the guidelines in Table 7. Refer to Section 4.4.6
StationJunction.txt	Lists stations where the nearest road junction is more than 50m from the station. This means that the station is not connected properly to the road network, and will not be able to turn out.	There should be zero records. Refer to Section 4.4.7
TQ107_FireStationWithoutVehicles.txt	This query identifies fire stations which do not have any vehicles attached to them.	There should be zero records. Refer to Section 4.4.8
TQ108_VehiclesNotInStations.txt	This query identifies vehicles not attached to a fire station.	There should be zero records. Refer to Section 4.4.8
TQ109_VehiclesNotMatched.txt	This query identifies vehicles whose co-ordinates do not match those of the fire station.	There should be zero records. Refer to Section 4.4.8

Table 5: Summary guidance on station/vehicle text queries (continued)

File Name	Purpose	Guidance
TQ115_OAVehiclesDwellings.txt	<p>This checks if the vehicles defined in dwelling planning scenarios match those that exist.</p> <p>Check looks at only those output areas which are part of a dwelling risk area</p>	<p>There should be zero records. Refer to Section 4.4.9</p>
TQ116_OAVehiclesMI.txt	<p>This checks if the vehicles defined in major incident planning scenarios match those that exist.</p> <p>Check looks at only those output areas which are part of a major incident risk area</p>	<p>There should be zero records. Refer to Section 4.4.9</p>
TQ117_OAVehiclesOB.txt	<p>This checks if the vehicles defined in other building planning scenarios match those that exist.</p> <p>Check looks at only those output areas which are part of an other buildings risk area</p>	<p>There should be zero records. Refer to Section 4.4.9</p>
TQ118_OAVehiclesSS.txt	<p>This checks if the vehicles defined in special service planning scenarios match those that exist.</p> <p>Check looks at only those output areas which are part of a special services risk area</p>	<p>There should be zero records. Refer to Section 4.4.9</p>
TQ120_DRA_PS.txt	<p>All risk areas require a planning scenario in order for a response to be made.</p>	<p>There should be zero records. Refer to Section 4.4.10</p>
TQ121_MIRA_PS.txt	<p>All risk areas require a planning scenario in order for a response to be made.</p>	<p>There should be zero records. Refer to Section 4.4.10</p>
TQ122_OBRA_PS.txt	<p>All risk areas require a planning scenario in order for a response to be made.</p>	<p>There should be zero records. Refer to Section 4.4.10</p>
TQ123_SSRAPanning.txt	<p>All risk areas require a planning scenario in order for a response to be made.</p>	<p>There should be zero records. Refer to Section 4.4.10</p>
TQ127_AIOAPSNotBuilding	<p>Used to list ALL planning scenarios, excluding other buildings, for use with the pivot tables to show how the different scenarios are used in the different areas.</p>	<p>Used to see how many times scenarios are used and whether the same scenarios are used across different modules. It would be expected to see some scenarios listed under the major incident and special services modules that are not part of the dwellings module.</p>
TQ130_AIOAPSBuilding	<p>Used to list ALL planning scenarios used within other buildings for use with the pivot tables to show how the different scenarios are used across the different types of other buildings</p>	<p>Used to see how many times scenarios are used and whether the same scenarios are used across different modules. Would expect to see different scenarios listed for particular other building types e.g. hospitals or high occupancy buildings than those used for factories, or different scenarios for different time periods.</p>

4.4.2 Resource definitions

The Resource Definition includes the F&RS entries on pay costs and overall F&RS costs. These need to be checked in the following terms:

- The Pay Cost per Year can be (1) compared with ‘typical’ values applied elsewhere (as per Table 6) and (2) the approach taken to derive these costs can be discussed at Stage 5
- All fields in the ‘Brigade Costs’ of the ‘Resource Definition’ should be populated and the approach taken to derive these costs discussed in Stage 5

The defaults can be checked using the ResourceDefinitions.xls macro or review the saved file.

Input File	MS-Excel File	Macro	Save as Filename
TQ003_ResourceDefinitions.TXT	Macros.xls	ImportData	TQ03_RD.xls

TQ003_RD.xls

This query presents the default values for fire-fighter costs used in the FSEC model by the F&RS. This macro highlights in red any values in row 5 that have been changed from the defaults. Row 3 also shows the percentage difference between the defaults and those in the F&RS.

It should be noted, however, that blanks and/or changes in this data may not be significant because the F&RS may not have used these fire fighter individual costs to calculate their crew costs. The approach the F&RS has taken to the calculation of their crew costs should be queried at Stage 5.

It should be remembered that the important value is the ‘Crewing Cost £ per year’ value which may be derived using:

- the individual fire-fighter costs presented on TQ003_RD.xls or
- costs entered on an individual basis or
- an overall cost entered in the ‘crewing costs £ per year’ (which over-rides any calculation in the costs spreadsheet)

The results of this query should therefore be borne in mind when checking the crew costs for their ‘reasonableness’ in Section 4.4.3 below.

4.4.3 TQ100: Fire station, vehicles, crews and costs

The output file TQ100_.txt reports the cost of stations, vehicles and crews. The text query provides:

- List of stations along with their vehicle types, crew types and stated cost
- Whether the station is within (P) or outside the F&RS (O)

It is important to note that:

- The file contains stations that are inside and outside of the F&RS
- The file only contains those vehicles that are assigned to a station. If the vehicle numbers don't match up it may be because the vehicles are not attached to a station, or because they have not been entered

Before examining the output, a list of stations, vehicles and crew type (wholetime, retained, day crewed, variable) and crew composition and their costs should ideally be obtained to compare with data in FSEC. This should be requested at the time of the decision to proceed with the full review. If these are not available, comparison can be made with expected costs as discussed below.

It should be noted that there are no firm rules about which stations outside of the F&RS area should be included. However, as a guide the F&RS should include the first nearest station at each point around the F&RS area.

Then the following questions should be addressed. Reference can be made to the ‘typical’ costs in Table 6.

Issue	Reviewer observations			Reviewer comments
Are all in F&RS and neighbouring F&RS stations present? ^{Note 1}	Yes	No	Uncertainty	
Is the Location status shown in column W of the station (inside P or outside O the F&RS) correct?	Yes	No	Uncertainty	
Are the stations costs values in column G (Stn Cost) present and reasonable? ^{Note 2}	Yes	No	Uncertainty	
Do the stations still have the correct vehicles attached to them?	Yes	No	Uncertainty	
Do all stations have at least one vehicle (vehicle number is in column H (V_VNO))?	Yes	No	Uncertainty	
Do all stations have an Easting in column D (EAST) and a Northing in column E?	Yes	No	Uncertainty	
Do all stations have at least one crew?	Yes	No	Uncertainty	
Do the stations have the correct crew types? ^{Note 3}	Yes	No	Uncertainty	
Do all stations have a nearest junction shown by a value in column F (NEARJNCT)?	Yes	No	Uncertainty	
Are the vehicle costs values in column K (Veh cost) present and reasonable?	Yes	No	Uncertainty	
Is the vehicle type in column I (Vehicle Type) correct?	Yes	No	Uncertainty	
How do the crew costs cost value in column L (Crew cost) compare against typical values? ^{Note 4}	Yes	No	Uncertainty	
Are the crewing types in column J (Crewing) correct?	Yes	No	Uncertainty	
Does the nearest junction to each station match that defined by FSEC (columns headed NEARJNCT and Nearest Jn)?	Yes	No	Uncertainty	

Note(s)

1. Data for stations within the F&RS area may need to be requested from ODPM. However, Table 19 in Appendix E presents the number of stations for the F&RS and can be used as a quick comparison to ensure that the total number of stations appears accurate
2. Stations, crews and vehicles in neighbouring F&RS have a zero cost.
3. If a crew is shared between stations this is achieved by having the same crew entered into two stations, but the mobilisation times is ‘None’ for those periods when the crew is not present.
4. Crews with zero costs for vehicles within the F&RS area should be reviewed to see if they are ‘alternate crewed’. TQ100 identifies whether a vehicle is alternate crewed (a ‘Y’ in column N (Alt Crew)). If a vehicle is marked as alternate crewed then there should be no crew cost (or crew) assigned (as this has been taken account of elsewhere in FSEC). Conversely, a vehicle with a crew and crew cost entered should not be marked as alternate crewed and such results should also be queried in Stage 5.

4.4.4 TQ104 – Vehicle and crewing cost

Output file TQ104_.txt reports the cost of vehicles and crews. It is possible to check the following points:

Issue	Reviewer observations		Reviewer comments	
Do all vehicles have an annual Vehicle Cost?	Yes	No		
Are the vehicle costs reasonable?	Yes	No	Uncertainty	
How do the crew costs compare against typical values?	Yes	No	Uncertainty	

When reviewing this output, an entry in the spreadsheet of <??> may suggest that a vehicle has not had a ‘type’ associated with it (this may be an issue where neighbouring F&RS vehicle types do not closely match those defined for the F&RS under consideration. This should be noted and raised at Stage 5 if present as these vehicles will not be used by FSEC unless they have a ‘type’ allocated.

It should be noted that:

- Stations, crews and vehicles in neighbouring F&RS areas do not require a cost and so could have a zero for this value
- All stations, crews and vehicles within the F&RS area should have a cost
- Alternate crewed vehicles should not have a crewing cost as this cost is already accounted for elsewhere in the FSEC model

The F&RS’s approach to identifying those stations in neighbouring areas which should be included in their model, and the approach taken to determine the type and number of appliances available should be investigated in Stage 5.

Some typical station, vehicle and crew costs are summarised in Table 6 below. Note that these values have been obtained from FSEC data entered by F&RS’s in their models and should be used only as guidance of the range of values which may be expected, and their relative values. In all cases, the Stage 5 of the review process should explore how the F&RS derived their costs. Note that the output of TQ104 should present cost data in full (i.e. ‘22000’ and not ‘22’).

Table 6: 'Typical' costs

Item	Typical costs (£ thousands)	(£ thousands)
Station		
Whole time	65 - 150	Maximum and minimum data from Lothian and Cambridgeshire datasets
Day crewed	25 - 73	Maximum and minimum data from Lothian and Cambridgeshire datasets
Retained	5 - 35	Maximum and minimum data from Lothian and Cambridgeshire datasets Vehicle
Vehicle		
Pump	18 - 22	Maximum and minimum data from Lothian and Cambridgeshire datasets
Aerial	21 - 38	Maximum and minimum data from Lothian and Cambridgeshire datasets
Command unit	14 - 19	Maximum and minimum data from Lothian and Cambridgeshire datasets
Chemical Incident	22	Cambridgeshire data
Emergency Tender	22	Cambridgeshire data
Incident Support Unit	18 - 25	Maximum and minimum data from Lothian and Cambridgeshire datasets
Water Ladder Rescue	18 - 22	Maximum and minimum data from Lothian and Cambridgeshire datasets
Water Carrier	10	Cambridgeshire data
Major Incident Support Unit	16	Lothian data
Boat	–	No guidance at present
Ambulance	–	No guidance at present
Whole time crew		
Sub officer	30	Lothian data
LFF	29	Lothian data
FF	25	Lothian data
Day crewed		
Sub officer	37	Lothian data
LFF	36	Lothian data
FF	31	Lothian data
Retained crew		
Sub officer	7	Lothian data
LFF	6.7	Lothian data
FF	5.7	Lothian data

4.4.5. TQ105: Vehicles without crews

Check the output file TQ105_.txt this reports any vehicles that do not have a crew. There should not be any records in this file. If there are records returned by this query then these vehicles will not be used within the system.

4.4.6. TQ106: Turn out times

The output file TQ106_.txt reports the turnout times where the times are outside the typical times shown in Table 7 expected for the specified crewing level. The vehicles reported here should be reviewed with the F&RS. There are at least two aspects to consider:

- Do all vehicles have a turn out time? If it is ‘none’ the vehicle will not be used by FSEC
- Are the turn out times reasonable? Whilst they are F&RS specific they can be compared with the following generic ‘typical’ values in Table 7. Any variations from the ‘typical’ values should be checked against the F&RS evidence base

Note that it is common for day crewed appliances to have retained crews at night. In this case, the TOT will be approx 1-2 mins during the day and approx 5 mins at night. TQ106 will identify records of this type as it expects a zero mobilisation time at night for day crewed appliances. Any records of this type should be confirmed as appropriate with the F&RS in Stage 5.

Table 7: Typical turn out times

Crew Type	Typical mobilisation times
Whole Time	1 to 2 minutes
Day or night crewed	1 to 2 minutes when present. None at other times.
Variable crewing	1 to 2 minutes
Retained	5 to 6 minutes

4.4.7 StationJunction.txt: Station not connected to road network

The StationJunction.txt cites any station that is not connected to a junction. No stations should be reported by this query; any that are is an error which should be investigated at Stage 5.

4.4.8 TQ107 to TQ109: Stations connected to vehicles

A vehicle must be attached to a station to be mobilised and costed. This is checked in three different ways as follows:

- TQ107_.txt which identifies stations without any vehicles

- TQ108_.txt which identifies vehicles away from stations
- TQ109_.txt which identifies vehicles and stations without matching co ordinates.

The output of all three should be zero records; any records returned should be investigated at Stage 5.

4.4.9 TQ115 to TQ118: Alignment of planning scenarios and vehicle types

A planning scenario must be defined for each risk area, citing the number and type of vehicles needed for that risk area. This is done for each type of risk, as follows:

- TQ115 Dwellings
- TQ116 Major incidents
- TQ117 Other Buildings
- TQ118 Special services

The text queries TQ115 to TQ118 ask “Are there any output areas where the ‘OA Vehicle PS Requirements’ in the output area results dialogue boxes are not satisfied?”

Any such records (provided the module has been completed) are an error that requires correction by either correcting the vehicles defined in the planning scenario or adding the vehicle type to the resources.

Further guidance on this is presented in Section 5.6.2.

It would also be possible to review the output from the UpdateScenarios macro in PSResources.xls or re-run the macro.

Input File	MS-Excel File	Macro	Save Output
BROSD.TXT	Table_Comparison.xls	Macros.xls UpdateTableComparisons	PSResources.xls

Sheet BPS lists all of the defined planning scenarios.

- Column ‘C’ shows the name of the planning scenario used in the scenario/vehicle list (Sheet brosdB)
- If the name is ‘#N/A’ then a vehicle combination has not been defined for the plan
- Names highlighted in Red are duplicated in the system. This will cause problems as only the one scenario can be changed. Duplicate scenario names will need to be rectified for the F&RS by FSEC

Sheet brosdB lists the vehicle type combinations for each planning scenario.

- Column I (Scenario Defined) shows the scenario name cross referenced against the scenario list (sheet BPS)
- If the name is ‘#N/A’ then the scenario is not in the list
- Column J (Vehicle Defined) shows the vehicle type cross referenced against the vehicles list (sheet VTYPE)
- If the name is ‘#N/A’ then the scenario is not in the list
- The last section on the sheet lists the vehicle types and their associated costs. This list is cross referenced against the appropriate sheets
- Column J shows the vehicle type (sheet VTYPE) this should not be blank or ‘#N/A’
- Column K shows the vehicle percentage speed (sheet PSPEED) this should not be blank or ‘#N/A’
- Column L shows the vehicle cost (sheet VCOST) this should not be blank or ‘#N/A’

In addition the UpdateBuildingScenarios macro using the following files:

Input File	MS-Excel File	Macro	Save Output
TQ127_AlloAPSNotBuilding.txt	Risk Area Planning Scenarios Not OB.xls	Macros.xls UpdateBuildingScenarios	TQ127_AlloAPSNotBuilding.xls
TQ130_AlloAPSBuilding.txt	Risk Area Planning Scenarios OB.xls	Macros.xls UpdateBuildingScenarios	TQ130_AlloAPSBuilding.xls

These two files allow the split of planning scenarios to be looked at across the modules, i.e. how many times is a ‘2 pump’ planning scenario used in other buildings or special services etc. Is it the only scenario used in other buildings?

These files can be referenced to see how many of the output areas have no planning scenario defined in each of the modules. If the pivot table for major incidents shows a single count of ‘blank’ scenarios in an incident type, then this incident type does not have any risk areas. Similarly if with the other buildings if there is a single count of ‘Blank’ scenarios against hospitals then there is not a planning scenario defined for hospitals.

4.4.10 TQ120 to TQ123: Are planning scenarios selected for each risk area?

In order for a response to be made to an output area, a planning scenario must be specified for every risk area. TQ120 to TQ123 identifies any risk areas, taking each FSEC module in turn, where this is not the case. Any such records are an error that requires correction by specification of a planning scenario.

There should be no records in any of the above files (i.e. TQ120 to TQ123).

4.5 Processing Dwellings

4.5.1 Introduction

FSEC comes loaded with census data for each output area and dwelling fire incident data. It is possible for F&RSs to load more population data onto FSEC, or accidentally delete data.

Due to the small size of output areas, adjacent output areas with a similar socio-demographic profile (as indicated by four socio-demographic factors) are merged into larger 'risk areas'. These risk areas are then merged into groups, termed 'risk groups'. The robustness of these groups is tested and, if need be, they are merged into larger or different risk groups until they are "Robust".

The calculated casualty rate is used in robust risk groups for the prediction of fatalities. If robustness cannot be achieved, it is possible to apply an assigned risk category that applies an assumed casualty rate.

However, as the incident data may not be properly geo-coded, there is a process of checking the location of incidents. Also the data may have been of poor quality, such as lacking details on whether there were casualties. This may also require manual checking.

The errors that can occur include:

- Losing census or incident data or deleting output areas
- Using the wrong dataset
- Entering the wrong number of years, which would divide the incidents by the wrong period to get an incorrect casualty rate per year
- Miss out dwelling incidents coded under other building categories, especially dwelling incidents in HMOs and purpose built flats
- Coding other building incidents as dwellings
- Failing to correct data supplied to F&RS which does not include information on fatalities, casualties and rescues
- F&RS reporting practices differ from standard practice leading to skewed ratio of fires, deaths, casualties and rescues
- Overlooking 'dumps' of incidents that need to be manually re-located
- Failing to include all output areas in dwelling risk areas, or missing some risk areas out of dwelling risk groups
- Creating risk areas or risk groups according to inappropriate criteria
- Failing to re-link dwelling risk areas after edits or failing to run 'Update areas and groups'

- Dwelling risk groups too small and not robust
- Wrongly over-riding the actual casualty rate where data is robust

It is also necessary to assign a planning scenario to each risk area. The text queries TQ120 to TQ124 will have checked if a planning scenario has been assigned. It is also necessary to check if the intended, and reasonable, planning scenario has been assigned in Stage 5.

The dwelling text queries are summarised in Table 8.

Table 8: Summary of dwelling text queries

File Name	Purpose	Guidance
TQ150_IncidentsDwellings.txt	The location of dwelling casualty incidents needs to be checked. This query extracts all dwelling fires incidents.	The file should contain records. It is used with the incidents pivot table. Refer to Section 4.5.2
TQ152_IncidentsFires.txt	Extracts all Fire incidents (ROITYPE 1 to 5), so that they can be examined using the macros.	Refer to Section 4.5.2
TQ153_RADOther.txt	This checks if the population level multiplier given by the census data has been modified.	Any change from 1 needs justification. Refer to Section 4.5.3.
TQ160_AllIncidentsNotChecked.txt	The location of incidents can be checked. This query identifies any type of incident that should have been checked but has not.	The output should be zero if all modules have been completed. Refer to Section 4.5.2
TQ162_DwellingFiresCasualties.txt	The location of dwelling fire incidents with casualties must be checked. This query lists all dwelling fire incidents with casualties. It is used with the pivot tables to give a comparison of the number checked against those not checked etc.	Refer to Section 4.5.2
TQ163_DwellingFiresNotChecked.txt	As above but only includes those incidents that have not been checked.	Should be zero, refer to Section 4.5.2.
TQ164_CensusData.txt	This reports the total population and number of output areas in the F&RS area.	This should match the information from FSEC. Refer to Section 4.5.4
TQ165_OAMissingDRA.txt	This checks for Output areas that have not been assigned to a risk area.	Should be zero Refer to Section 4.5.5
TQ166_DRAMissingDRG.txt	This checks for risk areas that have not been assigned to a risk a group.	Should be zero. Refer to Section 4.5.6
TQ167_DRG.txt	This provides information for checking robustness of risk groups.	This provides a set of information to be scrutinised. Refer to Section 4.5.7
TQ170 DRAFireSafety	This query checks to see if the community fire safety field has been completed for dwelling risk areas by the F&RS	This field is present for information only, records will be returned where they have been completed.

4.5.2 TQ150, TQ152, TQ160, TQ162, TQ163: Dwelling incidents

The following output files can be used with the MS-Excel macros to generate pivot tables to view the incident data.

Save as	MS-Excel File	Macro	Save Output
TQ150_IncidentsDwellings.txt	Incidents.xls	Macros.xls UpdateIncidents	TQ150IncidentsD.xls
TQ152_IncidentsFires.txt	Incidents.xls	Macros.xls UpdateIncidents	TQ152IncidentsFires.xls
TQ160_AllIncidentsNotChecked.txt	Incidents.xls	Macros.xls UpdateIncidents	TQ160AllIncidentsNotChecked.xls
TQ162_DwellingFiresCasualties.txt	Incidents.xls	Macros.xls UpdateIncidents	TQ162IncidentsDFires.xls
TQ163_DwellingFiresNotChecked.txt	Incidents.xls	Macros.xls UpdateIncidents	TQ163IncidentsDFiresNotChecked.xls

All of the above input files can be processed with the UpdateIncidents macro to show a number of pivot tables based on the selected incident data. The type of information shown in the tables is common to all input files. The changing factor is the amount of incidents that are reviewed. In summary:

- TQ150 includes all incidents related to dwelling fires
- TQ152 includes all incidents related to fires, this includes dwellings, other buildings, chimneys etc
- TQ160 includes all incidents (fires, special services and major incidents) that have not been checked
- TQ162 includes all dwelling fires incidents that have a recorded casualty, rescue or fatality
- TQ163 includes only those dwelling fire incidents that should have been checked and have not

To examine details of all fire incidents review the output of TQ152. To just look at dwelling fires review the output from TQ150.

Location check

The Check Flag sheet shows a pivot table detailing the incident type (ROITYPE) and the location status (ipcl value) against the check flag. Incidents with a location status above 250, should always be checked if they involve casualties.

Number of years data

The number of years covered by the data should be defined in the ‘Risk Assessment Definitions; Background dataset’. Commonly F&RSs use three whole years of data (1/10/99 to 30/9/02) that can be checked by examining the ‘Incident Data’ entries and comparing it with the declared period of data used.

If the F&RS has added extra years, it is necessary to check:

- Have they entered whole years of data?
- Have they updated the 'No of years of incident data' entry?

The 'Month and Year Chart' sheet shows the spread of incidents over the years. This sheet can be used to check for gaps in the data and also the start and end of the data. There should be whole years of data. The dates should match those reported in the risk assessment definitions. The output file, RAD.xls (created previously), can be reviewed to check. Row 11 shows the start year for incident data and row 15 identifies the number of years of data.

Care should be taken when looking at the 'Month and Year chart' as gaps may be present when looking at a subset of the incidents e.g. TQ160 or TQ163.

TQ150: Comparison of incident data

The output file TQ150_IncidentDwellings has a dwellings summary sheet which shows a comparison table with the FSEC values against the F&RS values.

As part of this it is necessary to check:

- Have fatalities, casualties and rescues been added (where absent from pre-loaded data)?
- Is the ratio of incidents to ROF/ROC/ROR reasonable?
- Is the ratio of ROF/ROC/ROR reasonable, when compared with the values in Table 9?

TQ152 provides a series of pivot tables. These are checked by comparison with the values in Table 9.

Table 9: Summary of dwelling fire data used in FSEC

	Data used for FSEC
Incident type 1 without ROF/ ROC/ ROR	196,308
Incident type 1 with 1+ ROF/ ROC/ ROR	36,624
Incident type 1	232,932
ROF	1,600
ROC	48,636
ROR	6,258
Total ROF/ROC/ROR	54,494
Ratio of ROC/ ROR/ ROF to ROF	35.31
Ratio of total ROF/ ROC/ ROR to ROC	1.16
Incident Type 2	11,111
Ratio of all Incident type 2 to total ROF/ ROC/ ROR	20.96

4.5.3 TQ153: population multipliers

TQ153_.txt which shows the multiplier values for population counts, which are normally left at 1. The default dwelling multiplier is shown in the last but one column followed by the default residential multiplier. These values can also be checked in the RAD.xls output file rows 11 and 12.

4.5.4 TQ164: Population count

The F&RS should contain the same census data as supplied with the original system. The output file TQ164_.txt details the number of output areas, and total population for the F&RS. These figures can be checked with paper records of population level. Table 20 in Appendix E presents census data from population levels for English F&RS areas. It should be noted that the comparison should be for guidance purposes only as this data is from a different source than the FSEC data.

4.5.5 TQ165: Missing output areas

All output areas must belong to a dwelling risk area. The output file TQ165_.txt shows any output areas that does not belong to a dwelling risk area. Any such records are an error.

If all output areas have been allocated to a dwelling risk area this file should not contain any records. If the file contains records, these should be noted for follow up in Stage 5, and can be checked using the review overlay O165_DPS_OA to identify the appropriate output areas.

4.5.6 TQ166: Dwelling risk areas missing from a dwelling risk group

The output file TQ166_.txt shows any dwelling risk area that does not belong to a dwelling risk group. There should be no records. Any records are an error. If the file contains records then the review overlay O166_DRG_DRA can be used to identify which dwelling risk areas have not been assigned to a group. These should be noted for follow up in Stage 5.

4.5.7 TQ167: Dwelling risk group robustness

TQ167 lists:

- Robustness
- Actual & predicted casualty rate
- Total number of dwelling residencies, fires & casualties
- comments

TQ167 lists all dwelling risk groups and can be used to check:

- Are the dwelling risk groups 'robust'?
- What casualty rate is being used?
- What is the calculated casualty rate level?
- Entry of comments where calculated casualty rate is not used

The text query should be used to spot where calculated/assigned casualty rate is not used (due to use of override), with comments reported.

The following guidance is given:

- Where the casualty rate is 'robust', this should normally be used. If it is the query can be closed
- If the casualty rate is 'robust' but a different casualty rate has been assigned manually, the logic for this must be stated
- If the casualty rate is not robust then:
 - The F&RS should be asked whether they have attempted to re-group risk areas to form robust groups
 - The F&RS may use an assigned (self-selected casualty rate category). If so the logic for the selection should be stated in comments

If the dwelling risk group is not robust or is robust but has been over-ridden, this should be noted for follow up in Stage 5. However, it should be noted that one or two groups being 'not robust' is not an unexpected result given the amount of data within the model. Where a very high risk group is not robust it should be noted that this can cause the predicted fatalities to be higher than expected.

4.6 Processing Special Services

4.6.1 Introduction

The special services FSEC module uses F&RS incident data that must first be geo coded by the F&RS. Then the output areas are grouped into risk areas and then risk groups, as per dwelling risks, with areas and groups displaying similar rates of incidents.

It is more common than with dwellings that the data supplied by F&RS is of a poor quality for special services, (aside from geocoding and risk grouping errors).

Also in the case of special service incidents, in some cases the incidents follow a linear feature such as an A road in a rural area rather than being dispersed across an area such as a town. In the former case a special 'linear feature' within FSEC must be used.

Errors can include:

- F&RS incident data lacks data on deaths, casualties or rescues, requiring manual entry of data and the risk of omission of data
- F&RS reporting practice is skewed leading to inappropriate ratio of incidents, deaths, casualties or rescues
- F&RS fail to distinguish between categories of special services and so incidents are recorded under wrong categories
- Incident location not checked/ corrected
- Creation of risk areas and risk groups is achieved using inappropriate criteria
- Failure to use linear risk feature
- Failure to re-link risk areas after edits
- Demarcation of risk areas is too approximate or too granular

It is also necessary to assign a planning scenario to each risk area. The text queries TQ120 to TQ124 will have checked if a planning scenario has been assigned. It is also necessary to check if the intended, and reasonable, planning scenario has been assigned. For example, RTA scenarios usually distinguish between motorway and low speed roads.

The special service text queries are summarised in Table 10.

Table 10: Summary of special service text queries

Save as	Purpose	Guidance
TQ200_IncidentsSS.txt	This allows examination of the quality of the incident data.	The data needs to be assessed as per guidance in Section 4.6.2 below with issues noted for Stage 5 discussions.
TQ202_IncidentsSS_LR.txt	This summarises all special services incident data where there is a life risk (rosub = 1)	The data needs to be assessed as per guidance in Section 4.6.2 below with issues noted for Stage 5 discussions.
TQ203_OAsWithoutSSRA.txt	This checks for output areas omitted from the creation of risk areas..	There should be no records. Refer to Section 4.6.3
TQ205_SSRAMissingSSRG.txt	This checks for risk areas missed from creation of risk groups.	There should be no records. Refer to Section 4.6.4
TQ206_IncidentsSS_CAS.txt	Lists all special service incidents where there are any casualties (i.e. ROF+ROC+ROR>0)	The data needs to be assessed as per guidance in Section 4.6.2 below with issues noted for Stage 5 discussions.

4.6.2 TQ200, TQ202 & TQ206: Data inputs

The following output files and pivot tables created by the MS-Excel macros can be used. The ‘special services summary sheet’ shows a comparison of the FSEC values against the F&RS’s values.

Input File	MS-Excel File	Macro	Save Output
TQ200_IncidentsSS.txt	Incidents.xls	Macros.xls UpdateIncidents	TQ200IncidentsSS.xls
TQ202_IncidentsSS_LR.txt	Incidents.xls	Macros.xls UpdateIncidents	TQ202IncidentsSS_LR.xls
TQ206_IncidentsSS_CAS.txt	Incidents.xls	Macros.xls UpdateIncidents	TQ206IncidentsSS_CAS.xls

It was apparent from the Pathfinder brigade data that there were sets of very anomalous special service data. As the number of special service deaths is based on the recorded number of incidents with one or more death, casualty or rescue, the results will be highly influenced by differences in reporting practices.

Table 11 presents the ratio of deaths, casualties and rescues per n casualty incidents used for producing the response time fatality rate relationship for special services. Any data supplied for (say) a F&RS that reports very different ratios, such as 50% greater or less than those noted here, should be checked. For example, does the F&RS adopt a significantly different reporting practice or are there substantive differences between the specific F&RS and others, such as it being entirely rural?

TQ200 presents results for all incident data, whereas TQ202 presents results where ROSUB = 1 (i.e. the incident is marked as a “life risk” incident). TQ206 presents data for ‘casualty incidents’ – i.e. where the record of fatalities, casualties or rescues for an incident is greater than or equal to one. The Pivot table created for TQ202 above should be used in conjunction with Table 11 below for comparison of expected and actual ratios.

FSEC calculates special service fatality rates using the number of incidents that are marked by the F&RS within FSEC as a “life risk incident”. These are incidents which would be expected to be recorded as having involved one or more death, casualty or rescue. However, this may not always be the case – for example the F&RS may have recorded rescues in the case of lift rescue or lock-ins which were not life threatening incidents and it would be appropriate for these not to be marked as life risk incidents. Additionally, in some cases, the F&RS reporting practice may record ‘casualties’ for incidents which did not require F&RS attendance (e.g. where casualties were removed prior to F&RS arrival at the scene of the incident). In these cases, marking these incidents as ‘life risk’ within FSEC could skew the results and the F&RS may need to review incident reports to ensure that only genuine life risk incidents are recorded as such within FSEC.

A useful check is to look at the ‘Incident Data’ tab on TQ202 and review the allocation of life risk incidents (ROSUB = 1) to the ROF/ROC/ROR values. Where there are records of fatality, casualty or rescues, it would generally be expected to be recorded as ROSUB = 1, although as mentioned above this might not always be the case and should be discussed at Stage 5. Conversely, where ROSUB = 1 and there are no fatalities, casualties or rescues recorded for that incident the reasons for this should be discussed in Stage 5.

In theory, any incident involving one or more death, casualty or rescue should be cited as a Category A (life risk) incident. However, it is not so simple for a number of reasons:

- 1) In some cases a ‘rescue’ is not really a rescue. In particular, ‘releasing’ people from lifts or a house has in the past been recorded as a rescue – as this was the only term used. Such releases are now reported separately from rescues but this was not always previously the case. So the F&RS must go through the old data and manually identify ‘real’ rescues from releases. This is particularly true for lift releases and lock in/lock out.
- 2) In some F&RSs the occurrence of deaths, casualty or rescue is not recorded for special services incidents. The F&RS did record the occurrence of the incidents so the F&RS should use alternative sources to identify which involve a risk to life, and then denote it as category A regardless of whether the data in FSEC declares a death, casualty or rescue. In some cases the F&RS use police data on RTAs to spot incidents attended by the F&RS that involved a casualty.

Unfortunately this manual reconciliation process is prone to error and there is little (if any) guidance on how to do it. So different F&RS must be expected to have done very different things to reconcile their data.

It may be correct to mark incidents as Category A even if FSEC does not cite any deaths/ casualties/ rescues, if data from elsewhere shows there was a death/ casualty/ rescue. On the other hand, if there are (say) RTA incidents with a death that is entered as Category 0, this should be questioned.

There are cases where a death may be marked as ‘no life risk’, namely where the call was to retrieve a dead body, where the death occurred well before the 999 call, e.g. a corpse found in the woods or a house.

The idea of the ratios in Table 11 is to help spot anomalies in the way the F&RS has coded its data. The anomalies need to be explored and investigations undertaken to see if the F&RS has followed the principle of identifying all special service incidents involving one or more death/casualty/rescue, what data source was used etc; did they exclude releases etc?

Unfortunately, some F&RS record casualties who have left scene of a RTA before F&RS arrival, other F&RS only record casualties there on their arrival – so even when ‘good’ data is used it may be developed on different rules.

FSEC does not really use data on special service incidents without deaths/ casualties/ rescues. Such data can be used as a secondary way of gauging risk in an area but is not used in the fatality rate predictions.

It is also possible that some incident types are not recorded by F&RS and have zero entries.

Table 11: Ratio of deaths, rescues and casualty per “life risk” special service incidents in FSEC, for comparison with TQ202

Incident type	Deaths per <i>Life Risk</i> casualty incidents	Casualties per <i>Life Risk</i> casualty incidents	Rescues per <i>Life Risk</i> casualty incidents
RTAs	1 in 10	2 per incident	1 in 2
Extrications	1 in 43	1 in 1.5	1 in 1.3
Other special services	1 in 13	1 in 1	1 in 6
Lift rescues*	Less than 1 in 600	1 in 10	3 per incident
Lock in / out*	1 in 7.5	1 in 4.5	1 in 1
HAZCHEM	1 in 24	1 in 1.4	1 in 1.5
Line rescues*	Less than 1 in 2	1 in 1.4	1 per incident
Ladder rescues*	Less than 1 in 40	1 in 5.5	1.2 per incident
Water rescues	1 in 6	1 in 9	2 per incident

*There are so few line/lift/ladder rescues that the ratios are extremely uncertain.

4.6.3 TQ203: Missing output areas

The output file TQ203_.txt shows any output areas without special services risk areas. This file should contain no records if all output areas have been allocated to a risk area.

4.6.4 TQ205: Missing risk areas

The output file TQ205_.txt shows any special services risk areas not assigned to special services risk groups. This file should contain no records if all risk areas have been allocated to risk groups.

4.7 Processing Other Buildings Data

4.7.1 Introduction

The other buildings module uses the following inputs:

- Valuation Office data – showing buildings, plotted on the GIS, each with an occupancy type, and
- A mastermap – with building footprints that the building must be placed on to pick up the floor size

F&RSs must ‘cleanse’ this data by:

- Checking the position of buildings
- Adding in HMOs and purpose built flats that are not included in the Valuation Office data
- Reconciling the count of buildings with other sources, particular Fire Safety files and information on care homes and hospitals

Areas of homogenous risk are identified and arranged into risk areas and thence into groups as per dwellings and special services. However, in the case of other buildings it is then necessary to create Time Generated Other Building Risk Areas (TGOBRAs) upon which the risk of death is assessed.

Also, each building has a site assessment, covering issues such as quality of fire detection and number occupants. The F&RS is expected to progressively edit the site assessments, starting with the higher risk and larger buildings, over a matter of years.

The F&RS may delete the Valuation Office data and replace it with another set of data.

The errors that can occur include:

- Failure to replace a deleted Valuation Office dataset by another dataset, and/or only partially replace the dataset
- Failure to add in HMOs and purpose built flats
- Inadequate reconciliation of Valuation Office data with other counts/records of buildings, causing omission of large or high risk types of buildings
- Failure to correct geocoding of other buildings, leading to buildings to be either on the wrong footprint and in wrong location, or not on a footprint and hence lacks a size
- Method of identifying HMOs and purpose built flats is inaccurate
- Failure to progressively modify the pre-set ‘average’ site assessments

- Default site assessments are lost or wrongly over written whilst loading Valuation Office data or operating FSEC
- Inappropriate approach to site assessments
- Omit some output areas, risk areas or risk groups in the grouping process
- Link together output areas that are not comparable in terms of risk (profile and mix of buildings)
- Risk groups are too small or too large
- Failure to re-link risk areas after edits
- Process of creating TGOBRA too coarse – omitting key areas of risk

The other building text queries are summarised in Table 12.

Table 12: Summary of other building text queries

File Name	Purpose	Guidance
TQ250_OBSiteAssessment.txt	Checks if the Valuation Office data has been augmented. If the F&RS has added in HMOs, care homes, purpose built flats, hospitals and other buildings as they are expected to, then there should be records.	If records are reported the completeness of these added records can then be explored. If no records are reported then the F&RS may have failed to correctly augment the Valuation Office data set. Refer to Section 4.7.2
TQ251_OBWithoutFootprint	Checks for buildings without a footprint	This file should contain no records. Refer to Section 4.7.2
TQ252_ObsMoved.txt	Checks for buildings where the location has not been checked.	This file should contain no records. Refer to Section 4.7.2
TQ254_OBDefaultsNotChanged	Checks if defaults fire safety features have been changed.	The file reports records where the defaults have not been changed. Ideally this file should contain no, or very few, records. Refer to Section 4.7.3
TQ255_OBSAPeople	This gives the occupancy level per type of other building. The default occupancy levels for FSEC need to be edited.	The file is used with the macro to show the occupancy levels for different buildings across the six time periods. Refer to Section 4.7.3 This query also shows the move flag for each other building site assessment.
TQ257_OBSAless20	This query shows buildings with 'Category A' occupation from 08:00 to 20:00 for buildings N/R/S (Shops/Factories/Offices)	This query shows the number of shops, factories and offices for which the default values have not been changed (the F&RS should legitimately change the values for such premises which are certificated)
TQ258_OB>20	This query shows buildings with 'Category B' occupation at all times for C/D/E/F/G/H (HMSO's/Flats/Hotels/Hostels/Houses/Other Sleep)	This query shows the occupancy levels for types C, D, E, F, G and H properties and therefore can be used to identify where defaults have been changed.
TQ259_OB>20onetimeperiod	This query shows buildings with 'Category C' occupation at all times for A/B (Hospital/Care Homes)	This query shows the occupancy levels which are unchanged from the default values for hospitals and care homes
TQ275_OB20to50	This query shows buildings with 'Category B' occupation for J/M/T (Education/Schools/Other work)	This query shows the occupancy levels which are unchanged from the default values for education, schools and other work places.
TQ276_OB50to100	This query shows buildings with 'Category C' occupation for K (Public buildings)	This query shows the occupancy levels which are unchanged from the default values for public buildings
TQ277_OB20to50_12to24	This query shows buildings with 'Category B' occupation for Licensed premises	This query shows the occupancy levels which are unchanged from the default values for licensed premises.
TQ256_OBSiteVisits.txt	This gives records of where site visits have been made by the F&RS.	There should be some records in this file to indicate that the F&RS site visit details are being updated. Refer to Section 4.7.3

Table 12: Summary of other building text queries (*continued*)

File Name	Purpose	Guidance
TQ260_OANotinOBRA.txt	Identifies any output areas not assigned to a risk group.	Should be no records. Refer to Section 4.7.4
TQ261_OBRANotInOBRG.txt	Identifies any risk area not in a risk group	Should be no records. Refer to Section 4.7.5
TQ263_TGOBRAMissingH_VHRisk.txt	Identifies any high or very high risk areas not allocated to a TGOBRA.	If records are reported this may mean the TGOBRAs are poorly placed and have missed some areas of high risk. Refer to Section 4.7.6
TQ273 HMO or Flats with Wrong Storeys.txt	Reports any other buildings that are classed as HMO's but have less than three storeys or any that are classed as flats with less than four storeys.	This file should contain no records. All HMO's should have at least three storeys and all flats should have more than four storeys. If they have less then the category may be wrong, or the details have not been revised. The entries reported should be checked and either correctly classified or the storeys changed. If the number of storeys is wrong then the floor area is not correctly calculated and consequently the impact of a fire is not correct. See Section 4.7.7.
TQ274 EnvironmentandHeritageRisk	This query identifies other buildings site assessments where at least one of the 'other risk' fields have been completed	This file will contain records if the F&RS has identified other buildings which are a heritage, fire fighter, environmental, sole supplier or exceptional value risk.

4.7.2 Data inputs, TQ250-252

TQ250: Valuation Office data check

This text query checks if the Valuation Office data has been augmented. If the F&RS has added in HMOs, care homes, purpose built flats, hospitals and other buildings (as they are expected to) then there should be records.

TQ251 and 252 - Status of building locations

The output file TQ251_.txt lists all buildings without a footprint. This file should contain no records. If it does contain records then correcting these issues should be done based on the building type, with the higher occupancy buildings being corrected first.

The output file TQ252_.txt lists all buildings where the building location has not been checked. Ideally this file should not contain any records. If it does contain records then correcting these issues should be done based on the building type, with the higher occupancy buildings being corrected first.

4.7.3 Site assessments

TQ254, TQ255, TQ256, TQ257, TQ258, TQ259, TQ275, TQ276 & TQ277: Check on modification of defaults

The output file TQ254_.txt, shows sites where none of the general default values (i.e. smoke alarm etc as shown in Table 13) have been changed. Ideally this file should contain very few records. Priority on correcting these issues should be based on the building type with highest occupancy building being resolved first. It is advised that the very large buildings and possibly higher risk occupancies (HMO’s, hospitals, care homes, hotel and hostels are assessed as a first priority.)

For TQ255 the UpdateAssessments macro also creates a pivot table showing the count of different occupancy types against the move flag. This can be used to identify how many buildings of each category have been checked. For example if there were ten hospitals then how many of those ten had been checked, moved etc. If very few have been checked then priority should be given on ensuring that the location is correct for the most highly occupied, (in general this is the ones starting with ‘h’, hospitals, hotels, HMOs etc)

The output file TQ256, shows sites that have been visited by the F&RS and the assessments have been checked.

The output files TQ257, 258, 259, 275, 276 and 277, show sites where none of the default occupancy levels (as shown in Table 14) have been changed. Priority on correcting these issues should be based on the building type with highest occupancy building being resolved first. It is expected that:

- All HMOs (of three storeys or more), houses converted to flats, purpose built flats, other sleeping accommodation, public buildings, buildings open to the public, hospitals, care homes, hotel, licensed premises, schools, further education and hostels should have >20 people³
- A minority of shops, offices, factories, and other work places should have >20 people, i.e. those that are certificated

The following output files and the pivot tables created by the MS-Excel macros can also be used. Each sheet shows the split of occupancy and building type for a specific time period.

Input File	MS-Excel File	Macro	Save Output
TQ255_OBSAPeople.txt	OB Assessments.xls	Macros.xls UpdateAssesments	TQ255_OBSAPeople.xls

³ Note that an update to the FSEC software is planned which will ensure that all hospitals, care homes, hotels, hostels, HMOs (> 3 storeys) are identified as being of ‘social risk’, regardless of the occupancy levels allocated within FSEC.

However:

- The ‘persons at risk’ should not be less than 20 to 50 in all time periods for HMOs of three or more storeys, houses converted to flats of three or more storeys, care homes, hotels, hostels, purpose built flats, and other sleeping accommodation
- The ‘persons at risk’ should not be less than 20 to 50 for hospitals, schools, further education colleges and licensed premises – in at least one time period
- The ‘persons at risk’ should not be less than 20 to 50 people for certificated premises in at least one time period for shops, public buildings, factories, offices and other workplaces

If this is not the case, then the rationale for the deviation should be discussed. It should be noted that the generic fire frequencies for HMOs of three or more storeys, houses converted to flats of three or more storeys, hotels, care homes and hostels are based on the assumption that they all present a societal risk – even if they have less than 20 persons at risk. This was done to help simplify the site assessment process and hence users should not state <20 persons in these properties. Note that an update to the FSEC software is planned which will ensure that all hospitals, care homes, hotels, hostels, HMOs (> 3 storeys), purpose built flats and houses converted to flats are identified as being of ‘societal risk’, regardless of the occupancy levels allocated within FSEC.

It should be noted that FSEC requires that HMOs entered by the F&RS should have three storeys or more. Some F&RSs may have data for HMOs of less than three storeys. In this case, the F&RS should ensure that these buildings are entered as ‘other sleeping accommodation’, especially where there are > 20 people at risk.

The default ‘number of people in the most highly occupied compartment’ is ‘Less than 20 people’ for all other occupancies. F&RS are meant to change the ‘number of people in the most highly occupied compartment’ by identifying which shops, offices, factories, and other workplaces properties have a fire certificate, if they have a certificate they should be assumed to have 20 to 50 persons at risk as a minimum. Therefore, there should be some entries for these types of properties. If not they are likely to have overlooked a minority of their societal risk.

In the case of very large properties, such as shopping malls and football stadiums, the persons at risk could be >100. Therefore, there should be some entries for >100 persons. If not, the F&RS may not have site assessed some of their larger societal risk properties and hence be understating the risk.

Table 13: Site assessment defaults (user modified)

Number of storeys			
1			
Alarm	Standard	Management of fire safety	Average
Type of people	Normal mix	Sprinklers	No sprinklers fitted
Smoke control	None	Afa present	Left blank

Table 14: Maximum loss (societal risk defaults)

Occupancy	Societal risk status		Number of people in the most highly occupied compartment		Time period for which 'number of people ...' is applied	
	Default set on import to FSEC	F&RS action when using FSEC	Default set on import to FSEC for specified time periods	F&RS action when using FSEC	Default set on import to FSEC	F&RS action when using FSEC
Hospital (A)	Imported as a "societal risk"	Do not change regardless of number of patients	50 to 100	Check & change as appropriate but apply a minimum of 20 to 50	All time periods	Check if (e.g.) day care only, and change as appropriate
Care homes (B)	Imported as a "societal risk"	Do not change for certificated care homes regardless of number of residents	50 to 100	Check & change as appropriate but apply a minimum of 20 to 50	All time periods	Do not change
Houses in multiple occupation 3 or more storeys (Bed sits, HMOs, & tenements) (C)	Imported as a "societal risk"	Do not change regardless of number of residents	20 to 50	Check & change as appropriate but apply a minimum of 20 to 50	All time periods	Do not change
Purpose built flats 4 storeys and above (D)	Imported as a "societal risk"	Do not change regardless of number of residents	20 to 50	Check & change as appropriate but apply a minimum of 20 to 50	All time periods	Do not change
Hotels (E)	Imported as a "societal risk"	Do not change regardless of number of residents	20 to 50	Check & change as appropriate but apply a minimum of 20 to 50	All time periods	Do not change
Hostels (F)	Imported as a "societal risk"	Do not change regardless of number of residents	20 to 50	Check & change as appropriate but apply a minimum of 20 to 50	All time periods	Do not change
Houses converted to flats of 3 or more storeys (G)	Imported as a "societal risk"	Do not change regardless of number of residents	20 to 50	Check & change as appropriate but apply a minimum of 20 to 50	All time periods	Do not change
Other sleeping accommodation (H)	Imported as a "societal risk"	Add in HMOs of <3 storeys that have 20+ persons at risk	20 to 50	Check & change as appropriate but apply a minimum of 20 to 50	All time periods	Do not change

Table 14: Maximum loss (societal risk defaults) *(continued)*

Societal risk status			Number of people in the most highly occupied compartment		Time period for which 'number of people ...' is applied	
Occupancy	Default set on import to FSEC	F&RS action when using FSEC	Default set on import to FSEC for specified time periods	F&RS action when using FSEC	Default set on import to FSEC	F&RS action when using FSEC
Further education colleges (J)	Imported as a "societal risk"	Do not change	20 to 50	Check & change as appropriate but apply a minimum of 20 to 50	08.00 to 20.00 7 days per week	Check to see if hours of occupation differ, e.g. late opening and change as appropriate
Licensed premises (L)	Imported as a "societal risk"	Do not change regardless of number of customers	20 to 50	Check & change as appropriate but apply a minimum of 20 to 50	12.00 to 24.00 7 days per week	Check to see if hours of occupation differ and change as appropriate
Schools (M)	Imported as a "societal risk"	Do not change	20 to 50	Check & change as appropriate but apply a minimum of 20 to 50	08.00 to 20.00 7 days per week	Check to see if hours of occupation differ, e.g. late opening and change as appropriate
Shops (N)	Imported as non-societal risk	Need to identify and include all <u>fire certificated</u>	20 to 50	Check and change certificated (but apply minimum of 20 to 50 <u>for certificated</u>)	08.00 to 20.00 7 days per week	Check to see if hours of occupation differ, e.g. 24 hr shopping and change as appropriate
Buildings open to the public (P)	Imported as non-societal risk	Need to identify and include all <u>fire certificated</u>	50 to 100	Check and change certificated (but apply minimum of 20 to 50 <u>for certificated</u>)	08.00 to 20.00 7 days per week	Check to see if hours of occupation differ, e.g. night time opening and change as appropriate
Factories (R)	Imported as non-societal risk	Need to identify and include all <u>fire certificated</u>	50 to 100	Check and change certificated (but apply minimum of 20 to 50 <u>for certificated</u>)	08.00 to 20.00 7 days per week	Check to see if hours of occupation differ, e.g. 24 hr shift and change as appropriate
Offices (S)	Imported as non-societal risk	Need to identify and include all <u>fire certificated</u>	20 to 50	Check and change certificated (but apply minimum of 20 to 50 <u>for certificated</u>)	08.00 to 20.00 7 days per week	Check to see if hours of occupation differ, e.g. 24 hr shift and change as appropriate

Table 14: Maximum loss (societal risk defaults) *(continued)*

Occupancy	Societal risk status		Number of people in the most highly occupied compartment		Time period for which 'number of people ...' is applied	
	Default set on import to FSEC	F&RS action when using FSEC	Default set on import to FSEC for specified time periods	F&RS action when using FSEC	Default set on import to FSEC	F&RS action when using FSEC
Other workplaces (T)	Imported as non-societal risk	Need to identify and include all fire certificated	50 to 100	Check and change certificated (but apply minimum of 20 to 50 for certificated)	08.00 to 20.00 7 days per week	Check to see if hours of occupation differ, e.g. 24 hr shift and change as appropriate

4.7.4 TQ260 – Output areas overlooked

TQ260 identifies any output areas not assigned to a risk group. There should be no records.

4.7.5 TQ261 – Risk areas overlooked

This checks if any risk areas have been omitted from risk groups. There should be no records.

4.7.6 TQ263 – TGOBRA for all high and very high risk areas

If records are reported this may mean the TGOBRAs are poorly placed and have missed some areas of high risk.

4.7.7 TQ273 – HMOs or flats with 'wrong' number of storeys

This file should contain no records. All HMO's should have at least three storeys and all flats should have more than four storeys. If they have less then the category may be wrong, or the details have not been revised. The entries reported should be checked and either correctly classified or the storeys changed.

It should be noted that some F&RSs may have entered HMOs with fewer than three storeys, and any records returned should be checked at Stage 5. 'HMOs' of less than three storeys should be entered as 'other sleeping accommodation' and their occupancy levels set to reflect their actual occupancy levels.

4.8 Major Incidents

4.8.1 Possible errors

The major incident module relies on the user to define risk areas for each type of major incident and to select a risk level for each risk area.

Risk areas do not have to cover all output areas. The F&RS may choose to only identify areas of medium or high risk, and may choose to only map out those types of major incidents that pose a significant risk (and hence not denote areas of low risk).

Possible errors include:

- Fail to demarcate risk areas for each category of major incident
- Assign an inappropriate risk category

4.8.2 TQ300: Major incidents data

The incident pivot table identified below can be used to review the outputs, in similar way that done for dwellings and Special services. If there are major incidents reported then the F&RS should have defined some major incident risk areas.

Input File	MS-Excel File	Macro	Save Output
TQ300_IncidentsMI.txt	Incidents.xls	Macros.xls UpdateIncidents	TQ300IncidentsMI.xls

4.8.3 TQ302: Output areas linked to major incident risk areas

TQ302 notes output areas that are part of a risk area. There should preferably be some records.

4.9 FSEC Outputs (performance predictors)

4.9.1 Introduction

FSEC produces a set of predictions for:

- Fatalities in dwellings
- Fatalities in other buildings
- Fatalities in each type of special service and all special services
- Loss in £ of property in other building fires

It is possible, using data in FSEC, to compare the reported number of (actual) dwelling and special service deaths with those predicted by FSEC.

4.9.2 TQ152 & TQ200 – Dwellings and special services predicted deaths

The ‘All’ sheet in the output files TQ152IncidentsD.xls (dwelling incidents) and TQ200IncidentsSS.xls (special services incidents) shows the reported ‘actual’ numbers of incidents. The ‘Dwelling Summary’ sheet in TQ152 shows summary values for ROITYPE 1 (Dwelling Fires) and 2 (Fires in other buildings). The ‘special services summary’ sheet in TQ200, shows summary values for each special services. These values can be compared the values reported in the ‘PerformancePredictors.txt’ file.

The following guidance is offered.

The predicted number of dwelling fatalities should preferably be within 10% of the reported number. However, this may (legitimately) not be the case where:

- The F&RS has a relatively small number of dwelling fire deaths each year (such as less than 10 to 20), and hence their ‘actual’ number of deaths for any 3 year period may be subject to spikes and dips, such as if a fire with (say) 5 deaths occurs

It is also possible for the predicted and actual number of deaths to differ due to:

- The F&RS has implemented a successful community fire safety scheme that has reduced the number of deaths per fire
- The F&RS has a skewed reporting practice that leads to an over or under reporting of casualties

If the predicted and actual deaths differ greatly, such as by more than 20%, then (1) review the results of the earlier text queries and if they are satisfactory (2) explore other explanations for the divergence in results.

In the case of special services it is possible that the predicted deaths differ, ‘legitimately’, from the predicted deaths by far more than 20%. The following guidance is offered.

In the case of lift releases, HAZCHEM, ladder rescues, lockin/lock out – the number of actual deaths can be a fraction per year or even zero. Therefore, FSEC may give a prediction of (say) 0.01 deaths per year against zero reported. Alternatively, FSEC may predict 0.001 deaths per year against a reported 0.3 per year arising from 1 death in 3 years.

In the case of RTAs, extrications and other special services, there tends to be a larger number of actual and predicted deaths. However, as reporting practices vary greatly between F&RS (such as what is counted as a casualty) this introduces a relatively wide margin of error. Therefore, it is reasonable to expect the prediction to be within a reasonable margin of the actual deaths, such as within 50%. It is useful to scrutinise these results in parallel with the results of TQ200 which helps to identify differences in reporting practices.

In the case of water and line rescues, the number of deaths and hence the robustness of the actual number of deaths varies between F&RS according to (1) if these incidents are attended by the F&RS and (2) if local features are present that contribute to such incidents. Therefore, the possibility of checking the robustness of the predicted number of water and line rescues needs to be considered on a case by case basis.

Finally, as some F&RS may not report all categories of special services, there may be gaps in the results. Whilst it is reasonable to omit the lesser categories of special service (lift releases, HAZCHEM, ladder rescues, lockin/ lock out), the other categories (RTAs, extrications and other special services, and possibly water and line rescues) tend to pose a significant risk and are less reasonable to omit.

4.9.3. Other buildings performance predictors

PerformancePredictors.txt – Societal risk

It is difficult to assess the validity of the predicted number of societal risk deaths due to the lack of an independent measure of actual deaths. The societal risk prediction includes rare events that may have large numbers of deaths, and may not have occurred in recent years. In anything other than metropolitan F&RSs, there may be no such events reported for the past 10 or 20 years.

It is possible to make a simple and somewhat coarse comparison against the expected number of deaths. FSEC is based on a set of societal risk fire frequencies and fatality rates per response time. The dataset for the UK indicates about 110 societal risk fires per annum. If a three appliance attendance is made in <10 minutes FSEC would predict 1.6 deaths per fire, also assuming 8 persons at risk per fire. Thus, for the UK as a whole FSEC would 'expect' about 170 deaths per annum. If such fires occurred in areas where 4 appliances can attend in <10 minutes, the predicted total for the UK would fall to about 53 deaths per year. Thus, the 'expected' total number of deaths is very sensitive to the assumptions made. Therefore, a range of expected number of deaths is shown in Table 15 for English F&RS.

As societal risk is approximately proportionate to the number of other buildings, the predicted number of deaths should be a similar proportion of 53 to 170.

In the case of English F&RS, the expected deaths are shown in Table 15, based on the count of Valuation Office data. Care must be taken here as the expected deaths are based on the proportion of Valuation Office buildings in each F&RS. Societal risk is significantly influenced by HMOs which are not noted in Valuation Office counts. Therefore, it is possible that the distribution of HMOs between F&RSs may not be the same as the distribution of the types of buildings counted by the Valuation Office.

In the case of Scotland and Wales, reliance must be placed on comparing the predicted number of deaths

There are about 170,000 HMOs and tenements in the UK, plus about 1.9m other buildings, i.e. a total of about 2.1m. Thus, if the F&RS has (say) 15% of 2.1m other buildings (including HMOs and purpose built flats), the predicted number of societal risk deaths should be within a reasonable distance of this value.

If there is a great difference, such as double or half the expected value, this should be explored further.

PerformancePredictors.txt – Property loss

In the case of English F&RS it is possible to compare the predicted property loss with the 'expected values' shown in Table 15. These expected values are based on the Valuation Office data on the number of other buildings, multiplied by respective generic fire frequencies and average loss per fire. Thus, these are approximate values of the expected loss per year.

In the case of Wales and Scotland it is possible to compare the predicted loss with the loss expected for the UK, as a test of whether it is in proportion. That is, property risk is determined mainly by the number of other buildings (excluding HMOs and purpose built flats). Therefore, the predicted loss as a proportion of UK loss should be approximate to the proportion of other buildings in the F&RS area.

The ‘expected’ loss for the UK is about £2.4billion per year. There are, as per the Valuation Office data, 1.5million buildings with known categories and about 150,000 with unknown categories in England. If this is scaled up for Scotland and Wales in proportion to the population level you arrive at ~1.9m other buildings (excluding HMOs and purpose built flats).

Thus, if the F&RS account for (say) 10% of the 1.9m other buildings (excluding HMOs and purpose built flats), it should also predict about 10% of £2.4billion loss per year.

These are clearly simple comparisons and it should be noted that the F&RS prediction may have legitimately changed due to:

- Corrections to the Valuation Office data
- Amendment of site assessments
- A significant difference in response times to the ‘average’ for the UK

However, if the prediction is (say) double or half the expected, this should be reviewed.

Table 15: Expected property loss and societal risk deaths per annum in English F&RS

F&RS	Expected property loss	Expected range of societal risk deaths	
Avon Fire Authority	£38,599,277	0.9	2.83
Bedfordshire Fire Authority	£19,455,341	0.4	1.29
Berkshire Fire Authority	£26,087,270	0.5	1.79
Buckinghamshire Fire Authority	£24,000,134	0.5	1.55
Cambridgeshire Fire Authority	£28,468,742	0.5	1.73
Cheshire Fire Authority	£36,312,710	0.8	2.65
Cleveland Fire Authority	£16,614,336	0.4	1.40
Cornwall	£54,531,283	1.1	3.50
Cumbria	£43,630,810	0.9	2.86
Derbyshire Fire Authority	£42,224,563	0.9	2.82
Devon Fire Authority	£68,743,008	1.4	4.64
Dorset Fire Authority	£33,929,126	0.8	2.66
Durham Fire Authority	£23,383,949	0.5	1.60
East Sussex Fire Authority	£32,177,069	0.8	2.64
Essex Fire Authority	£56,763,072	1.2	3.96
Gloucestershire	£28,278,605	0.6	1.87
Hampshire Fire Authority	£56,439,418	1.2	3.94
Hereford and Worcester	£34,495,200	0.7	2.15
Hertfordshire	£35,450,938	0.7	2.41
Humberside Fire Authority	£34,617,504	0.8	2.64
Isle of Wight Council	£9,387,398	0.2	0.72
Kent Fire Authority	£61,927,392	1.3	4.24
Lancashire Fire Authority	£63,832,570	1.6	5.40
Leicestershire Fire Authority	£36,160,858	0.8	2.56
Lincolnshire	£29,864,256	0.6	2.06
Norfolk	£47,724,211	0.9	3.01
North Yorkshire Fire Authority	£50,029,882	1.0	3.35
Northamptonshire	£23,407,488	0.5	1.49
Northumberland	£17,574,374	0.3	1.11
Nottinghamshire Fire Authority	£35,804,525	0.8	2.64
Oxfordshire	£26,225,395	0.5	1.63
Shropshire Fire Authority	£21,059,347	0.4	1.41
Somerset	£29,184,710	0.5	1.76
Staffordshire Fire Authority	£39,109,536	0.9	2.82
Suffolk	£33,033,792	0.6	2.10
Surrey	£38,329,517	0.8	2.62
Warwickshire	£21,774,566	0.4	1.47
West Sussex	£26,757,965	0.6	2.00
Wiltshire Fire Authority	£25,161,446	0.5	1.56
ISLES OF SCILLY	£1,252,512	0.0	0.08
Greater Manchester Fire	£94,233,178	2.2	7.30
Merseyside Fire Authority	£44,958,259	1.2	3.89
South Yorkshire Fire Authority	£43,247,770	1.0	3.28
Tyne and Wear Fire Authority	£34,124,717	0.9	2.84
West Midlands Fire Authority	£93,264,307	2.1	7.05
West Yorkshire Fire Authority	£82,345,824	1.9	6.24
GLA	£283,592,755 7.0	23.10	

Stage 5 – Reviewer visit to F&RS for philosophy checks and follow up to Stage 4

5.1 Introduction

Stage 5 involves:

- Scrutinising the F&RS project management arrangements
- Structured discussion of the F&RS's approach to FSEC, and how they have completed the various modules of FSEC
- Following up on any errors or queries arising from the Stage 4 desk top examination

5.2 Possible Project Management Issues

The entries in the project management checklist can be used to help guide the examination of FSEC project management.

The issues that should be checked and discussed are summarised below:

Resourcing

- Are there an adequate number of properly trained and experienced personnel?
- Is the resourcing of FSEC consistent or is the team frequently changed or rarely working together (e.g. due to shift systems or multiple jobs) such that continuity of work is lost?

Management

- Is the level (authority and effort) of project management adequate?
- Is the regularity of project management adequate?
- Is there evidence of clear project planning?

Quality control

- Is there evidence of version control?
- Is there evidence of data set control?

Prioritisation of FSEC analysis

- Has priority been awarded to cleansing the priority data only?
- Prioritisation of modules

5.3 Dataset

On the day of the review the dataset which is in use and how management of version control is achieved can be questioned by the reviewer.

5.4 Road Network and Vehicle Speeds

5.4.1 Review discussions

The reviewer should discuss the F&RS approach to the road network checking and calibration.

This could include discussion around the following topics, also included are references to the text queries run in Stage 4, the output of which could be used to inform more detailed follow-up questions at this stage or later in the discussions as required:

- **What checks have been made on the road network?**
 - Guidance Section 5.4.2
 - TQ011
 - TQ013
 - TQ017
 - Overlays in Sections 5.4.4, 5.4.6, 5.4.7, 5.4.8, 5.4.9
- **How have road speeds been calibrated? How many road speeds have been calibrated?**
 - Guidance Section 5.4.3
 - TQ024 – checks to see if default (i.e. ‘global’) road speeds have been changed
 - TQ026 – checks to see if *individual* road link speeds have been changed (by > 10%)
 - TQ027 – checks to see if *individual* road link speeds have been changed (by > 50%)
- **Are there plans to undertake further calibration of road speeds?**
- **What is the F&RS’s approach to the definition of dead ends?**
 - TQ012 – looks for false dead ends (but is only relevant if the F&RS has checked their dead ends or added loop backs)
 - Overlay Section 5.4.5
- **How have vehicle speeds been calibrated?**
 - TQ025 – checks for vehicles where speed is changed from 100%

The output of the queries associated with each of these topics can be used to inform the discussion and be used as a prompt for more detailed questioning where necessary.

Arrival times can be checked using the output of the following queries:

- TQ018
- TQ019
- TQ020

This can be used as a further check on the road network to highlight any junctions which have a protracted arrival time which could indicate an error in the road network. In general it would not be expected (but still possible in, say, very rural areas) to receive an output for TQ018 and 019. TQ020 may well identify junctions with an arrival time of between 30 and 59 minutes but it would be expected that these would be on the edge/beyond the F&RS area. Overlays in Section 5.4.10 are available to provide further information on this result and can be used to highlight junctions for discussion with the F&RS. It should be noted that these overlays may highlight ‘false junctions’ on motorways which have been added (sometimes at the point where minor roads pass beneath the motorway) but this may be done by the F&RS to break the motorway up into road links. This can be checked with an overlay to confirm that they are false junctions and do not allow access to or from the motorway itself.

5.4.2 Guidance on road network changes

The following are checks which would be expected to have been made by the F&RS on the road network. The reviewer should ensure that these checks have been undertaken through the output of text queries and/ or spot checks on the dataset using overlays:

1. A check for road links not connected to the main road network

An overlay is provided on the FSEC system to make this check (path is Overlay, Road Overlay, Linked to Network Check).

2. A check for breaks in the road network

An overlay is provided Overlay, Road Overlay, Road link Check though this is more difficult as it displays all road links connected to the network at one end only and includes all genuine dead ends. Some F&RSs may have edited all genuine dead ends and have systematically checked the network. Often it is only found by finding some erroneous results.

3. A check for ‘spurious junctions’, this is a junction say on a motorway flyover but connected to the road above or below which would allow a vehicle to drive along an A, B or C road and turn onto the motorway

Where F&RSs have the ITN layer supplied by ODPM as their road network this should not occur as the ITN layer recognises grade separation. What may be found are two junctions stacked on top of each other but only connected to one road either the motorway or to the other road but not joining all four roads together. Where F&RSs have changed their road network to say Oscar Routemanager this can occur. There is one situation where it can occur in the ITN layer and that is if the F&RS has exported and re-imported their road network. When the ITN layer is re-imported it loses grade separation and, in theory, can allow connection between the different roads.

4. Adding one way streets and checking and correcting, if necessary, the direction of travel

Where the F&RS has chosen to make motorway slip roads one way and not the carriageway they need also to make the link between the on and the off slip roads one way or in theory you could double back up the motorway and exit at the off slip road.

5.4.3 Guidance on road speed changes

The F&RS should also have done some customisation to their road speeds. All F&RSs were supplied with the same defaults, based mainly on the Lothian & Borders road network, so the F&RS at least need to modify the speeds in urban areas. The effect of not changing road speeds is that it would impact on the predicted fatalities; if the network is too fast they will under predict, too slow and they will over predict the number of fatalities. The best way to do this is to check the predicted times at road junctions and compare it against actual incident data for their F&RS. Some F&RSs have software from ODPM called T-check which allows them to compare actual and predicted speeds but it was not sent out as part of the standard build. The same thing can be checked in other ways.

5.4.4 Overlays: Road network

If the output from TQ011.txt reported any results then some of the road junctions did not have a 'first arrival time'. These junctions can be viewed and spot checked to ensure that they have been defined correctly using either the standard 'Overlay►Road Overlays►Link to Network Check' overlay or the 'O011 Missing Road Junction and Road Link Info' Review overlay.

Review Overlay

- Choose any map scale other than 1:1250
- Remove background map
- Overlay►Define O011_MissingRoadJunctionandRoadLinkInfo

This overlay shows the following

- Pink lines for road links that don't have a type and unclassified roads (roads without a type ONLY can be shown by deleting "or RTYPE='U' " from the where clause for the pink lines and deselecting all other features on the overlay)
- Blue lines for Motorway road links
- Red lines for A road links
- Yellow lines for B road links
- Green lines for C road links
- Red circles with labels for stations showing the station id and name
- Black cross for junctions with no first arrival time.

Checks should be made on any Black Crosses and appropriate amendments made, e.g. adding a road link to the junction, or if the junction looks ok checking the direction of the road links.

The following additional review text query is available to check for road links that are missing

Feature	Criteria Name	Layout Name	Description
Road Links	Q014 Changed Road Link Info	L013 Road Link Info	Reports Road links where the road details have been changed from the defaults

5.4.5 Overlays: Dead ends

Genuine dead ends are defined by setting the road link property ‘Genuine Dead End’ to true. If this has been done and the output from TQ012_.txt reported some records then a review overlay can be used to view these junctions.

Review Overlay

- Choose a any map scale other than 1:1250
- Overlay ► Define O012_DeadEnds
- Hide black crosses for road junctions
- This overlay shows the following:
- Green line all road links
- Large Red Cross all junctions with less than one road link, where the junction is not defined as a genuine dead end.
- Large black cross all junctions connected to more than one road link, or junctions with only one road link that are defined as genuine dead ends. This item is not initially hidden (to avoid cluttering the screen). For instructions on making the item visible please refer to Appendix B.

Checks should be made on any Red Crosses and appropriate amendments made, e.g. setting the genuine dead end property.

Note: Whilst it is useful to identify genuine dead ends it is not a high priority. If there are a small number of dead ends these should be corrected (to complete the process). If there are a large number then the F&RS should tidy these up after any other items have been resolved.

5.4.6 Overlays: Road continuity check

Review Overlay

- Choose a any map scale other than 1:1250
- Remove the background map
- Overlay ► Define O013_RoadContinuityCheck

Note that the overlay prompts for a station number. This can be found in the 'ID' column of the output of TQ100 or can be seen on any overlay within FSEC which highlights fire station location.

This overlay shows the following:

- Black line all road links
- Large Green Cross all junctions where the first arrival is from the specified station
- Large Red Cross all junctions where the first arrival is not from the specified station
- Small Blue Circle all fire stations
and label

Checks should be made where there are green crosses within the area of red crosses. These show areas where the local station is the first to arrive at the junction. Generally red crosses would only appear at junctions around the station boundary. If they appear within the middle of the station area this indicates a problem with the network, either the junctions are not linked correctly or the roads are defined as one way in the wrong direction.

5.4.7 Overlays: False junctions

Review Overlay

- Remove the background map
- Overlay ► Define O014_FalseJunctions_Motorways
- Overlay ► Define O015_FalseJunctions_Aroads
- Hide the small black crosses for the road junctions

This overlay shows the following:

- Pink lines for road links that don't have a type
- Blue lines for Motorway road links
- Red lines for A road links
- Yellow lines for B road links
- Green lines for C road links
- Small black cross all road junctions

- Blue cross & label all fires stations
- Large Black Cross any junction that is only attached at one end to a Motorway (for O014)
- Large Black Cross any junction that is only attached at one end to an A Road (for O015)

Checks should be made where there are Black Crosses in areas that are not real motorway junctions (O014) or not real A Road junctions (O015). For A roads particular attention should be paid to dual carriageways.

5.4.8 Overlays: One way

Review Overlay

- Remove the background map
- Overlay ► Define O016_OneWayRoads

This overlay shows the following:

- Blue lines roads not defined as either one-way or two way, defaults to two way
- Green lines roads defined as two way
- Red lines roads defined as one way
(These lines show an arrow to indicate the direction of travel.)

The overlay prompts for the type of road to be displayed. To show all motorways enter 'M', 'A' for A roads etc.

The following spot checks can be made for a sample of motorways:

- that all slip roads are defined as one way,
- the direction is correct (if not use the 'Overlay ► Road Overlays ► Change road link direction' to correct the direction)

The following spot checks can be made for a sample of A Roads:

- that the slip roads for dual carriageways are one way,
- the direction is correct

The following spot checks should be made for a sample of roundabouts:

- entry and exits defined correctly as either two or one way.
- direction of travel for the entry and exits is correct,
- roundabout is defined as one way,
- direction of travel on the round about is correct.

5.4.9 Overlays: Check for output areas with no junction

If TQ017_.txt reported any records then some of the output areas do not have a road junction associated to them. The following overlay can be used to identify these output areas, in order to correct the problem.

Review Overlay

- Remove the background map
- Overlay ► Define O017_OA_WithoutJunction
- Initially hide the road junction and road link.

This overlay shows the following:

- Black crosses any road junction
- Pink lines any road links
- Green areas any output area that does not have a road junction defined

Any green areas should be checked and an appropriate road junction defined. Alternatively use the FSEC Overlay, 'Overlay_Road Overlays_Check for Road Junction in OA'

5.4.10 Overlays: General test of arrival times

The output files TQ018_.txt to TQ020_.txt report any road junctions where the first arrival time is not within 120, 60 or 30 minutes. The following review overlay can be used to identify these road junctions.

- Remove the background map
- Overlay ► Define O018_O020_FirstJunction
- Initially hide blue line for output area boundary.

This overlay shows the following:

- Blue line Boundary outline for each output area.
- Small blue cross Fire stations labelled with id and name
- Large Green Cross Road junction where first arrival is between 30 and 60 minutes
- Large Yellow Cross Road junction where first arrival is between 60 and 120 minutes
- Large Red Cross Road junction where first arrival over 120 or not defined

All Red and Yellow crosses should be checked and discussed as appropriate. Green crosses may appear at the edges of the F&RS boundary, these should be spot checked to ensure that they are as expected and not caused as a result of an error with the road network.

A similar review overlay can be used to view the first arrival time for each output area.

- Remove the background map
- Overlay ► Define O018_O020_OAFirstArrival
- Initially hide blue line for output area boundary.

This overlay shows the following:

- Blue line Boundary outline of each output area.
- Small blue cross Fire stations labelled with id and name
- Green area Output Area where there is a first arrival is between 30 and 60 minutes
- Yellow area Output Area where there is a first arrival is between 60 and 120 minutes
- Red area Output Area where there is a first arrival over 120 or the area does not have a road junction defined

All Red and Yellow areas should be discussed as appropriate. Green areas may appear at the edges of the F&RS boundary, these should be spot checked to ensure that they are as expected and not caused as a result of an error with the road network.

If the arrival time queries (TQ018 to TQ020) showed a large number of road junctions, then the following additional queries can be used to highlight output areas that have junctions where there are arrival times in excess of 30, 60 or 120 minutes.

Feature	Criteria Name	Layout Name	Description
Output Area	Q021 OA First Junction Arrivals 120 min Plus	Output Areas	Reports output areas where at least one junction has an arrival time over 120 minutes or the output area does not have a road junction associated to it.
Output Area	Q022 OA First Junction Arrivals 60 min Plus Output Areas	Output Areas	Reports output areas where at least one junction has an arrival time over 60 minutes.
Output Area	Q023 OA First Junction Arrivals 30 min Plus	Output Areas	Reports output areas where at least one junction has an arrival time over 30 minutes.

5.4.11 Overlays: Road link specific road speeds

The output from Q026_.txt (just a number) indicates those roads where the speed has been amended by more than 10% from the F&RS defaults. The output from TQ027_.txt lists all roads where the speed has been amended by more than 50% from the F&RS defaults. If TQ027 contained any records these can be reviewed using the following overlay.

Review Overlay

- Remove the background map
- Overlay ► Define O027_RL_Speeds

This overlay shows the following:

- Green line All road links
- Yellow line Road links where the speed has been changed to more than +/-10% of the F&RS default.
- Red line Road links where the speed has been changed to more than +/-50% of the F&RS default.

5.5 Stations, Crews and Vehicles

5.5.1 Review discussions

The reviewer should discuss the F&RSs approach to identifying the stations, crews and vehicles within FSEC and their associated costs. The following points may be useful to discuss (even where the queries run in Stage 4 do not appear to highlight any issues):

- **How were station costs calculated?**
 - TQ100 – lists all fire stations, the vehicles at the station including the vehicle crewing details and costs
 - TQ104
 - Overlay Section 5.5.3
- **How were crew costs calculated?**
 - TQ100
 - TQ104
 - TQ003 (where the F&RS has used the spreadsheet within FSEC to determine crew cost)
 - Overlay Section 5.5.4, 5.5.5
- **How were the vehicle costs calculated?**
 - TQ100
 - TQ104
 - Overlay Section 5.5.6

- **How are records of calculations maintained – e.g. data, evidence or justifications for calculations?**
- **How have stations outside of the F&RS area been included? How was it decided which stations from neighbouring F&RS areas should be included? Have all ‘mutual assistance’ stations been included? How were the vehicle types and crews at these stations confirmed?**
 - TQ100
 - TQ104
- **How were vehicle turn out times calculated?**
 - TQ105 – vehicles without TOTs
 - Overlay Section 5.5.6
 - TQ106 – vehicles with TOTs outside guidance values
 - Overlay Section 5.5.6

The outcomes of the detailed checks undertaken on TQ100 and 104 in Section 4.4.3 may be used to highlight specific areas for more detailed discussion. It should be noted that vehicles, crews and stations outside the F&RS area do not need to have a cost associated with them.

In terms of the inclusion of stations beyond the F&RS area, a pertinent question may be to ask whether the F&RS has checked with their command which over the border stations are called to incidents in the F&RS area, and confirmed that these are included in the FSEC model.

It is important to remember that for crewing cost the most important part of the review is to confirm that the ‘Crewing Cost £ per year’ value is reasonable. Costs for individual crew members do not need to be completed for this to be calculated as the F&RS can enter their own calculated crew cost values without using the FSEC facility to calculate this value for them using the crew member costs defined within FSEC. If the crew member costs have been used to calculate the total crewing cost for a vehicle in FSEC then TQ003 can be used to see if the defaults costs have been changed and can highlight large differences between the default and changed value. It should be noted, however, that the F&RS may have changed the default values but overwritten them in the actual cost spreadsheets so it is important to discuss the rationale behind their approach to crewing costs calculation.

The output of the following queries can be used to highlight particular issues within FSEC which can be explored with the F&RS. It may be useful to have the outcome of the queries available for these questions as they relate to specific anomalies in the F&RS modification of FSEC and could be spot-checked as necessary:

- Stationjunction.txt – highlights stations which may not be correctly connected to the road network
 - Overlay Section 5.5.7

- TQ107 – identifies stations without vehicles
 - Overlay Section 5.5.2
- TQ108 – identifies vehicles not within stations
 - Overlay Section 5.5.2
- TQ109 – identifies vehicles not matched to a station co-ordinates
 - Overlay Section 5.5.2

5.5.2. Overlays: Fire station and vehicles

FSEC Overlay

- Overlay_Fire Station and Vehicles_Fire Station and Vehicles

This overlay shows the following:

- Big pink cross Each vehicle
- Yellow label Each fire station

When looking at vehicle locations it may be useful to use the zoom function to see whether vehicles are, in fact, at the station as they may appear to be when they are not when on a larger scale map.

5.5.3 Overlay: Stations

The overlay can be used to spot check on any anomalies identified in Stage 4 (TQ011.txt). For stations this includes checks that:

- All F&RS and neighbouring stations are included
- Each station has an annual cost
- Station has the correct vehicles (i.e. at least one pink cross)
- Station location is correctly identified as inside/outside the F&RS

5.5.4 Overlay: Correct crew

The same overlay can be used to check that stations have

- At least one crew
- The correct crew types

5.5.5 Overlay: Vehicle crewing cost/vehicle speeds

The same overlay can be used to spot check on any anomalies identified in Stage 4 (TQ100_.txt and TQ104_.txt) that:

- All crews have a cost
- All vehicles have a speed

5.5.6 Overlay: Vehicle type/vehicle cost/turn out times

Review Overlay

- Overlay_Define O105_VehiclesWithoutCrewTT

This overlay shows the following:

- Yellow label Each fire station
- Green small Cross Each vehicle.
- Big Pink Cross Vehicle without a turn out time, cost, or vehicle type.

The same overlay can be used to spot check on any anomalies identified in Stage 4 (TQ100_.txt and TQ104_.txt) that:

- Big All vehicles have a type
- Big All vehicles have a cost
- Big All vehicles have a turn out time

5.5.7 Overlay: Stations not connected to road network

If the StationJunction.txt output file reported any stations, these can be spot checked using the following overlay.

FSEC Overlay

- Big Overlay➤Fire Station and Vehicles➤Fire Station Location Check
or
- Big Overlay➤Fire Station and Vehicles➤Fire Station Road Junction Check

This overlay shows the following:

- Big Yellow Cross Each fire station not connected to the road network.
- Green line Each road link
- Black cross Each road junction

The following additional query can be used to interrogate anomalies with the fire station and vehicle information.

Feature	Criteria Name	Layout Name	Description
Vehicle	Q102 Missing Vehicle	L104 Vehicle Details	Reports Vehicles that have no type, cost, crewing, ranks or officers.

5.6 Planning Scenarios

5.6.1 Review discussions

Planning scenarios are defined in the Response Database. These are then applied to dwellings, special services, other buildings and major incidents. The F&RS may make these specific to their circumstances. There is no standard for what each planning scenario should be.

The F&RS may have defined planning scenarios on the basis of incident type and/ or building attributes, and used scenario descriptions accordingly. These can be viewed on PSResources.xls

TQ117.xls and TQ119.xls provide information regarding the planning scenarios allocated to each FSEC module (the reference numbers need to be cross referenced with those on PSResources.xls). It is suggested that the approach taken to allocating these planning scenarios is investigated with the F&RS and any obvious anomalies raised.

It is suggested that it is possible to:

- **Check the philosophy and evidence used by F&RS in defining Vehicle Combinations**
 - Compare the 'Vehicle Combinations' for each scenario description against 'typical' vehicle combinations, as shown below in Table 16
 - Check if the Vehicle Combinations specified in the scenario list allows for use of neighbouring F&RS vehicle types
 - Review TQ103 which identifies vehicles not used in planning scenarios
 - Review TQ117.xls and TQ119.xls for the allocation of planning scenarios to FSEC modules
 - Section 5.6.3
- **Check the completeness of the scenario list - does it cover the full range of incident types as listed below in Table 16**
- **Has phasing been used?**
 - Section 5.6.4

It should be noted that FSEC only gives credit to the first four vehicles to arrive at an incident and it treats all vehicles equally. Thus, a command unit (or incident support unit) is treated as the same as a pumping appliance. This has the effect that, if the planning scenario is based on two pumping appliances and a command unit, FSEC will model (if the command unit arrives first) the fire-fighting etc to be commenced when the command unit arrives. Therefore, it is reasonable for F&RS to 'ignore' in FSEC units that do not have a material role, or to phase these units by (say) 40 minutes to ensure their arrival time does not adversely impact the modelling.

A vehicle may not be used because it may not have a vehicle type, i.e. Vtype column is blank (or column 4 (D) in spreadsheet). In this case the vehicle can't be used so simply needs a 'type' defining. It may be that the vehicle is part of a neighbouring F&RS and only entered so that the details for the neighbouring station are complete. In this case it may be correct if it is not used (this should be raised at the review).

Where vehicles which are part of the F&RS and have a type but are not used this should be investigated further (although this may be correct if the vehicle is a special service one and the special service module has not been completed). Vehicles may be included in the output file if they have not been included in the vehicle combinations allowed for a planning scenario. This can be checked using the Response database, and reviewing the planning scenario combinations, or looking at the output from the table_comparison spreadsheet.

5.6.2 Do planning scenarios cover all risks?

As a first step, the scenario list can be compared with the guidance on 'typical' Pre-Determined Attendances in Table 16.

The F&RS scenario list should at least cover the four incident types, namely dwellings, special services, other buildings and major incidents. These risks are typically be sub-divided, typically into sub-types (e.g. RTA vs. water rescues) and commonly accordingly to incident scale (e.g. motorway RTA vs. B road RTA).

As the scenario list may not be self-explanatory, for example a code may be used, it might be necessary to print the scenario list and talk it through with the F&RS team.

The following text query results might be useful to inform this discussion:

- TQ115 – checks that vehicles defined in dwelling planning scenarios exist
- TQ116 – checks that vehicles defined in major incident planning scenarios exist
- TQ117 – checks that vehicles defined in other buildings planning scenarios exist
- TQ118 – checks that vehicles defined in special services planning scenarios exist
- TQ120 – checks that all dwelling risk areas have a planning scenario defined
- TQ121 – checks that all major incident risk areas have a planning scenario defined
- TQ122 – checks that all other buildings risk areas have a planning scenario defined
- TQ123 – checks that all special services risk areas have a planning scenario defined
- TQ127, TQ130 checks how many of the output areas have no planning scenario defined in each of the modules

The output files for TQ115 to 118 provide additional details on what aspects of the scenario are not met, i.e. planning scenario itself, Vehicles, Time or Phase. This is particularly relevant for TQ116 which includes all the major incident types only one of which may have Vehicles not met. It is also relevant for TQ118 which includes all special services, again only one may have vehicles requirements not met.

The heading lines at the top of the output files for TQ116 and TQ118 detail the order of the major incidents/special services and the order of the fields with each group. For each module of major incidents or special services there are two fields reported, the planning scenario number and the Vehicle Met criteria. Only those with a 'Vehicle Met Criteria' of N need to be checked, e.g. if for an output area only one of the special services (Lock) has a vehicle met of 'N' then this should be checked. A similar approach may be taken for major incidents.

5.6.3 Are the vehicle combinations specified for each scenario reasonable and evidence based?

The 'as-is' FSEC assessment is intended to replicate the current disposition of resources. Therefore, it has been advised that the planning scenarios should match, or be similar, to resources noted in current Pre-Determined Attendances.

As the list of FSEC scenarios may not precisely match those in current PDAs, it is pertinent to check the basis on which the scenario list and vehicle combinations have been developed.

When checking scenario lists and vehicle combinations it is common for F&RS to:

- Vary the resources according to the height and size of buildings, in the case of building fires
- Vary the resources according to other operational factors, such as poor water supplies, limited access, long delay in 'make up' (i.e. other vehicles would take long time to arrive) and so on – typically increasing resources in areas/building types with operational difficulties
- Vary the resources according to other site specific factors, such as historic site needs rapid salvaging, special fire fighter or environmental risks etc
- Vary resources according to likely incident severity, such as RTAs on M-Ways vs. B roads

The following types of analysis might be used in support of vehicle combinations:

- Task and time line analysis
- Analysis of safe systems of work

Table 16: Incident types and typical vehicle combinations (Pre-determined attendances)

Incident type	Vehicles (PDA)	Comment
Dwelling fires		
Dwelling fire (1 to 2 storeys)	2 pumps	
Dwelling fire (3 to 5 storeys)	2 to 4 pumps (incl. ladder)	Combinations may vary if (say) need extra vehicles due to poor access (e.g. terraced housing), poor water supply, history of multiple rescues etc.
Dwelling fire (>5 storeys)	2 to 4 pumps plus aerial	May increase pumps to allow for additional resource needed for high rise incidents
Other buildings		
Other buildings fires (1 or 2 storeys)	2 or 3 pumps (incl. Ladder)	Combinations may vary according to building size, complexity (need for multi entry points), specific risks such as historic site, fire loading etc.
Other buildings fires (3 or more storeys)	2 to 4 pumps plus aerial	Combinations may vary according to building size, complexity, specific risks such as historic site etc.
Special services		
RTA (A roads or less)	2 pumps with special service equipment. Or: 1 or 2 pumps plus ET.	Some F&RS equip all pumps with rescue gear whilst others may not and instead use special emergency tenders. Some F&RS also specify an ISU or command unit.
RTA on motorway/dual carriage way	3 pumps or 2 pumps and an ET	Typically send at least one vehicle up each carriageway and plan for larger vehicles/high speed crashes.
Extrications and Other Special Services	2 pumps with special service equipment. Or: 1 or 2 pumps plus ET.	
Line rescue	1 or 2 pumps plus line rescue unit (e.g. ISU)	Line rescue equipment may be described as part of an Incident support unit, or an Emergency Tender or a Major Incident Support Unit.
Water rescue	1 or 2 pumps plus line rescue unit (e.g. ISU)	Water rescue equipment (for open water, mud banks etc) may be described as part of an Incident support unit, or an Emergency Tender or a Major Incident Support Unit or special boat unit.
HAZCHEM	1 or 2 pumps plus foam tender/chemical response unit	Special unit could be defined as a Foam Tender, Chemical response unit, incident support unit, Emergency Tender or a Major Incident Support Unit. The number of pumps may vary depending on typical incident scale, such as areas with history of 'small' leaks and spills (e.g. conventional factories) versus areas of special chemical risk such as refineries and plastics plants etc.
Lift release, lock in, ladder rescue	1 pump (ladder)	
Major incidents		
Rail, vehicle, bomb	3 or 4 pumps plus MISU	Support unit may be described as major incident support unit, heavy lifting unit etc
Chemical/airport	2 or 3 pumps plus foam tender/chemical response unit	
Shipping	Specialist units	

5.6.4 Phasing

It is not necessary for vehicles to be phased.

If the phasing facility has been used, it is pertinent to ask:

- What is the aim in using phasing?
- On what basis have vehicles been phased?

Where F&RSs are phasing, the reviewer should record the responses to these questions.

5.6.5 Overlay: Spot checks on assignment of planning scenarios to dwelling risk areas

Having checked that the planning scenarios are reasonable, spot checks can be made on the application of the planning scenarios to risk areas using a separate overlay for each risk area. For example, an F&RS may have declared a three pump plus aerial planning scenarios for inner city areas that have (say) terraced five storey tenements or town houses, versus a two pump planning scenario for suburban semi-detached two-storey areas. The application of the scenario to an area can be spot checked by use of overlays.

The planning scenario related to the risk area is labelled in the overlay.

Review Overlay

- Turn off background map
- Select map scale 1:50,000
- Overlay►Define O168_DRA_DPS_OA

Alternative use the FSEC Overlay

- Turn off background map
- Select map scale 1:50,000
- Overlay►Create Area and Groups►Output Area to Dwelling Risk Area Check
- Overlay►Create Area and Groups►Dwelling Risk Area to Dwelling Risk Group Check

This overlay shows the following:

- Colour coded areas for each output area, the colour defines the risk level from dark red (very high) to pale green (very low)
- Black hash lines for output areas covered by a risk area. This includes the planning scenario label for the risk area.
- Black cross Output areas without a risk area
- Black circle Risk areas without a planning scenario

Note The FSEC overlays do not show the planning scenario name for the risk area or a black circle for areas without planning scenarios.

The following additional queries can be used to interrogate anomalies with the fire station and vehicle information.

Feature	Criteria Name	Layout Name	Description
Vehicle	Q125 Vehicles Not Used	L104 Vehicle Details	Lists vehicles that are not in the part of the results for dwellings, special services, major incidents or other buildings.
Vehicle	Q126 Vehicles Not Used in OA	L104 Vehicle Details	Lists vehicles that do not have an output area list for dwellings or other buildings.
Output Area	Q110 OA PS Not Satisfied	Output Areas	Lists all of the output areas where all of the planning scenarios are not satisfied. This can only be used if vehicles are not phased.
Output Area	Q111 OA PS Not Satisfied – Dwellings	Output Areas	Lists all of the output areas where the dwelling planning scenarios are not satisfied. This can only be used if vehicles are not phased.
Output Area	Q112 OA PS Not Satisfied – For Major Incidents	Output Areas	Lists all of the output areas where the major incident planning scenarios are not satisfied. This can only be used if vehicles are not phased.
Output Area	Q113 OA PS Not Satisfied – Other Buildings	Output Areas	Lists all of the output areas where the other building planning scenarios are not satisfied. This can only be used if vehicles are not phased.
Output Area	Q114 OA PS Not Satisfied – Special Services	Output Areas	Lists all of the output areas where the special services planning scenarios are not satisfied. This can only be used if vehicles are not phased.
Output Area	Q115 OA Vehicles Not Satisfied – Dwellings	L128 OA PS Names Vehicles Exclude OB	Lists the output areas with all scenario names (excluding other buildings) where the dwelling planning scenarios are not satisfied for vehicles
Output Area	Q116 OA Vehicles Not Satisfied – For Major Incidents	L128 OA PS Names Vehicles Exclude OB	Lists the output areas with scenario names (excluding other buildings) where the major incident planning scenarios are not satisfied for vehicles.
Output Area	Q118 OA Vehicles Not Satisfied – Special Services	L128 OA PS Names Vehicles Exclude OB	Lists the output areas with scenario names (excluding other buildings) where the special services planning scenarios are not satisfied for vehicles.

Feature	Criteria Name	Layout Name	Description
Output Area	Q117 OA Vehicles Not Satisfied – Other Buildings	L129 OA PS Names for OB	Lists the output areas with other building scenario names where the other building planning scenarios are not satisfied for vehicles.
Other Buildings Risk Area	Q122 Risk Area Missing PS – OBs	L124 OB PS Names for RA	Lists any risk areas where the risk area contains types of other building but does not have a corresponding planning scenario, i.e. has care homes but not care home scenarios.

5.7 Dwellings

5.7.1 Review discussions

The following questions should be explored with the F&RS:

- **What approach has been taken to check the location of the dwelling casualty incidents?**
 - TQ150.xls
 - Overlay Section 5.7.2
 - TQ160
 - TQ162
 - TQ163
- **Have extra year's data been added?**
 - RAD.xls – row 11 and row 15
 - TQ150.xls
- **How were dwelling risk areas generated?**
 - TQ165 – identifies output areas not in dwelling risk areas
 - Overlay Sections 5.7.3, 5.7.4
- **How were dwelling risk groups generated?**
 - TQ166 – identifies dwelling risk areas not in dwelling risk groups
 - Overlay Section 5.7.5
- **How has dwelling risk group robustness been achieved?**
 - TQ167 – lists robustness and whether values have been overridden
- **Have the community fire safety fields been completed?**
 - TQ170

The following queries may yield more detailed questions:

- TQ150, TQ152 ratios
- TQ150 location check (code > 250 expected to be checked if involves casualties)
- TQ153 population multipliers
- TQ164 population count

5.7.2 Overlay: Location status of incidents

Spot checks on the incidents location checks can be done using a separate overlay for each incident type.

FSEC Overlay

- Overlay ► Incidents ► Incident Location Check

Enter the ROITYPE number for the incidents to be checked. ROITYPES for dwellings are 1 to 5, particularly need to check ROITYPE 1

This overlay shows the following:

- Red cross Incidents not checked
- Blue circles Incidents checked.

The following additional queries can be used to investigate anomalies in the dwelling incident data.

Feature	Criteria Name	Layout Name	Description
Incident	Q151 Incidents Not Checked	L150 Incidents – With IPCL Reason	Lists all incidents that have not been checked (i.e. ipclcheck <2)
Incident	Q161 Incidents Not Checked Casualties	L150 Incidents – With IPCL Reason	Lists incidents with casualties for a specified ROITYPE that have not been checked. Use ROITYPES 1 to 5.
Incident	Q168 All Incidents Checked But not moved	L150 Incidents – With IPCL Reason	Lists all incidents that have been checked but not yet moved. These incidents have still to be correctly located.

5.7.3. Overlay: Risk areas and groups– implementation of potential risk factor (PRF) in creating dwelling risk areas

FSEC advises that adjacent output areas are made into dwelling risk areas by identifying output areas that have common levels of (for example) lone pensioners. Where an F&RS has adopted this approach, it can be checked using the FSEC overlay:

- Overlay ► Dwelling Risk ► Create Areas and Groups ► Create Dwelling Risk Areas

Having created risk areas, the next objective is to group together those risk areas that have similar rates of incidents. This is achieved in two steps. First those with similar risk factors and are judged to have similar rates of incidents can be made into an initial set of (smaller) risk groups, perhaps each with fewer than 100,000 people. FSEC then presents the calculated casualty rate for these initial risk groups. The calculated rate may then be used to guide the merger of the initial set of risk groups into fewer but larger (of 100,000 or more people) risk groups. During this process, the analyst is meant to check the robustness of the risk group, as reported by FSEC, and attempt to merge risk areas and groups (with similar rates of incidents) until they are robust.

This process can be checked by discussion with the analyst and checking of any earlier datasets that show the initial risk groups. The following points may need to be explored:

Are the risk groups robust?

- Are the final risk groups a reasonable size, such as at least 100,000 people or are they small (such as under 50,000 people)?

If this approach has been adopted no further scrutiny is needed.

Some F&RS may, legitimately, create risk areas using other socio-demographic indicators, such as deprivation data. In these cases it is necessary to enquire:

- Has a defined and logical process been adopted?
- Did the process aim to create areas and risk groups of homogenous risk (similar rates of incidents)?

If areas with significantly different rates of incidents have been merged, this has the effect of ‘averaging’ the rate of incidents between a high and low risk area, and is therefore considered inappropriate.

5.7.4 Overlay: Risk areas – missing output areas and planning scenarios

Where the work in Stage 4 shows that there are output areas missing from risk areas the following overlay will show which output areas are missing. This overlay also shows which output areas do not have a planning scenario defined.

Review Overlay

- Turn off background map
- Select map scale 1:50,000
- Overlay►Define O165_DPS_OA
- Hide the black boundary for output areas

This overlay shows the following:

- Green hash All output areas.
- Black boundary Each output area
- Orange wash Each dwelling risk area labelled with the planning scenario.
- Red wash Each dwelling risk area without a planning scenario.

Check on those areas that are red. These require a planning scenario.

Alternatively use the FSEC Overlay

- Overlay►Create Area and Groups►Output Area to Dwelling Risk Area Check

5.7.5 Overlay: Risk groups – missing dwelling risk areas & planning scenarios

Where the work in Stage 4 shows that not all risk areas belong to a risk group the following overlay will show which are missing. This overlay also shows whether the dwelling risk areas have a planning scenario

Review Overlay

- Turn off background map
- Select map scale 1:50,000
- Overlay_Define O166_DRG_DRA
- Hide the DRA label

This overlay shows the following:

- Green hash All output areas.
- Orange wash Each dwelling risk area labelled with the planning scenario.
- Blue boundary Each dwelling risk group with a dwelling risk area.
- Red boundary Each dwelling risk group without a dwelling risk area.

Check for any red boundaries, as these must be associated to dwelling risk areas.

Alternatively use the FSEC Overlay

- Turn off background map
- Select map scale 1:50,000
- Overlay_Dwellings_Create Area and Groups_Dwelling Risk Area to Dwelling Risk Group Check

The following additional queries can be used to investigate anomalies in the dwelling risk groups.

Feature	Criteria Name	Layout Name	Description
Dwelling Risk Group	Q167 DRG Not Robust	L167 Dwelling Risks Groups	Lists dwelling risk groups that are not robust.
Dwelling Risk Group	Q169 Risk Group Missing PS – Dwellings	L167 Dwelling Risks Groups	Lists dwelling risk groups that do not have a dwelling planning scenario.

5.8 Special Services

5.8.1 Review discussions

The following areas may be explored with the F&RS:

- **Has the F&RS added additional data or taken steps to improve the data present?**
- **What approach has the F&RS taken to checking/ correcting incident location?**
 - Overlay Section 5.8.2
- **What approach was taken to identify incidents as ‘life risk’ incidents?**
 - TQ202
- **What approach has been taken for the creation of risk groups and risk areas?**
 - Overlay Sections 5.8.3, 5.8.4, 5.8.8

- **Has the linear feature been used for RTAs?**
 - Section 5.8.5
- **How have City, Town or Village risk areas and background risk areas been created?**
 - Section 5.8.65.8.7

The following queries may yield more detailed information for discussion:

- TQ202 – anomalous ratios may indicate skewed reporting practices and allows quality of the incident data to be viewed (TQ200 & 206 may be used for further investigation of the data, but not ratio comparison)
- TQ203 – shows output areas without special services risk areas
- TQ205 – Risk areas not in risk groups

5.8.2 Overlay: Incident location

Spot checks on the incidents location checks can be done using a separate overlay for each incident type.

FSEC Overlay

- Overlay ► Incidents ► Incident Location Check

Enter the ROITYPE number for the incidents to be checked. ROITYPES for special services are 6 to 14.

This overlay shows the following:

- Red cross Incidents not checked
- Blue circles Incidents checked.

The following additional queries can be used to investigate anomalies in the special services incident data.

Feature	Criteria Name	Layout Name	Description
Incident	Q201 Incidents – Special Services Not Checked	L150 Incidents – With IPCL Reason	List all special service incidents (ROITYPE 6 to 14) that have not been checked.
Incident	Q161 Incidents Not Checked Casualties	LL150 Incidents – With IPCL Reason	Lists incidents with casualties for a specified ROITYPE that have not been checked. Use ROITYPES 6 to 14.

5.8.3 Overlay: Risk areas – missing output areas and check on planning scenarios

This overlay can be used to check for output areas omitted from risk areas, and for checking the assignment of special service planning scenarios to risk areas.

Review Overlay

- Turn off background map
- Select map scale 1:50,000
- Overlay ► Define O206_SSRA_PS_OA
- Hide the black boundary for output areas

This overlay shows the following:

- Green hash All output areas.
- Black boundary Each output area
- Orange wash Each risk area labelled with the planning scenario.
- Red wash Each risk area without a planning scenario.

Check on those areas that are red. These require a planning scenario.

Alternatively use the FSEC Overlay

- Overlay ► Special Services_Create Area and Groups ► Road Traffic Accidents
- Overlay ► Special Services_Create Area and Groups ► Lift Rescue
- Overlay ► Special Services_Create Area and Groups ► Lockouts/lockins
- Overlay ► Special Services_Create Area and Groups ► Hazardous Materials
- Overlay ► Special Services_Create Area and Groups ► Line Rescue
- Overlay ► Special Services_Create Area and Groups ► Rescues from height
- Overlay ► Special Services_Create Area and Groups ► Water rescues
- Overlay ► Special Services_Create Area and Groups ► Other special services call risk areas

The following additional queries can be used to investigate anomalies in the special services incident data.

Feature	Criteria Name	Layout Name	Description
Special Services Risk Area	Q207 Risk Area Missing PS – SS	L150 Incidents – With IPCL Reason	Lists special services risk area that do not have a planning scenario
Special Services Risk Group	Q208 SSRG Missing PS	L150 Incidents – With IPCL Reason	Lists special services risk groups which do not have a planning scenario

5.8.4. General process check

Special service risk areas and groups are meant to be demarcated in such a way that areas of homogenous risk are created. It is necessary to first identify areas (risk areas) where the risk is different to the next area, and to then group risk areas into groups that have common or similar rates of incidents. The following guidance is noted for using in scrutinising the process applied by F&RS.

Risk areas and groups may be created, for each type of special service incident in turn, by:

- Creating an overlay plotting incidents, in order to discern how incidents are distributed and how they are related to features such as road, natural features (e.g. rivers) and areas of population
- Identifying areas by scrutiny of the overlay (to be merged) with either common levels of incidents, or common potential for incidents, and
- Identifying areas that need common type of response, e.g. motorways needing larger response than A road RTAs.

Taking some examples:

- All A roads in a F&RS may be made into areas and grouped on the basis they have a common rate of incidents along them
- A city tourist attraction with a history of line rescues (where visitors become trapped on slopes etc) may be made into a risk area separate from the rest of the city
- A natural feature, such as a reservoir or rock climbing area, may be made into a risk area separate from surrounding countryside.

Where, for example, it is judged that extrications follow populated areas, it may be reasonable to make all populated areas (i.e. towns) into a single risk group, after having made each town into a risk area, even if some towns lack any incidents. This could be judged as reasonable where the features in each town area similar and hence the potential for incidents is the same. It should be noted that with most categories of incidents, there will be few (if any) actual incidents in any one town or village.

Some further guidance is laid out below on specific issues to be checked.

5.8.5 Linear features

Where incidents occur along a linear feature, the linear feature facility should be used, and the risk area should therefore follow the linear feature. This serves the purpose of prompting FSEC to calculate the rate of incidents as a rate per linear kilometre rather than as a rate per square kilometre. This is likely to be important in the following types of situations:

- Where road traffic accidents occur along a road, such as an A road, in rural or suburban areas

- Where other types of incidents are related to and hence follow other types of linear features, such as water rescues occurring along a river, or HAZCHEM incidents occurring along a chemical tanker transport route.

The linear feature is less likely to be applicable where incidents occur on a more scattered basis across an area, such as RTAs occurring across urban areas.

5.8.6 City, town and village risk areas

In the case of extrications, other special services, lock-ins, lift release, HAZCHEM, RTAs (not those on arterial routes) and ladder rescues, it is common that they are concentrated in populated areas such as cities, towns and villages. Therefore, it is typical that an F&RS may create risk areas around populated areas. In these cases it is important to check:

- Has FSEC 'extended' the risk area into the countryside by catching an out of town output area?
- Is the distribution of incidents within a (for example) urban risk areas even, or should a city be split into inner and outer risk areas, for example?
- If towns have been made into a 'towns' risk group, is the rate of incidents the same in each town or do the towns differ in terms of either the rate of incidents or (say) one is more industrial than others?

5.8.7 Background risk areas

The countryside is commonly made into a background risk area. Care must be taken in whether a single background risk area is enough, or whether the number of incidents varies between one part of the countryside and another. For example:

- Does (say) the eastern countryside of an F&RS have more (say) extrications due to a higher level of agricultural activity than the western side that has (say) heath land? If so the two areas should be split.

In order to test the demarcation of risk areas, it is useful to (1) display the risk areas and (2) show the incidents on the same overlay, whilst also enquiring after the logic applied by the F&RS when creating the risk areas.

Review Overlay

- Turn off background map
- Select map scale 1:50,000
- Overlay ► Define O204_RA_SS6to14
- Hide the black boundary for output areas

This overlay shows the following:

- Colour coded Each risk area from dark red (very high) to pale green (very low)
- Blue boundary Each output area
- Red cross Each incident of the selected type

This overlay prompts for risk type, which is 6 to 14 (see Table 23).

5.8.8 Overlay: Risk groups – missing risk areas

Review Overlay

- Turn off background map
- Select map scale 1:50,000
- Overlay ► Define O207_SSRG_MissingSSRA

This overlay shows the following:

- Colour coded Each risk area from dark red (very high) to pale green (very low)
- Blue boundary Each output area
- Black cross Each risk group without a risk area

5.9 Other Buildings

5.9.1 Review discussions

The following should form the basis of the discussions:

- **What is the F&RS approach to other building site assessments?**
 - Guidance Section 5.9.2, 5.9.5
 - TQ254 – notes where default fire safety features have been changed
 - TQ255, TQ256, TQ257, TQ258, TQ259, TQ275, TQ276 & TQ277
- **What approach has been taken to checking and editing occupancy levels?**
 - TQ255
 - TQ257
- **Have site visits been undertaken and used to update FSEC?**
 - TQ256

- **How have HMOs and purpose built flats been added to the model? How was the data obtained?**
 - Guidance Section 5.9.3
 - TQ250
 - TQ273 – checks for the number of storeys for HMOs and purpose built flats
- **How has data reconciliation been achieved (i.e. augmenting Valuation Office data, particularly for care homes and hospitals)?**
 - Guidance Section 5.9.4
 - TQ250
- **How have building positions been checked?**
 - TQ251
 - TQ252
- **Have ‘other risks’ been defined – i.e. heritage, environmental, fire fighter, sole supplier or exceptional value been identified?**
 - TQ274
- **How have risk areas and risk groups been created?**
 - TQ260
 - TQ261
 - Guidance Section 5.9.6
 - Overlays Section 5.9.7, 5.9.8
- **How were planning scenarios matched to each other building and have they been varied by the time of day?**
 - TQ119
- What approach was taken in the creation of TGOBRAs?
 - TQ263
 - Guidance Section 5.9.6
 - Overlay Section 5.9.9

The following sections provide further guidance and additional queries and overlays which may be useful to highlight areas for discussion:

5.9.2 Overlay: Missing site assessments

Spot checks can be made on Site Assessments that are missing details using the following review overlay.

- Overlay ► Define O253_MissingOBSSiteAssessmentDetails

This overlay shows the following:

- Black boundary Each building
- Big red cross Buildings with no floor area, site assessment, address point or no valuation data.
- Big red circle Building with no address point
- Big blue circle Other building outline
- Yellow cross Address points
- Green cross Other building site assessments
- Black cross Valuation Data

Check on those areas that have a red cross.

The following additional queries can be used to investigate anomalies in the other building site assessment data.

Feature	Criteria Name	Layout Name	Description
Other Building Site Assessments	Q258 – OB More than 20 People at all times	L255 OB Site Assessment People	Lists all assessments where there are less than 20 people in all period. (Building types B,F,E,C,D,G)
Other Building Site Assessments	Q259 – OB At least 20 People in one time	L255 OB Site Assessment People	Lists all assessments where there are more than 20 people in any period. (Building types A,M,J,L)

5.9.3 Adding in HMOs and purpose built flats

As HMOs with three or more storeys account for a large, if not the majority, of societal risk it is important that they are added into FSEC. Tenements are counted as HMOs.

There is no single ‘best’ way as yet defined for how to identify HMOs of three or more storeys or purpose built flats of four or more storeys. The F&RS should be asked how they approached this task and to justify their method and evidence base.

Some reasonable sources of information include:

- Local authority records of licensed HMOs
- Site visits, touring areas to spot purpose built flats and houses (of three or more storeys) converted into flats
- GIS of multiple address points in areas of housing identified by tours as being three or more storeys

The following are not HMOs of three or more storeys:

- 3+ storey buildings with multiple occupancies, such as shops with a flat above it – unless the upper floors have more than one flat and the building used to be a house, or the upper floors comprises bed sits

- Buildings purpose made for multiple flats (except Scottish tenements)

It is considered unsafe to identify HMOs or tenements by simply:

- Applying a 'year of build' criteria
- Spotting multiple address points on a building without first checking the number of storeys and if they are purpose built flats

5.9.4 Philosophy checks of data reconciliation

The Valuation Office data is known to have omissions and errors in the categorisation of buildings. The Valuation Office do not list care homes, which are a key occupancy. The F&RS should review this data comparing with other sources of data that buildings are correctly identified in FSEC. It is advised that this process of reconciliation is prioritised with the highest priority awarded the higher risk occupancies (hospitals, care homes, hotels and hostels) and other very large buildings.

The reconciliation can use the F&RS fire safety files as a main input, to both spot omissions and to reconcile the building occupancies. Otherwise, miscellaneous sources may be used including local knowledge and Scottish care home commission data.

The F&RS should be asked how they have approached this task and to justify the information sources.

The F&RS may have opted to delete the Valuation Office data entirely and, typically, rely on fire safety files. In this case it should be checked how the F&RS is:

- Ensuring the property risk assessment to which non-certificated buildings contribute is being achieved
- Ensuring that non-certificated buildings that contribute to societal risk, especially hospitals, are included

5.9.5 Amending site assessments

It is advised that:

- The site assessments are amended progressively over a number of years
- It is not necessary to amend all site assessments before FSEC is run
- The occupancy level (MPL) for those types of other buildings with a default of <20 (shops, offices, factories, other buildings open to the public) are amended as a first priority based on fire safety files (i.e. noting those that have a fire certificate)

Other than amending MPL for certificated buildings it is advised that further site assessment work is:

- Prioritised for very large buildings, the higher risk occupancies (hospitals, care homes, HMOs, hotels and hostels), and/or areas of high risk
- Based on information from fire safety files for certificated buildings and by use of ‘generic’ risk assessments for HMOs and purpose built flats
- Further prioritised to identifying both large and very large buildings which have sprinklers

In addition, it is reasonable to use the ‘elastic’ feature to increase the number of storeys from the default of 1, as follows:

- Increase HMO storeys to 3
- Increase purpose built flats storeys to 4
- Increase hospitals, care homes, hotels, hostels, further education, schools and other sleeping accommodation storeys to 2
- Increase offices and other building open to the public storeys to 2

F&RS may judge it is necessary to visit buildings to achieve a more up to date assessment. However, FSEC has been designed such that site assessments can be completed using information in fire safety files. As HMOs, purpose built flats and hospitals may not be certificated, these may necessitate site visits.

Where a generic site assessment is applied, it is pertinent to check the following:

- Has a single generic assessment, such as rating all HMOs as higher risk, been applied where in fact the standard of fire safety varies from good to poor? In this case, it would be more appropriate to make a proportion of HMOs high risk and a proportion low risk based on the results of a sample of site assessments.

5.9.6 Creating risk areas, groups and TGOBRAs

The objective for the F&RS is to:

- First demarcate areas with a similar profile and mix of other buildings, such as demarcating business parks, industrial estates, multi-storey retail areas, areas of high rise flats, areas of 3+ storey HMOs/ tenements
- Make individual large buildings, especially high risk types such as hospitals, into risk areas of their own
- Group risk areas (non-adjacent) that have similar risk profile, such as grouping two non-adjacent business parks, into risk groups

The FSEC user may choose to apply a generic site assessment to all instances of a type of other building within a risk group. For example, all inner city ‘HMO groups’ may be assigned five storey, whilst outer city ‘HMO groups’ have a three storey value.

These two steps will ‘sum’ the risk in each risk group and read it back down to each output area. Next TGOBRAs are created by a semi-manual process. The objective is to minimise the gaps between TGOBRAs and ensure the majority of ‘high’ and ‘very high’ risk areas are covered by TGOBRAs. The TGOBRAs provide a measure of the risk of death that is used in judging the tolerability of the risk and hence the adequacy of the F&RS resourcing.

The following additional queries can be used to investigate anomalies in the other building data.

Feature	Criteria Name	Layout Name	Description
OA OBRA Results	Q272 OA Missing TGOBRA	L263 TGOBRA Missing H/VH Risk	Lists all output areas that don't have a TGOBRA defined.

5.9.7 Overlay: Missing output areas

FSEC Overlay

- Turn off background map
- Overlay_Other Buildings_Create Areas

This overlay shows the following:

- Red crosses Other building site assessments
- Blue boundary Each output area
- Grey hatch Building footprints
- Black grid Other building risk area
- Yellow wash Other building risk group

The following additional queries can be used to investigate anomalies in the other building data.

Feature	Criteria Name	Layout Name	Description
Output Area	Q270 Output Areas – PS for OBs	L117 OA PS Vehicles OB	Lists all output areas that don't have any other building planning scenarios.
Output Area	Q270 Output Areas – PS for OBs	L129 OA – PS Names for OB	As above but layout shows planning scenario names instead of numbers.
Output Area	Q271 Output Areas – PS for OBs	L117 OA PS Vehicles OB	Lists all output areas that don't have any other building planning scenarios but should have. (i.e. have a number of care homes but not care home planning scenarios)
Output Area	Q271 Output Areas – PS for OBs	L129 OA – PS Names for OB	As above but layout shows planning scenario names instead of numbers.

5.9.8 Overlay: Missing risk areas

FSEC Overlay

- Turn off background map
- Overlay_Other Buildings_Create Groups

This overlay shows the following:

- Black hatch Other building risk area
- Yellow wash Other building risk group

Has a single generic assessment, such as rating all HMOs as higher risk, been applied where in fact the standard of fire safety varies from good to poor? In this case, it would be more appropriate to make a proportion of HMOs high risk and a proportion low risk based on the results of a sample of site assessments.

5.9.9 Overlay to spot gaps in TGOBRAs

FSEC Overlay to view TGOBRAs:

- Overlay>Other Buildings>Other Buildings Output Overlay>TGOBRA Societal Risk Fires>TGOBRA Societal Risk Fire Rate for 24 Hours
- Overlay>Other Buildings>Other Buildings Output Overlay>TGOBRA Fatality Rates>TGOBRA Fatality Rate for 24 Hours

Additional overlays are available showing the Societal and Fatality rates for each of the individual time slots, rather than a summary for the 24 Hours.

This overlay shows the following:

- Red wash Very high or Well above average
- Orange wash High or Above average
- Yellow wash Medium or Average
- Turquoise wash Low or Below average
- Pale Green wash Very Low or Well below average

TGOBRAs will tend to have gaps between them. Whilst this is reasonable, it should be checked whether areas that are likely to have significant levels of societal or property risk have been poorly mapped, such as omitting large parts of city centres or industrial parks.

5.9.10 Check on other building planning scenarios

A pivot table (TQ119.xls) can be used to check which planning scenarios have been assigned to each type of other building in each time period. It should be noted that:

- The planning scenario may change between day and night, such as if the building is unoccupied at night
- The planning scenarios may differ between types of occupancies.

The F&RS should be asked how they decided on how to match planning scenarios to each occupancy and if/how they varied them by time of day.

5.10 Major Incidents

5.10.1 Review discussions

The following issues could be raised:

- **How were risk areas for each type of major incident defined?**
 - See guidance in Section 5.10.2
- **How were the risk levels for these areas allocated?**
 - See guidance in Section 5.10.3
 - TQ302

5.10.2 Creation of risk areas

The FSEC manual provides guidelines on how to rate the risk of major incidents in an area. There are two main checks:

- Has an important feature/risk been overlooked?
- Has a risk area been assigned an appropriate risk category?

Where a major incident risk area has been created and assigned a risk category, the area can be selected (using the overlay) and the F&RS asked to cite the evidence used to assign its risk category. Their evidence can be compared with the risk categorisation guidance in the FSEC manual. Clearly each risk area should have a planning scenario that matches the nature of the risk, such as boats for flood rescues, and heavy lifting units for railway incidents.

Also, where an area has been created, the precision/coarseness of its boundaries can be checked. Point features such as airports and chemical plants can be precisely mapped, linear features such as motorways can be traced, whilst more diffuse features such as the London Underground may be mapped by 'circling' the parts of London with underground routes rather than tracing each line.

Otherwise, it is useful to select an area and scrutinise it for features that commonly present major incidents risk, including:

- Any main line (intercity) railway terminals or intercity through routes?
- Any motorways?
- Any regional or international airports?
- Any petro-chemical plants, refineries or gas terminals?
- Any underground railway systems?
- Any major rivers or estuaries (prone to flooding) adjacent to low-rise housing or caravans?
- Any capitals or major cities that may be a terrorist target, especially those with key political sites such as parliaments and assemblies?
- Any ports or inshore shipping channels frequented by passenger ferries?

It would be pertinent to check if there has been correspondence with the Environment Agency regarding flood zones.

The following overlays can be used to display the risk areas and hence facilitate spot checks.

FSEC Overlay

- Overlay ► Major Incidents ► 38 Major Incident Risk Areas (All categories)

This overlay shows the following:

- Light purple Major vehicle risk area
- Deep orange Railway risk area
- Light steel blue Aircraft risk area
- Green Shipping risk area
- Mustard Yellow Hazardous materials risk area
- Brown Bombing risk area
- Light brown Flooding risk area

Alternatively use the following FSEC Overlay to view individual major incidents.

- Overlay_Major Incidents_Major Incident Risk levels (Individual Categories)_Major Vehicle Risk Level
- Overlay ► Major Incidents ► Major Incident Risk levels (Individual Categories) ► Railway Risk Level

- Overlay►Major Incidents►Major Incident Risk levels (Individual Categories)►Aircraft Risk Level
- Overlay►Major Incidents►Major Incident Risk levels (Individual Categories)►Shipping Risk Level
- Overlay►Major Incidents►Major Incident Risk levels (Individual Categories)►Hazardous Material Risk Level
- Overlay►Major Incidents►Major Incident Risk levels (Individual Categories)►Bombing Risk Level
- Overlay►Major Incidents►Major Incident Risk levels (Individual Categories)►Flooding Risk Level

This overlay shows the following:

- Orange High special services Risk Area
- Yellow Medium special services Risk Area
- Pale blue Special services Risk Area

5.10.3 Major incident planning scenarios and risk areas

This overlay can be used to check for output areas omitted from risk areas, and for checking the assignment of major incident planning scenarios to risk areas.

Review Overlay

- Turn off background map
- Select map scale 1:50,000
- Overlay►Define O306_MIRA_PS_OA
- Hide the black boundary for output areas

This overlay shows the following:

- Green hash All output areas.
- Black boundary Each output area
- Orange wash Each risk area labelled with the planning scenario.
- Red wash Each risk area without a planning scenario.

The overlay will prompt for the major incident type.

Check on those areas that are red. These require a planning scenario.

The following additional queries can be used to check on anomalies with major incident data.

Feature	Criteria Name	Layout Name	Description
Output Area	Q301 OAs Without MIRA	Output Areas	Lists all output areas that don't have a major incident risk area.
Output Area	Q304 OA Vehicle No Satisfied – For Major Incidents	L110 OA PS Vehicles MI	Lists all output areas where the planning scenario is not satisfied for vehicles.
Output Area	Q304 OA Vehicle No Satisfied – For Major Incidents	L127 OA PS Vehicles Exclude OB	As above but lists all non other building scenario numbers.
Output Area	Q304 OA Vehicle No Satisfied – For Major Incidents	L128 OA PS Names Vehicles Exclude OB	As above but lists all non other building scenario names
Output Area	Q305 OA Vehicle No Satisfied – For Major Incidents – PS Defined	L110 OA PS Vehicles MI	Lists all output areas where the planning scenario is not satisfied for vehicles where output area has a defined major incident scenario.
Output Area	Q305 OA Vehicle No Satisfied – For Major Incidents – PS Defined	L127 OA PS Vehicles Exclude OB	As above but lists all non other building scenario numbers.
Output Area	Q305 OA Vehicle No Satisfied – For Major Incidents – PS Defined	L128 OA PS Names Vehicles Exclude OB	As above but lists all non other building scenario names
Incident	Q161 Incidents Not Checked Casualties	L150 Incidents – With IPCL Reason	Lists incidents with casualties for a specified ROITYPE that have not been checked. Use ROITYPE 18.

5.11 FSEC Outputs

5.11.1 Review discussions

The following should form the basis of the discussion:

- **How does the predicted number of dwelling deaths in FSEC compare with the actual (reported) values?**
 - TQ152.xls
- **How does the predicted number of special services deaths in FSEC compare with the actual (reported) values?**
 - TQ200.xls
- **How does the predicted societal risk deaths compare to that estimated using Section 4.9.3?**
- **How does the predicted property loss compare to that estimated using Section 4.9.3?**

Where there are significant differences then the reviewer should look for reasons, for example:

- Reviewing the results of the text queries run in the previous stages of the process or
- Exploring other explanations for the divergence of results with the F&RS.

It should be noted that for F&RSs where the actual annual casualty figures are low (say below 5) then a larger percentage difference in predicted versus actual fatalities may be acceptable.

Stage 6 – Rating of Modules

6.1 Guidance

The results of the review can be summarised using the scheme below.

Module	Grading	Key points
Road network		
Stations, crews, costs and vehicles		
Dwellings		
Special services		
Other buildings		
Major incidents		

Grading	Meaning
A	Module has been completed with no further analysis or data cleansing needed
B	Module results are adequate with minor revisions needed
C	Module results have significant issues to be resolved
D	Data cleansing in progress/incomplete or needs revision
N/A	Module yet to be commenced

Appendix A – Loading data, running text queries, exports and overlays

This section of the document contains general instructions regarding functions of the WINGS system. It includes instructions for the following:

- Loading datasets sent by candidate review F&RSs
- Using text queries, i.e. running and saving text queries
- Export data
- Running overlays

A7.1 Loading the FSEC Datasets

The following instructions should be used to create a version of Wings that can be run for a different F&RS, in order to have multiple F&RS data on the machine.

1. Make a copy one of the brigade directories within the FSEC folder, e.g.
C:\FSEC\AuditBrigade
2. Rename the directory to reflect the F&RS e.g.
C:\FSEC\Lothian
3. Delete the existing contents and then copy the supplied F&RS ‘tables’ into the new F&RS tables directory e.g. into
C:\FSEC\Lothian\tables
4. Delete the existing contents and then copy the supplied F&RS data set into the new F&RS dataset directory as a new folder e.g.
C:\FSEC\Lothian\dataset\master
5. Edit the dslist file (using notepad) in the dataset folder e.g.
C:\FSEC\Lothian\dataset\dslist
6. This file lists the dataset names and the folder they reside in that are available within wings. The dataset name appears before the ‘b’ character and can be anything. The folder appears after the ‘b’ and must match exactly the name folder name of the dataset sent from the F&RS e.g.
Lothian Datasetb\Master
7. Save the file.
8. Go to the F&RS top level directory and edit the file (using notepad)
C:\FSEC\Lothian\PASSLOG.INI

9. Change all references from 'AuditBrigade' to the F&RS folder name e.g. 'Lothian' e.g.

SCRIPTS=C:\FSEC\AUDITBRIGADE\LOGON

To

SCRIPTS=C:\FSEC\LOTHIAN\LOGON

10. Save the file

11. Repeat the above edit steps (8 to 10) for the following files:

C:\FSEC\Lothian\WINGSUP.INI

C:\FSEC\Lothian\WINGSuper.INI

C:\FSEC\Lothian\WINGuser.INI

12. Go to the F&RS logon folder i.e.

C:\FSEC\LOTHIAN\LOGON

13. Repeat steps 9 and 10 for the following files:

C:\FSEC\LOTHIAN\LOGON\GLOBAL.INI

C:\FSEC\LOTHIAN\LOGON\super.scp

C:\FSEC\LOTHIAN\LOGON\user.scp

14. Finally copy the desktop shortcut for the review F&RS and rename it to reflect the new F&RS, e.g. Lothian

15. Click on the shortcut and choose the properties option from the menu. Amend the target directory to be the new F&RS folder e.g.

C:\FSEC\wings32\wings.exe C:\FSEC\Lothian

16. Close the properties dialog and run the shortcut. The username and password are the same as before. The dataset list should reflect that in the new F&RS. If it doesn't check that all the files have been amended correctly.

The contents of the 'Export' folder should be deleted from the newly created F&RS data folders to avoid confusion between text query outputs from the old AuditBrigade data and the new data.

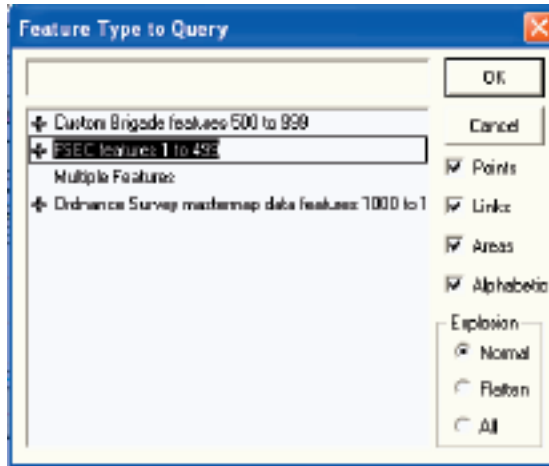
A7.2 Using Text Queries To Examine Results

Text queries are used to examine detailed results, which can be counted, listed or reported to the screen. Listed or reported results can also be copied to the pasteboard or saved to a file.

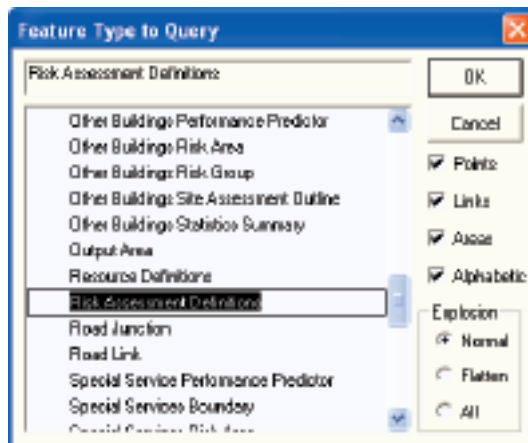
To run a text query:

- Select Action ➤ Text Query from the main menu.

This will display the following screen, listing the FSEC features that can be queried.



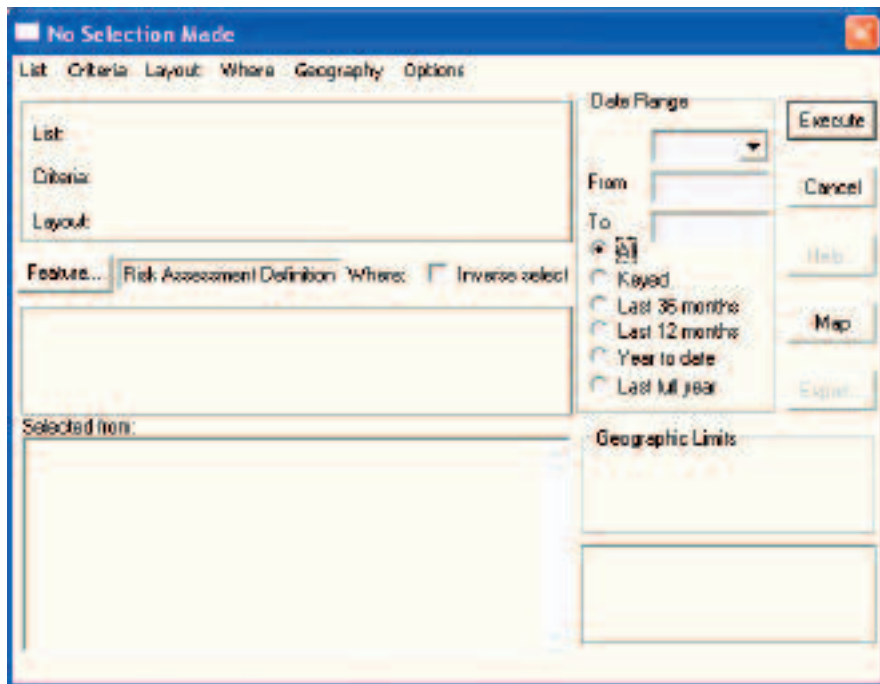
- Click on '+' alongside 'FSEC features 1 to 499' to expand selection



- Select the required feature
- Click the OK button

This will display the following screen showing the selected feature next to the feature button.

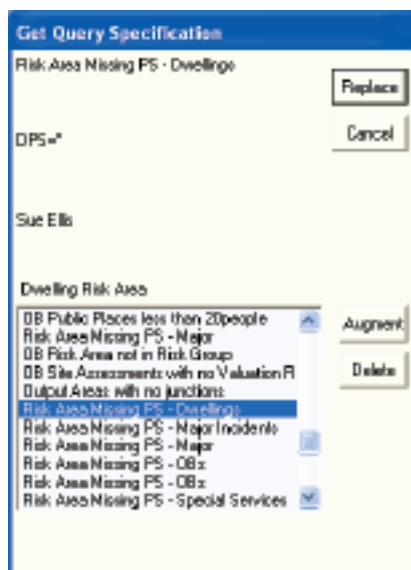
Note Clicking the feature button displays the 'Feature Type to Query' screen, which allows the feature to be changed.



A predefined 'where' clause can be used to extract a feature. This is done using the select criteria specification.

- Select Criteria ➤ Get from the menu.

A list of predefined 'where' conditions is displayed.



- Select the required criteria specification
- Click on the Replace button.

The Criteria name is then displayed on the Text Query screen.

To run the Criteria and retrieve a simple count of the number of items that would be reported.

- Select Layout ➤ Clear from the menu
- Click the Execute button

A predefined layout can be used to format the results of a query. This is done using the layout specification.

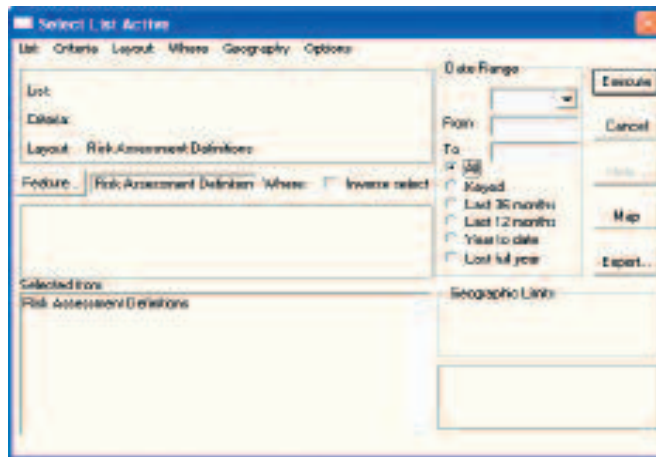
- Ensure the ‘All’ option is selected
- Select Layout ➤ Select Layout_Get from the menu.



Note The feature and selected for the text query determines what layouts are available. If the required layout is not listed ensure that the correct option (Counts, Reports, Listings or Tables) is included, and that the feature is correct.

- Tick the Listings check box
- Select the required Layout specification
- Click on the Get button.

The Layout name is then displayed in the Text Query screen.

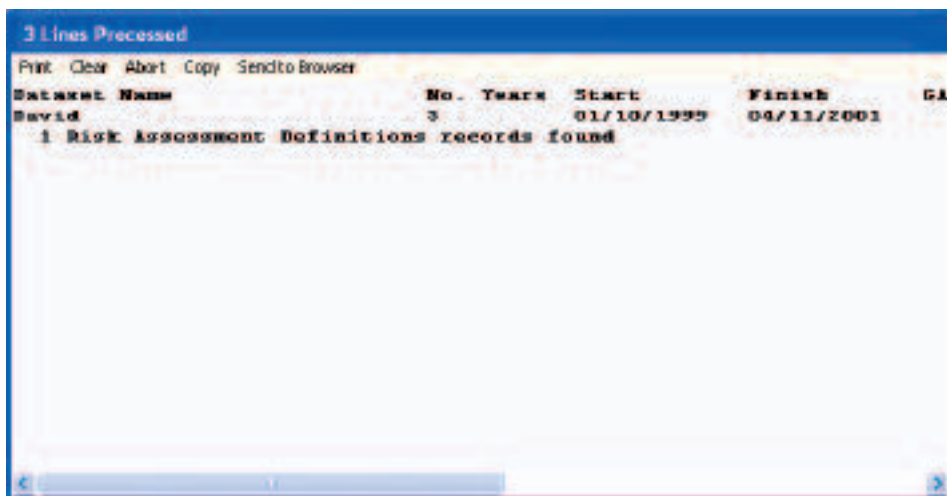


Executing the query will display the results in a window.

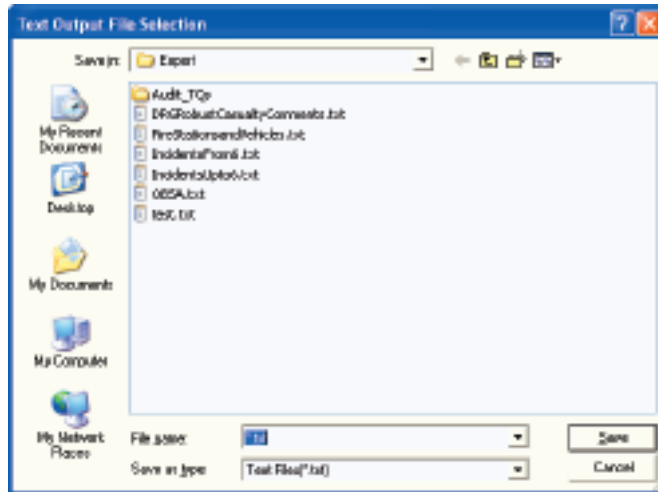
- Click on the Execute button

Note When doing Criteria to obtain a count, followed by a layout to view the counted data, answer ‘Yes’ to use the active list as this reduces time required producing the report.

The screen below displays the results of the query.



If the file is small enough it can be copied to the clipboard and pasted into MS-Excel. Larger files must be copied to a file before they can be processed.



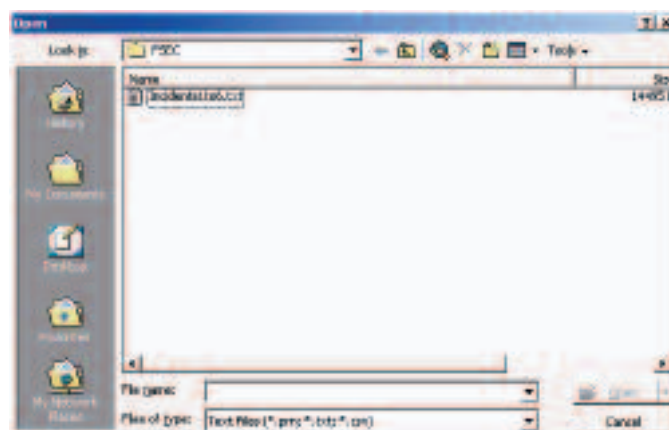
- Enter the name RAD.imp in the '**File name**' box
- Click on the '**Save in**' drop down box to change a location to save the file
- Click on the Save button

The file is now ready to import into Excel.

A7.4 Running Review Overlays

The review overlays are used to view/spot check issues raised by the review text queries run as part of Stage 3, and the reviewers findings in Stage 4. As part of the review installation program a number of predefined overlays have been added to the WINGS system. These overlays can be found in the folder 'C:\FCM\OVERLAYS\AUDIT'.

- From within WINGS
- Select Overlay ► Define from the main menu



- Browse to the folder 'C:\FCM\OVERLAYS\AUDIT'
- Select the required overlay file, e.g. O011_MissingRoad.ODF

If required, some of the items can be excluded from the initial display. This is done as follows:

- Scroll down the window until the required item is displayed
- Remove the tick from alongside the item or label
- Click on ok to run the overlay

Items can be added back into the overlay as follows:

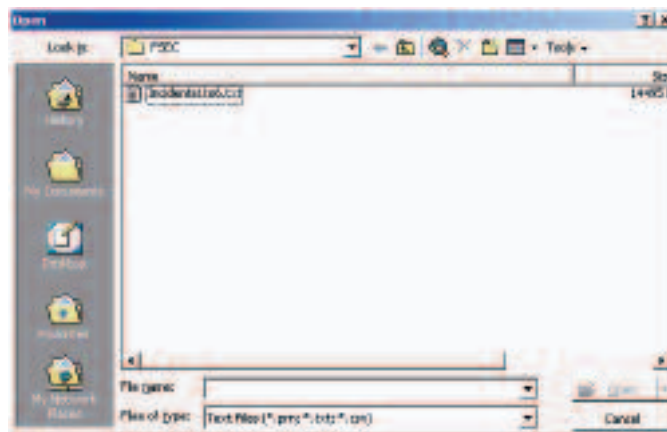
- Select Overlay ► Query from the main menu
- Add the tick back to the item or label
- Click on ok to run the overlay

Appendix B – How to import files into MS-Excel and run the review macros

B8.1 Importing Text Query Results into MS-Excel

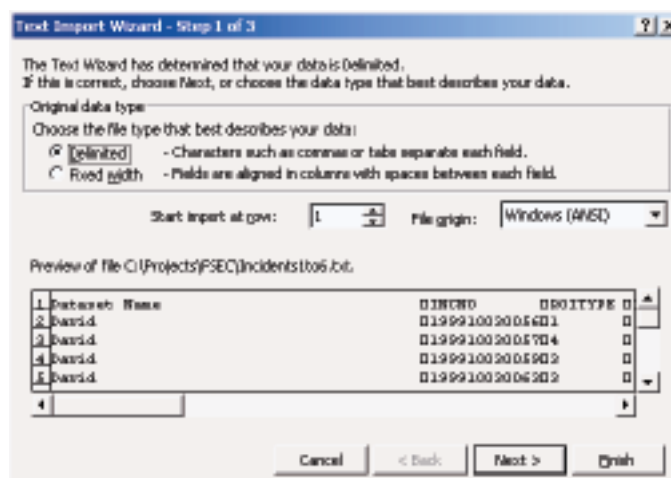
To import the query results files into MS-Excel

- Launch Excel
- Select File➤Open from the main menu



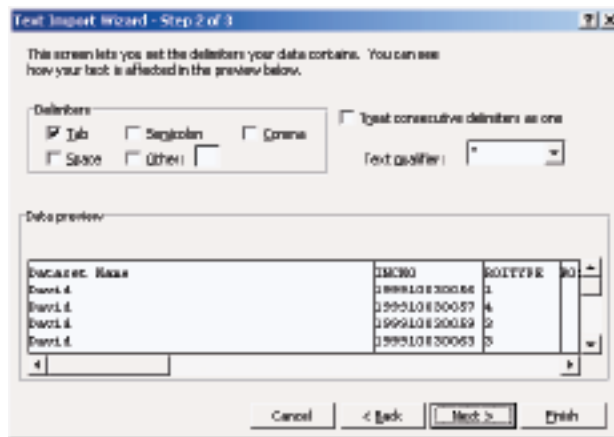
- Select Text Files from the 'Files of type' drop down list
- Select the file you wish to import
- Click on the Open button

This opens the MS-Excel import wizard and displays the following screen.



- Ensure the 'Delimited' option is selected
- Click on the Next button

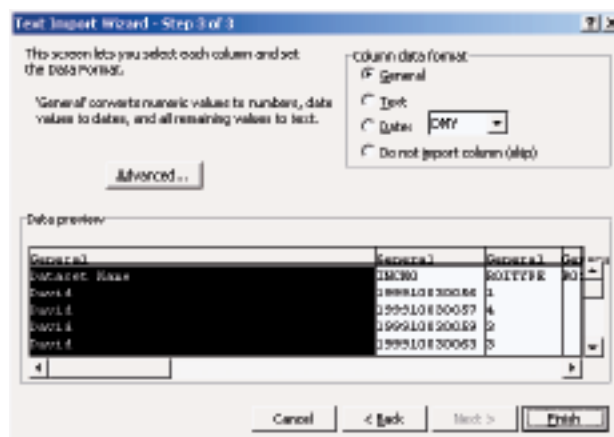
The following screen is displayed:



This screen is used to specify the delimiter that separates the columns of text file within the file. The delimiter for saved text query outputs (i.e. .txt files) is the Tab, and the delimiter for WINGS Export files (i.e. .imp) is the Comma.

- Tick the required delimiter, e.g. Tab (for .txt files)
- Ensure that all other check boxes are clear
- Click on the Next button

The following screen is displayed:



This screen is used to define the format of any columns. MS-Excel selects a default format based on the contents of the columns. The format is displayed above each column in the 'Data Preview' grid. In most cases the defaults can be accepted by selecting the Finish button.

If the imported data does not look correct then the default format may need to be changed. To do this repeat the import process and then change the column format following the instructions below.

- Highlight the required column
- Choose the appropriate ‘column data format’
- Repeat for each column that should be changed
- Click on the ‘Finish’ button to complete the import

The following formats are suggested for some of the data.

Incident Number (INCNO)	Text instead of General
Any date	Date in DMY format instead of General.

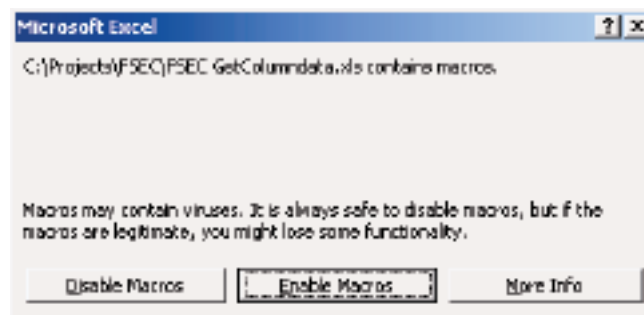
B8.2 How to Load and Run MS-Excel Review Macros

To run an MS-Excel macro, you first need to open the spreadsheet within MS-Excel. If the MS-Excel file is already open this step should be skipped.

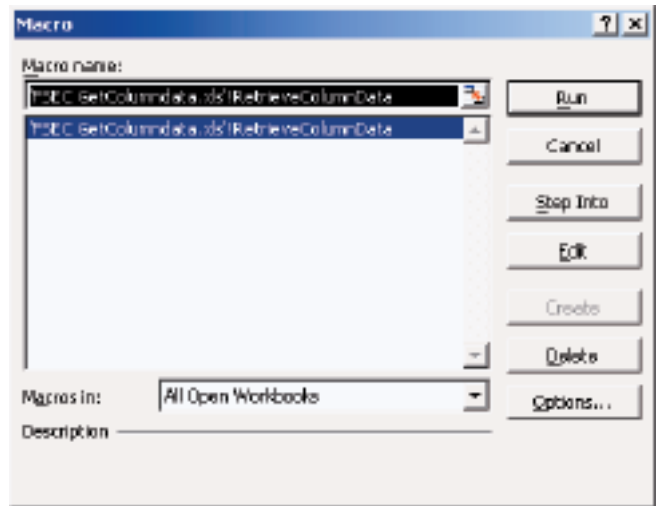
Note The MS-Excel files are located in the ‘C:\FCM\Audit’ folder.

- From within Ms-Excel
- Choose File►Open from the main menu
- Browse for the required macro file, e.g. ‘FSEC Get_ColumnData.xls’

You will be presented with a dialog box informing you that the Excel file contains macros:



- Click on the ‘Enable Macros’ button
- Select Tools_Macro_Macros from the main menu



- Ensure the ‘Macros in:’ combo-box is set to ‘All Open Workbooks’
- Select the required macro from the list, e.g. ‘RetrieveColumnData’
- Click on the Run button

If required, save the spreadsheet with the specified file name.

- Select File ► Save As from the main menu
- Save the Excel File with the specified name, e.g. RADDefaults.xls

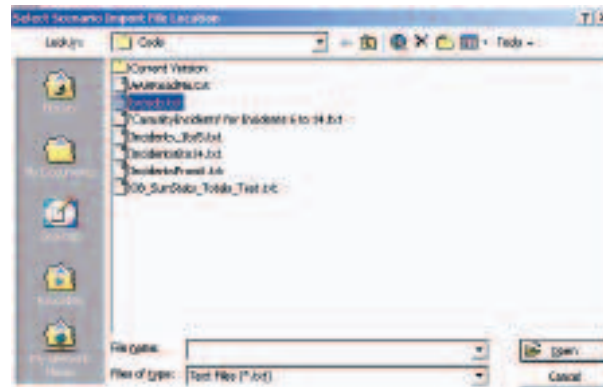
B8.3 How to Run Specific Macros

B8.3.1 Table comparisons macro

This macro uses the following input files. If the macro spreadsheet is not already then it should be opened following the instructions in the previous section of this document (Section 8.2).

Input File	MS-Excel File	Macro	Save Output
Brosdb.TXT	Macros.xls	UpdateTableComparisons	PSResources.xls

- Open the 'Table_Comparison.xls' Excel file
- Select Tools►Macro►Macros from the main menu
- Choose the 'UpdateTableComparisons' macro and click 'Run'
- The macro will display a 'Select' dialog, shown below

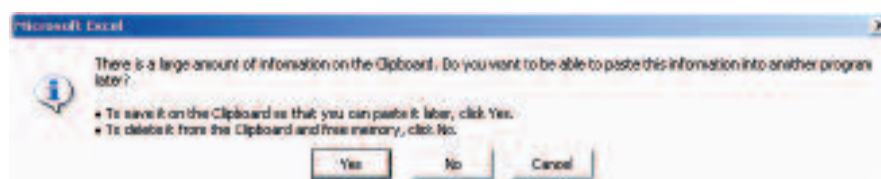


- Using this dialog window, select the 'brosdb' text file and then click the 'Open' button.

Note The macro assumes that all of the scenario files (bps.tab, crewing.tab, pspeed.tab, ranks.tab, risks.tab, vcost.tab and vtype.tab) are in the same location as the 'brosdb.txt' file. It will only request the location for this file. If the files are in different locations please move them all to the same folder before proceeding.

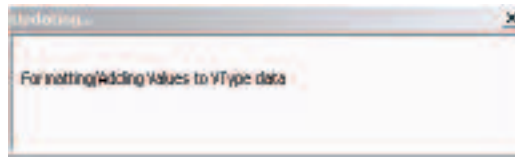
The macro will open this file and copy the required data to the Scenarios workbook. It will then create any additional validation data in the Scenario workbook.

When the copy has finished, the imported file will be closed. At this stage you may receive a dialog window asking you if you want to save the data currently on the clipboard (see below)



- If this dialog does appear, then click the No button.

Messages will be displayed during the process, to inform the user of the current stage (as shown below):



The macro will then proceed to open the other scenario related files.

- BPS.TAB
- CREWING.TAB
- PSPEED.TAB
- RANKS.TAB
- RISKS.TAB
- VCOST.TAB
- VTYPE.TAB

When the Macro has completed, you will be informed via a message box:



- Click on ok to acknowledge the message and then review the 'Table Comparison.xls' file.

Note If an error occurs during any part of the process, the macro will inform you. Click OK to accept the message.

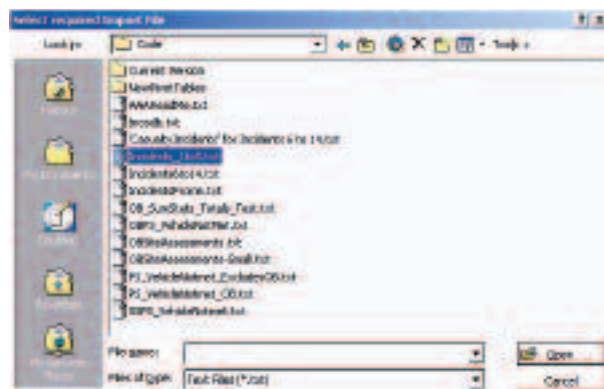
The macro will then continue to completion. i.e. if an error occurs during the import of the BPS.TAB file, the macro will continue and attempt to import any remaining files.

B8.3.2 Incidents

This macro is used to process the various incident data output files. If the macro spreadsheet is not already then it should be opened following the instructions in the previous section of this document (Section 8.2).

Input File	MS-Excel File	Macro	Save Output
TQ150_IncidentsDwellingsInjuries.txt	Macros.xls	UpdateIncidents	TQ150IncidentsDIInjuries.xls
TQ152_IncidentsDwellings.txt	Macros.xls	UpdateIncidents	TQ152IncidentsD.xls
TQ162_DwellingFires	Macros.xls	UpdateIncidents	TQ162IncidentsDFires.xls
TQ163_DwellingFiresNotChecked	Macros.xls	UpdateIncidents	TQ163IncidentsDFiresNotChecked.xls
TQ200_IncidentsSS.txt	Macros.xls	UpdateIncidents	TQ200IncidentsSS.xls
TQ300_IncidentsMI.txt	Macros.xls	UpdateIncidents	TQ300IncidentsSS.xls

- Open the 'Incidents.xls' Excel file
- Select Tools►Macro►Macros from the main menu
- Choose the 'UpdateIncidents' macro and click 'Run'
- The macro will display a 'Select' dialog, shown below



Using this dialog window, select the required text file and then click the 'Open' button.

The macro will open this file, remove any unwanted data and then copy this data to the Incidents spreadsheet. Once the data has been copied the Pivot Tables will be updated. The macro will keep you informed throughout each process:



When the Macro has completed, you will be informed via a message box:



- Click on ok to acknowledge the message and then review the 'Incident.xls' workbook.

Information about the Incident Workbook

The Incident workbook (Incident.xls) contains the following worksheets:-

Dwelling Summary

This sheet contains a table showing typical figures supplied from FSEC in relation to dwelling incidents. The table is used to compare the FSEC values against the imported F&RS incident data. The values are automatically calculated from the incident data, but they can be cross-checked using the following table.

Value Required	Location
Incident type 1 without ROF/ ROC/ ROF	All worksheet
Incident type 1 with 1+ ROF/ ROC/ ROF	All worksheet
Incident type 1	All worksheet
ROF	Fatalities worksheet
ROC	Casualties worksheet
ROR	Rescues worksheet
Incident Type 2	All worksheet

Special Services Summary

This sheet contains a table showing typical figures supplied from FSEC in relation to special services incidents. The table is used to compare the FSEC values against the imported F&RS incident data. The values are automatically calculated from the incident data, but they can be cross-checked using the following table.

Value Required	Location
Your 'n Casualty' Incidents	This value can be found on either the Casualties, Fatalities or Rescues worksheets
Your Fatalities	Fatalities worksheet
Your Casualties	Casualties worksheet
Your Rescues	Rescues worksheet

All

Contains the pivot table which shows the number of special services fatalities, casualties and rescues by incident types.

Cat A Special Services

Contains the pivot table that shows the number of special services by incident type

Fatalities

Contains the pivot table that shows the number of fatalities by incident type

Casualties

Contains the pivot table that shows the number of casualties by incident type

Rescues

Contains the pivot table that shows the number of rescues by incident type

Check Flag

Contains the pivot table that shows the number of 'check flags' by incident type

IncNo

Contains the pivot table that shows the number of incidents by date

Month and Year

Contains the pivot table that shows the number of incidents by month and year

Month and Year Chart

Contains a chart plotting the data in the month and year pivot table

Incident Data

Contains all the raw data used to generate the pivot tables

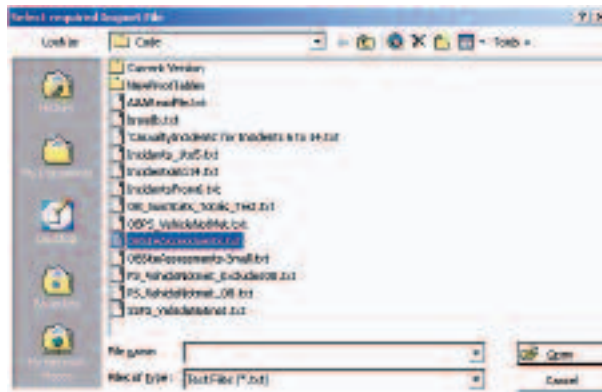
B8.3.3 Other building assessments

This macro is used to process the various incident data output files. If the macro spreadsheet is not already open then it should be opened following the instructions in the previous section of this document (Section 8.2).

Input File	MS-Excel File	Macro	Save Output
TQ255_OBSAPeople.TXT	Macros.xls	UpdateAssessments	TQ255_OBSAPeople.xls

- Open the ‘OB Assessments.xls’ Excel file
- Select Tools➤Macro➤Macros from the main menu
- Choose the ‘UpdateAssessments’ macro and click ‘Run’

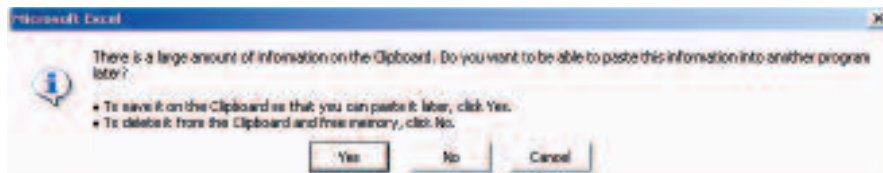
The macro will display a ‘Select’ dialog, shown below:



Using this dialog window, select the required text file and then click the ‘Open’ button.

The macro will open this file, remove any unwanted data and then copy this data to the Incidents spreadsheet.

When the copy has finished, the imported file will be closed. At this stage you may receive a dialog window asking you if you want to save the data currently on the clipboard (see below):



- If this dialog does appear, then click the ‘No’ button.

Once the data has been copied the pivot tables will be updated. The macro will keep you informed throughout each process:



When the Macro has completed, you will be informed via a message box:



- Click on 'OK' to acknowledge the message and then review the 'OB Assessment' file.

B8.4 Risk Area Planning Scenarios

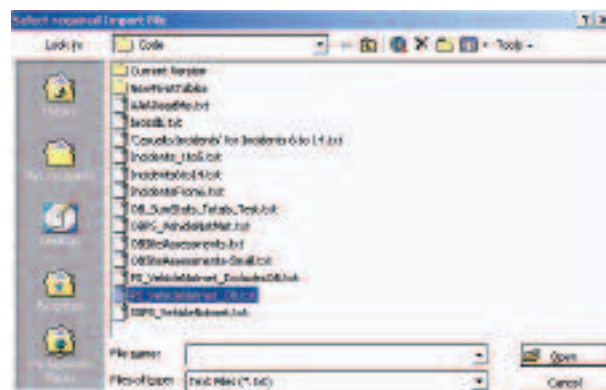
This macro uses the following input files. If the macro spreadsheet is not already then it should be opened following the instructions in the previous section of this document (Section 8.2).

Input File	MS-Excel File	Macro	Save Output
TQ127_OAPSNotBuilding.TXT	Macros.xls	UpdateBuildingScenarios	TQ119_OAPS_NotOB.xls
TQ130_OAPS_Building.TXT	Macros.xls	UpdateBuildingScenarios	TQ117_OAPS_OB.xls

- Open the required Excel file

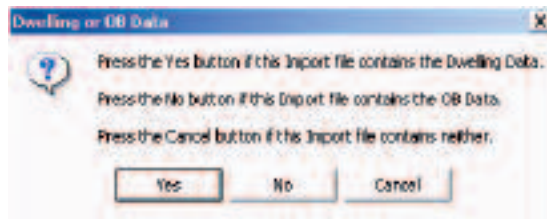
Excel Filename	Contents
Risk Area Planning Scenarios Not OB.xls	Data excluding other buildings
Risk Area Planning Scenarios OB.xls	Other buildings data only

- Select Tools➤Macro➤Macros from the main menu
- Choose the 'UpdateBuildingScenarios' macro and click 'Run'
- The macro will display a 'Select' dialog, shown below:



Using this dialog window, select the required text file and then click the 'Open' button.

The macro will then ask you to specify the type of data entered (see below):



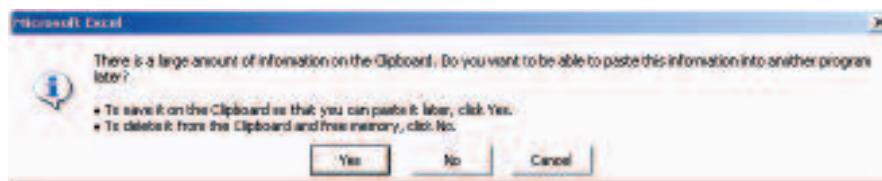
Click the 'Yes' button if the data is associated with dwellings.

Click 'No' if the data is associated with other buildings.

If you are not sure what data is in the Import file, then click 'Cancel' to stop the macro.

The macro will open this file, remove any unwanted data and then copy this data to the Incidents spreadsheet.

When the copy has finished, the imported file will be closed. At this stage you may receive a dialog window asking you if you want to save the data currently on the clipboard (see below):



- If this dialog does appear, then click the 'No' button.

Once the data has been copied the Pivot Tables will be updated. The macro will keep you informed throughout each process:



When the Macro has completed, you will be informed via a message box:



- Click on 'OK' to acknowledge the message and then review the excel file.

Appendix C – Standard review worksheets

Table 17 presents the progress checklist which is sent to the F&RS for completion in Stage 1.

An electronic copy of the checklist form can be opened by clicking on the icon below.



Table 17: Progress checklist

F&RS name:	Complete one box per row			
	No	In progress (state % complete)	Yes/ Completed	Completed & Checked by F&RS
Road networks, vehicles, crews and stations				
Have you completed the road network?				
Have all three stages of running the travel time matrix been completed?				
Have all crews & vehicles been created, and costs added to stations?				
Incident data				
Have you entered extra years of incident data?				
Dwellings				
Has the location of dwelling fire fatalities, casualties and rescues been checked?				
Have dwelling risk areas and groups been made and linked?				
Have dwelling planning scenarios been defined & applied?				
Special services				
Has the location of special service fatalities, casualties and rescues been checked?				
Have risk areas and groups made for each of the following:				
RTAs				
Extrications				
Other Special Services				

Table 17: Progress checklist (continued)

F&RS name:	Complete one box per row			
Date form completed:	No	In progress (state % complete)	Yes/ Completed	Completed & Checked by F&RS
Water rescues				
Line rescues				
Ladder rescues				
HAZCHEM				
Lift rescues				
Lock in/outs				
Have you defined special service planning scenarios for all risk areas?				
Other buildings				
Has the location of other buildings been checked?				
Have HMOs and purpose built flats been added into the other buildings data?				
Have site assessments been modified for HMOs, hotels, hostels, care homes, hospitals?				
Have site assessments been modified for large or very large other types of other buildings (e.g. very large shops, offices etc)?				
Have site assessments been modified for other types/sizes of other buildings?				
Have you created other building risk areas, groups and TGOBRAs?				
Have you defined other building planning scenarios for all risk areas?				
Major incidents				
Have you created risk areas made for all types of major incidents?				
Have you defined planning scenarios for all major incident risk areas?				
FSEC updates				
What is the FSEC Version number? (click on FSEC Version Checker)				

Table 18 presents the progress checklist which is sent to the F&RS for completion in Stage 1.

An electronic copy of the checklist form to be sent to the F&RS can be opened by clicking on the icon below.



Table 18: Project Management checklist

F&RS name:	Answer
Date form completed:	
Resourcing	
How many full time equivalent staff are currently working on FSEC?	
Have all of the FSEC team been trained on FSEC?	
If you have been trained on FSEC, who ran the training (ODPM or other)?	
Has the staffing of the FSEC team changed since the F&RS started using it?	
Project management	
Do you have a project manager/FSEC manager?	
If you have a project manager, what is their job title and rank?	
Do you have a project plan?	
If you have a project plan, do you have completion dates for tasks on your project plan?	
If you have a project plan, are you on target?	
Do you hold regular project management reviews?	
Quality control	
Do you have a coding system for maintaining version control of your FSEC datasets?	
How often do you back up and is there a back up control process?	
Do you have a procedure for ensuring the correct dataset is used and not overwritten?	
Prioritisation of FSEC work	
Do you have a schedule of prioritised FSEC work?	
Are your priorities consistent with guidance note 8? E.g.: <ul style="list-style-type: none"> • Complete geocoding of dwelling and special fatalities, casualties and rescues only (defer geocoding of all other incident data); • Correct the location of high risk other buildings only (Hs) • Create other building risk areas and groups before completing site assessments; • Run FSEC with pre-loaded road network before attempting to update road network 	

Appendix D – Standard review worksheets

The following Excel spreadsheet has been created as part of the review manual development and pilot review programme and may be useful for the reviewer to use to record findings at each stage of the review process.



Appendix E: Reference data

The data in Table 19 were obtained from the ODPM website in July 2005.

Table 19: Number of of fire stations in England at 31 March 2004

Fire & rescue services	Number of stations	Fire & rescue services	Number of stations
Avon	23	Lincolnshire	38
Bedfordshire & Luton	14	London	112
Buckinghamshire	20	Merseyside	26
Cambridgeshire	28	Mid & West Wales	57
Cheshire	24	Norfolk	40
Cleveland	15	North Wales	44
Cornwall	31	North Yorkshire	38
County Durham & Darlington	15	Northamptonshire	22
Cumbria	38	Northumberland	19
Derbyshire	31	Nottinghamshire	25
Devon	58	Oxfordshire	24
Dorset	26	Royal Berkshire	20
East Sussex	24	Shropshire	23
Essex	51	Somerset	24
Gloucestershire	20	South Wales	50
Greater Manchester	41	South Yorkshire	24
Hampshire	52	Staffordshire	30
Hereford & Worcester	27	Suffolk	35
Hertfordshire	32	Surrey	24
Humberside	32	Tyne & Wear	19
Isle Of Wight	10	Warwickshire	19
Isles Of Scilly	6	West Midlands	41
Kent	66	West Sussex	28
Lancashire	39	West Yorkshire	49
Leicestershire	20	Wiltshire	25

The data in Table 20 were obtained from the Census 2001 data presented on the National Statistics website (http://www.statistics.gov.uk/census2001/region_county.asp#region).

Table 20: Population Count English F&RS Areas 2001

F&RS Area	All people resident in households	All people resident in Communal Establishments	Total
Bedfordshire County	376679	4893	381,572
Buckinghamshire County	469848	9178	479,026
Cambridgeshire County	532707	19951	552,658
Cheshire County	664929	8859	673,788
Cornwall and the Isles of Scilly	492852	8415	501,267
Cumbria	478810	8797	487,607
Derbyshire County	725667	8918	734,585
Devon County	684482	20011	704,493
Dorset County	380125	10855	390,980
Durham County	481729	11741	493,470
East Sussex County	479550	12774	492,324
Essex County	1294077	16758	1,310,835
Gloucestershire	553900	10659	564,559
Hampshire County	1214514	25589	1,240,103
Hertfordshire	1018872	15105	1,033,977
Kent County	1302329	27389	1,329,718
Greater Manchester (Met County)	2444165	38163	2,482,328
Merseyside (Met County)	1337523	24503	1,362,026
South Yorkshire (Met County)	1248808	17530	1,266,338
Tyne and Wear (Met County)	1058855	17083	1,075,938
West Midlands (Met County)	2519721	35871	2,555,592
West Yorkshire (Met County)	2050135	29076	2,079,211
Lancashire County	1111554	23420	1,134,974
Leicestershire County	596120	13458	609,578
Lincolnshire	635026	11619	646,645
Norfolk	779700	17028	796,728
Northamptonshire	619987	9689	629,676
Northumberland	301959	5231	307,190
North Yorkshire County	552998	16662	569,660
Nottinghamshire County	738168	10342	748,510
Oxfordshire	581178	24310	605,488
Shropshire County	274747	8426	283,173
Somerset	485481	12612	498,093
Staffordshire County	793470	13274	806,744
Suffolk	656093	12460	668,553
Surrey	1032781	26234	1,059,015
Warwickshire	499596	6264	505,860
West Sussex	736880	16734	753,614
Wiltshire County	420315	12658	432,973
Worcestershire County	532823	9284	542,107
London	7078632	93459	7172091
Total	40,237,785	725,282	40,963,067

The data in Table 21 were obtained from the ODPM website (http://www.odpm.gov.uk/stellent/groups/odpm_fire/documents/divisionhomepage/039819.hcsp).

Table 21: Dwelling Deaths per Year

F&RS Area	Deaths per Year			
	1999	2000	2001	Average
Avon	8	4	6	6.0
Bedfordshire	1	5	3	3.0
Berkshire	2	5	4	3.7
Buckinghamshire	4	7	4	5.0
Cambridgeshire	3	3	2	2.7
Cheshire	9	6	7	7.3
Cleveland	4	1	5	3.3
Cornwall	2	4	5	3.7
Cumbria	3	3	5	3.7
Derbyshire	8	9	5	7.3
Devon	4	7	3	4.7
Dorset	8	1	7	5.3
Durham	9	6	5	6.7
East Sussex	5	3	3	3.7
Essex	5	10	8	7.7
Gloucestershire	1	2	1	1.3
Hampshire	8	9	7	8.0
Hereford & Worcs	2	3	2	2.3
Hertfordshire	4	6	6	5.3
Humberside	5	7	7	6.3
Isle of Wight	0	0	2	0.7
Kent	6	9	12	9.0
Lancashire	15	17	14	15.3
Leicestershire	3	4	5	4.0
Lincolnshire	3	4	4	3.7
Norfolk	5	8	5	6.0
North Yorkshire	5	2	3	3.3
Northamptonshire	4	3	2	3.0
Northumberland	2	1	6	3.0
Nottinghamshire	9	3	6	6.0
Oxfordshire	6	1	3	3.3
Shropshire	2	8	2	4.0
Somerset	1	1	5	2.3
Staffordshire	6	8	7	7.0
Suffolk	2	4	5	3.7
Surrey	3	6	2	3.7
Warwickshire	2	6	4	4.0
West Sussex	7	3	2	4.0
Wiltshire	1	0	4	1.7
Isles of Scilly	0	0	0	0.0
Greater Manchester	32	22	27	27.0
Merseyside	11	21	16	16.0
South Yorkshire	10	10	19	13.0
Tyne & Wear	5	5	6	5.3
West Midlands	21	26	23	23.3
West Yorkshire	21	22	12	18.3
Greater London	61	45	63	56.3
North Wales	3	3	7	4.3
Mid and West Wales	5	14	9	9.3
South Wales	10	8	7	8.3

The data for Table 22 were obtained from the ODPM website and may be used as a guide when checking the number of vehicles entered by the F&RS

(http://www.odpm.gov.uk/stellent/groups/odpm_fire/documents/page/odpm_fire_035604.xls).

Table 22: F&RS Vehicles (March 2003)

	Front-line Appliances			Reserve Appliances		
	Front-line pumping appliances	Front-line aerial appliances	Front-line special appliances	Reserve pumps	Reserve aerials	Reserve specials
FCDA's and FEPA'						
Greater Manchester	67	9	17	14	4	3
London	185	16	33	0	0	0
Merseyside	42	5	7	7	0	1
South Yorkshire	33	3	7	5	1	1
Tyne & Wear	33	3	6	7	0	1
West Midlands	62	8	5	13	2	3
West Yorkshire	65	7	7	14	2	1
TOTAL	487	51	82	60	9	10
ENGLAND						
Avon	37	6	18	8	0	0
Bedfordshire & Luton	22	2	15	4	0	0
Buckinghamshire	31	2	7	2	0	0
Cambridgeshire	38	2	9	8	0	1
Cheshire	37	3	17	7	0	0
Cleveland	23	2	5	3	0	0
Cornwall	43	2	30	9	0	3
County Durham & Darlington	27	2	7	3	0	0
Cumbria	50	3	13	6	0	1
Derbyshire	44	3	10	6	0	0
Devon	81	5	20	11	0	1
Dorset	41	2	24	6	1	0
East Sussex	38	4	9	7	1	0
Essex	72	5	12	15	0	3
Gloucestershire	33	2	14	6	0	0
Hampshire	76	3	34	13	0	1
Hereford & Worcester	43	3	14	8	0	0
Hertfordshire	43	3	5	6	0	1
Humberside	50	6	6	9	0	0
Isle Of Wight	16	2	6	2	0	0
Isles Of Scilly	2	0	5	1	0	0
Kent	87	7	17	13	1	2
Lancashire	63	5	12	7	0	1
Leicestershire	33	2	12	6	0	0
Lincolnshire	48	3	8	4	0	0
Norfolk	52	3	10	8	0	0
North Yorkshire	45	3	18	5	1	0
Northamptonshire	28	2	6	5	0	0
Northumberland	24	0	0	3	0	0
Nottinghamshire	36	2	7	6	1	1
Oxfordshire	35	1	7	6	1	0
Royal Berkshire	24	2	5	6	0	1
Shropshire	33	2	11	4	0	3
Somerset	40	3	18	0	0	0
Staffordshire	48	4	13	11	0	0
Suffolk	47	2	12	4	0	0
Surrey	36	3	19	12	0	0
Warwickshire	26	1	6	5	0	1
West Sussex	46	2	28	10	0	1
Wiltshire	35	2	13	6	0	0
TOTAL	1,633	111	502	261	6	21
WALES						
Mid & West Wales	72	4	33	12	0	0
North Wales	54	4	27	9	0	0
South Wales	64	5	49	19	1	1
TOTAL	190	13	109	40	1	1
GRAND TOTAL	2,310	175	693	361	16	32

The data in Table 23 were obtained from the FSEC Manual, Volume 1 Appendix 1.

Table 23: Incident Types

Incident Type	Description	Incident Type	Description
1	FDR1 Dwellings	13	Water rescues
2	FDR1 Other buildings	14	Other special services
3	FDR1 Other (properties other than buildings) including vehicles	15	False alarm malicious
4	FDR3 Secondary fires	16	False alarm good intent
5	FDR3 Chimney fires	17	False alarm equipment
6	RTAs (not including fires in vehicles)	18	Major incident
7	Extrications	19	Standby
8	Lift rescues	20	Over the border
9	Lockins/outs	21	Other with mobilisation
10	HAZCHEM	22	Other without mobilisation
11	Line rescues	23	Late call
12	Ladder releases		

Appendix F – Glossary

The following is a list of Acronyms and Abbreviations used within the Review Manual

Acronym	Description
Cat A	Any incident involving one or more fatalities, rescues or casualties.
CFO	Chief Fire Officer
CFS	Community Fire Safety
DCFO	Deputy Chief Fire Officer
DRA	Dwelling Risk Area
DRG	Dwelling Risk Group
ET	Emergency Tender
FF	Fire Fighter
F&RS	Fire and Rescue Service
FEU	Fire Experimental Unit
FSEC	Fire Service Emergency Cover (Toolkit)
GLA	Greater London Authority
HMO	House of Multiple Occupancy
Incident Type	See Table 23 for definitions
IPCL	Incident Position Confidence Level
ISU	Incident Support Unit
LFF	Leading Fire Fighter
MISU	Major Incident Support Unit
MPL	Maximum Potential Loss
OA	Output Area
OB	Other Building
OBRA	Other Building Risk Area
ODPM	Office of the Deputy Prime Minister
PDA	Pre Determined Attendance
PS	Planning Scenario
RA	Risk Area
RADS	Risk Assessment Definition
ROC	Record of Casualty
ROF	Record of Fatality
ROITYPE	Record of Incident Type
ROR	Record of Rescue
RTA	Road Traffic Accident
SS	Special Services
TGOBRA	Time Generated Other Building Risk Area
TOT	Turn Out Time
TQ	Text Query
VO	Valuation Office