



Confidential Incident Reporting and Passenger Safety in Aviation

Executive Summary

In order to tackle the problem of human error on the flight deck (which accounts for the majority of commercial aircraft accidents), a database of self-reported errors in serious incidents is required in addition to the independent investigation of aircraft accidents and serious incidents, which is now required by EU Directive (94/56/EC). Confidential incident reporting systems already exist around the world. Although none should be regarded as a precise model for a European system, they do demonstrate the potential utility of the technique in acquiring data concerning human error.

Incident reporting systems rely on gathering data from individuals about their mistakes and guaranteeing that their identities will not be revealed, especially to their employer or licensing authority. The legality of operating a confidential system, and of protecting the identities of reporters, must be closely examined in the context of different European jurisdictions.

To ensure that benefit accrues, every effort should be made to maximise the feedback of information to aviation personnel and to integrate stored data with those data gained from other incident reporting programmes and accident databases on a world-wide basis.

Such systems cannot be operated or funded by airlines or regulatory authorities if aviation personnel are to have faith in them. A European system should be funded centrally, and operated from a co-ordinating hub with satellite reporting stations in

European states or regions.

The establishment of an effective European confidential reporting system is possibly the single greatest innovation that could be made to improve European and world air safety. This importance should be recognised and reflected in the priority and funding that it is given.

Introduction

It is now recognised in a number of regions of the world that aircraft safety has improved dramatically in the post war era, but not markedly over the last ten or more years. This slow down, or even arrest, in the rate of improvement in aviation safety is frequently attributed to a failure of the aviation system to bring about a reduction in the number of accidents attributable to human error which now accounts for the majority, probably about three quarters, of all public transport aircraft accidents.

The problem of reducing the number of accidents attributable to the human factor has been the subject of countless symposia and conferences within the aviation community, and has resulted in two main initiatives: Cockpit or Crew Resource Management (CRM) training for flight crews, and confidential human factors incident reporting programmes. It is the function of this paper to analyse the applicability of a confidential aviation incident reporting system to Europe, the establishment of which was described as a desirable development by the European Commission more than 5 years ago (SEC(91) 1419 final).

Since a confidential incident reporting system explicitly aims to gain insight into the human factor, it must be seen as a development parallel and in addition to the independent in-depth investigation of accidents and serious incidents, which is now mandatory by EU Directive 94/56/EC.

Existing incident reporting schemes

In aviation, the importance of incident reporting schemes has always been recognised but, although most of such schemes that existed around the world recorded incidents attributable to both technical and human failure, the number of human errors that were reported were minimal. Although some nations have made efforts to give pilots confidence in using existing reporting schemes for human error reports, this has not generally been successful for a number of reasons, some of which are addressed below. For example, in one European nation in which the

reporting of all incidents was 'mandatory', a study of the reports submitted to the scheme showed that only about 2 per cent of the reports submitted involved any form of human error.

There is, however, already considerable experience around the world in the operation of reporting systems that have two characteristics in common; first, they seek to gather data principally about human error, and second, they seek to facilitate this by guaranteeing the confidentiality of the reporter.

In the USA, the Aviation Safety Reporting System (ASRS) is the forerunner of large schemes operating in the civil environment, though a number of military schemes in both the US and UK predated it. The ASRS is promoted throughout the pilot, cabin crew and engineering communities, and not only offers confidentiality to reporters, but offers immunity from prosecution if the reporter has committed an offence, even if this offence is detected by a third party. Such immunity was clearly designed to encourage reporting, but many judge it to have had an unfortunate side effect. This is because probably the commonest breach of flying law that occurs in the US is the 'altitude bust', when an aircraft (normally inadvertently) departs from the altitude assigned to it by the air traffic controller. If the pilot submits an ASRS report on the incident, he or she may not be penalised (normally in the form of a licence suspension) for it. Since such altitude busts are now detected more or less automatically by the ATC data processing system, a very large proportion of all reports concern such altitude busts, are submitted purely for the immunity, and do not result in much increase to the error knowledge base. This shortcoming may well be offset by the fact that the system attracts huge numbers of reports and is extremely well established within the aviation industry, and it should be noted that although the provision of immunity may be important in attracting reports, it is rarely actually used in order to avoid penalty.

The US system is funded by the FAA, but is operated by NASA who contract out the day to day working of the scheme. The difficulties that the scheme has faced are well known, and include a number of problems in the relationship between NASA and the FAA, and the problem of operating a confidential scheme in an environment that places great importance on the freedom and accessibility of stored information. Such considerations led to the scheme initially being unable to store data even on aircraft type and, today, ASRS still does not retain information on the airline involved in the incident, and has to lose a large proportion of its other data in order to maintain confidentiality. This is partly because the freedom of information act has enabled anybody to be able to buy a copy of the database on CD ROM. Many pilots are unhappy with this situation.

In Canada, a scheme (CASREP - Confidential Aviation Safety Reporting Program) is operated by the Transportation Safety Board of Canada, an independent organisation. The same immunity is offered as in ASRS, but exemption for the system from the Canadian freedom of information act avoids many of the problems.

It is worth noting that 80 per cent of the reports submitted to this system arrive via toll free telephone rather than on paper.

Schemes have also been initiated in both Australia and New Zealand. The smaller populations in these countries and the consequently increased difficulty of ensuring the confidentiality of stored data have proven problematic, and the New Zealand scheme was effectively closed in 1991 because a pilot who had submitted a report was identified by the regulatory authority. The Australian scheme, operated by the Australian aircraft accident investigation unit, has also experienced difficulty in attempting to prevent the police from seizing information and data files. Again it should be noted that 70 per cent of the Australian reports are submitted by toll free telephone.

Other than a scheme operated in southern Africa by SASCO (the Southern Africa Aviation Safety Council), and schemes operated by some individual airlines, the remaining scheme of note is that operated within the UK and known as CHIRP (Confidential Human Factors Incident Reporting Programme). This scheme is funded by the UK Civil Aviation Authority (CAA), the UK regulatory body and, until a recent reorganisation was implemented, was operated by agencies of the UK Ministry of Defence. It should be noted that the scheme was always aimed only at commercial pilots and air traffic controllers and, although the CAA had agreed to offer immunity from penalty to CHIRP reporters, this immunity had never been promoted conspicuously within the aviation community and almost certainly played no part in motivating the submission of reports.

It can be seen that the schemes presently in existence vary in a number of respects. The client or target populations differ in that some are aimed largely at commercial flight crews, whereas others are promoted throughout the whole of the private and commercial, flight and flying support communities. The funding and operating agencies differ, with government departments, regulatory authorities, accident investigation units, commercial research organisations, and university departments all playing their parts. Some schemes offer immunity to reporters, others do not; some allow telephone reporting, others do not, some have public access to their databases and others do not. What is demonstrated by the existence and operation of these schemes and by comparing them with the pre-existing mandatory and more technically oriented schemes is that if we are to acquire self reports of human error, the reporter must feel confident that he or she will not suffer any adverse repercussion from submitting the report. Based on this premise, the remainder of this paper addresses what the characteristics of a European system should be if its chances of success are to be maximised.

An EU scheme

Confidential or anonymous?

The object of introducing a new reporting system is to gather those reports that, say, a pilot would be naturally reluctant to submit to a system operated by his or her employer or licensing authority. If such individuals are to be protected they must be allowed to submit reports either anonymously or confidentially. The word 'confidential' is used in this context to mean that the reporter's identity will be known to the agency to which the report is submitted, but that it will not be passed on to ANY third party. Moreover, any details in the report content that could lead to the identification of the reporter will be removed before the report is made available to any third parties.

The latter confidential option has been chosen by most current reporting schemes. Importantly, it enables the reporter to be contacted by the report receiving agency in order to clarify and amplify it, yet still protects the reporter's identity. If a reporter still does not trust the confidential agency, he or she may submit a report anonymously. It is therefore a confidential scheme that should be implemented in Europe.

Voluntary or mandatory?

Since the object of any confidential reporting scheme is to gather data on incidents that generally are not made visible to third parties (the existence of which is known only to their perpetrators), there is no function in attempting to make such a scheme mandatory since it will inevitably be up to the individual concerned whether to make a report or not.

Geographical extent

There are a number of considerations that influence the geographical extent of an incident reporting scheme. First, the geographical area of operation should be sufficiently small that reporters can make their report by telephone and be able to talk to somebody who certainly possesses some knowledge of aviation, and preferably possesses some knowledge of human factors, in their own language. Second, the area should be sufficiently large that enough commercial aviation takes place within it to enable reports to be disidentified and rendered confidential without the incidents being identifiable from the contextual information the reports contain. Third, the area of operation of the system should be contained within a single legislature (though see below). In the European context, the above points indicate a system that has a single hub, at which a central database is maintained and analysis carried out, with satellites located in the larger states or language

regions whose principal responsibility is to gather reports and to interact with reporters.

Target population

Existing schemes vary in their target populations, but all include commercial flight deck crews. The next populations to be included tend to be air traffic controllers, licensed engineers, cabin crew, and the private aviation fraternity, in that order. From the point of view of ETSC, the principal population whose safety should be ensured is the commercial airline passenger. Although there are arguments that incidents that occur within any field of aviation may have an impact on the commercial passenger, there can be little doubt that the populations that must be included in a scheme for it to be effective are commercial flight deck crews and air traffic controllers. Whether other populations are included in a European scheme depends, it is felt, on the available funding. Each new group that is included in a scheme increases the complexity of initiating the system, since individual unions and employers must be won over in all relevant states, and increases the complexity of running it since contact must be maintained with disparate populations. If sufficient funding were available to undertake these activities successfully, then they may be attempted, but as this is unlikely it is strongly felt that an initial European scheme should concentrate on the important core occupations. The question therefore becomes whether, from a cost effectiveness viewpoint, to add engineers and cabin crew to the essential flight crews and air traffic controllers, since including the private aviation population is unlikely to be a significant contributor to passenger safety.

Legal issues

It is noted above that some of the confidential schemes operating around the world offer some immunity from prosecution to personnel submitting a report to the scheme. The most appropriate way of dealing with this issue is beyond the scope of this report, but what is most certainly important is that reporters should feel and be certain that submitting a report of their own errors to a confidential scheme will not result in any prosecution or penalty, or aggravate any penalty that might be served on them if errors are detected by other means. There will be difficulties in this respect, insofar as there will be the rare reporter who reveals himself to be an alcoholic or psychiatrically disturbed in some other way. Clearly, the same sort of rules that are applied to doctors in breaching confidentiality with their patients will have to be applied to this system also. Such issues require detailed resolution.

A separate legal issue that may impact on the operation of the scheme is the legality of operating the scheme. It is obvious that for the scheme to be successful, reporters must have the utmost confidence that confidentiality will not be breached. With regard to stored data this ought not to be an overwhelming problem since all incidents should be sufficiently disidentified before insertion in the database that

they could not, with certainty, be associated with known specific events. Nevertheless, if completely free access is given to the database (perhaps because of freedom of information legislation), it would permit newspapers to select the most sensational reports and to publicise them. For example, some reports made to existing systems detail whole crews falling asleep. Although it is important that the aviation system should be aware of such incidents, it is not necessarily useful for them to receive sensational publicity.

The third possible legal difficulty is that in operating such schemes there is certain to be a period between the submission of a report and its disidentification when the details of the reporter are available. Ideally, protection from the intrusion of either police or regulatory authority should be provided, but this might require specific provision if the reporter's identity is to be safeguarded.

The last legal potential problem is that throughout Europe there are three quite different legal codes in operation, and it is quite possible that these will present separate possibilities and difficulties for a confidential reporting scheme. For example, in the Napoleonic code, there is a requirement for anybody who is aware of a potential offence in law to report it, and this could generate significant difficulty for such schemes.

Data utilisation

If a European confidential reporting scheme is to be successful, the maximum use must be made of the information received, and the target population of reporters must also realise that their contributions are being effectively utilised. Such effective utilisation will result only if those who are capable of implementing change, essentially air carriers, air traffic control providers, and regulatory authorities have a comfortable relationship with the scheme and have a positive attitude towards using the information to bring about changes to, inter alia, equipment, procedures, and training. Experience has shown that developing such attitudes is not necessarily straightforward: airlines and regulatory authorities have the major responsibility for running the aviation system and any report that appears to demand change is either implicitly or explicitly critical of some equipment or procedure that has already been approved, licensed, or authorised by those bodies. Thus to implement change, these organisations have first to accept the notion that their previous rules or procedures were capable of improvement and may even have been wrong. Furthermore, it appears to be human nature for the messenger to be blamed for the message, and it is very tempting for operators and regulators to form negative views of the reporting system simply because the messages that it conveys can be uncomfortable to them.

An important requirement in terms of data utilisation is the necessity to integrate the information derived from a confidential reporting system with that arriving by other means, principally from accidents and technical incident reports. This means

that a further level of European and world co-operation is called for to ensure that all safety data are effectively collated, but such considerations are outside the scope of the present paper.

If great care and tact must be exercised in the development of relationships with operators and regulators, this is even more true of relationships with reporters. If reporters lose faith in the system, then there will be no system. If potential reporters do not understand the importance of a system and its method of operation, then it is quite possible for them to become disenchanted and disillusioned with it. Furthermore, an important function of a confidential reporting system is to promulgate difficulties experienced by pilots and air traffic controllers such that others may learn and avoid the same problems. To bring this about, some form of publication is a requirement of a scheme, and this must be efficiently produced and distributed.

System funding and operation

It is clear that if reporters are to be confident that their identities will not be revealed either to their employers or licensing authorities, then neither type of organisation can credibly operate confidential reporting systems. Furthermore, although it may be difficult to avoid, such organisations should not be the source of funding for confidential systems since funding a system will inevitably generate the capacity, real or imagined, to put pressure on the system. For these reasons, a European system should be funded centrally, not by the Joint Aviation Authorities, but by the Commission itself.

The Commission should contract agencies in the nations and regions to set up a co-ordinated system in the manner described above. The agencies selected to operate the system may be university departments or other types of establishment, but the selection criteria should include the possession of some aviation human factors expertise and, moreover, complete integrity. Such organisations should have a clear capacity to exist without the funding provided by operating a reporting system, since this will enable them to operate it with disinterest, impartiality, and without pressure to compromise any operational decisions they are required to make.

Cost

Detailed costing of the type of scheme suggested above are obviously not available. Outline estimates can, however, be made. It can be presumed that in order to provide coverage of all EU regions a minimum of six satellite nodes to the system will be required. Each of these will require at least one full time individual, a small amount of computer hardware, and some form of accommodation. It is estimated that the annual cost of each of these nodes is likely to be not greater than 100,000 ECU in year 1 and 70,000 ECU in subsequent years. The central data processing hub may be assumed to cost roughly double this amount, but is also likely to

function as one of the system nodes. Thus the total initial cost is likely to be in the order of 700,000 ECU with a continuing annual cost of 500,000 ECU.

The present situation

An embryonic system is established that meets many of the criteria set out above. It is funded by the Directorate General Transport, is operated by the Technical University of Berlin, but presently operates essentially as a German reporting system. It may be possible that this system could be developed, as is planned, to form the hub of a European system. It has experienced problems, however, in its relationships with the German pilot population, and includes in its target population the private aviation population, a factor that might not aid its rapid development across Europe as observed above.

Without doubt, the most important factor limiting the implementation of such a scheme across Europe is limited funding for DGVII. It has been argued that a scheme must be centrally funded, but there is some danger presently that compromises will be made such that if national or regional funding is available, then local schemes will be allowed to develop funded, for example, by regulatory authorities, and these schemes will not meet a reasonable set of the criteria laid out above for their effective operation.

Conclusion

The establishment of a European Confidential Incident Reporting Programme for (at least) flight deck crews and air traffic controllers may be the single most important contribution that could be made to European aviation safety. It would permit the early identification of problems in the aviation system, and allow their rectification before they cause accidents. The provision of such a reporting system must therefore be taken with the utmost seriousness, possibly given the highest priority for action in the European aviation safety field, and provided with the level of funding that will allow its effective implementation throughout the European community.

It is therefore recommended that:

- a confidential aviation incident reporting programme should be established within the European Union
- it should comprise a central data processing node being fed by a number of (perhaps 6) satellite nodes.

- the system should be funded by the Directorate General Transport independently of local airline and regulatory authority interests, and this Directorate should be provided with the appropriate level of funding (initially 700,000 ECU reducing to 500,000 ECU per annum) to implement such a scheme

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