TRAINING NEEDS ANALYSIS
CABIN CREW FIRE TRAINING

A study carried out on behalf of the UK Civil Aviation Authority

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TRAINING NEEDS ANALYSIS
CABIN CREW FIRE TRAINING

"To evaluate current and possible future issues, and identify potential improvements to existing fire training in order to ensure that cabin crew members have the most appropriate training and procedures to match current and likely future fire threats."

TRAINING NEEDS ANALYSIS
CABIN CREW FIRE TRAINING

PRIMARY TASKS

- REVIEW OF CURRENT CABIN CREW TRAINING
- ON-LINE SURVEY
- FIRE TRAINING IN NON-CIVIL AIRCRAFT ENVIRONMENTS
- REVIEW OF IN-SERVICE OCCURRENCES

TASK 1- REVIEW OF CURRENT CABIN CREW TRAINING

REVIEW OF CABIN CREW FIRE TRAINING PROGRAMMES

U.K. / NON-U.K. EUROPEAN AIRLINES

TASK 1- REVIEW OF CURRENT CABIN CREW TRAINING

8 U.K. and 2 Non-U.K. European Operators/ Training Organisations were visited to benchmark current training practices.

A cross-section of types of operation and aeroplane types were reviewed during the visits.

TASK 1- REVIEW OF CURRENT CABIN CREW TRAINING

The broad objectives of Task 1 were to carry out a review of current training both in absolute terms and in relation to the European requirements.

- **Duration of the training**
- **Firefighting equipment used in training**
- **Types of fires**
- **Crew communications**
- **Interface with Flight Crew and Flight Crew training**
- **Required urgency of response to an in-flight fire event**
- **Evaluation criteria**
- **Compatibility of training, Training Manuals and Operations Manuals**
- **Other issues (e.g. Single Cabin Crew Operations, Cabin Crew clothing, procedures of Ground-Based Emergency Services at aerodromes)**

TASK 1- REVIEW OF CURRENT CABIN CREW TRAINING

This review formed a basis for the direction of subsequent tasks and identified areas where there might be potential for improvement – both in terms of recommended best practice and regulatory change.

TASK 2 - ON-LINE SURVEY

SURVEY DIRECTED PRIMARILY AT CABIN CREW, FLIGHT CREW AND CABIN CREW TRAINING INSTRUCTORS

TASK 2 - ON-LINE SURVEY

- **Online Survey - cabin crew, flight crew, instructors and other interested parties to comment based on a questionnaire.**
- **The survey was publicised through various media, including:**
    - **A UK CAA FODCOM & Press Release**
    - **Conferences**
    - **Links from aviation authorities websites and aviation safety-related websites.**

TASK 2 - ON-LINE SURVEY

QUESTIONS ASKED:

- **Background information and experience with in-flight fire occurrences**
- **Attitude/perception towards statements related to the adequacy and content of fire training**
- **Attitude/perception towards statements related to the realism of the practical fire training**
- **Attitude/perception towards statements related to the adequacy of procedures related to in-flight fire events**
- **Problems encountered during fire-fighting**
- **Suggestions for improvements**

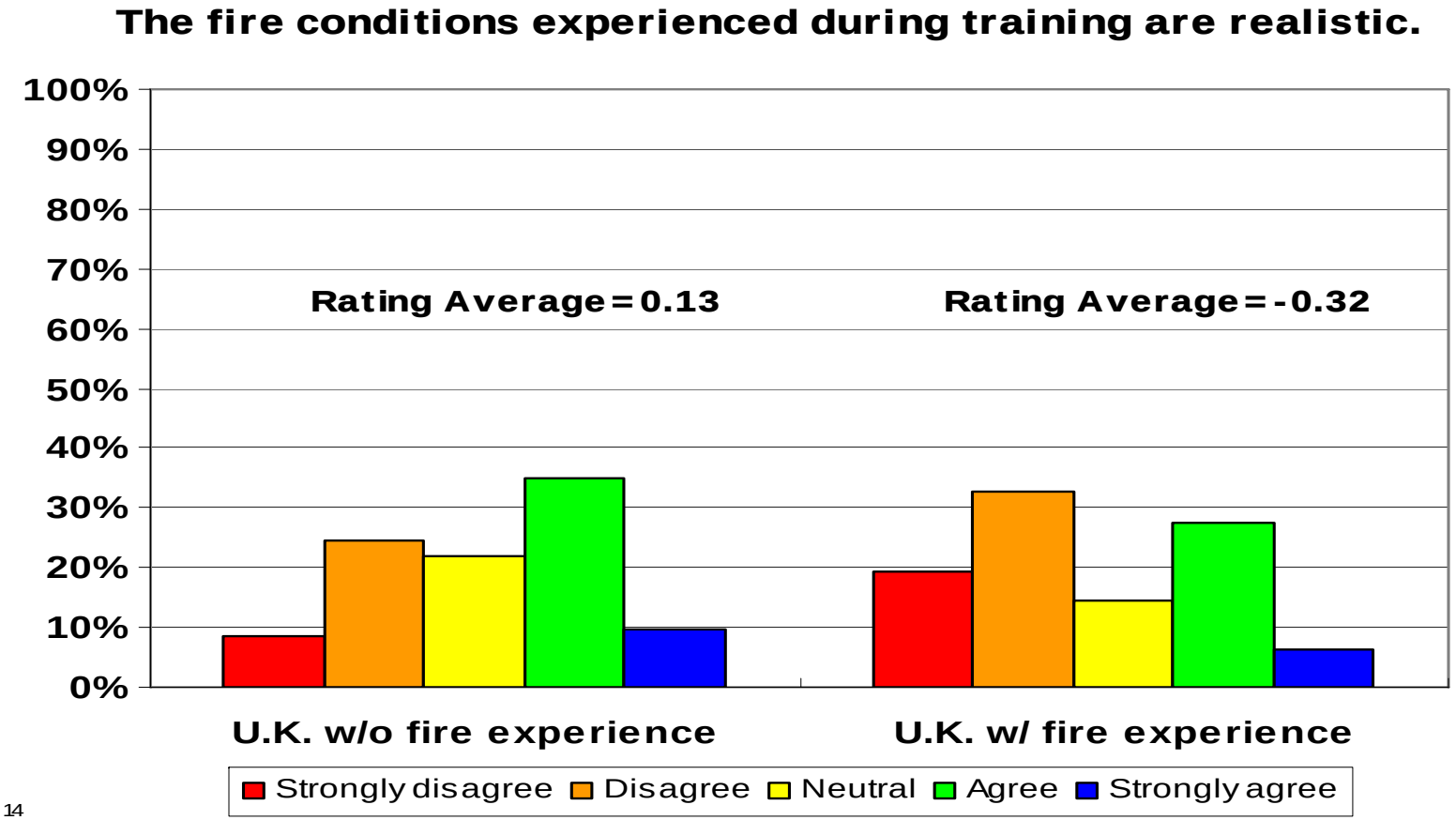
TASK 2 - ON-LINE SURVEY

RESPONSE:

- **Between 19 October 2007 – 13 January 2008, 2164 respondents from 66 countries in Europe, Asia Pacific, Africa, North America and South America completed the survey.**
- **A database was constructed from the online survey responses to enable analysis of information**

TASK 2 - ON-LINE SURVEY

Example of Responses to Survey Question:



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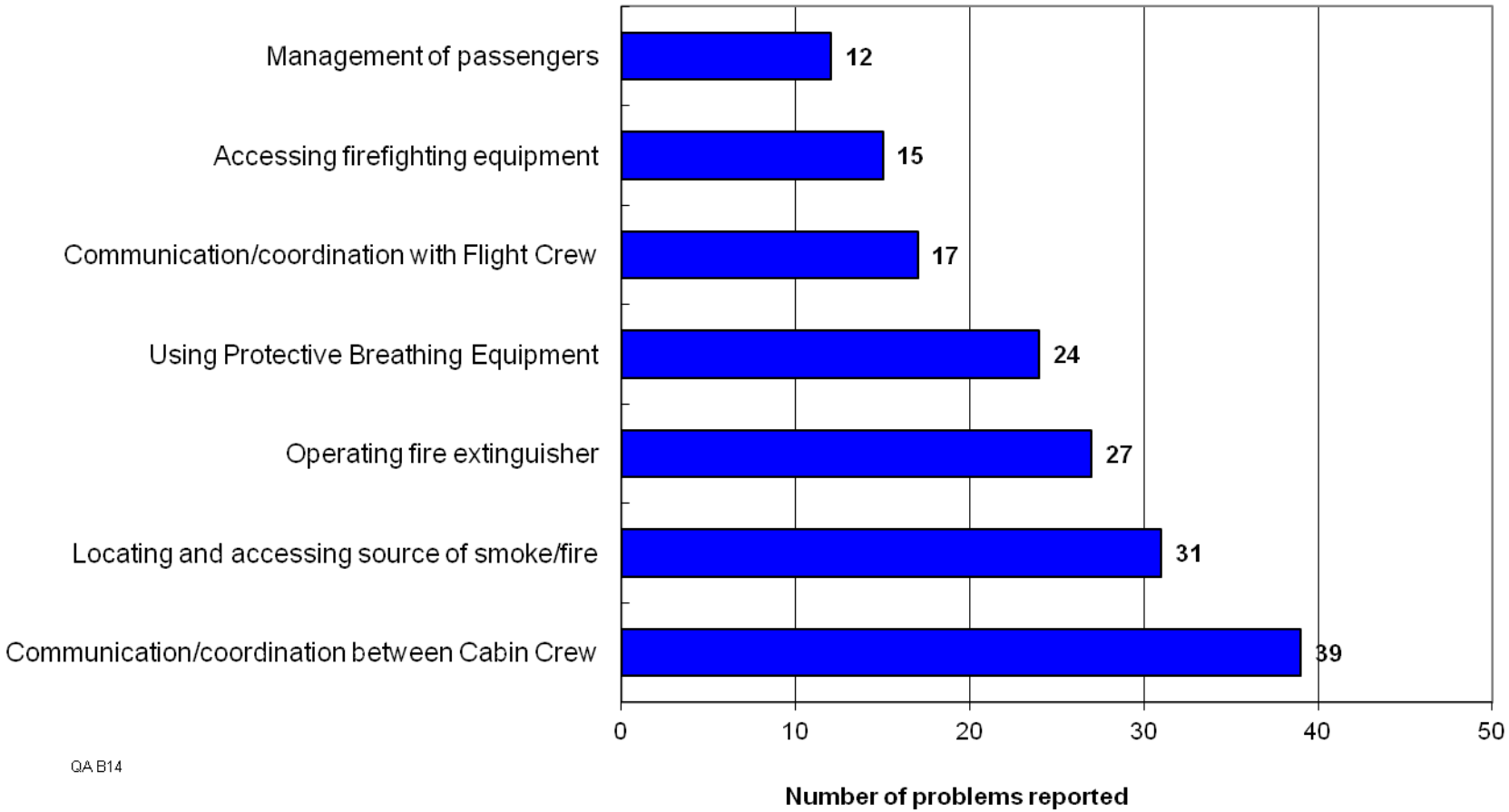
TASK 2 - ON-LINE SURVEY

Example of Responses to Survey Question *"The fire conditions experienced during training are realistic"*:

"Nothing about the practical training is realistic. In my previous job on the continent we had fight real oil fires and this with real CO2 or BCF. This made you realize the danger and the need the know what to do with the correct equipment. Unfortunately as I have been told real training will be too costly and too dangerous, so we will never be able to have a good standard in the UK. So let us concentrate on preventing instead of curing."

(Flight Crew) – Strongly Disagree; No Experience With In-flight Fire

TASK 2 - ON-LINE SURVEY - PROBLEMS ENCOUNTERED DURING FIREFIGHTING



U.K., 165 problems from 81 respondents

TASK 3 - FIRE TRAINING IN NON-CIVIL / NON-AIRCRAFT ENVIRONMENTS

COMPARISON WITH CURRENT FIRE PROTECTION TRAINING IN NON-CIVIL AVIATION SITUATIONS

TASK 3 - FIRE TRAINING IN NON-CIVIL / NON-AIRCRAFT ENVIRONMENTS

Organisations responsible for fire protection training in non-civil aviation, difficult to escape situations were visited to gain an understanding of the details of their training programmes.

- **Royal Air Force (VC-10 Crew Training)**
- **Royal Navy (Submarine Crew Training)**
- **Tunnel Train Operator (Onboard Crew Training)**

TASK 3 - FIRE TRAINING IN NON-CIVIL / NON-AIRCRAFT ENVIRONMENTS

Royal Air Force Crew Training

RAF Brize Norton Air Crew Smoke and Fire Training Facility

TASK 3 - FIRE TRAINING IN NON-CIVIL / NON-AIRCRAFT ENVIRONMENTS

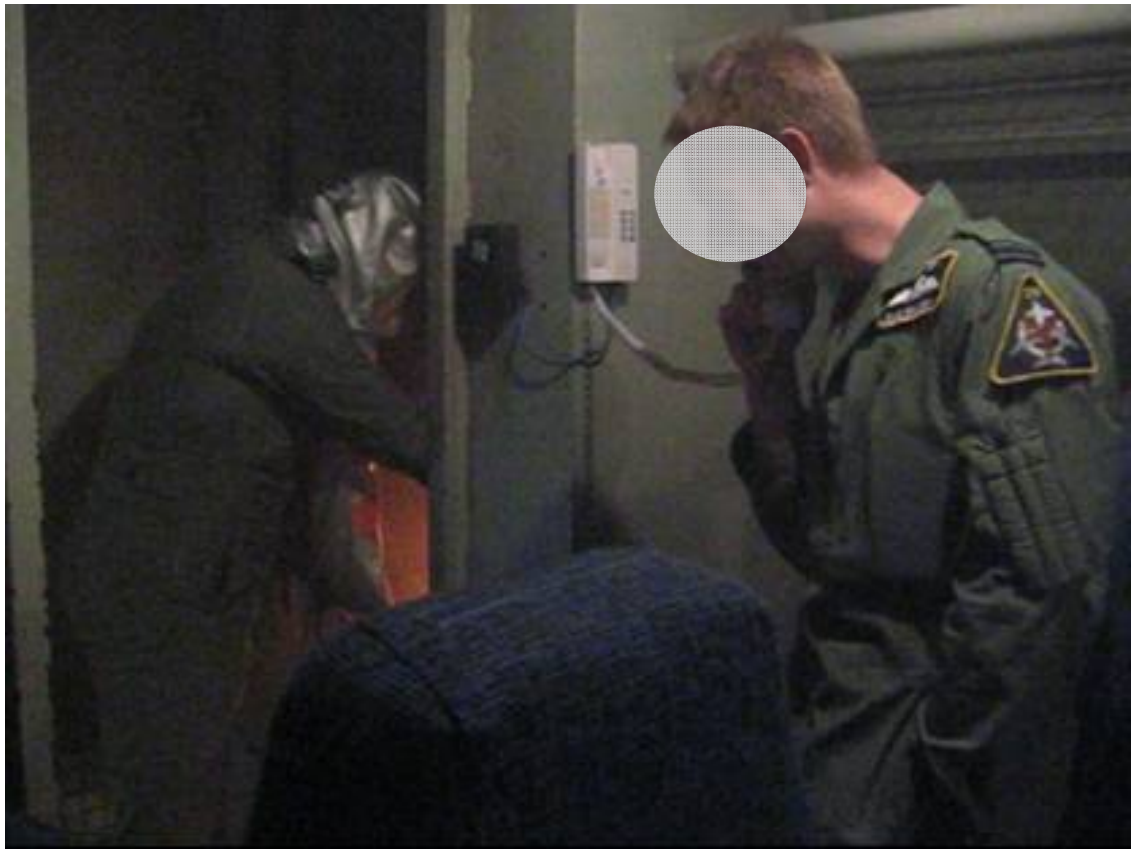
Royal Air Force Crew Training

- **Fight different classes of fires of various intensities**
- **Benefit from practicing with actual (not gas-powered) fires.**

TASK 3 - FIRE TRAINING IN NON-CIVIL / NON-AIRCRAFT ENVIRONMENTS

Royal Air Force Crew Training

- Combines practicing the duties of each of the three roles in firefighting procedures
- Use of extinguisher and use of PBE.
- Integrates all aspects of the fire training



TASK 3 - FIRE TRAINING IN NON-CIVIL / NON-AIRCRAFT ENVIRONMENTS

Royal Navy Crew Training

HMS Raleigh, Torpoint, Cornwall Fire Fighting Training Unit - Submarine/Ship Crew

TASK 3 - FIRE TRAINING IN NON-CIVIL / NON-AIRCRAFT ENVIRONMENTS

Royal Navy Crew Training

- **Different levels of crew firefighting skills.**
- **Integrates all aspects of fire training in the mock-up: use of breathing equipment in smoke, removal and use of an extinguisher, and the execution of procedures in various scenarios**

TASK 3 - FIRE TRAINING IN NON-CIVIL / NON-AIRCRAFT ENVIRONMENTS

Royal Navy Crew Training

“Instructors from both the Royal Navy and the ‘third-party’ organisation are of a high standard. The instructors from the ‘third-party’ organisation are actual fire-fighters who are very familiar with the requirements of Royal Navy training. Instructors from the Royal Navy would have completed the Advanced Sea Survival Course with 5 days of advanced fire training.”

TASK 3 - FIRE TRAINING IN NON-CIVIL / NON-AIRCRAFT ENVIRONMENTS

Eurostar Training

Many aspects of the training encountered during the Eurostar visit are not appropriate to the civil aviation environment. However, several issues were noted that might be considered as good practice including:

"Trainees were required to pass examinations at the end of both theoretical and practical training (with a pass mark of 80%)."

TASK 4 – IDENTIFICATION OF CURRENT AND FUTURE THREATS

IDENTIFICATION OF CABIN FIRE THREATS BASED ON INCIDENT DATA, ACCIDENT DATA, AND ANALYSIS OF FUTURE THREATS

AFT CABIN RIGHT-HAND SIDE

TASK 4 – IDENTIFICATION OF CURRENT THREATS

CURRENT THREATS IDENTIFIED BY ANALYSIS OF:

- UK CAA Mandatory Occurrence Reports MORs
- UK Air Accidents Investigation Board Bulletins
- Accident Reports
- CSRTG Accident Database
- NTSB Database
- FAA SDR Database

TASK 4 – IDENTIFICATION OF CURRENT THREATS

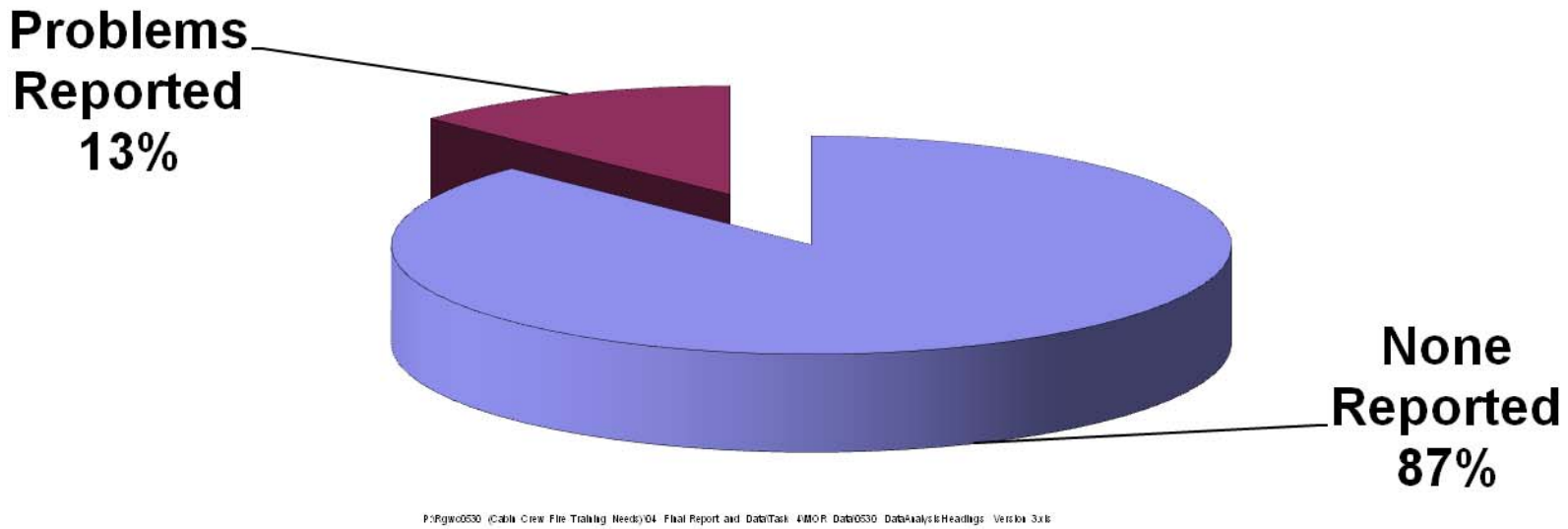
The Incident and Accident data were analysed to:

- **Identify the threats**
- **Assess their relative frequency of occurrence**
- **Assess the severity of the threats**
- **Identify difficulties encountered by cabin crew**

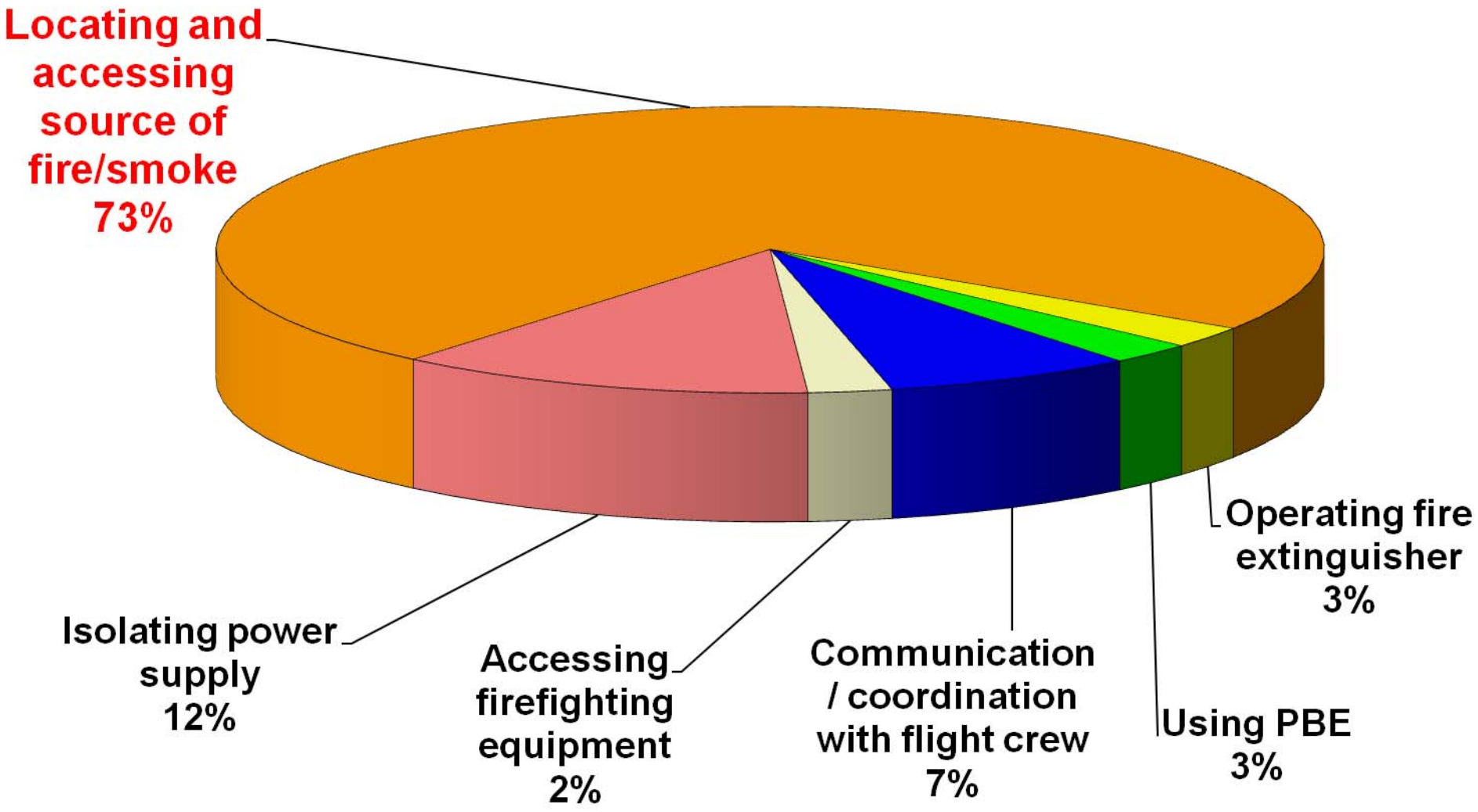
TASK 4 – IDENTIFICATION OF CURRENT THREATS – based on UK Mandatory Occurrence Reports

Reported Difficulties Encountered By Cabin Crew:

- **316 Fire/Smoke related Mandatory Occurrence Reports were analysed.**
- **Resulting in the identification of 41 instances of difficulties being encountered by the Cabin Crew**



TASK 4 – IDENTIFICATION OF CURRENT THREATS – based on UK Mandatory Occurrence Reports



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TASK 4 – IDENTIFICATION OF CURRENT THREATS – based on UK Mandatory Occurrence Reports

The three most frequently occurring problems, constituting over 90% of reports, related to:

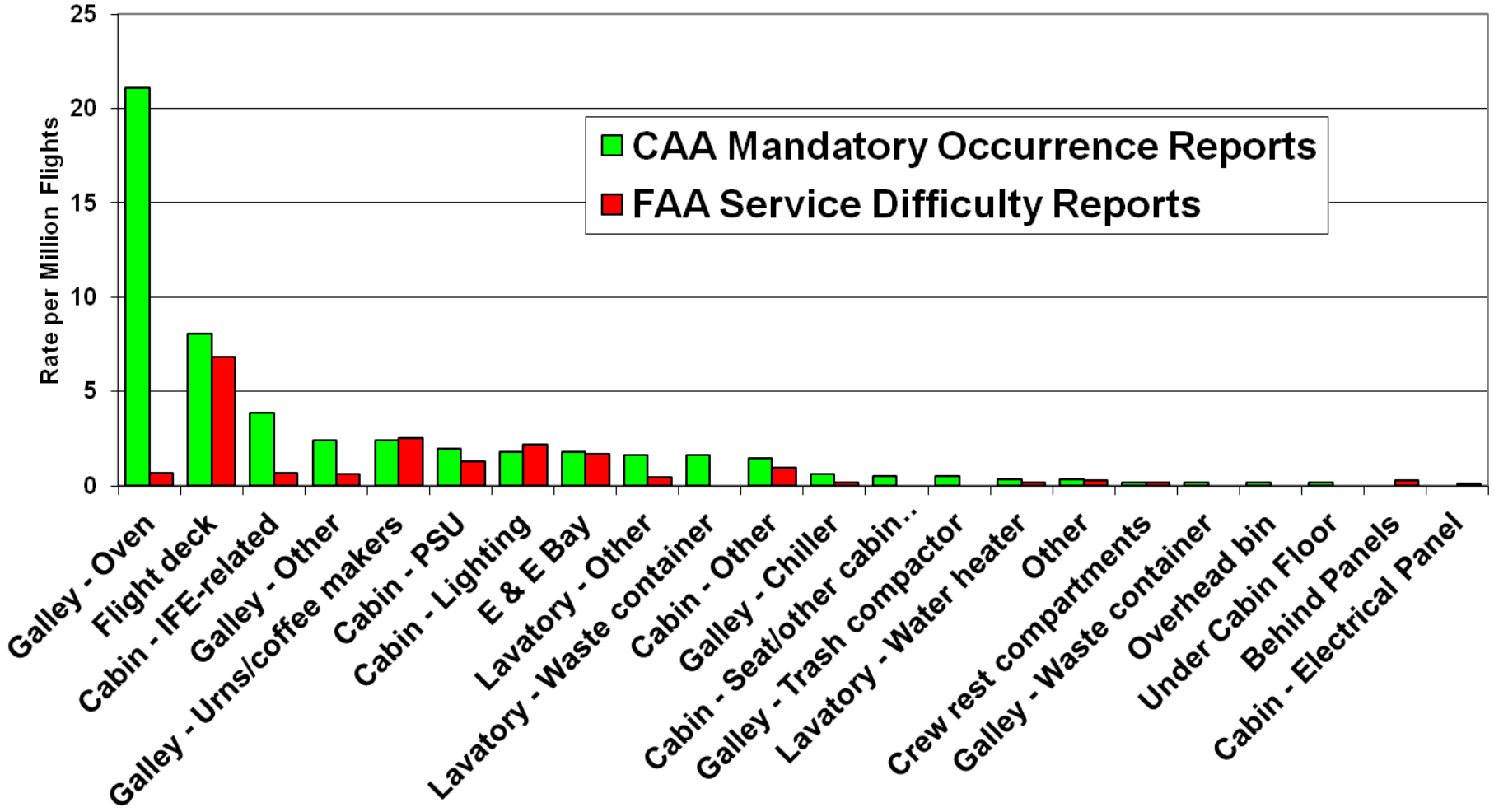
i. **Locating and accessing the source of fire/smoke**

ii. **Isolating power supply**

iii. **Communication/coordination between cabin crew and flight crew**

TASK 4 – IDENTIFICATION OF CURRENT THREATS

Threats and Their Frequency of Occurrence



TASK 4 – IDENTIFICATION OF CURRENT THREATS

Threat Severity

A methodology was developed for assessing the severity of a fire/smoke occurrence based on the following factors:

- **the degree to which the fire/smoke source could be identified and accessed**
- **the resultant fire intensity**
- **the resultant smoke intensity**

TASK 4 – IDENTIFICATION OF CURRENT THREATS

Threat Severity - Fire/Smoke Severity Rating:

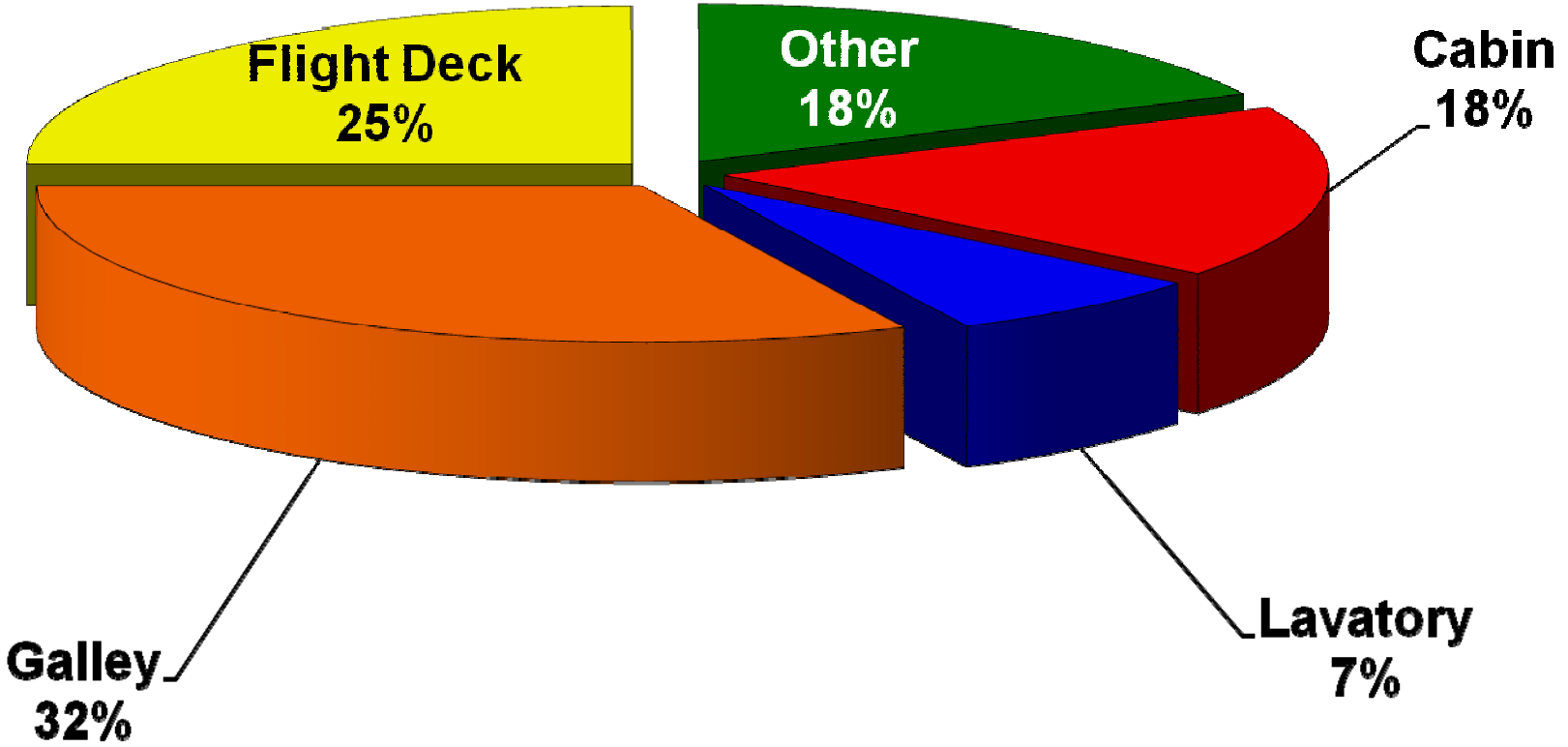
Fire Accessibility		Fire Intensity		Smoke Intensity	
Degree of Accessibility	Score	Degree of Intensity	Score	Degree of Intensity	Score
Easily Accessible	1	No Fire	0	No Smoke	0
Limited Accessibility (Action required)	2	Localised Light Burning/Charring of Material	1	Smell / No Visible Smoke	1
Not Accessible	3	Localised Moderate Burning (Fire damage to adjacent materials or components)	2	Light Smoke	2
Fire Location Unidentified by Crew	3	Localised Heavy Burning	3	Moderate Smoke	3
		Extensive Fire (hot enough to melt aircraft aluminium structure/skin)	4	Heavy Smoke	4

Severity Score =

(Fire Accessibility Score) ^{2} + (Fire Intensity Score) ^{2} + (Smoke Intensity Score) ^{2}

TASK 4 – IDENTIFICATION OF CURRENT THREATS

Location of in-flight fires with a Severity Score of 11 or above



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TASK 4 – IDENTIFICATION OF CURRENT THREATS – based on Accidents

Analysis of accidents and in particular the recommendations made by the accident investigation authorities.

The following issues were considered to present the greatest problems to cabin crew:

i. **Locating and accessing the source of fire/smoke**

ii. **Communication/coordination between cabin crew and flight crew**

iii. **Operating fire extinguisher**

iv. **Using Protective Breathing Equipment**

TASK 4 – IDENTIFICATION OF FUTURE THREATS

FUTURE THREATS

The development of European Regulations needs to be appropriate to the future fleet and this is likely to change significantly over forthcoming years

TASK 4 – IDENTIFICATION OF FUTURE THREATS

In carrying out this review the following factors were considered:

- **Aircraft design changes (e.g. larger aircraft, longer range aircraft, new materials, more/all electric aircraft)**

- **Other changes not resulting from aircraft design and operational developments (e.g. the proliferation of the use of Lithium Batteries, Fuel Cells)**

TASK 4 – IDENTIFICATION OF FUTURE THREATS

The identification of future threats was supported by:

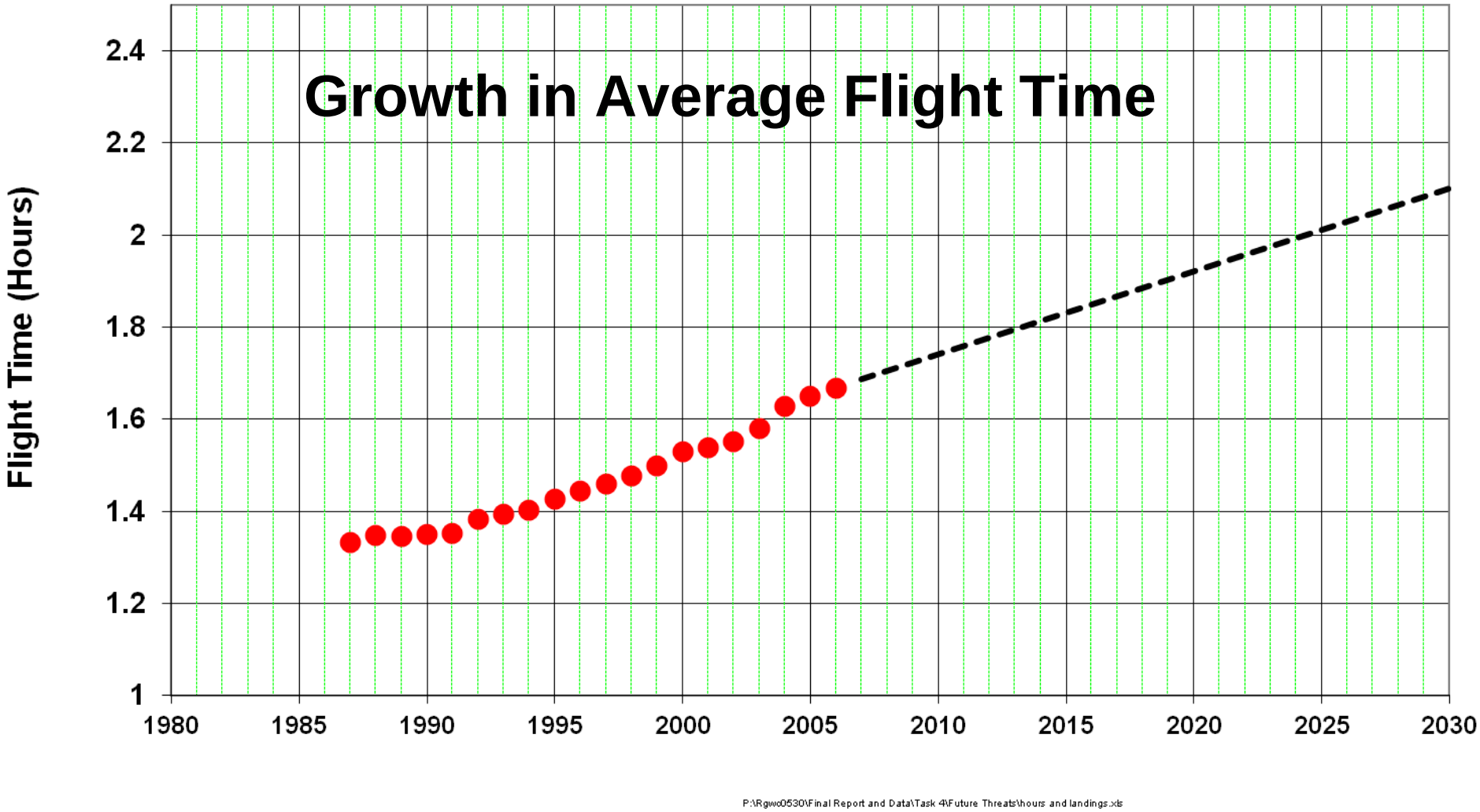
- An analysis of trends in existing data
- Consultation and brainstorming with specialists that may be involved in fire and cabin safety research, aircraft certification, aircraft design, etc.
- Literature review

TASK 4 – IDENTIFICATION OF FUTURE THREATS

Growth in Aircraft Size
- A Market survey by Airbus states:

".....the composition of the world fleet will shift towards larger aircraft. By 2023 mainline single-aisles will make up 69% of the fleet, compared with 77% in 2003. At the same time very large aircraft will account for 6% of the world passenger fleet; approximately the same percentage as represented by 747s today. The role played by very large aircraft is more clearly seen in terms of capacity. By 2023, these aircraft will provide 15% of all seats in service".

TASK 4 – IDENTIFICATION OF FUTURE THREATS



TASK 4 – IDENTIFICATION OF FUTURE THREATS

Changes in future technologies will also present new challenges.

The changes that were identified in the study as requiring further consideration in relation to training of Cabin Crew include:

- **Increased carriage of lithium batteries in Portable Electronic devices**
- **Fuel Cells**
- **The use of Magnesium Alloys in the passenger cabin.**

CABIN CREW TRAINING NEEDS ANALYSIS FINDINGS AND RECOMMENDATIONS

IDENTIFICATION OF ISSUES AND POTENTIAL IMPROVEMENTS

CABIN CREW TRAINING NEEDS ANALYSIS FINDINGS

Although each of the tasks were conducted separately, the project has identified several common issues

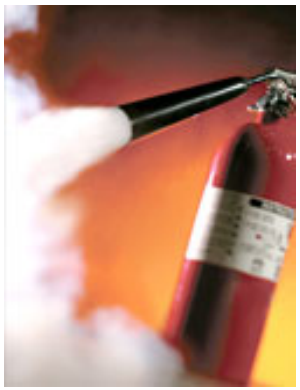
- **Issues relating to Training Equipment**
- **Issues relating to In-Flight Fire Procedures**
- **Issues relating to Adequacy and Realism of Training**
- **Issues Relating to Standardisation**

CABIN CREW TRAINING NEEDS ANALYSIS - RECOMMENDATIONS

EQUIPMENT

STANDARDS OF FIRE EXTINGUISHERS USED IN TRAINING:

- ✓ **The study found that the extinguishers and the extinguishing agent currently used in training generally did not adequately represent the fire extinguishers installed on board the aeroplane.**



"…. Never get to test a BCF in real conditions - on a flight several BCFs were thought inoperable due to crew not being able to break the seal on the BCF, therefore wasting valuable seconds and risking a potential disaster." **(Cabin Crew)**

CABIN CREW TRAINING NEEDS ANALYSIS - RECOMMENDATIONS

EQUIPMENT

STANDARDS OF FIRE EXTINGUISHERS USED IN TRAINING:

- ✓ **Standards and guidance material for fire extinguishers and extinguishing agents used in training need to be provided.**

"…. It would be beneficial to get the feel for an unused BCF as there have been cases of crew not able to break the seal, the one used in training is not anything like operating a BCF with seal intact, that way we will know what to expect." **(Cabin Crew)**

CABIN CREW TRAINING NEEDS ANALYSIS - RECOMMENDATIONS

EQUIPMENT

PRACTICAL TRAINING IN REMOVING FIREFIGHTING EQUIPMENT:

- ✓ **The study found that that some cabin crew have experienced difficulties in removing fire fighting equipment (particularly fire extinguishers) from stowage during an in-flight fire/smoke event.**
- ✓ **Consideration needs to be given to the issue of removal of firefighting equipment from representative stowage, during fire and smoke training.**

"…. I have always stated that it would be useful to retrain people on how to actually release the equipment from stowages … . As we don't EVER practice removing equipment from stowages - it could be a time hindrance if there was a need to do it in a hurry and possibly in a smoke filled cabin… " **(Cabin Crew)**

CABIN CREW TRAINING NEEDS ANALYSIS - RECOMMENDATIONS

EQUIPMENT

USE OF PROTECTIVE EQUIPMENT DURING TRAINING:

- ✓ **The study found that the use of protective equipment such as PBE and fire gloves when fighting a fire could present difficulties to cabin crew.**
- ✓ **The use of protective equipment needs to be incorporated in firefighting training.**

"….We do not practice fighting (simulated) fires while wearing the appropriate safety equipment - smoke hood & gloves - so the first time these are worn while trying to let off an extinguisher is the day it happens for real." **(Flight Crew)**

CABIN CREW TRAINING NEEDS ANALYSIS - RECOMMENDATIONS

EQUIPMENT

STANDARD OF PROTECTIVE BREATHING EQUIPMENT DURING TRAINING:

- ✓ **The study found that consideration should be given to amending future European aviation requirements to specify the standard for PBE units used in training.**

"…. As the smoke isn't harmful many crew don't realise the need to use a smoke hood. The smoke hoods used allow crew to breath in outside air and don't give a sufficient realisation of using a real smoke hood. On many occasions the seals on the hoods are loose and unrepresentative." **(Instructor)**

CABIN CREW TRAINING NEEDS ANALYSIS - RECOMMENDATIONS

EQUIPMENT

REMOVAL OF PBE FROM PACKAGING:

- ✓ **The study found that removal of PBE from its packaging has presented difficulties to cabin crew during in-flight fire/smoke events.**
- ✓ **The removal of PBE from its packaging needs to be addressed in practical training.**
- ✓ **Consideration should also be given to investigating the feasibility of developing PBE containers and packaging so that they are easier to open; hence reducing the possible delay in dealing with an in-flight fire.**

"… if possible make us fight a real fire under controlled conditions with proper equipment so we can experience it at least once - make us open a smoke hood box and take it out and put it on at least once during our career so we can see how difficult it is to use onboard." **(Cabin Crew)**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

TRAINING FACILITIES:

- ✓ **The** **noke** **trai** **ope**
- ✓ **It is** **iven to** **prov** **faci**

"… Wo ***t*** ***mim*** ***ve*** ***pan*** ***etc)*** ***wou*** ***x with*** ***gas*** ***t or its*** ***con*** **ew)**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

STANDARDS FOR FIRES USED IN TRAINING:

- ✓ **It was identified that the type and size of the fire used in practical fire training varied considerably amongst operators and training organisations visited.**
- ✓ **It is evident that a set of standards for fires used in practical fire training needs to be provided.**

"…. The practical firefighting involves merely one squirt of water from the fire extinguisher onto a fire that is immediately extinguished by the instructor turning off the gas supply. The training is perfunctory and unrealistic; it seems designed merely to tick the appropriate boxes to maintain currency." **(Flight Crew)**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

STANDARDS FOR SMOKE TRAINING:

- ✓ **It was found that the conduct of smoke training using Protective Breathing Equipment (PBE) varied considerably amongst operators and training organisations.**
- ✓ **Consideration needs to be given to the development of a standard for PBE training in a smoke-filled environment, including the minimum requirements for visibility and duration**

"… It would be much more realistic to be on a mock-up of an aircraft that we work on, so we can experience what it would be like to be totally in the dark and thick smoke so we can try and locate our equipment. I personally think that it would be very hard to locate the equipment in the dark and with thick smoke even with our knowledge of equipment locations." **(Cabin Crew)**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

STANDARDS FOR INSTRUCTORS:

- ✓ **It was found there is a need for standards that fire training instructors shall meet in order to ensure that the training conducted achieves the objectives of the JAR-OPS 1 requirements and be totally consistent with the operator's Training Manual and Operations Manual.**
- ✓ **It is suggested that consideration should be given to establishing standards for fire training instructors.**
- ✓ **Another recommendation is a forum for instructors to share information.**

"…. I have experienced a wide range of fire instructors training skills ranging from excellent to poor (technical knowledge of the subject has always been high)." **(Instructor)**

"….. Standard of Recurrent Training varied greatly from airline to airline, and from instructor to instructor, in my experience." **(Flight Crew)**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

REGULATION OF THIRD PARTY TRAINING ORGANISATIONS:

- ✓ **Problems were identified in terms of the conformity of the training provided by third-party organisations with the operators' training requirements and operating procedures.**
- ✓ **There needs to be guidelines to ensure that the training provided by 'third-party' training organisations is consistent with the operator's Operating Manuals and Training Manuals.**

"…. a problem arose with some 'third-party' training organisations, especially those who did not have access to relevant parts of their Client's Operations Manuals or Training Manuals." **[finding from the Review of Cabin Crew Fire Training Programmes]**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

EVALUATION CRITERIA FOR CABIN CREW:

- ✓ **The study found that there were no evaluation criteria in terms of the level and type of skills that need to be acquired and demonstrated by cabin crew in respect of practical fire and smoke training.**
- ✓ **It is evident that consideration should be given to providing standardised evaluation.**

"…. The fire training plan used by my airline aims to train the cabin crew and flight crew in fighting fires in the cabin. However, when crew do not carry out the drill successfully, there is no PASS/FAIL element emphasised by the trainers. So usually a facilitative debrief is carried out and no re-test taken. This gives the impression to crew that getting it wrong is ok." **(Flight Crew)**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

CONVERSION / RECURRENT TRAINING:

- ✓ **The study found that theoretical fire training is only specified in Initial Training (Appendix 1 to JAR-OPS 1.1005 (b)).**
- ✓ **Consideration needs to be given to include theoretical training in Conversion and Differences Training and Recurrent Training.**

"… The theory of fire fighting is only covered in Initial Training…" **(Cabin Crew)**

"… Initial Training – sufficient. Recurrent Training - not enough time spent on theory." **(Instructor)**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

COMMUNICATION WITH FLIGHT CREW:

- ✓ **The study suggests that theoretical fire training for cabin crew might be deficient with regard to their awareness of likely flight crew workload during emergency situations.**
- ✓ **Issues related to flight crew workload and specific communication procedures with flight crew during an in-flight fire/smoke event needs to be addressed in theoretical fire training.**

"…. Flight crew's knowledge of the cabin crew roles in a fire fighting drill are very poor. From my experience they do not appreciate the workloads of the cabin crew during this and are often overly critical of the cabin crew. There is no way near enough joint training so both cabin and flight crew can see each other's roles/ responsibilities." **(Flight Crew)**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

COMMUNICATION WITH FLIGHT CREW:

- ✓ **It was also found that practical training in communicating and coordination with flight crew, whilst wearing PBE, is needed.**

"… we've never practiced communicating on an actual functioning interphone wearing a smoke hood. Also, no procedure in place for communicating with cabin crew to flight crew if interphone is not working." **(Cabin Crew)**

COMMUNICATION WITH OTHER CABIN CREW:

- ✓ **It is suggested that practical training in communicating and coordination with other cabin crew members, whilst wearing PBE, is needed.**

"… Maybe would be useful to have a practical training session on this aspect [communication/coordination] of fire fighting. The practical tends to concentrate on just the fire fighting element." **(Cabin Crew)**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

MANAGEMENT OF PASSENGERS:

- ✓ **The study found that training for the management of passengers during in-flight fire/smoke events might not be sufficient.**
- ✓ **It is suggested that specific training requirements and guidance material for management of passengers during in-flight fire/smoke events needs to be addressed.**

"… There are very few drills in a training scenario that actually involve dealing with a large number of passengers…" **(Cabin Crew)**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

FIRE SCENARIOS:

- ✓ **JAR-OPS 1 requirements do not specify the types of in-flight fires that should be addressed in cabin crew fire training.**
- ✓ **The study found that theoretical training did not always cover all fire types relevant to the aircraft operated and cabin crew practical training experience was limited to a very few types of fire.**

"…..Concentration is mainly on the distinguishing of toilet and oven fires. Aircraft panels and electrical fires are only discussed in the theoretical side of fire training, yet we as cabin crew are taught that a fire on board an aircraft could result in a catastrophic situation. All fires need to be fully covered – not simply showing cabin crew how to open a toilet door if a suspected fire is behind it!!" **(Cabin Crew)**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

FIRE SCENARIOS:

- ✓ **There was also the need to emphasise during training those fire threats requiring specific procedures such as electrical/IFE system fires, PED/lithium battery fires, multiple fires, and flight deck fires.**
- ✓ **It is evident that training requirements for various fire scenarios need to be addressed.**

"…one type of fire that could be practiced is how to deal with lithium battery fires as more and more people are carrying these onboard our aircraft and there is no practical training done on this, we just spend 5 minutes doing theory." **(Cabin Crew)**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

INTEGRATED FIRE SCENARIOS:

- ✓ **As currently written, the requirements of JAR-OPS 1 allow aspects of practical fire and smoke training to be conducted separately and do not require any related fire scenarios to be incorporated into an integrated practical exercise.**
- ✓ **This means that the current fire training for cabin crew can be conducted in isolated sessions and thus proficiency in a combined and integrated practical exercise cannot be demonstrated.**

"… The training in our airline is separated as the smoke filled cabin does not occur in the same location as the fire fighting drill practical location so when you are fighting a fire in practical there is no smoke or realistic cabin to simulate a scenario effectively." **(Cabin Crew)**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

DETECTING/LOCATING SOURCE OF SMOKE & FIRE:

- ✓ **The study suggested that theoretical and practical training in detecting and locating the source of smoke/fire was inadequate.**
- ✓ **It was found that detecting and locating the source of smoke/fire needs to be addressed in theoretical and practical training.**

"… at the moment, we all line up and extinguish a fire in an oven - not very realistic at all. Setting it up so we don't know where the fire is going to be or what type it is, who is going to be the first to tackle it etc would make it more realistic." **(Cabin Crew)**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

HIDDEN FIRES:

- ✓ **The study found indications that the level of training for dealing with hidden fires carried out by some operators/training organisations was not sufficient.**
- ✓ **It is suggested that specific training requirements and guidance material for dealing with hidden fires need to be considered.**

"….In 11 years I have never done any practical exercise which involved pulling out a panel with a jemmy [crowbar]. Practicals seem to centre around toilet & oven fires." **(Cabin Crew)**

"…. Concealed fire training was just talked through – came away not feeling confident in that…" **(Cabin Crew)**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

HIDDEN FIRES:

In addition:

- ✓ **Consideration should be given to investigating the feasibility of implementation of procedures or aircraft modifications that will provide the most effective means for crew members to gain access to areas behind interior panels for the purpose of applying extinguishing agent to hidden fires.**
- ✓ **Consideration should be given to investigate the feasibility of using complementary tools such as thermal imaging cameras to assist crew in detecting and locating fire or hotspots.**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

TRAINING METHODS IN PERFORMING FIREFIGHTING PROCEDURES:

- ✓ **It was found that fire training scenarios during practical training should be conducted such that cabin crew follow the specific operator's procedures for dealing with an in-flight fire as well as using judgment and common sense with regard to implementing the in-flight firefighting procedure that incorporates the three roles of the cabin crew (i.e. Firefighter, Assistant Firefighter/Coordinator, and Communicator procedure).**

" …. I am concerned that the training is too prescribed and procedural, making crew feel scared to act unless they are in the correct role. 'No I can't help you fight the fire because I'm the communicator'!!!" **(Cabin Crew)**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

TRAINING METHODS IN PERFORMING FIREFIGHTING PROCEDURES:

- ✓ **Additionally, there is no recommended in-flight fire procedure for single cabin crew operations.**
- ✓ **Consideration should be given to providing guidelines on the training of in-flight firefighting procedures and development of procedures for single cabin crew operations.**

"… The difficulties in communication for operators of single cabin crew aircraft present particular problems, which are not fully addressed by standard fire fighting training." **(Flight Crew)**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

TRAINING METHODS IN EMPHASISING URGENCY OF RESPONSE:

- ✓ **It was found that the conduct of fire training did not adequately reflect the required urgency of response during an in-flight fire event.**
- ✓ **Consideration should be given to developing guidelines as to how this might be achieved.**

"…The ease in which most of the fires encountered in training were extinguished, may lead cabin crew to a false sense of security or confidence. This may detract from the urgency of the situation and that all in-flight fire and smoke situations must be dealt with immediately and aggressively" **[finding from the Review of Cabin Crew Fire Training Programmes]**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

THEORETICAL TRAINING IN FIRE PREVENTION:

- ✓ **The study found that a high proportion of in-flight fire/smoke events could have been prevented had the cabin crew involved, exercised more caution in using galley appliances. JAR-OPS 1 requirements address the necessity for frequent checking of potential fire-risk areas in Initial Training; however, instructions on other fire prevention measures are not addressed.**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

THEORETICAL TRAINING IN FIRE PREVENTION:

- ✓ **Additionally, none of these subjects is included in Conversion and Differences Training and Recurrent Training.**
- ✓ **It is evident that training in prevention measures and safe work habits needs to be expanded.**

THANK YOU

ACKNOWLEDGEMENTS

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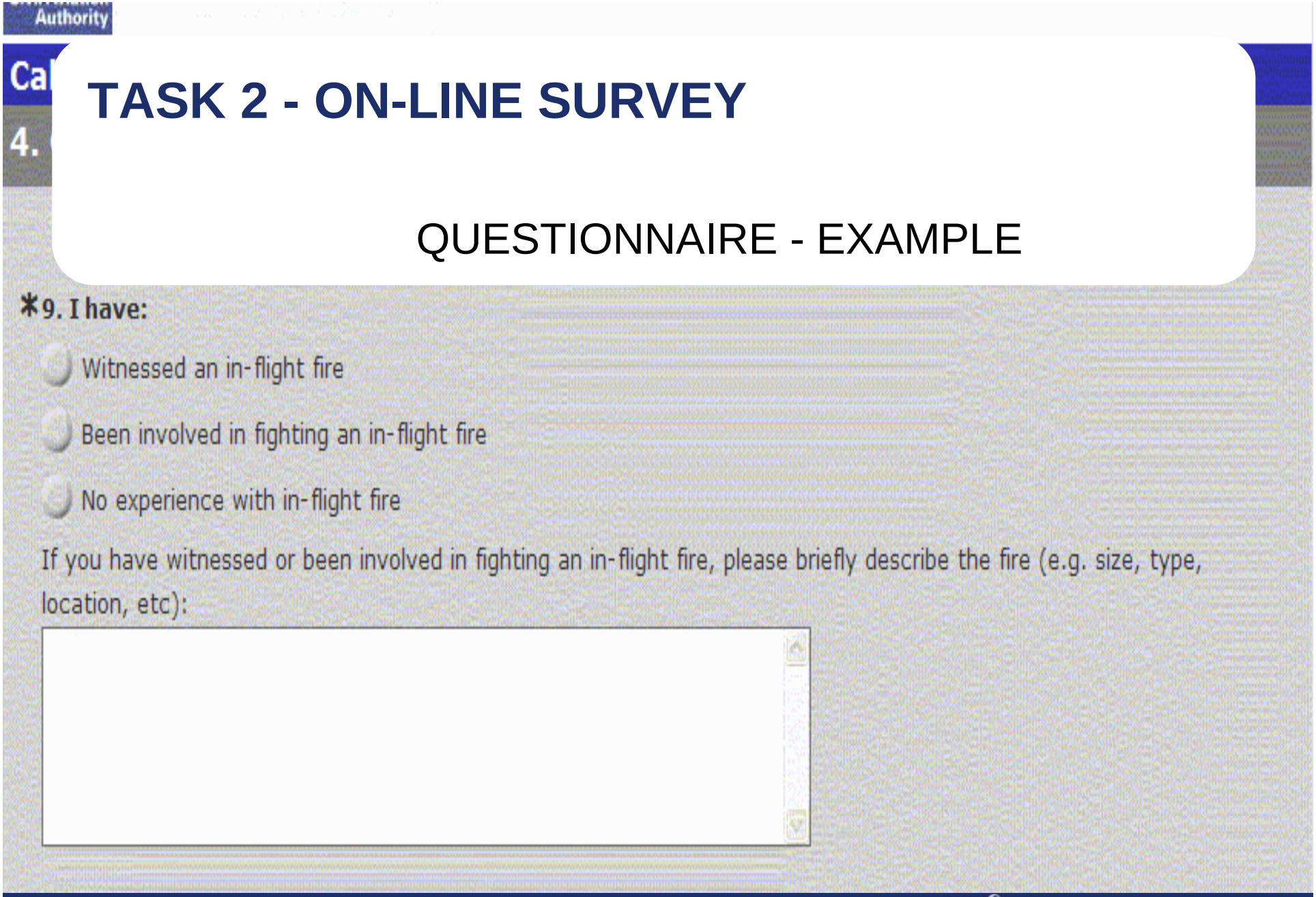
- Flight Safety International Inc
- The operators and training organisations who participated in the review of the cabin crew training programmes
- The organisations and websites who helped in promulgating the online survey
- The respondents who participated in the survey
- The Royal Navy
- The Royal Air Force
- Eurostar
- The US Federal Aviation Administration
- Transport Canada Civil Aviation

OPERATOR	FLEET	OPERATION	DESTINATIONS
UK Operator 1	Narrow / Wide Body	Scheduled	Domestic / European / Long Haul
UK Operator 2	Narrow Body	Scheduled (Low Cost)	Domestic / European
UK Operator 3	Regional Aeroplane (Single & 2 CC)	Scheduled	Domestic / Limited Routes Near Europe
UK Operator 4	Narrow / Wide Body	Charter	European / Long Haul
UK Operator 5	Narrow / Wide Body	Scheduled Charter	European / Long Haul
UK Operator 6	Wide Body	Scheduled	Long Haul
UK Operator 7	Regional Aeroplane (Single Cabin Crew)	Scheduled, Some Charter	Domestic / Limited Routes Near Europe
UK Operator 8	Regional Aeroplane (Single & 2 CC)	Scheduled	Domestic / Limited Routes Near Europe
Non-UK European Operator 1	Narrow Body	Scheduled (Low Cost)	European
Non-UK European Operator 2	Narrow Body	Charter	European / Long Haul

TASK 2 - ON-LINE SURVEY

QUESTIONNAIRE - EXAMPLE



TASK 2 - ON-LINE SURVEY

Example of Responses to Survey Question – *"The fire conditions experienced during training are realistic"*:

"The magnitude of the fires is not particularly realistic due to health and safety restraints."

(SEP Manager) – Agree

"Simulating a fire can only go so far, for various reasons including health and safety and duty of care". **(Training Manager) – Agree**

"The simulated fire and smoke conditions are as close as possible to real conditions without anybody being at risk. Good practise." **(Cabin Crew) – Agree**

TASK 2 - ON-LINE SURVEY

Example of Responses to Survey Question *"The fire conditions experienced during training are realistic"*:

"Facilities are limited, but it is a little unrealistic to simulate a fire from an overhead locker with red/orange LEDs and lots of smoke. We have no appreciation of temperatures etc. and little use of 'genuine' equipment…"

(Cabin Crew) – Strongly Disagree; Have Been Involved In Fighting In-flight Fire

TASK 2 - ON-LINE SURVEY

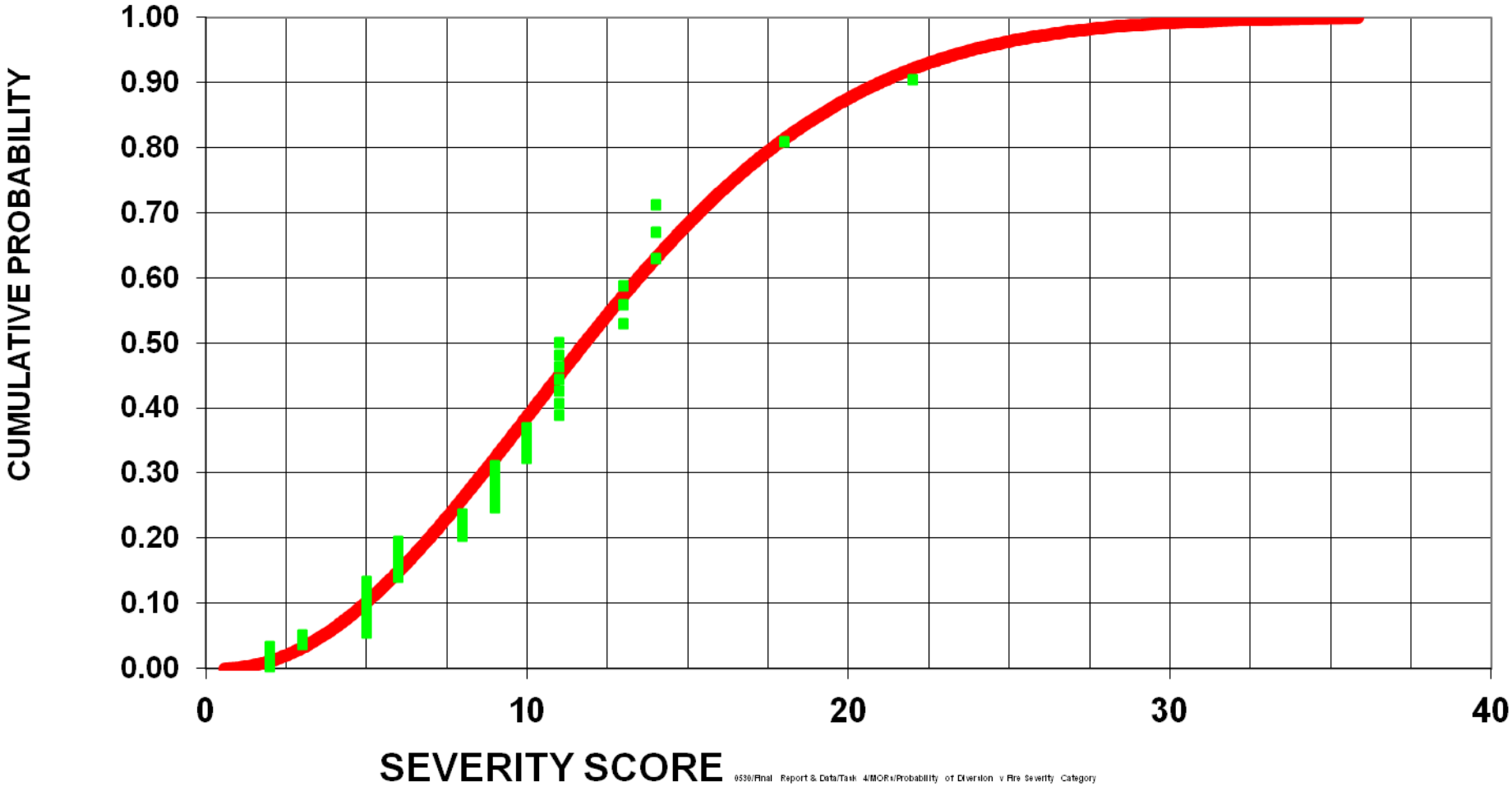
Example of Responses to Survey Question *"The fire conditions experienced during training are realistic"*:

"The scenarios and equipment may be the same, but it doesn't mean that the training is GOOD ENOUGH for cabin crew to put out any fire apart from minor fires like oven and toilet bin and ONLY if the fire is small!!!"

(Cabin Crew) – Strongly Disagree; No Experience With In-flight Fire

TASK 4 – IDENTIFICATION OF CURRENT THREATS

Probability of a Diversion v Threat Severity



INTEGRATED FIRE SCENARIOS:

- ✓ **It is evident that implementing an integrated fire scenario in practical fire training will benefit cabin crew.**

- ✓ **It was also found that this subject is addressed in Transport Canada Civil Aviation regulatory material.**

CABIN CREW TRAINING NEEDS ANALYSIS – RECOMMENDATIONS

DETECTING/LOCATING SOURCE OF SMOKE & FIRE:

- ✓ **Consideration should be given to investigating the feasibility of using complementary tools such as thermal imaging cameras to assist crew in detecting and locating fire or hotspots.**