Investigating Reporting Culture Amongst Pilots: A Briefing Study

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LSE Enterprise

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Abbreviations

ASR	Air Safety Report
BALPA	British Airline Pilots Association
CAA	Civil Aviation Authority
CHIRP	Confidential Hazardous Incident Reporting Programme
EASA	European Aviation Safety Agency
MOR	Mandatory Occurrence Report
SESMA	Special Event Search and Master Analysis

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Introduction

This document results from a request from the Civil Aviation Authority (CAA) and the British Airline Pilots Association (BALPA) to undertake a briefing study reviewing the reporting culture of pilots. The document is intended for internal use, to help inform the CAA and BALPA of the issues and encourage debate. It is designed as the first stage of a potential larger, more detailed and representative review of the scale and reasons behind pilots' safety reporting.
The intention was to:

1. Provide value in terms of (a) generating rich qualitative data across a sample of pilots, (b) recruiting interest of pilots and airlines in safety culture and reporting, and (c) helping BALPA and CAA to develop stakeholder involvement;
2. Scope questions and issues potentially to be followed up in a larger survey;
3. Investigate variation between groups to inform decisions on sample sizes and sub groups for larger survey (e.g. do important variables differ by airline, stage of career).

As agreed, the research team has undertaken an exploratory study across a small sample of approximately 20 pilots to examine the following:

1. The reasons given by pilots for reporting or non-reporting of occurrences
2. Some indication of the extent of non-reporting
3. Pilots' awareness of and views of the current reporting procedures
4. Pilots' views about how to improve the system and improve reporting, for example, whether there is a need to raise awareness about reporting procedures and the need to report; how to increase confidence in the reporting system.

An important stimulus for the project, mentioned in early discussions of the proposed research, was the imminent application (from November 15th, 2015) of a new directly applicable EU regulation governing the reporting of occurrences in civil aviation and the co-ordination of resulting information.[1] There was also some concern within both the CAA and BALPA that there may be underreporting of some types of occurrence, and that this may relate to the existence or otherwise of a 'just culture' on safety reporting. For practical reasons the study was limited to pilots flying fixed-wing aircraft. The project's scope and focus was further defined during Phase 1.

Methods

The project proceeded in two phases. Phase 1 was designed as a preparatory phase during which the scope, focus and purposes of the project were clarified, and the method for drawing interview samples was established. Phase 2, the heart of the project, was a series of open-ended interviews pilots. These were recorded and transcribed. Questions were exploratory and adapted to directions the interview took with particular pilots.

[1] Regulation (EU) No 376/2014 of the European Parliament and of the Council of 3 April 2014 on the reporting, analysis and follow-up of occurrences in civil aviation, amending Regulation EU No 996/2010 of the European Parliament and of the council and repealing Directive 2003/42/EC of the European Parliament and of the Council and commission Regulations (EC) No 1321/2007 and (EC) No 1330/2007 (1).

The LSE team regarded confidentiality as of the highest importance, and the methodology was designed around protecting the identities of all those participating in the research. Assurances of confidentiality were given before pilots agreed to take part and were repeated at the actual interviews. In this briefing paper we protect identities by reporting in summary terms and not revealing gender or airline when referring to more specific comments.

Phase 1

Obtaining a pool of pilots from which to draw samples for interview

The project required a list of pilots who had consented to be contacted by the research team, from which a sample could be drawn for interview. During Phase 1 it became apparent that to protect information it holds about licensees, the CAA could not easily provide the research team with contact details for prospective interviewees. We also wished to ensure that the CAA could not know who had consented to be interviewed. It was agreed that contact with pilots should be made in two stages. The CAA would send out an initial email to just over 10,000 licensees, containing a letter from CAA/BALPA introducing the project and the LSE team (Appendix 1.1). Within the email a link to an anonymous questionnaire would invite pilots to provide the LSE directly with contact details if they were willing to join a pool of potential participants.[2] This procedure gave the LSE team sole access to responses to the questionnaire and to contact details provided directly by participants.

In February 2015, questionnaire materials designed by the LSE team (Appendix 1.2) were approved by the CAA and BALPA and the CAA selected a subset of licensees to whom the email would be sent. The aim was to cast the net sufficiently wide without including large numbers of pilots beyond the feasible scope of the project. The selection included pilots licensed to fly most planes flown commercially, but excluded single pilot aircraft (Appendix 2). The email was sent out by the CAA on Monday 2nd March 2015 and resulted in 10,268 successful deliveries. After cleaning of the data, this resulted in a pool of 504 potential interviewees.

Note:
Under the contract the CAA and/or BALPA were responsible for providing the necessary data from which a sample of pilots could be selected for interview, and no allowance was made within the budget for expenses associated with identifying a sample pool. For the above reasons, the LSE research team agreed to take on the additional tasks of designing and implementing the questionnaire to obtain a sample pool of pilots. The additional work was carried out within the original budget but it delayed the start of Phase 2 of the project and correspondingly extended the project time. A revised timeline was agreed with BALPA and the CAA in February 2015.

[2] After discussion with the CAA the team decided to use QUALTRICS online survey software, which is available under the LSE's license. A fully anonymous QUALTRICS survey meant that all contact data came solely from the details provided by respondents.

Background discussions of issues and scope

In late 2014 and early 2015 we held a series of discussions and interviews with representatives from the CAA and BALPA. The purpose was to clarify what expectations they had of the project, and determine the issues that would guide design of the interviews and the scope of this briefing paper. Phase 1 discussions were also preparatory to selecting a sample of pilots to interview.

High level expectations were that the study would give some insight into the effectiveness of reporting systems and in particular, any factors that might discourage reporting. Accepting the limitations of a small exploratory study, it was hoped the project would put discussion and potentially further investigation on a firmer footing, and indicate ways in which reporting systems might be improved. It was particularly important to explore the extent to which airlines operated an effective just culture, and it was hoped that an independent study would be viewed as unbiased and give pilots confidence to speak openly. Besides trust in the protection provided by a just culture, more practical factors that it was suggested might be explored were knowledge and understanding of what should be reported; ease of reporting; seniority within an airline; the perceived utility of filing a report; and awareness that some reportable occurrences would be recorded by inflight monitoring systems.

Questions and sample

The opportunity for pilots to discuss these factors and also to take the interview in the direction of other factors was provided within very broadly framed interviews. (A fixed schedule was not appropriate for the open-ended, exploratory purposes of the project.) Interviews broadly covered: knowledge of reporting systems; how pilots learned what/how to report and what they saw as the purposes of reporting; what factors made reporting more likely and what factors inhibited reporting; their airline's attitude and support in response to reports; whether they thought there was underreporting and if so of what kinds of things and why; and their views about safety reporting systems, how well they work, and how they might be improved.

Expectations put to us of what we would find in the study indicated some criteria for sampling the pilots to be included in Phase 2 of the study. A number of key characteristics were identified as important. These centred around (i) characteristics of the pilots themselves (notably their rank, experience and type of work they are engaged in; possibly their gender) and (ii) characteristics of the airlines (such as the size and economic health of the airline, the nature of its business, and whether there had been recent major changes such as merger).

It was understood that we would talk to a very limited number of pilots, and that systematic sampling of numerous permutation was impossible. All those we spoke to expected important differences according to airline to emerge. The consensus was that we should select pilots of different ranks and flying both long and short/medium haul from two larger airlines; and should also talk to pilots employed in examples of some smaller and charter airlines. The sampling questionnaire therefore included questions enabling these selections to be made (Appendix 1).

Phase 2

Selecting a sample of pilots for interview

The pool of 504 pilots from which the interview samples were drawn was self-selected and not expected to be representative. Appendix 3 indicates the characteristics of the 504 and gives some indication of how they correspond with characteristics of the 10,000 plus pilots who received the sampling email.

A cursory comparison with industry statistics[3] suggests the sample pool was weighted towards more senior and experienced pilots. Approximately a quarter of the sample pool were flying for small airlines such as corporate jet companies, ferries, freight etc., including a number who described themselves as freelance – a reminder that there is a large number of such pilots, often combined into a category 'other'.

The interview phase started with two group interviews (with a total of eight pilots) to lay the ground and help optimise the individual interviews. These were followed by interviews with 25 further pilots. An additional six British Airways captains were interviewed as a group towards the end of the interviewing phase.[4] This weighted our total sample towards experienced British Airways pilots. In total we spoke to 39 pilots.

Interviews took place in five locations and were conducted by the core research team of Sally Lloyd-Bostock, Bridget Hutter and Paz Concha. Eight of the individual interviews were conducted over the telephone; otherwise all interviews were face to face.

The sample included captains and first officers from 11 different airlines, differing in rank and flying experience. The distribution of airlines, rank, distance currently flying and commercial flying experience for the 39 pilots interviewed (including group and individual interviews) was as follows[5]:

[3] Sources for a rough comparison were provided by the CAA.

[4] The meeting was arranged by one of our 504 pilots who was invited for interview and offered to arrange a group interview with five additional pilots.

[5] Finer details are not given to protect identities.

Airline	Frequency
British Airways plc	13*
Easyjet Airline Co. Ltd	5**
BA Cityflyer Ltd	Less than 5
Flybe Ltd	"
Monarch Airlines	"
Thomas Cook Airlines Ltd	"
Thomson Airways Ltd	"
Jet2.Com Ltd	"
Three other small airlines	"
Consultant and freelance	"
Total	39

* Includes 9 interviewed as part of a group

** Includes 1 interviewed as part of a group.

Rank	Frequency	Percent
Captain	28	71.8
First Officer	11	28.2
Total	39	100.0

Commercial flying experience		Frequency	Percent
Valid	1-5 years	3	7.7
	6-10 years	6	15.4
	11-20 years	13	33.3
	More than 20 years	17	43.6
	Total	39	100.0

Long/short haul	Frequency	Percent
Short haul	23	59.0
Long haul	11	28.2
Medium or both	5	12.8
Total	39	100.0

Results

In order to maintain confidentiality we provide aggregated results. We give only a general indication of the numbers of pilots making various points to avoid any spurious impression of precision or generalisability. In total we spoke to 39 pilots. We draw on all of these discussions. The paper is based on what pilots told us; we make no judgement as to whether their perceptions are accurate. We were alert to the interviews possibly being coloured by topical discussions and events (such as the German Wings incident), and to the possibility of being seen as a channel for particular messages.

We explained to pilots that the project was concerned with safety reporting, especially mandatory reporting and ASRs. Their responses were therefore primarily focused on ASRs, but the interviews were designed to provide opportunities for pilots to comment more widely on the reporting of safety-related matters and whether the reporting of safety concerns is well catered for by existing systems.

Knowledge of what and how to report

All the pilots we spoke to were well aware of obligations on them to submit safety reports. Safety and safety reporting were universally seen as of great importance and reporting was universally accepted as a requirement of pilots.

Reporting had not featured as a part of formal training as far as pilots could recall, though some instances were given where it was covered, e.g. in command preparation. There was no sense that formal training in reporting would be regarded as beneficial. The general feeling seemed to be that this is something best learned on the job. Pilots are accustomed to working with manuals detailing the procedures they must follow and those we spoke to regarded the 'ops manual' as the natural place to expect safety reporting guidance and procedures to be found alongside other procedures.

MORs were primarily seen as a subcategory of ASRs in which reporting to the CAA is mandatory as well as reportable within the airline. Pilots' own responsibility in respect of MORs was seen as satisfied by submitting an ASR: responsibility then fell on the airline to forward reports to the CAA as appropriate[6], e.g.:

> "…most people would not necessarily know what an MOR requires… the system is set up that they don't need to. My understanding is that the MOR system from the CAA actually relies on company safety reporting systems to filter out the more minor things and to forward so the companies are expected to be responsible."

Several pilots mentioned the option of 'ticking the MOR box' when they submitted an ASR report, although it appeared this option was no longer available on some electronic forms. Most were also aware of the possibility, in principle, of reporting directly to the CAA, though their knowledge of how to do so varied.[7] Captains recognised that command of the aircraft gave them principal responsibility for MORs, but all pilots were viewed as having their own obligations in respect of safety reporting.

All the pilots we spoke to were familiar with their airline's reporting forms and procedures, and indeed, all had experience of submitting safety reports. From what we saw, airlines' own safety reporting forms were similar from one airline to the next and resembled or duplicated the CAA's

[6] Pilots flying for very small airlines may have a different perception. The limited data we have suggests that environments differed greatly, but as a whole they tended to have much more limited (if any) formal reporting, a greater awareness of commercial pressures and the personal risks of reporting (see further below) and a greater sense of vulnerability since anonymity was impossible in a small group.

[7] Whether this was a feasible option, or one they considered important, varied and would require more detailed investigation particularly in smaller airlines.

MOR form.[8] The procedures described to us for submitting reports varied between airlines. Some required reports to be prepared on, and submitted electronically from, an iPad or computer; some were made on paper. Some were submitted from home, some from the crew room, and some from the aircraft itself. Some said their airlines specified a time within which a report should be submitted, but others said there was no time limit in their airline. The effects of forms and procedures on reporting are discussed below.

When asked how they knew *what* should be reported, pilots regularly referred to airlines' operations manuals, and in particular to lists of reportable occurrences, some of which pilots showed us in the course of interviews. A typical comment was:

> 'We've got a list of about 28 occurrences that constitute mandatory reporting points. I will not be able to recite them all but I know where to find the list!'

Although ops manuals are particular to airlines it appeared that the airlines we sampled had the same or a very similar list of reportable occurrences. Lists of occurrences where reporting was mandatory appeared also to guide reporting via ASRs.

Interpreting lists of reportable occurrences was viewed as straightforward in relation to some occurrences but much less so in others. Obviously reportable matters included fires, failure of a major component; a burst tyre; deaths on board, entering an active runway where you shouldn't be, and serious mistakes, e.g. setting flaps. Less serious but clearly reportable were deviations from prescribed margins of height, speed, heading etc. on take-off and landing; and use of oxygen in the cockpit. Some commented that the list covered reporting of things that were not in fact a threat to safety in the circumstances. Examples included going around when there were good air traffic reasons for it, or a technically 'unstable approach' that was under control. On the other hand, some matters not obviously covered by the list were seen by pilots as presenting a threat to safety. Examples related primarily to human factors (see further below) – for example, being given the wrong paperwork. There was also a grey area over matters where there had been no adverse outcome.

For example (in relation to a mistake with the flaps at some distance out):

> 'Everything's sorted …. We'll continue the approach, all safe. And would I report that, no monitoring? Absolutely no, no way, because in my opinion we've made a mistake, we've corrected it.'

A further grey area was the borderline between appropriate channels – for instance, between a flight crew report, an ASR or an MOR. For example:

> 'They all sort of intermingle …. I think that's probably the bit where you're not sure which one you are supposed to be doing, and quite often I'm filling out a form and I'll say to the captain 'Is this an MOR or is it just an ASR?''

[8] This may be very different in smaller airlines. The CAA told us that reports from small airlines often come in on the CAA's own forms, rather than being forwarded on forms belonging to the airlines.

We were told that occasionally the 'safety guys' might ask for reports (not necessarily via the airline's ASR system) on certain matters of current interest (such as a new airport), or the message might be conveyed that some had not been needed. Again, this varied with airline and experience, and differed from pilot to pilot.

Deciding to report

The decision whether or not to submit a report is not easily separated from understanding and knowledge of reporting systems. In practical terms, the decision to report involved experience of local practice and expectations, interpretation of the requirements and guidance, and airlines' attitudes to reports.

Pilots agreed that captains tended to take the lead and that first officers tended to rely on captains to clarify whether a report should be made. More senior pilots might speak directly to safety departments to check whether a report should be submitted. Some captains commented that newly qualified pilots were likely to interpret requirements over-inclusively. Several captains told us they would not overrule a first officer who wanted to report, and gave examples. These included instances where in the captain's view there was not a safety concern but the first officer was concerned not to fall foul of rules that they must report. We were told by both captains and first officers that once they had agreed that a report should be submitted, the captain might put in the report or they might prepare it jointly. It was much less usual for the first officer to put in a report.

First officers said they might feel inhibited from submitting a report when the captain didn't think it was necessary, but they did talk about occasionally submitting their own reports, and about not being deterred from doing so. Marked differences between airlines emerged here, depending in particular on employment contracts (see below).

There was some mention of other sources of information about reporting. These included online chats; corporate magazines including case studies of reported incidents; calls from safety departments, and prompts arising from incidents previously flagged on electronic monitoring systems.

Certain factors emerged clearly as encouraging or inhibiting reporting.

Report expected by the airline

Captains and first officers alike talked about submitting reports whether or not they thought there was a safety issue in the particular case,[9] because a report would be expected and they would probably be asked to explain why they hadn't made one. An example was going around as requested by air traffic control because a previous aircraft had not cleared the runway. Matters that should be reported were further defined by airline practice, communication with safety departments and managers. An important example here was the information that would be available to airlines, including flight data provided via electronic monitoring software. Pilots were aware that certain occurrences such as going around, deviations from prescribed speeds, headings, levels, and other

[9] Some said they could see it might be useful to collect and aggregate the information nonetheless (below).

actions in preparation for take-off or landing, would be flagged and a report would be expected. Some also specifically said they will report if they are aware something will be flagged up on SESMA. This was mostly put to us not as being because they will not be able to get away with something, but rather as happening because they are likely to be reprimanded if they do *not* submit a report. A number of pilots were very apprehensive about this. Even where pilots were not apprehensive, we were told some reports were submitted although the pilot did not think it was necessary, to save the hassle of someone coming back and querying why they had not reported: 'someone is going to ask about it. You weren't stable at x feet – why didn't you report?'

The reporting process

Reporting forms were thought by some to be unnecessarily time consuming to complete, asking for a lot of marginally relevant or irrelevant information. A few pilots said they preferred using the paper form: an electronic version could be too prescriptive – e.g. not allowing the pilot to continue until required fields had been filled. A draft electronic report could be lost before it was submitted; and some felt that electronic reporting opened up the possibility of their report being changed – for example, the MOR box being unticked.

The anticipated consequences

Discussion of reporting and just culture has made much of the importance of pilots feeling confident they will not be penalised as a result of reporting. We found a considerable degree of inhibition expressed by pilots in our sample, but it did not result from a straightforward fear of being penalised for an error if they admitted it. We were given some examples of pilots being disciplined following reports, but the picture was far more complex. There were marked differences between airlines, and between pilots of different rank and experience. Pilots working for the major airlines, and also most of the other airlines we spoke to, were confident they would not be punished for mistakes provided they reported them – but certain vulnerable groups expressed very definite concerns about being seen as a thorn in the side of the airline if they made too many, or unwanted reports. Fatigue reports were seen as particularly risky here: '…I think the safety reports and fatigue reports are treated very differently by the company'.

Feared consequences could be as important as actual consequences. Pilots were aware that anxieties might be unfounded, but they were nonetheless very real. For example:

> 'I think people feel threatened if they report things and it gets traced back to them... I'm in a lucky position, I have a permanent contract, but most of the first officers don't. The ones that do, when they come up to their assessment for command think 'You've had all these days off fatigued' 'You've had them off sick'; and they'll just – they'll be worried about it. Whether or not it's true and it is taken into account, they still feel concerned about it and reluctant to report things.'

Several pilots reported worrying that they would be called in and may be disciplined – worries that could last for weeks after submitting a report. Captains, who often had more secure employment, were aware of the anxieties of junior staff. Possible feared consequences included reducing their chances of promotion or progressing to a more secure contract. Several pilots described being called in for a 'chat' or 'conversation' following a report. This was sometimes seen as time consuming (similarly to the time consuming nature of reporting itself), and in some instances as the setting for

veiled threats ('there are always subtle undertones'), e.g. to the effect that if the pilot found rosters exhausting perhaps flying wasn't the career for them. It could be intimidating and deter reporting. For example:

> 'I was invited for a conversation …. and it was quite intimidating [because of who was present at the meeting]…. I think that is quite a destructive way of doing things because it makes people very defensive; very reluctant to report unless they absolutely have to.'

Concern about job security and progression was a recurring theme in the interviews and there was an acute sense that for many pilots this is a precarious job. This concern was most frequently raised with respect to their own personal job security and progression. The most vulnerable groups emerged as inexperienced pilots not yet on full contracts and first officers in airlines where promotion to captain was not based on seniority. These groups were very reluctant to risk jeopardising career security or progression. Reluctance to report was expressed especially by newish first officers in airlines where pilots at entry level are not on a secure contract. Some expressed the further concern that if their airline decided not to keep them, submitting safety reports could mean they were seen as having a blemished record or as a trouble maker, reducing their chances of a job with another airline. More confidence was expressed by captains and those on permanent contracts.

It was emphasised to us numerous times that most pilots joining the industry today have personally invested very heavily in training and do not want to do anything to risk their investment. Some captains said they were sympathetic to this and would be deterred from insisting on a report where it might affect a first officer's security or progress. Insecurity of this group around reporting was also described as part of a more general lack of experience. New pilots have much less flying experience than was previously the norm, and are learning a huge amount very quickly. One concern put to us here was that new pilots rely heavily on the captain's experience, but that in some airlines promotion to captain was occurring from a pool of first officers who are themselves younger and less experienced than had previously been the norm.

First officers' insecurity worked also in the direction of possibly leading to over reporting. For example:

> 'The consequences *not* reporting it if the company decides that it should have been reported are quite severe. Particularly younger people, they are absolutely paranoid about it, and sometimes you can persuade them and actually there wasn't anything safety-related in that, so it is not worthwhile reporting. Sometimes they want to report it. Individual captains have individual ways of dealing with that issue, but I've never stopped anyone putting in a flight safety report.'

We mentioned above that captains sometimes referred to new pilots' tendency to 'go by the book' and report with less discrimination than more experienced pilots. Some first officers themselves reported that they were more concerned about being in trouble for *not* reporting than that they would be in trouble for reporting. (See also above re: reporting matters picked up by SESMA). Again, the views expressed by pilots in different airlines varied.

Insofar as it was mentioned at all, reporting directly to the CAA was seen as likely to be interpreted as a hostile act by the airline. For example:

'I know somebody who's done that … who has actually gone straight to MOR; …. The proverbial started to hit the fan and he was contacted straight away … managers were called in straight away saying 'What have you done? Why have you reported it? Are you trying to shut us down?'

Whether it is worth reporting

Being tired at the end of the day could be compounded by the lack of a sense that reporting was worthwhile. Two related reasons were mentioned to us.

Feedback

In the absence of feedback on the use and usefulness of reports pilots were left unsure whether the time and effort of submitting reports was worthwhile. The majority of pilots told us that they did not know what happened to reports. Unless the airline came back to them for further information or explanations, often they heard nothing more. Not all pilots wanted feedback. Some said they were too busy to take an interest in follow up; but most said they would welcome more feedback on what happened as a result of reports.

For example:

'… you're more likely to report a problem if you get feedback I think, because it is of interest to you what the company are going to do about it to make sure that that doesn't happen again.'

'Maybe a little bit more feedback? That always seems to be where things fall down. You end up in a situation where you think to yourself "it is pretty much a one-way system".'

'Wouldn't it be nice to know what the CAA are doing with this MOR information? … I think it would be nice to know what the Authority are doing with this information.'

'Would be would it be possible for me to see in more detail the ASR data?.'

A number of pilots, generally more senior and experienced, referred to being able to call the safety department (or indeed other departments within the airline) and this could be an important route for feedback. Airlines varied here. Some pilots reported systematic feedback, though usually quite limited. The safety department might come back to a pilot for more information. Some had continuing access to an electronic version of their report but this did not give much if any information about any investigation or other response. The relationship between individual pilots and their airline's safety department varied, and with it, pilots' confidence that their reports would be used to improve safety.

Feedback was not received from the CAA itself by pilots we interviewed.[10]

[10] The CAA told us they would get back to pilots if they needed to as part of their investigation, but not otherwise; and that the majority of reports were not investigated further. The main reason was time pressure, but another factor here is the importance of keeping information secure. There used to be a web page on which the outcome of reports to the CAA could be tracked by pilots, but it is no longer available without special permissions for security reasons.

Scepticism about usefulness

Absence of feedback was related to scepticism about the use made of reports. There was general scepticism that information was not made use of:

For example:

> 'As far as I am aware it goes into a big filing cabinet.'

> 'If people are always reporting something but nothing ever changes, people will eventually stop reporting - not that the threat has gone away it is just that people get fed up of going "it's happened again".'

> 'I think at times people get a little bit disheartened … you get an enthusiastic pilot and he submits reports upon reports upon reports … it could very well be that what he is submitting … is not resulting in any tangible change… That person slowly becomes discouraged and says "oh what is the point of reporting; the company never does anything about it".'

There was more specific scepticism about how the selection of reports to forward to the CAA as an MOR was made within the airline. Pilots had a general idea that the company forwarded mandatory reports to the CAA, and the majority trusted their company to forward relevant reports, but there was a more cynical minority who suspected that this was not always the case. Some pilots mentioned having been dismayed to discover that MOR box was sometimes 'unticked' by the airline[11], meaning that the company could block use of the report. Some said there was no longer an MOR box on the ASR form.

Scepticism arose in particular where safety concerns related to management decisions and/or to commercial pressures. A clear common perception was that airlines did not want to receive reports about safety risks arising from commercial pressures: 'There is no point reporting something the airline doesn't want to hear about'. This was more marked for some airlines than others, but it arose across the board. In particular, pilots said they did not expect reports to be welcomed where the employing airline and the commercial pressures under which it is operating was seen as the source of a safety risk. Examples here were pressures on pilots to stretch rules, take actions or assume additional responsibilities they felt to be unsafe distractions from e.g. working through check lists and accurately entering computer settings, or heavy rosters. In some cases pilots felt strongly that management decisions on such matters were being made by people with insufficient understanding of what they are asking of pilots, with consequences for safety.

For example:

> 'The people sitting in the office… they're sitting there in the comfy chair. There is no stress, there is nothing going on; and they think "Well, we'll get the guy to work an extra hour, or two hours, or whatever. They don't understand… I often think those people who come up with those limitations etc. - if they were sitting on the jump seat for the previous two or three days when you're going from night to day … and you see how tiring it is with the decisions you have to make, then you might be a little bit more sympathetic.'

[11] We do not know whether this is true or not of course, only that it is the perception.

Airlines differed here, but even in airlines with a highly regarded safety department, management was widely viewed as driven by commercial considerations at the expense of safety.

Some pilots volunteered that they had sympathy with their airlines and the pressures it faced. They did not wish to cause difficulty for the airline and felt their interests were aligned in desiring the success – even survival – of the airline in a difficult economic climate and highly competitive environment. A related sentiment commonly expressed was that pilots as a group were professional people who would 'get on with it' and not complain. This meant some safety issues would not be reported because they were not recognised as something that *should* be reported (see below).

Relationships with colleagues

Maintaining team spirit and a sense of camaraderie is clearly valued. Occasionally the consequences could inhibit reporting. Concern for colleagues could add pressure to fly whilst unwell or tired because reporting as unfit to fly meant another pilot would be called in. It was mentioned that this could be especially acute when flying at Christmas. We have already noted that some captains said they might hold back on reporting where they were aware a junior colleague felt vulnerable to consequences. Nurturing cooperation was highly valued. Submitting reports tended to be a joint activity, especially between captains and first officers (although there is some variation here, with some in smaller airlines seeming to regard reporting solely as the captain's job). It is on the flight deck discussing these things that first officers learn about the reporting systems, resulting in some contradictory dynamics as described above. Captains generally told us they would support first officers in reporting issues they themselves felt did not require reporting, and there was a sense amongst some that inexperienced first officers were quick to report in a precautionary 'by the book' way. Colleagues here included cabin crew, and again some captains reported that they discussed reporting any cabin- or passenger-related issues with cabin staff. There is a sense that there would usually be very little cabin crew could contribute regarding flight deck matters.

Problems working with a colleague or concern that a colleague might need help were discussed as very sensitive and some clearly regarded as them difficult to report. Some captains said they would try and deal with these matters informally, outside of reporting systems. It was felt there is not a good route for handling some of these.

Do pilots think current reporting systems provide good channels for safety information?

Scope of matters captured

ASR reporting was widely viewed as focused on certain types of threats to safety. It was generally believed reporting systems work very well in respect of these, and have made a huge contribution to safety; but also that flying today presents new risks that are not being captured.

Although MOR and ASR reporting requirements include blanket inclusion of 'anything else' that was a threat to safety, there were important safety concerns for which the ASR/MOR route is not usually considered, and some where an ASR report may be seen as inappropriate. It seemed that proactive

reporting of some risks to safety was inhibited whilst more and more reporting was encouraged within a narrow range that did not necessarily include where pilots see the greatest risks.

Examples of areas where they perceived the biggest current risks to safety included: stress and fatigue; rostering, especially during the summer season; pressures to carry the minimum of fuel; other pressures to push/exceed limits; pressures not to report a minor problem with the aircraft so as to avoid flight delays or cancellations[12]; very short turnaround times; new procedures and additional responsibilities that distract or pressurise pilots at a crucial time of preparation for a flight; changed requirements regarding flight time experience for new entrants (e.g. 'Concerns about experience levels are wildly underreported'); lack of support in their own attempts to ensure safety; and airline mergers when different safety cultures and different details of flight operations on the same aeroplane are likely. Pilots said these factors were unlikely to trigger an ASR report.

Fatigue and its consequences were mentioned frequently as a looming major safety problem. For example:

> 'I think [fatigue] is vastly underreported and that is probably going to be the biggest safety problem in the future.'

> 'A lot of people, the press and public probably are obsessed with the idea of terrorism, but there is a far greater threat actually of a huge flight safety event arising purely out of burn-out and fatigue I think.'

There was a consensus that ASRs are not a good channel for human factors concerns. These tend to be less readily recognised, and they do not necessarily give rise to the types of clear cut incident that trigger a report. Yet they were seen as sources of risk at least as important as matters that are routinely reported. For example:

> 'Let's weigh it now: I infringe by ten feet the stable approach criteria and I write a report: and I am awake for 13 hours. What do you think is the most risk?'

Several were concerned that human factors threats are worsening and not captured within ASRs. For example, in relation to fatigue:

> 'I think fatigue is going to be a massive issue. ……. I think it is something that is going to come to bite us and I do think that that is a very difficult thing currently, to ASR. How do you put into words that you're feeling knackered and then why?'

A breakdown in teamwork was another threat thought to be serious but likely to be missed in ASR reports. It could interact with other risks, for example:

> '[an event has potential to be dangerous] especially when something has happened and there has been a breakdown in the team work between the two pilots on the flight deck as well; or there is a trigger event like for example a go-around due to wind shear, and then

[12] This focuses on pressure not to report something during a flying day rather than not to submit a later ASR, but is nonetheless a potential influence on safety reporting.

> one of the pilots doesn't perform as expected or didn't react in the correct manner – so a breakdown of communications between the two pilots …. Sometimes pilots don't necessarily recognise a breakdown in communication and the breakdown of the CRM principles that we operate to are actually reportable events.'

Pilots said that human factors might be mentioned in an ASR as a background reason for something more technical happening, but generally they would not be. CHIRP was seen more as the place such reports might be expected, but it was not seen as having any influence. Pilots we spoke to found it interesting reading, but we did not interview anyone who had used it.

Conflicting pressures

ASRs were not viewed as a good channel where safety and commercial pressures conflict. These pressures combined with feelings of vulnerability among more recently qualified pilots who may be unwilling to do anything to antagonise their airline or be seen as a potential thorn in its side. One said: 'I am not the biggest risk in the front: the biggest risk is the commercial pressure. How do we report that?'

We were given numerous examples: stress and fatigue; increasing responsibilities that distract pilots; examples of pressure from the airline to push to legal limits and beyond (e.g. on weight carried on take-off; fuel carried; hours flown) and in some cases to massage paperwork to do so. A frequent comment was that the legal limits become targets – and then are exceeded.

Separate fatigue reports were not seen as a good information channel in their current form. There was a widespread sense that they are treated with scepticism by airlines and discouraged. The same vulnerability that could inhibit ASR reports was felt strongly when it came to reporting fatigue or resisting rosters. Pilots said they were aware that some pilots do 'swing the lead' – but they also gave many examples of stress and fatigue as safety risks, and said that dismissing fatigue reports as pilots 'trying it on' is not a safe management practice. A particular difficulty arose when pilots were unfit to fly because of illness or personal circumstances such as bereavement, rather than fatigue or rosters. We were told this could be seen as 'not the airline's problem'. Similarly, airlines did not regard it as their responsibility to ensure that a pilot finished the day fit to travel safely home.

A number of pilots said a further reason that fatigue is underreported is that pilots tend to 'get on with it' and do their best to meet demands put on them. In other words, fatigue had become normalised. This could pilots mean flying when they shouldn't, and was a safety concern not catered for by reporting systems.

For example:

> 'For example, you make a maximum duty say eleven hours… And you are scheduled 10 hours and 50 minutes. You know there are going to be delays, its summer and there are going to be delays. You can say "that's aviation" but on the other hand it is putting pressure every day on me with passengers behind, because I'm not going to let the poor guys – you can see that I'm already making a wrong statement – but I'm not going to let them not go to

their destination … you see how all the pressure … I'll just get on with it for another 20 minutes.'

'There is no wellbeing of the pilot these days to be honest. There is none, there is just a legal limit; that's the legal limit, that's what we have to do, get on with it.'

This applied to large as well as small airlines. For example, one captain described 'the insidious wearing down that a busy summer period roster can inflict'. Pilots were persevering with heavy workloads and becoming increasingly exhausted, 'hitting a wall', and ending up signed off as long term sick. He feared the same could be round the corner for others. The pilot felt the CAA should be compiling data on this, but said he was not aware of any method of passing on fatigue-related concerns that bypass the company.
It is worth emphasising that these concerns were not expressed to us as 'moans' but in answers to open ended questions towards the end of interviews about whether the ASR/MOR systems provide a good channel for information relevant to safety to be reported.

The role of MOR reports and the CAA

Some pilots were not interested in the procedural routes for reports but the large majority believed it was important that the CAA should see reports. This was for a variety of reasons. Prominent among these was the importance of an independent body taking a global view of reports coming in from different airlines. The view was that collating this information and identifying trends is vital for transparency and also for any possibility of effecting change. The CAA is regarded by some pilots as the ultimate arbiter of safety issues, standing aside from the commercial concerns of the airlines. There was a consensus that a route external to the airline was needed for matters the airline might prefer not to deal with.

A minority expressed concerns about the ability of the CAA to act on reports. Views ranged from being unclear what the CAA did to an occasional forthright scepticism that the CAA had the powers and inclination to regulate effectively. This was related to concerns about the resources available to the CAA; their legal powers; asymmetries of power and capacity between the regulator and the airlines; and concerns that government deregulation policies weighted the economy above safety. There was a view that the CAA is being undermined by government, industry, and transnational regulators. There were concerns that its authority in relation to airlines was shrinking because it is secondary to EASA and because it is funded by an industry that can shop around for a regulator – 'the airlines pay their bills'.

What is clear from the interviews is that the CAA is not particularly visible to pilots with respect to safety reporting. This led some to believe that submitting reports makes no difference. We mentioned above that no feedback from the CAA is apparent to pilots following reports. There was a clear wish to know how the CAA reacts with respect to individual reports, especially those of a more serious nature, as well as general trends. The most visible presence of the CAA on the ground is its Flight Operations Inspectors. They were generally (but not universally) talked about positively.

Summary of main themes

1. The overwhelming majority of pilots were strongly committed to safety, and took pride in this. They felt that safety culture is at the heart of the job, and for many this was the reason they gave us for replying to our e-mails and agreeing to be interviewed. Pilots were willing to give up time to talk to us, travelling especially to meet us on a day off, or fitting in a meeting between flights. They thought the topic was important and if they could help then they were pleased to.

2. We found very little sense of axe grinding and a high sense of commitment. Related to this is the view that reporting occurrences is important for both their own learning and the industry's.

3. We cannot speculate on the extent of under-reporting/non-reporting but we can say that everyone we interviewed thought that there was under-reporting.

4. Clear differences affecting reporting were apparent between airlines, across a number of dimensions. These include promotion structures, ease of reporting; safety culture and rapport with 'the safety guys'; the anticipated response of companies to reports/failure to report; and the security of employment contracts which in turn related strongly to confidence in reporting. This was not simply a division between large and small airlines. Some smaller airlines were talked about very positively, others less so. Large airlines were not immune to commercial pressures, and feelings of insecurity over reporting were found amongst airlines of all sizes. There were some clear notions amongst those we interviewed of airlines where safety culture is exemplary and ones where they would prefer not to work.

Other strong themes were:

5. The precarious nature of a career as an airline pilot, especially when newly qualified, and the influence this has on reporting about both oneself and others.

6. The commercial pressures that permeated every aspect of reporting and information flow. This resulted in mixed messages for pilots regarding the industry's commitment to safety and safety reporting. There were strong perceptions that commercial pressures on the industry and the marketisation of the regulator influenced likely responses to reports, thereby influencing reporting in the first place. Pilots also experienced commercial pressures more directly, on their careers and job security; and on the safety-related decisions they took daily and the likelihood they would formally report safety matters.

7. Perceptions that there are important sources of risk to safety for which pilots would be a good source of information, but that are not captured within the ASR/MOR system. These include i) matters not reported because a report is not expected to be welcome, and non-reporting has become normalised; ii) matters not obviously falling within reportable categories, notably human factors; and iii) matters where risk is recognised but tolerance of risk has become normalised.

8. The system of self-regulation whereby the company is primarily responsible for the reporting system not being really understood by some respondents and being viewed cynically by others. It appears to undermine confidence in the regulatory system and also affect what is reported.

9. Ease of use and convenience of reporting methods, which can facilitate or deter reporting.

10. The importance of the belief that pilots have the support of their company and the CAA in reporting. However, confidence in a 'just culture' in the sense of a non-punitive response to particular individual mistakes is only part of the picture. More important in the sample we spoke to were the vulnerability and insecurity of many pilots; and the lack of effective channels for reporting many of their safety concerns. Most were sceptical that confidentiality could be adequately maintained within the reporting system.

11. The importance of the collaborative nature of reporting. This is the main way new pilots learn about reporting. They also learn what not to report, and this may perpetuate patterns of non-reporting.

12. The normalisation of fatigue, and also of matters which pilots think should be taken up by companies but where experience of reporting suggests it is a 'waste of time'. It becomes 'normal' not to report these things and they do not change.

13. Concern that management teams and those scrutinising reports should be pilots who understand the pressures of commercial flying and the nature of the job. Particular concern was expressed about board-level ignorance of the job, and privileging of the bottom line in ways that assume pilots can safely work routinely to legal limits and beyond.

14. To explain reporting practice, pilots' knowledge of formal requirements under the regulations was less relevant than their knowledge of how requirements are normally interpreted and applied in practice and how they are modified by less formal requirements and expectations.

Suggestions and further lines of enquiry

Topics that could usefully be followed up in a larger scale study have emerged above and will not be repeated here. Our interpretations are tentative and require further study on larger and systematically representative samples.

For example:

- The marked differences we found between airlines mean that a full picture would require a comprehensive sample of airlines. Some pilots talked of great improvements in safety culture in their airline in recent years; others still had serious concerns. In particular, the

position could be very different in the long tail of very small airlines. Comments from the pilots in this study suggested that risks, reporting procedures and safety/just culture might be very different in small companies. The number of passengers carried may be small, but the number of pilots and the possible extent of unreported unsafe practice is significant. Interviewees also indicated that the experiences of pilots in non-UK airlines flying into the UK might also look very different.

- We have suggested that commercial pressures, regulatory approaches and employment structures systematically affect reporting and can block certain categories of report. Self-regulation in a highly competitive industry and a difficult market seemed to be an obvious potential block to information flow. These ideas need systematic testing.
- At a more detailed level, comparison of operations manuals and reporting forms could provide some information about pilots' knowledge and experience of reporting procedures in different airlines.

The interviews imply several ways in which reporting could be improved.

For example:

- The findings strongly suggest that pilots could be recruited more effectively as a source of safety information, enabling the regulator to pick up on risks more comprehensively, especially in relation to 'unknown unknowns' and in areas outside the mainstream of ASR/MOR reporting. Pilots' commitment to helping promote safety was obvious but discouraged in some areas, and not used to the maximum. Pilots sometimes felt unsupported in their own attempts to promote safety.
- Pilots' reliance on the operations manuals together with informal learning on the job suggests these are good places to target any moves for change.
- The confidence and co-operation of pilots in reporting could be enhanced by providing clearer information and feedback.
- The CAA has limited resources, but higher visibility might help willingness to report and also help define what information is helpful, how it is used and how it could be used. Greater availability of both trend data and occurrence reports would be helpful. It was clear that pilots do want to learn from incidents and reports, and devour and discuss reports of incidents when they are published e.g. in company magazines.
- At a more detailed level, reporting could be improved by increasing the ease of reporting, possibly including pre-populating forms with basic flight data that already exist in electronic form.
- Pilots' perceptions and worries were sometimes based on soft information. Their confidence in reporting might be increased by better communication and feedback.

Acknowledgments

We are extremely grateful to all the pilots who spoke so openly and helpfully to us, especially because participation in the project required a generous commitment of time by extremely busy people.

Appendices

Appendix 1.1

CAA and BALPA approved covering email

Dear Licence holder

Joint BALPA/CAA Safety Reporting Project

This email is to invite you to join a pool of pilots for a project seeking pilots' views on occurrence reporting and safety culture.

The British Airline Pilots' Association (BALPA) and UK Civil Aviation Authority (CAA) both share a commitment to the safety of UK aviation. Part of this commitment includes promoting an open and just safety culture.

To better understand the level of trust and understanding of occurrence reporting among pilots the CAA and BALPA are jointly funding an independent project which is being run through the London School of Economics (LSE). They have commissioned Professor Bridget Hutter and Professor Sally Lloyd-Bostock to conduct a series of face to face interviews and report independently on our reporting culture.

The LSE have a wealth of experience in this type of study and take a very rigorous approach in protecting the anonymity of those they interview. To ensure that the identities of pilots interviewed are protected, we are asking you to click on the link below and answer a few brief questions to indicate your willingness to be contacted by the research team. Your response will go directly to the LSE and will not be shared with anyone else, including BALPA and the CAA. By using a reputable and impartial institution such as the LSE we hope that you will feel comfortable and assured that your privacy is protected and you can give an open account of your experiences.

Link to survey

Best Regards
Signed Mark Swan & Brendan O'Neal

Appendix 1.2
Content of on-line sample gathering questions distributed through QUALTRICS [13]

Welcome to the Safety Reporting Study

Thank you for opening the link. We are seeking pilots' views as part of a project to improve the effectiveness of reporting systems and we are looking for pilots willing to be interviewed. We are therefore asking your permission to contact you about participating in the research. A sample of pilots responding will be invited to take part. You are not committing yourself to anything at this stage.

All details you provide will be kept securely; used only for the purposes of contacting you about the research; and deleted as soon as they are no longer needed.

Please provide at least one way of contacting you:
Name
Email address .
Are there any other ways of contacting you or any further information that you think would be helpful if we wish to contact you?

To help us contact a cross section of pilots, please let us know:
Are you currently employed by an airline? If yes, please select: or write in below:
Where are you based?
Are you currently flying long haul, short haul, other
Are you a captain, first officer, other
How long have you flown commercially?
Are you male/female

[13] The bare content is shown here. Pre-codes, dropdown lists etc. in the questionnaire as it appeared on-line are not reproduced. Some additional questions were asked about whether respondents had filed an MOR report but they were not used to select the sample.

Appendix 2

Age, gender and type of licence held by pilots included in CAA's email inviting participation in the project

Aircraft Type	Count		Licence	Count		Age	Count
A320	4498		ATPL	9876		20	10
B777/787	1689		CPL	1246		21	39
B737 300-900	1445		MPL	57		22	38
B747 400	1146			**11179**		23	82
B757/767	1135					24	98
A330	749		**Gender**	**Count**		25	143
A340	447		M	10637		26	203
DHC8	376		F	542		27	229
EMB170	320					28	253
BD-700	206					29	268
EMB 135/145	192					30	317
A380	187					31	283
HS125	159					32	312
G-V	155					33	264
C560XL/XLS	135					34	300
CL604/605	121					35	325
ATR42/72	116					36	313
SAAB340	107					37	281
SAAB2000	95					38	343
C500/550/560	94					39	306
AVRORJ/BAe146	90					40	323
Jetstream41	84					41	371
Falcon2000EX EASy	74					42	355
BAe/ATP/Jetstream 61	72					43	370
Falcon 7X	70					44	376
A330/350	54					45	378
A310/300-600	51					46	361
Learjet45	49					47	410
Jetstream31/32	46					48	414
Falcon900EX EASy	42					49	356
DO328-100	38					50	327
GVI	38					51	318
Falcon20/200	37					52	288
Beech400/MU300	30					53	301
CL30	30					54	297
CL65	27					55	273
CL600/601	24					56	223
B717	23					57	216
Falcon50/900	22					58	198
C680	21					59	155
B747 100-300	20					60	149
Falcon2000/2000EX	20					61	94
G200	20					62	95

RA390	19					63	63
Learjet60	13					64	46
C750	11					65	24
Learjet20/30	11					66	20
L188 Electra	10					67	14
DC9 80/MD88/MD90	8					68	14
DC3	6					69	10
F50	6					70	2
HA4T	6					71	3
B727	5					72	2
LetL410	5					73	5
A400M	4					74	0
DHC7	4					75	0
F70/100	4					76	1
MD11	4						
F27	3						
G150	3						
L1011	3						
Learjet 45/75	3						
SD3-30/60	3						
A300	2						
E-3D Sentry	2						
Falcon10/100	2						
CL415	1						
DC8	1						
DO328-300	1						
GulfstreamIV	1						
IAI1125	1						
SA226/227	1						
	14497	>1179 due to multiple aircraft types held, this list only includes multi pilot A/C current as of 17/09/14					

Note: 10,268 emails were recorded as ‘successfully delivered’

Appendix 3
Characteristics of sampling pool of 504 pilots

Airline [14]

	Frequency	Percent	Cumulative Percent
British Airways plc	132	26.2	27.2
Easyjet Airline Company	109	21.6	49.7
Thomas Cook Airlines	23	4.6	54.4
Flybe Ltd	22	4.4	59.0
Jet2.Com Ltd	22	4.4	63.5
Thomson Airways Ltd	22	4.4	68.0
Monarch Airlines	12	2.4	70.5
Virgin Atlantic Airways	12	2.4	73.0
Ba Cityflier Ltd	8	1.6	74.6
Norwegian	8	1.6	76.3
Appearing less than 8 times	115		
Total answers	485	96.2	
Total including no airline specified	504	100.0	

Role

	Frequency	Percent	Valid Percent	Cumulative Percent
Captain	308	61.1	61.1	61.1
First Officer	183	36.3	36.3	97.4
Other	13	2.6	2.6	100.0
Total	504	100.0	100.0	

Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Female	26	5.2	5.2	5.2
Male	478	94.8	94.8	100.0
Total	504	100.0	100.0	

[14] The full list of airlines is not given to protect the identities of pilots volunteering to participate where numbers are small. The full list includes a mix of small airlines, ferry services, cargo companies, corporate jet companies, freelance pilots and others. Those 'not answering' include pilots not currently employed.

Long or short haul

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Long haul	144	28.6	28.6	28.6
	Short haul	283	56.2	56.3	84.9
	Medium/Other	76	15.1	15.1	100.0
	Total	503	99.8	100.0	
Missing		1	.2		
Total		504	100.0		

Commercial flying experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More than 20 years	167	33.1	33.3	33.3
	11-20 years	161	31.9	32.1	65.3
	6-10 years	102	20.2	20.3	85.7
	1-5 years	63	12.5	12.5	98.2
	Less than 1 year	8	1.6	1.6	99.8
	I have not flown commercially	1	.2	.2	100.0
	Total	502	99.6	100.0	
Missing		2	.4		
Total		504	100.0		

Whether currently employed by an airline

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	40	7.9	7.9	7.9
	Yes	464	92.1	92.1	100.0
	Total	504	100.0	100.0	