

Guidance on the Use of **Accident and Incident Data** by ISAs



Change History

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Please send suggestions for improvements, for example of other open access sources of data, for consideration by the Working Group to:

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Cover Images (clockwise from top left)

- Nuclear power plant
- Euro fighter
- Oil and natural gas offshore platform
- London Underground

About the supporting organisations

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Use of Accident and Incident Data by ISAs

Accidents and incidents are potentially valuable sources of information for ISAs and others involved in safety. By understanding why and how they happen, safety can be improved in future and potentially dangerous situations avoided in new and existing systems. It is therefore important that ISAs make effective use of accident and incident data. The following guidance is offered regarding the use of accident and incident data by ISAs.

Understanding Accidents and Incidents

ISAs should know and understand the accident and incident data available in their field sufficiently well to be able to use it effectively in assessing safety arguments and evidence. They should therefore:

- Know where to obtain relevant accident and incident data.
- Know the most significant accidents and incidents that have occurred.
- Understand the causes of relevant accidents and incidents.
- Understand the implications of the accidents and incidents for safety.

Accident and Incident Rates

ISAs should be sceptical about the use of historical accident and incident data to derive or justify accident rates for new or even existing safety related systems. The onus must be of the person/organisation that wants to use the historical data in this way to justify their use of the data. Reasons for taking a sceptical stance include:

- The amount of operational experience is unlikely to be sufficient to justify or support to a reasonable degree of confidence the low accident rates that must typically apply to safety related systems.
- Differences between systems or changes made to a given system through time mean that historical accident and incident rates might not readily be applied to new systems.
- Available accident or incident data may under-represent the true accident or incident rate as accidents and incidents may be under-reported or reports not publicly available.
- Changes in the way a system or equipment is operated, maintained or used can affect the applicability of accident and incident rates.

Counter Evidence

Accident and incident data are a valuable source of counter evidence for a safety argument. An ISA may use an accident or incident involving a system that is similar to the one for which they are ISA to challenge the safety claims and safety analysis. Even if there are differences between the systems (which is likely), an accident or incident can still be prima facie valid counter evidence. The ISA should only use data which they can justify as relevant in spite of differences between the systems. If those making the safety argument believe that the data are not valid counter evidence, they should give a satisfactory reason.

Hazards, Causes, Consequences

Insights into hazards, causes and consequences can be gained from analyses of accidents and incidents. For instance, accidents and incidents can point to complex and subtle dependencies and unexpected human actions that might not be readily identified using other methods. An ISA can use information about accidents and incidents that have actually happened to, for example:

- Check the completeness of hazard identification and accident analyses.
- Determine whether dependencies have been adequately taken into account in a safety analysis.
- Identify human factors issues (procedural, errors, cultural etc.) that may call into question assumptions made in a safety analysis.

Steve Kinnersly
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Sources of Information on Accidents and Incidents

Guidance relating to the need for ISAs to understand accidents and incidents includes the recommendations that ISAs should:

- Know where to obtain relevant accident and incident data.
- Know the most significant accidents and incidents that have occurred.
- Understand the causes of relevant accidents and incidents.
- Understand the implications of the accidents and incidents for safety.

Information on accidents and incidents is collected by many organisations. This ranges from companies collecting data on their own operations to industry bodies, regulators, government and research organisations collecting data across one or more industries. Information on many accidents and incidents is proprietary and therefore not openly accessible. However, some accident and incident data are accessible through open access or pay-to-access databases.

The databases or other collections of accident and incident data in the following list are mainly open access, although a few require registration or provide basic information with a charge for additional information. Please note that the list:

- Only includes databases that use the English language.
- Only includes databases that provide information about specific accidents and incidents.
- Does not include databases that address aggregated statistics (e.g. road traffic accidents).

Sources of Information on Accidents and Incidents			
Source	Coverage (if limited)	Website	Comment
Marine			
Marine Accident Investigation Branch (MAIB)	UK	http://www.maib.gov.uk/publications/investigation_reports.cfm	
US Coast Guard	USA	http://homeport.uscg.mil/mycg/portal/ep/home.do	
Association of Diving Contractors International		http://www.adc-int.org/	Safety notices and reports relating to diving.
Marine Safety Forum	N Europe	http://www.marinesafetyforum.org/index.asp?Target=http%3A%2F%2Fwww.marinesafetyforum.org%2Fsafety-alerts-notices.asp	Accidents and incidents in the marine sector of the Northern European oil and gas industry.
Offshore			
Step Change In Safety		https://www.stepchangeinsafety.net/	Oil and gas drilling alerts.
International Oil and Gas Producers Association (OGP) Safety Zone		http://info.ogp.org.uk/safety/	Includes safety alerts and statistics.
International Association of Drilling Contractors		http://www.iadc.org/safety-alerts/	Safety alerts arising from incidents.
Aviation			
Air Accident Investigation Branch (AAIB)	UK	http://www.aaib.gov.uk/sites/aaib/publications/formal_reports.cfm	Formal reports of investigations into incidents and accidents.
Aviation Safety Network		http://www.aviation-safety.net/database/	Aviation safety occurrences since 1943.
Warwick Air Accident Database		http://www.air-accidents.warwick.ac.uk/	Free access to workers and researchers in the aircraft industry (evidence of working in the industry needed).
Computer-Related Incidents with Commercial Aircraft (CRICA)		http://www.rvs.uni-bielefeld.de/publications/compendium/	Compendium containing accident reports, discussion, papers, etc, compiled by Peter Ladkin of Bielefeld University.
Civil Aviation Daily Occurrence Reporting System (CADORS)	Canada	http://wwwapps.tc.gc.ca/saf-sec-sur/2/cadors-screaq/	Transport Canada database.
National Transportation Safety Board (NTSB) Aviation Accident Database and Synopses	USA	http://www.nts.gov/layouts/nts.aviation/index.aspx	Civil aviation accidents and selected incidents within the United States, its territories and possessions, and in international waters (1962 and later)
Cabin Safety Research Technical Group (CSRTG) Database		https://www.fire.tc.faa.gov/adb/adb/introduction.asp	Mainly concerned with occupant survivability (or not) in aircraft accidents. Download database as a .exe file.
Helicopter Accident Database		http://www.griffin-helicopters.co.uk/accidents.asp	Gives links to accident reports, press coverage etc

Sources of Information on Accidents and Incidents			
Source	Coverage (if limited)	Website	Comment
Nuclear			
Quarterly Statements of Nuclear Incidents at Nuclear Installations	UK	http://www.hse.gov.uk/nuclear/quarterly-stat/index.htm	2000 - present.
US Nuclear Regulatory Commission - Reports Associated With Events	USA	http://www.nrc.gov/reading-rm/doc-collections/event-status/	Includes power generation, industrial and medical events.
Major Hazard Industries (Onshore)			
Accidents at UK major hazard plants	UK	http://www.hse.gov.uk/comah/index.htm	Includes COMAH major accidents reported by HSE to the European Commission.
MARS - Major Accident Reporting System	EU	https://emars.jrc.ec.europa.eu/	EU database maintained by Joint Research Centre, Ispra. Accesses local databases in 15 countries, open access to sanitised short reports only.
Rail			
European Railway Agency (ERA)	EU	http://www.era.europa.eu/Core-Activities/Safety/Pages/serious-accidents-in-europe-since-1990.aspx	Reports of investigations into railway accidents throughout the EU.
Office of Rail Regulation (ORR)	UK	http://www.rail-reg.gov.uk/server/show/nav.1112	Reports of investigations into railway accidents in the UK
Rail Accident Investigation Branch (RAIB)	UK	https://www.gov.uk/government/organisations/rail-accident-investigation-branch	Reports of investigations into railway accidents in the UK
Military			
Military Aircraft Accident Summaries	UK	http://webarchive.nationalarchives.gov.uk/20121026065214/http://www.mod.uk/DefenceInternet/AboutDefence/CorporatePublications/AirSafetyandAviationPublications/MAAS/	Summaries of UK military aircraft accidents prepared for non-specialists after the full investigation process has been completed.
Board of Inquiry reports into UK military incidents	UK	http://www.mod.uk/DefenceInternet/AboutDefence/CorporatePublications/BoardsOfInquiry/	Reports are sanitised for privacy, security etc. but details of accidents are as reported by the Board.

Sources of Information on Accidents and Incidents

Source	Coverage (if limited)	Website	Comment
Other			
CHIRP : Confidential Human Factors Incident Reporting Programme (Aviation) Confidential Hazardous Incident Reporting Programme (Maritime)	UK	http://www.chirp.co.uk/	Complements other formal reporting systems operated by many UK organisations, by providing a means by which individuals are able to raise issues of concern without being identified to their peer group, management, or the Regulatory Authority.
National Transportation Safety Board (NTSB) Accident Reports	USA	http://www.nts.gov/_layouts/ntsb.aviation/index.aspx	Includes aviation, highway, marine, pipeline, hazardous materials and railroad. Reports from 1996 - present can be downloaded.
Australian Transport Safety Bureau (ATSB)	Australia	http://www.atsb.gov.au/publications/investigation_reports/index.aspx	Transport safety investigation reports for aviation, marine and rail.
Transportation Safety Board of Canada (TSB)	Canada	http://www.tsb.gc.ca/eng/rapports-reports/index.asp	Reports on accidents investigated by TSB. Includes aviation, marine, pipeline and rail.
International Association of Geophysical Contractors HSE Alerts & High Potential Incidents Summary		http://www.iagc.org/HiPo-Alerts/	Sponsored by the UK Health and Safety Executive (HSE) and the UK Offshore Operators Association (UKOOA). Primarily a safety tool for the offshore industry but freely available to anyone
FACTS - Failure and Accidents Technical information System		http://www.factsonline.nl/	TNO (Netherlands) database of over 21,000 accidents and incidents involving hazardous materials. License needed to access details of incidents and accidents.
Coal Mining Accident Database	UK	http://www.cmhrc.co.uk/site/disasters/	Reports of accidents from 1707 - 1979
Case studies across a range of industries	UK	http://www.hse.gov.uk/resources/casestudies.htm	Covers accident prevention as well as reports of accidents and lessons learned.