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Incident reporting and the Australian Radiation Incident Register (ARIR)

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Overview

History and objectives of ARIR

How data collected

What types of things need to be reported

Some recent statistics

Commonwealth licence holder perspective

What is an incident

Incident reporting and safety culture

Other incident registers e.g. INES



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History of ARIR

The Australian Radiation Incident Register (ARIR) was established by the National Health and Medical Research Council (NHMRC) in October 1971

Originally maintained by ARL

Now managed by ARPANSA Standards Development & Committee Support Section

- MS Access database**

Originally included ionising radiation, microwaves & lasers – but not medical incidents (patient exposures)



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Objectives Of The ARIR

- To act as a national focus for information on radiation incidents and accidents
- To highlight, for radiation protection authorities and users of ionising and non-ionising radiation, specific sources, causes or procedures which give rise to potential incidents
- To provide useful data and reports to regulatory authorities and other advisory bodies
- To promulgate the lessons learned and encourage implementation to improve safety culture



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Data Collection and Use

Commonwealth, State and Territory **radiation regulators submit** to ARIR

- Standard form used
- Details from licence holder statements

Annual statistics provided to Radiation Health Committee (RHC)

Specialised reports provided on request to other bodies

Summaries placed on ARPANSA website

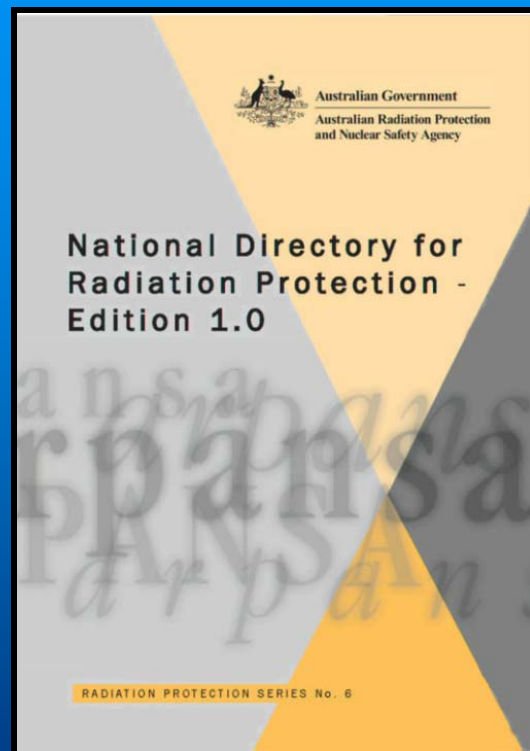
- De-identified data used in all external reports



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- Reporting requirements included in Schedule 13 (**national radiation incident reporting framework**) of the National Directory for Radiation Protection (NDRP)
- **Certain types** of radiation incidents must be reported to ARPANSA for inclusion in the ARIR (in some cases judgements will need to be made in regard to whether an incident is too minor for reporting)





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- 1. An incident which causes or may lead to radiation injuries or radiation doses exceeding the annual dose limits to workers or members of the public**
- 2. Medical exposure of patients (both diagnostic and therapeutic)**
- 3. Lost or stolen radioactive sources or radiation apparatus**
- 4. Transport of radioactive material**
- 5. Unintentional or unauthorised discharges of radioactive materials into the environment**
- 6. Damage to, or malfunctioning of, a radiation apparatus or sealed source apparatus**
- 7. Contamination with, or dispersal of, a radioactive material**
- 8. Out of control source of radiation**
- 9. Non-ionising radiation incidents**
- 10. Nuclear incidents**
- 11. Other incidents that the Authority considers warrants reporting**



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Some Statistics from ARIR

Currently approx. 900 incidents in total under 31 categories covering a variety of radiation practices e.g. industrial, medical, research, security, transport

Review of 2005 - 2007 data showed:

- Total incidents reported for all categories was 251 incidents**
- Medical incidents reported for that period - 173 incidents = 68% of total**

Next highest categories overall have been borehole logging, industrial radiography and high doses



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Incident Category	COMM	Total No. of 2009 Incidents	Comparison with 2008	Comparison with 2007
BOREHOLE LOGGING		4	5	4
CABINET X-RAY		1	0	0
CONSUMER PRODUCTS		0	0	0
CONTAMINATION		0	0	0
DELIBERATE OR MALEVOLENT ACT		0	0	0
DENTAL		0	0	0
DIAGNOSTIC RADIOLOGY		43	43	39
EXTERNAL EXPOSURE		0	0	0
HIGH RECORDED DOSE		2	4	1
INDUSTRIAL LINAC		0	0	0
INDUSTRIAL RADIOGRAPHY	2	3	6	1
IRRADIATOR		0	0	0
LABORATORY		0	0	0
LASER	1	1	1	1
LUMINISING/LUMINOUS DEVICE		0	1	1
MINING		0	0	0



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Incident Category	COMM	Total No. of 2009 Incidents	Comparison with 2008	Comparison with 2007
NUCLEAR MEDICINE		27	31	19
PDMG		2	1	2
RADIATION GAUGE		2	1	3
RADIOFREQUENCY		0	0	0
RADIOTHERAPY		12	10	4
SOURCES FOUND	1	1	1	1
SOURCES LOST		0	2	1
STATIC ELIMINATORS		0	0	0
THEFT OF SOURCES		0	2	0
TRANSPORT		0	0	5
ULTRAVIOLET		0	1	1
UNAUTHORISED DISPOSAL OF SOURCE		0	0	1
UNAUTHORISED POSSESSION OF SOURCE		0	0	0
X-RAY ANALYSIS		0	0	0
XRF SOURCE		0	0	0
TOTALS	4	98	109	84



What Is An Incident?

S. 13.1 NDRP Definition

Radiation Incident:

*Any unintended or ill-advised event when using ionising radiation apparatus, specified types of non-ionising radiation apparatus or radioactive substances, **which results in or has the potential to result in**, an exposure to radiation to any person or the environment, **outside the range of that normally expected for a particular practice**, including events resulting from operator error, equipment failure, or the failure of management systems that warranted investigation*



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Commonwealth Licence Holder Perspective

Requirement under regulation 46 to report radiation accidents to ARPANSA within 24 hours and provide a written report within 14 days

Requirement to report incidents in licence holder quarterly reports

In plain language – an accident is a significant incident!!

- There isn't really a threshold**
- ARPANSA recently revised reporting guideline**
- If in doubt report within 24hrs as an accident and ARPANSA will advise**



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Incident Reporting and Safety Culture

Recognised that under-reporting of incidents is an issue

ARIR information more available and useful to radiation users

Lessons identified can be used to improve safety culture

- Reporting lower level incidents and near misses still useful – especially if many the same**
- Implementing lessons learned by others helps to prevent future incidents and shows positive approach to continuous improvement**

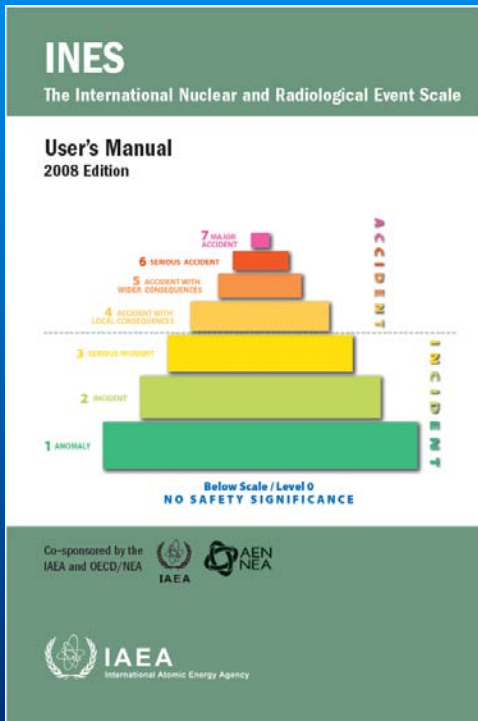


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INES

International Nuclear and Radiological Event Scale



- 1992 – Established by IAEA¹, the OECD-NEA² and member states for nuclear facilities
- 1996 – New edition issued
- 2001 – INES User's Manual produced
- 2006 – Guidance for radiation source and transport events added
- 2008 – INES User's Manual updated

¹ International Atomic Energy Agency

² Organisation for Economic Co-operation and Development – Nuclear Energy Agency



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Event Assessment by Areas of Impact

People and Environment

- radiation doses received and radioactivity release

Radiological Barriers and Controls

- only applies inside major facilities (not suitable for source licence holders)
- covers unplanned high radiation levels and spread of contamination within the installation

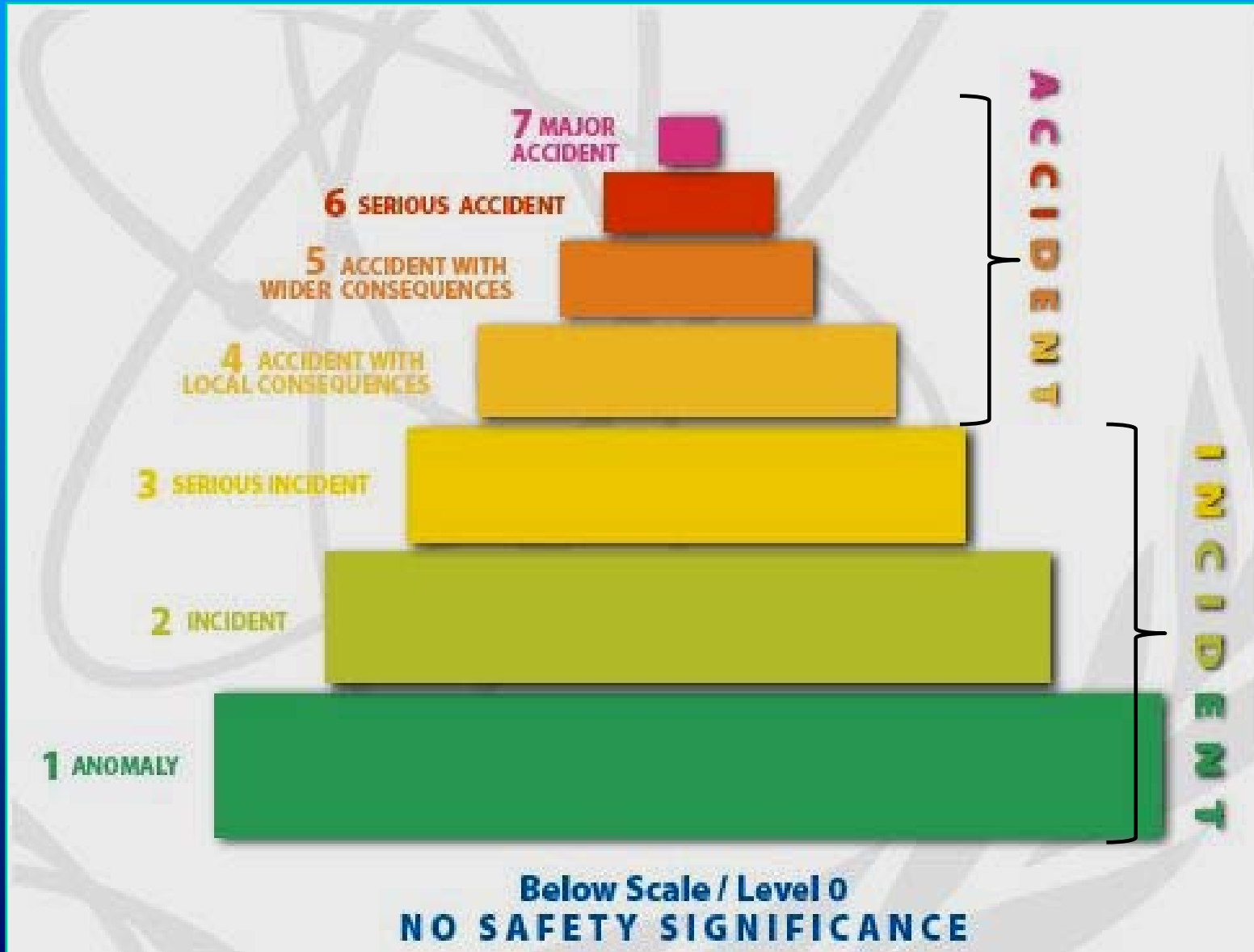
Degradation of Defence in Depth

- looking at failures in safety provisions to determine how close the event was to causing actual consequences



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Levels 4 to 7
'Accidents'

Levels 1 to 3
'Incidents'



Implications for Source Licence Holders

- **INES National Officer (ARPANSA) reports to IAEA within 24 hrs from their occurrence**
- **Nuclear facilities already report INES level 2 and above events to ARPANSA**
- **Potential for INES level 2 rating for source category 3 and higher**
- **ARPANSA to produce guideline for licence holders about reporting requirements associated with INES rating of source/transport events**
- **Interesting to note that majority of events reported are now those related to radiation sources rather than nuclear**



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Important Points

ARPANSA has national and international incident and accident reporting responsibilities

Licence holders are required to report both incidents and accidents to ARPANSA

Information from the ARIR will be more widely available

Lessons identified from incident data can be used to improve safety culture at your site