Access to Air Safety Information

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Apart from a few large companies and organisations, many in the aviation community do not have ready access to air accident and air safety information. What can be done to change this situation?

A paper submitted for the 2nd annual CIS & Eastern Europe Airline Engineering & Maintenance Conference, Budapest, October 9-10, 2002

Air Safety Information is limited, in this paper, to information/data on: **accidents**; **incidents**; **reported occurrences/defects**; and **unreported occurrences**.

Preventing accidents from happening and preventing recurrence of accidents that have happened, is a responsibility for everyone in the aviation industry.
In order to achieve this goal (air) accident investigation boards issue reports and recommendations in the wake of accidents/incidents, regulating authorities collect data on accidents, incidents, aircraft defects, airprox reports, inspection and surveillance data etc.
All these air safety data/information sources are a key element in the process of preventing accidents since it serves as a raw material for safety studies, trend analysis, monitoring, regulations etc.

Maybe not directly linked with accident prevention, a manufacturer or prospective buyer may want to investigate the defect and damage history of an aircraft.
Similarly, air safety data can be used to claim that a manufacturer knew about certain problems beforehand, because of earlier occurrences.

Vast amounts of aviation safety related information are currently available on paper as well as online, free as well as paid and reliable as well as unreliable.
It is becoming more and more difficult for aviation professionals to keep track of everything and filter out the reliable and relevant information for his/her organisation.

This paper focuses on information sources regarding accidents, incidents, aircraft defects and unreported occurrences.

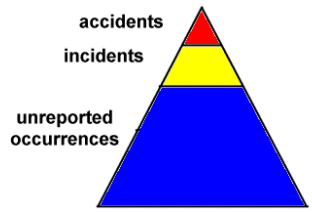


Fig. 1 – Heinrich Pyramid

The amount of publicly available safety information and the ease of which it is accessible, roughly depend on the severity of the occurrence.
The *air safety information model* (fig.2), based on the Heinrich Pyramid (fig.1), shows four types of possible occurrences: significant accidents; incidents; aircraft defects; and unreported occurrences.

The Heinrich Pyramid (fig.1), shows that for every major accident, there will be 3-5 significant accidents, and 7-10 incidents, but there will be at least several hundred (unreported) occurrences. Adopting this pyramid for the air safety information model, an extra layer for for instance aircraft defects can be added. The inverted pyramid on the right shows the relative amount of information available for each type of occurrence.

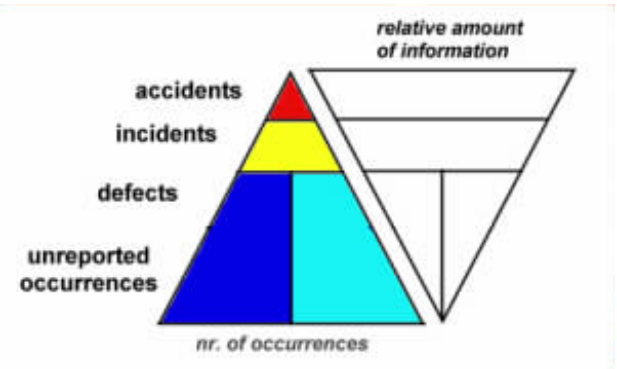


Fig. 2 – air safety information model, based on the Heinrich Pyramid

Two examples show that access to aviation safety information can be vital.
The first example[WARW] shows that an accident could have prevented another accident from happening; the second example shows the importance of (un)reported occurrences and incidents.
In March 1989, a Canadian Fokker F-28 crashed near Dryden while taking off in a snowstorm. The wings were contaminated with ice because 30 minutes had passed between leaving the gate and takeoff. The investigation was not carried out by the Canadian Aviation Safety Board, but by a Commission of Inquiry headed by Justice Moshansky. An interim report with recommendations regarding de-icing was issued December 1990. No copies of this report were forwarded to the FAA, NTSB or any airline.
In March 1992 a USAir Fokker F-28 was cleared for takeoff at New York-LaGuardia, 35 minutes since leaving the gate. Ice contamination on the wings caused the crew of this plane to lose control, causing the plane to crash on takeoff.
If the crew, airline, FAA or NTSB would have had access to the Canadian preliminary report, this accident might not have happened.
The second example shows the importance of information on pilot reports and incidents.
In June, 1991[NASA] a twin engine jetliner was flying near Groton, CT (USA) at 10.000 feet when a TCAS Traffic Advisory warned the crew of another airplane in the area. The air traffic controller instructed them to descend to 9000 feet, but during the descent a TCAS Resolution Advisory (RA) told the crew to climb because the other aircraft was descending as well. The crew then made a right turn to stop the closure rate.
Then at January 31, 2001 [ASN] a serious incident occurred when a Japan Airlines Boeing 747 and DC-10 almost collided over the Shizuoka Prefecture. The controller erroneously instructed the Boeing 747 to descend while the crew of that plane were simultaneously given a TCAS RA to climb to avoid a collision with the DC-10.
Finally, on July 1, 2002, another instance of a conflict between ATC instructions and TCAS RA had fatal consequences. A DHL Boeing 757 and a Bashkirskie Avialinii Tupolev 154M collided over Überlingen, Germany when the Russian crew complied with ATC instructions to descend instead of following his TCAS RA instruction to climb. Sadly enough the Japanese final investigation report regarding the January 2001 incident was released a few weeks after the accident in Germany.

Safety information sources

It's impossible to discuss all available accident, incident, defect and occurrence sources, but since the 20/80 rule roughly applies here as well (20% of all sources cover 80% of all information), only about 20% of all sources will be discussed.

Unreported occurrences

A large number of occurrences are not reported because the airplane was not damaged and none of the occupants were injured. In most cases an unsafe situation does not occur because of the many backup and safety systems of a plane.
However, today's unreported occurrences may be the building blocks of tomorrow's incidents or even accidents, especially in those cases were two or more situations (of unreported occurrences) coincide.

The first step was taken in 1975 by the FAA and NASA in establishing the Aviation Safety Reporting System (ASRS). The ASRS collects, analyzes, and responds to voluntarily submitted aviation safety incident reports in order to lessen the likelihood of aviation accidents.
The ASRS database now contains more than 300,000 reports.
A comparable system has been established in Russia by the Ministry of Transport in May 2002. Safety issues and incidents can be reported confidentially to the "SKES GA" system.

In 1996 the GAIN (Global Aviation Information Network) concept was proposed.
GAIN describes itself as "an industry-led international coalition of airlines, manufacturers, employee groups, governments and other aviation organizations formed to promote and facilitate the voluntary collection and sharing of safety information by and among users in the international aviation community to improve aviation safety." [GAIN]

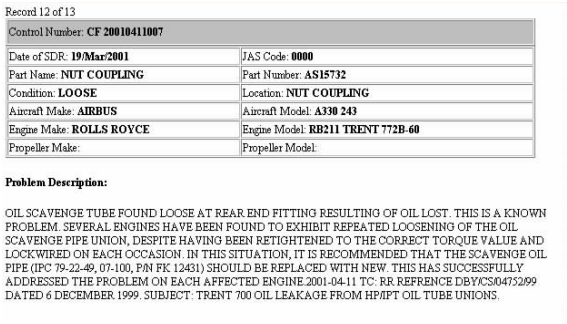
One of the problems associated with unreported occurrences is the fear of information misuse, which remains an important thing that needs to be dealt with. For instance, a pilot or maintenance engineer must know for sure that company management or regulatory authorities won't use the information for

punitive or enforcement purposes. Also, the fear of public disclosure (through a Freedom of Information Act) of this type of information would limit the number of reports. In the US legislation was obtained that requires the FAA to protect voluntarily supplied air safety information from public disclosure. Another problem is the fear for criminal prosecution, like the use of the cockpit voice recorder tape in a trial in New Zealand were the pilots were pursued criminally following an accident. A fourth problem is the concern that the information will be used against the reporter in accident litigation.
More information on the GAIN concept can be found on their website: http://www.gainweb.org.
GAIN is now in the process of evaluating two “near-real-time” sharing systems at two groups of airlines. The information is only shared among trusted groups, thus, accessibility is, and should remain very limited.

Aircraft defects

The aviation authorities of several countries have the reporting requirement for airlines and repair stations concerning failures, malfunctions, and defects of aircraft, aircraft engines, systems, and components. Australia for instance has its Aircraft Defect Reporting system, the UK uses a Mandatory Occurrence Reporting System (MORS) and the US has a Service Difficulty Reporting System (SDRS). In the case of the FAA, the reports provide airworthiness statistical data necessary for planning, directing, controlling, and evaluating certain assigned safety-related programs.
Currently, the Service Difficulty Reporting System (SDRS) is used amongst others to rapidly disseminate defect trends; and for evaluation of problems for potential use in preparing Airworthiness Directives (AD). In cases of aircraft accidents, both FAA and NTSB use the SDRS in their investigations.
Analysis of SDR data is not only done by the authorities mentioned, but also by independent organisations, like AlgoPlus Consulting. AlgoPlus for instance calculated 30-day recurrence rates of unscheduled landings over a certain period (1989-1994). It appeared that, per 100 Fokker F-28 aircraft that had to make an unscheduled landing, almost 27 planes had to make another unscheduled landing within 30 days. The rate for Boeing 737 for instance was 11.2 out of 100 and a DC-10 6 out of 100. AlgoPlus states that a repeat unscheduled landing within 30 days of a prior one could be a useful index for air safety officers because this is an objective indicator of possible changes in the level of maintenance. [RICH]

Regarding the SDRS, airlines and the FAA expressed concern that, because of a lack of a standardized reporting format, there are varied interpretations of what is required to be reported. Report information is inconsistent from airline to airline and this results in incomplete data. Amongst others these problems were raised during a 1988 conference on aging aircraft. It took several Committees, Working Groups and an FAA internal review of the SDR program before the FAA issued a proposed rule on a revision of the SDRS reporting requirements in 1995. A final rule was issued in September 2000, but the effective date of this rule was further delayed until January 16, 2002 because of questions being raised by industry on the reporting in the new requirements. The FAA now anticipates that it will issue an NPRM to address the issues raised and to give the industry the opportunity to comment on the proposed revisions to the final rule. This forced the FAA to further extend the effective date of the final rule until January 16, 2003.
The downside of SDRS is that airlines are reluctant to report defects because it is very time-consuming and the new rule would mean a huge increase in cost and man-hours with little or no visible benefit.



Record 12 of 13

Control Number: **CF 20010411007**	
Date of SDR: **19/Mar/2001**	JAS Code: **0000**
Part Name: **NUT COUPLING**	Part Number: **AS15732**
Condition: **LOOSE**	Location: **NUT COUPLING**
Aircraft Make: **AIRBUS**	Aircraft Model: **A330 243**
Engine Make: **ROLLS ROYCE**	Engine Model: **RB211 TRENT 772B-60**
Propeller Make:	Propeller Model:

Problem Description:

OIL SCAVENGE TUBE FOUND LOOSE AT REAR END FITTING RESULTING OF OIL LOST. THIS IS A KNOWN PROBLEM. SEVERAL ENGINES HAVE BEEN FOUND TO EXHIBIT REPEATED LOOSENING OF THE OIL SCAVENGE PIPE UNION, DESPITE HAVING BEEN RETIGHTENED TO THE CORRECT TORQUE VALUE AND LOCKWIRED ON EACH OCCASION. IN THIS SITUATION, IT IS RECOMMENDED THAT THE SCAVENGE OIL PIPE (IPC 79-22-49, 07-100, P/N FK 12431) SHOULD BE REPLACED WITH NEW. THIS HAS SUCCESSFULLY ADDRESSED THE PROBLEM ON EACH AFFECTED ENGINE.2001-04-11 TC: RR REFRENCE DBY/CS/04752/99 DATED 6 DECEMBER 1999. SUBJECT: TRENT 700 OIL LEAKAGE FROM HP/IPT OIL TUBE UNIONS.

fig. 3 – Canadian SDR sample

Defect reports of several countries (USA, Canada, Australia) are available through the internet. The FAA offers weekly downloads, enabling users to create their own database.
A query form to search all FAA SDR data from 1996 is available as well. CASA and Transport Canada offer SDR data as well through their respective websites. On the Transport Canada website it’s even possible to search through Canadian, Australian and US SDR. The range of years covered can nowhere be found on the website.

SDR data can also be obtained from commercial sources, like the AlgoPlus AviationSOS cd-rom. The SDR websites still do not fully meet the professional users needs, because a limited amount of data is available and the ways to query the database are very limited.

Incidents and Accidents

According to ICAO Annex 13 aircraft accident investigations should be conducted by the state of occurrence, though this state may delegate the investigation to state of registry or state of operator. ICAO recommends that serious incidents also be investigated. The sole objective of the investigation of an accident or incident shall be the prevention of accidents and incidents.
Information regarding the results of the investigation is usually made available by the (air) accident investigation authority of a country or any other party in charge of the investigation in the form of a preliminary and/or final report. The ICAO offers a standard report format, which has been adopted by ICAO member states throughout the world. Member states are urged to submit information for inclusion in the ICAO Accident/Incident Reporting (Adrep) database using a standard Adrep report format.

One of the problems associated with access to accident/incident investigation reports is the fact that there is no easily accessible central report repository. The ICAO office in Montreal has copies of many reports, but is unable to share this information with member states or the public. Since probably all reports are compiled by using a computer, ICAO should demand every paper report to be accompanied by a digital version of the document, preferably in a commonly used file format like PDF. Access to report now is limited to sending individual requests to the investigation authority that has probed the accident.
All airliner accident reports as well as lists of all investigation authorities present on the internet can be found on the Aviation Safety Network website.
Another problem is the language of the investigation reports. Many reports are still only published in the language of the investigating country. For instance, of all 243 reports on the Statens Haverikommission website (Sweden), just 49 are available in English.

Plenty of sources are available though to search for specific accidents/incidents. These databases, like the ICAO Adrep, contain accident report metadata. It's a common problem that there is a large variation in periods covered, and type of occurrences covered (also because an "incident" is defined differently by several sources).

Official sources

On the Internet several databases are available. These databases are either hosted by accident investigation authorities or by independent websites.
The NTSB database is by far the best publicly available one, run by a safety board. All NTSB investigated accidents/incidents since 1962 can be searched (over 46,000 records) through a query form and browsed through by month. The database is updated frequently and can even be downloaded for personal use.
The FAA Incident Data System (fig.4) is online available as well and contains events that occurred between 1978 and the present (almost 80,000 occurrences listed). The search interface offers many fields to limit the search, but the usability of this interface and the result presentation is rather poor (fig.5).
This database, which is updated monthly, can be found through the FAA Aviation Safety Information website, which is one of the few giving detailed information on the contents of the databases offered through the site. Other databases include a US Near Midair Collisions System (NMACS) Database, the ASRS database and a database containing NTSB Safety Recommendations to the FAA with FAA Responses. Daily updates of incidents can be found through the FAA Office of Accident Investigation website.

fig. 4- FAA Incident Data search interface

fig. 5 - search result presentation

The same accessibility problems faced with accident reports can be found with accident databases. The first one being that all databases maintained by authorities only have local coverage (those accidents that were investigated by that authority), with the exception of the NTSB. The NTSB also lists very brief descriptions of severe accidents regarding US-built airplanes.
The second problem is that these databases can only be searched separately. One of the initiatives to solve this problem is the ECCAIRS project. The European Co-ordination Centre for Aviation Incident Reporting Systems (ECCAIRS) is the heart of a network which objective it is to integrate information from aviation occurrence reporting systems running in the authorities of the various EU member states. This project started back in 1993 and has not been fully implemented yet.

An official computerised accident/incident database with worldwide coverage is the ICAO Adrep database. ICAO can only query this database upon request, which limits its use enormously. Database additions are also distributed on paper.
A common problem for both NTSB and ICAO databases is the fact that there is a large difference in the quality of the reports. Identical occurrences can be classified in entirely different ways and misspellings of for instance aircraft model names are not uncommon. Furthermore, the ICAO database cannot be considered complete because some member states rarely or never submit reports. Indonesia and India are two of these countries. Also, what one country considers an incident, another country might not investigate.

Independent sources
Several books are available; the problem though is the fact that books/loose leaf editions usually have a slow update frequency. Though indexes are usually provided, the information is not very accessible when you are for instance looking for all DC-9-30 series landing accidents, resulting in separation of the tail section.
A handy quick-reference directory is the 'World directory of airliner accidents' [1] but one of the best sources on paper is perhaps the CAA World Airline Accident Summary (WAAS), which is now being maintained by Airclaims. Airclaims has their database also available in the computerized CASE system.
WAAS lists both accidents and incidents, and can be considered fairly complete with regards to hull-loss accidents. Also, several websites run by individuals are available. The Aviation Safety Network website can be considered as the most complete of them all, covering 6600+ hull loss accidents involving airliner-type aircraft (seating 14+ pax) since 1945. Descriptions are tagged to show if the information was obtained from official sources. A search query form is not yet available; this is planned for November 2002. At present the database can only be browsed through by year, aircraft type, operator country, country location and safety issue. A future threat is a lack of funding, which could result in closure of the website.

fig. 6 – ASN sample description

Other websites have been found to contain old information from the Aviation Safety Network database and unknown sources. Since most of these sites seem to be targeted at the general public, being a reliable source for the aviation industry does not seem a primary concern for them. Few exceptions are Airsafe.com and the JACDEC database of incidents, which is very up-to-date, but mainly contains information from news media and a searchable database is not available.

Conclusion

Apart from a few large companies and organisations, many in the aviation community do not have ready access to air accident and air safety information. What can be done to change this situation?

A vast amount of aviation safety information is available worldwide. As discussed, one of the main problems is the fragmentation of the information.
One needs to have a clear understanding of the different categories (accidents, incidents, defects etc.) of information, knowledge of where to find it and the limitations. This paper hopes to serve as a guide for the reader.
On the part of the information suppliers it seems clear that much needs to be done to enhance the access to the information already available. Things that need to be enhanced are: better search

interfaces, years covered, and a common taxonomy for describing causal factors/events. Regarding the taxonomy, using the ICAO Adrep 2000 schema[1] would be a good start.
Also ICAO should play a key role in creating an online repository of all worldwide published formal accident and incident reports and making the Adrep database available through the Internet.
Fortunately the ICAO is going to address these issues [WYL].
Unfortunately, these projects are characterized by long times needed to reach the goal (for example the ECCAIRS project which started out in 1993 and the US SDRS changes, which possibly will never be implemented).
Since many information sources are now available through the internet, accessibility in the CIS and Eastern European countries can be a problem because some regions have a low internet-penetration. Also, for some countries, the lack of sufficient knowledge of the English language poses a problem.

For a quick-win situation, safety boards and aviation authorities should be urged to publish as many relevant aviation safety information on their websites as possible. This will not only make them more acquainted with the possibilities (fast dissemination of information for example) and threats (what will happen if news media uses the information) of the Internet, but will also teach them how to adapt the information to the user's needs. Until now most websites have just published digital versions of their reports on the internet (like the AAIB publishing a 40-page report on just one 1 html page). The time has come to adapt the information to the user's needs. An engineer working on a certain model Rolls Royce Trent engine may want to be notified by e-mail on every maintenance related occurrence regarding certain Trent components, not dig through several websites every week.
The advantage will be that authorities will be able to work with future ICAO information-sharing projects more easily.

Still, it will take quite some time before access to aviation safety information will be at an acceptable level.
In the meantime, on the part of the users (aviation industry), steps can be taken to obtain the right air safety information on the right time. For specific research, companies like Air Data Research (http://www.airsafety.com/) can be contacted to perform searches through sources that may not be easily available for many in the aviation industry.
Also, aviation industry professionals should be educated in the way to find aviation safety information. A company librarian or information specialist could be very helpful in organising an optimal dissemination of air safety information within the company. Although the aviation industry is suffering from the September 11, 2001 terrorist attacks, appointing someone to act as a linking pin between information sources available and the users within the organisation should be considered. For Russia for example the language barrier can be broken by the Russian Flight Safety Foundation International to disseminate Russian-language safety information.

[1] See Appendix 1 for details

Sources:

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In: Federal Register. – 14 August 1995 (Volume 60, Number 156)
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[FAA2] Federal Aviation Administration. Service Difficulty Reports; Final Rule
In: Federal Register. – 15 September 2000 (Volume 65, Number 180)
http://dms.dot.gov/search/document.cfm?documentid=127833&docketid=7952
http://dms.dot.gov/search/document.cfm?documentid=110658&docketid=7952

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[FAA3] Federal Aviation Administration, Office of System Safety. Aviation Safety Information : Four Potential Problems; Four Proposed Solutions
http://www.asy.faa.gov/gain/GAIN_information/infoprob.htm. – Jan. 1998

[FAA4] Federal Aviation Administration, Office of System Safety. The Global Aviation Information Network (GAIN) : Using Information Proactively to Improve Aviation Safety
http://www.asy.faa.gov/gain/GAIN_information/GAIN_Using_Info_Proactively_02.htm. - February 2002

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In: Aviation Quantitative Reports on Safety. – July/August 1997 (Vol. 1, Nr. 4/5)

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In: Flight International. - 8-14 April 1992; p. 9

[WYL] Wylie, Milton B. ICAO efforts to improve the exchange of safety related material
Fourth GAIN World Conference (Paris, France June 14-15, 2000) paper
http://nasdac.faa.gov/gain/Conferences/GAIN4/briefs/Wylie.pdf

Personal communications with Air Data Research, AlgoPlus consulting, Sergey Melnichenko and several employees of the Dutch aviation authorities.

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Appendix 1 - Information Sources:

Official sources

1/ ASRS Database
Category: Reported occurrences
Description: Incident data records for all categories of civil aviation. Incidents are events that do not meet the aircraft damage or personal injury thresholds contained in the NTSB definition of an accident.
Period covered: 1988 - present
Number of reports: ca. 300,000
Limitations: Limited search interface
Area covered: USA
Availability: https://nasdac.faa.gov/internet/

2/ CAB Investigations of Aircraft Accidents (1934 - 1965)
Category: Accident and serious incident investigation reports
Description: Full text (html and pdf) documents of every accident investigated by the CAB (now NTSB) between 1934 and 1965.
Period covered: 1934-1965
Number of accidents: almost 800
Area covered: USA
Availability: On the internet: http://specialcollections.tasc.dot.gov/

3/ CASA (Australia) Aircraft Defect Information Summaries
Category: Aircraft defects
Description: Aircraft defect summaries. The current year can be accessed by moth; previous years (1996-2001) can be downloaded as a text or database file.
Period covered: 1996 -
Number of reports: unknown
Limitations: Limited number of fields available to search through. For instance no ATA or JASC codes.
Area covered: Australia
Availability: On the internet: http://www.casa.gov.au/avreg/aircraft/sdr/index.htm

4/ ECCAIRS
Category: Accidents and incidents
Description: A planned network which objective it is to integrate information from aviation occurrence reporting systems running in the authorities of the various EU member states.
Period covered: unknown (not fully implemented yet)
Number of reports: 50,000 (by 1998)
Area covered: EU countries
Availability: On the internet: http://eccairs-www.jrc.it/ (general information only)

5/ FAA Incident Data System
Category: Incidents
Description: Incident data records for all categories of civil aviation. Incidents are events that do not meet the aircraft damage or personal injury thresholds contained in the NTSB definition of an accident.
Period covered: 1978 - present
Number of reports: almost 80,000
Limitations: Crude search interface; very poor display of search results.
Area covered: US aircraft
Availability: http://nasdac.faa.gov/

6/ FAA Office of Accident Investigation
Category: Accidents/Incidents
Description: Preliminary accident and incident data that has been received by the FAA Office of Accident Investigation during the last 10 business days. Data is also available in dbf format for downloading and use in databases and spreadsheets.
Period covered: the last 10 business days
Number of reports: varies; around 80
Area covered: US aircraft
Availability: http://www.faa.gov/avr/aai/iirform.htm

7/ FAA Service Difficulty Reporting System
Category: Aircraft defects
Description: Service Difficulty website; includes background information, SDR submission forms, a search interface to query all data since 1995 and the possibility to download database files.
Period covered: reports submitted from January 1, 1995 to present
Number of reports: over 250,000
Limitations: Date range is limited.
Area covered: USA
Availability: On the internet: http://av-info.faa.gov/isdr/

8/ ICAO Adrep database
Category: Accidents and incidents
Description: Final and preliminary reports on accidents/incidents of aircraft in excess of 2500kg mtow, sumbitted by member states.
Period covered: 1970 to present
Number of reports: ca 23,000
Limitations: Depends on member state willingness to send information; quality of descriptions vary.
Area covered: Worldwide
Availability: On paper; database can be searched by ICAO upon request.

9/ NTSB Accident Database
Category: Accidents and incidents
Description: Final and preliminary reports on accidents/incidents of aircraft investigated by the NTSB
Period covered: 1962 to present
Number of reports: over 46,000
Area covered: USA
Availability: On the internet: http://www.ntsb.gov/NTSB/query.asp

10/ Transport Canada Web based Service Difficulty Reporting System (WSDRS)
Category: Aircraft defects
Description: Requests from the aviation industry in Canada for an Internet based Service Difficulty Reporting (SDR) program have resulted in the development of this site, which is mainly for use by owners, operators, maintainers and manufacturers of Canadian registered aeronautical products or products for which Canada is the Country of Type Design responsibility. Registered users can utilize this site to: Submit SDRs; query the SDR database; track and store submitted SDRs; update previously submitted SDRs; and check status updates on Canadian SDRs.
Period covered: unknown; not documented
Number of reports: unknown
Limitations: Crude search interface; limited number of fields are displayed.
Area covered: Australia, Canada, USA
Availability: On the internet: http://www.tc.gc.ca/wsdrs/

Independent sources

11/ Aviation Safety Network Database
Category: Accidents (hull-losses)
Description: Descriptions of airliner hull-loss accidents. The database covers accidents since 1945, in which the airliner involved sustained irrepairable damage. An Airliner type is selected when the original passenger model is capable of carrying 14 or more passengers.
Period covered: 1945 - present
Number of accidents: 6270
Limitations: No query form available yet (planned for November 2001)
Area covered: Worldwide
Availability: On the internet: http://aviation-safety.net/database/

11/ Denham, T. World directory of airliner accidents. - Sparkford : PSL, 1996. - 320 p. ISBN 1852605545
Category: Accidents (hull-losses)
Description: List of all hull-loss accidents to transport category aircraft, capable of carrying approx. 8 passengers or more. Also includes smaller aircraft operated by commercial airlines. Information given per accident: date, type, c/n, operator, remars (very limited), location and casualties
Period covered: 1906 - present
Number of accidents: around 11,000
Limitations: No detailed information on causal factors
Area covered: Worldwide
Availability: book

12/ JACDEC
Category: Accidents, Incidents
Description: Recent jetliner accidents/incidents; updated nearly daily.
Period covered: 1999 -
Number of accidents: unknown
Limitations: Listed chronologically; no search / query possibilities. Mainly contains information from news media, so information should be regarded as preliminary and non-official.
Area covered: Worldwide
Availability: On the internet: http://www.jacdec.de/news.htm

13/ NTSB Aircraft Accident Reports (Embry-Riddle Aeronautical University)
Category: Accident and serious incident investigation reports
Description: All NTSB air accident investigation reports since 1967 can be downloaded as PDF files.
Period covered: 1967 -
Number of accidents: around 450
Limitations: No search interface, just a listed by report number. Scanning quality of the documents is moderate / poor (quite some text-recognition errors).
Area covered: USA
Availability: On the internet: http://amelia.db.erau.edu/ec/ntsb.htm

14/ World Airline Accident Summary (WAAS) – CAP479
Category: Accidents and serious incidents
Description: The World Aircraft Accident Summary (WAAS) produced on behalf of the British Civil Aviation Authority, by Airclaims Limited, provides brief details of all known major operational accidents to jet and turboprop aircraft and helicopters and the larger piston-engined types worldwide.
Period covered: 1990- present [original CAA binders contain accidents since 1946]
Number of accidents: over 3,000
Area covered: Worldwide
Availability: On paper; information regarding a subscription on the updates: http://www.airclaims.co.uk
A subset, produced on behalf of the FAA, is available on the internet: http:// www.waasinfo.net/

Other links

AlgoPlus AviationSOS CD-ROM
http://www.aviationsos.com/

Current versions of the ICAO ADREP 2000 proposals
Proposals for a common taxonomy for describing causal factors/events. These will supersede the 1987 Adrep standards.
http://eccairs-www.jrc.it/Support/Downloads/Files/Documentation/Release40Taxonomy/Default.htm

FAA Aviation Safety Information website
Contains links to several aviation safety databases: amongst others the ASRS database, NTSB accident/incident database, FAA incident database, Near Midair Collisions System (NMACS) Database and NTSB Safety Recommendations to the FAA with FAA Responses.
http://nasdac.faa.gov/internet/

Global Aviation Information Network - GAIN
http://www.gainweb.org/

Links to other air safety information related websites
http://aviation-safety.net/safe.htm

Links to investigation authorities offering formal investigation reports on the internet
http://aviation-safety.net/reports/