

International Atomic Energy Agency

Feedback on Safety Issues for Research Reactors

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Safety issues and trends - updating the IAEA Programme on Research Reactors safety

- **The identification of the safety issues and trends and the consequent update of the IAEA Programme on the Safety of Research Reactors were based mainly on the following sources of information:**
 - ◆ **Feedback from four regional meetings and the international meeting on application of the Code of Conduct on the safety of research reactors;**
 - ◆ **Reports on incidents collected through the Incident Reporting System for Research Reactors (IRSRR);**
 - ◆ **Evaluation of the results of the Safety Review Missions.**

Feedback from the Regional Meetings on Application of the Code of Conduct

Four Regional meetings:

- ◆ Africa, November 2006 (7 Countries)
- ◆ Europe, December 2006 (11 Countries)
- ◆ Asia and Pacific, April 2007 (8 Countries)
- ◆ Latin America, December 2007 (6 Countries)



Feedback from the Regional Meetings on Application of the Code of Conduct (cont'd)

The results showed the common need to:

- ◆ **Improve the capabilities of regulatory bodies in review of assessment of safety submittals;**
- ◆ **Develop comprehensive emergency plans and establish procedures and response capabilities at the national level;**
- ◆ **Enhance safety culture and address human factors in all the phases of RRs lifetime;**

Feedback from the Regional Meetings on Application of the Code of Conduct (cont'd)

- ◆ **Establish criteria, and perform accordingly, site re-evaluation for existing RRs;**
- ◆ **Improve the capability to prepare the safety documentation for decommissioning and to establish criteria for release from regulatory control of decommissioned RRs.**

Feedback from the International meeting on the Application of the Code of Conduct on the Safety of Research Reactors

28-31 October 2008, IAEA, Vienna

- ◆ **A questionnaire was sent to the 41 MSs which participated in the meeting, 48 answers from 37 MS were received;**
- ◆ **This meeting was a successful and effective forum for exchange of information and experience.**



The 32 country presentations at this meeting reported progress in implementation of the Code, but some MS reported continuing challenges, including:

- ◆ Effective independence of the regulatory body;**
- ◆ Need for improvement in the requirements and implementation process for periodic safety review;**
- ◆ Continuous improvement of safety culture;**



(cont'd to last slide)

- ◆ **Improved safety management, and greater transparency, stakeholder engagement and public involvement in regulation and operations;**
- ◆ **Aging of facilities and staff, establishment of adequate aging management programmes, and availability of well-trained and competent staff and appropriate financing of both the operating organization and regulatory body;**
- ◆ **Deficiencies in arrangements for reactors in extended shutdown and for decommissioning.**



Feedback from the International meeting on the Application of the
Code of Conduct on the Safety of Research Reactors
28-31 October 2008, IAEA, Vienna (cont'd)

**The principal conclusions and recommendations
for future work include the following:**

- ◆ **Future regional meetings should continue to be arranged;**
- ◆ **International or regional meetings should also be arranged with a focus on particular issues where difficulties have been reported;**



Feedback from the International meeting on the Application of the
Code of Conduct on the Safety of Research Reactors
28-31 October 2008, IAEA, Vienna (cont'd)

(cont'd to last slide)

- ◆ **There should be future triennial International Meetings at a time shortly after the Review Meetings of the Convention on Nuclear Safety. These meetings should include a voluntary, but expanded reporting and discussion process resembling the process used for the CNS.**

Incident Reporting System

Objectives

- ◆ To exchange information on events of safety significance
- ◆ To assure feedback on operating experience
- ◆ To help prevent occurrence and recurrence
- ◆ To help prevent precursors



IRSRR: Status and further developments

- 52 MS joined the IRSRR.

The screenshot shows a Microsoft Internet Explorer browser window displaying the IRSRR 2001 website. The address bar shows the URL: <http://www.iaea.org/~nsni-maz/index.html>. The website features a navigation menu on the left with the following items:

- ▶ About IRSRR
- ▶ IRSRR Events
 - ▶ New Event
 - ▶ Search Event
- ▶ Experience with RR 1999
- ▶ Watch Codes
- ▶ Guidelines
- ▶ Feedback
- ▶ Contact Us

Below the menu is a button labeled "IRSRR". The main content area is titled "IRSRR Welcome" and features a large image of a reactor control room with the text "Incident Reporting System for Research Reactors (IRSRR)" overlaid. At the bottom of the page, there is a footer with the following text:

[Home](#) | [About IRSRR](#) | [IRSRR Events](#) | [New Event](#) | [Search Event](#) |
[Guidelines](#) | [Feedback](#) | [Contact Us](#) |
[Worldatom](#)
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IRSRR: Events Reported

Address <http://www.iaea.org/irsrr/>

	09-1983	to operator's error.pdf	0004		Assembly	
3.	1997-07-02	Reactor tank water spilt .pdf (511 kb)	AR-0002	Argentina	RA-3, Pool	1.1.3, 1.3.3, 1.5
4.	1993-04-23	Over-exposure due to mishandling of activated fuel element.pdf	AU-0001	Australia	HIFAR - MTR Heavy Water	1.1.3
5.	2001-07-13	Leakage of pneumatic transfer system and consecutive loss of pool water .pdf (40 kb)	AT-0002	Austria	TRIGA Mark-II Pool	1.2.2, 1.3.2
6.	1984-08-23	Minor Loss of pool water due to immersion of suction end of air monitor.pdf	AT-0002	Austria	TRIGA MARK II - Vienna	1.2.2.1
7.	1983-12-21	Leakage of pneumatic transfer system.pdf	AT-0002	Austria	TRIGA MARK II - Vienna	1.1.1
8.	1980-01-25	Transient rod breaks under water.pdf	AT-0002	Austria	TRIGA MARK II - Vienna	1.2.3.1
9.	1979-11-26	Flooding of the rotary specimen rack.pdf	AT-0002	Austria	TRIGA MARK II - Vienna	1.3.1, 1.2.1.5, 1.2.4.1
10.	2003-04-20	Irradiation of an experimental fuel pin at a wrong power.pdf	BE-0002	Belgium	BR2, MTR Tank	1.6

IRSRR Home

- ▶ About IRSRR
- ▶ IRSRR Member States
- ▶ Guidelines
- ▶ Watch Codes
- ▶ Contact Us

IRSRR Events

- ▶ All Events
- ▶ Statistics
- ▶ Feedback

Meetings

Training Materials

Research Reactors Database

Useful Links



IRSRR - Training Material

IRSRR 2001, Index - Microsoft Internet Explorer provided by the Int. Atomic Energy Agency

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites History Links Google INIS Main

Address <http://www.iaea.org/irsrr/>

Guidelines
Watch Codes
Contact Us

IRSRR Events
Events reported in 2003
Statistics
Feedback

Meetings

Training Materials

Research Reactors Database

Useful Links

Training Material

No	Title of Lecture	Lecturer	Organisation	Country
1.	Safety Analysis - A tool in Accident Prevention .pdf (108 kb)	Veronica Garea	INVAP	Argentina
2.	Failure Modes and Effects Analysis .pdf (452 kb)	Pablo Ramirez	INVAP	Argentina
3.	Advantages of using IT in NRR .pdf (1186 kb)	Jorge Drexler	INVAP	Argentina
4.	Occurrence Reporting Program .pdf (1069 kb)	Eugenia Boyle	DOE	USA
5.	Internal and External Reporting .pdf (107 kb)	Jeanout Boogart	NRG	The Netherlands

If you do not have the Adobe Acrobat® Reader installed, click [here](#) to download a free copy.



IRSRR: Useful Links

- [NUSAFE Research Reactor Safety Topics](#)
- [Research Centres](#)
- [Information/Knowledge Management & Technical Co-operation](#)



The screenshot displays a web page with a navigation menu on the left and a main content area on the right. The navigation menu includes links for decommissioning, waste, health physics, government agencies, laws, standards, reports, research centres, products, consultants, utilities, fusion, international organizations, professional societies, industry associations, environmental organizations, personal pages, events, education, teacher's corner, journals, and search. The main content area is titled 'International' and lists various international projects and organizations, including EC-NIS, EPTA, ERRICCA, ESTO, EuRaTIN, Euratom, and several joint coordinating committees.

- [Decommissioning issues](#)
- [Mixed waste issues](#)
- [Health physics issues](#)
- [Government agencies](#)
- [Laws & regulations](#)
- [Nuclear standards](#)
- [Technical reports](#)
- [Nuclear research centres](#)
- [Nuclear products & services](#)
- [Technical consultants](#)
- [Nuclear power utilities](#)
- [Nuclear fusion](#)
- [International organizations](#)
- [Professional societies](#)
- [Industry & trade associations](#)
- [Environmental organizations](#)
- [Personal pages](#)
- [Events & conferences](#)
- [Continuing education](#)
- [Teacher's corner](#)
- [Technical journals & publishers](#)
- [Search](#)

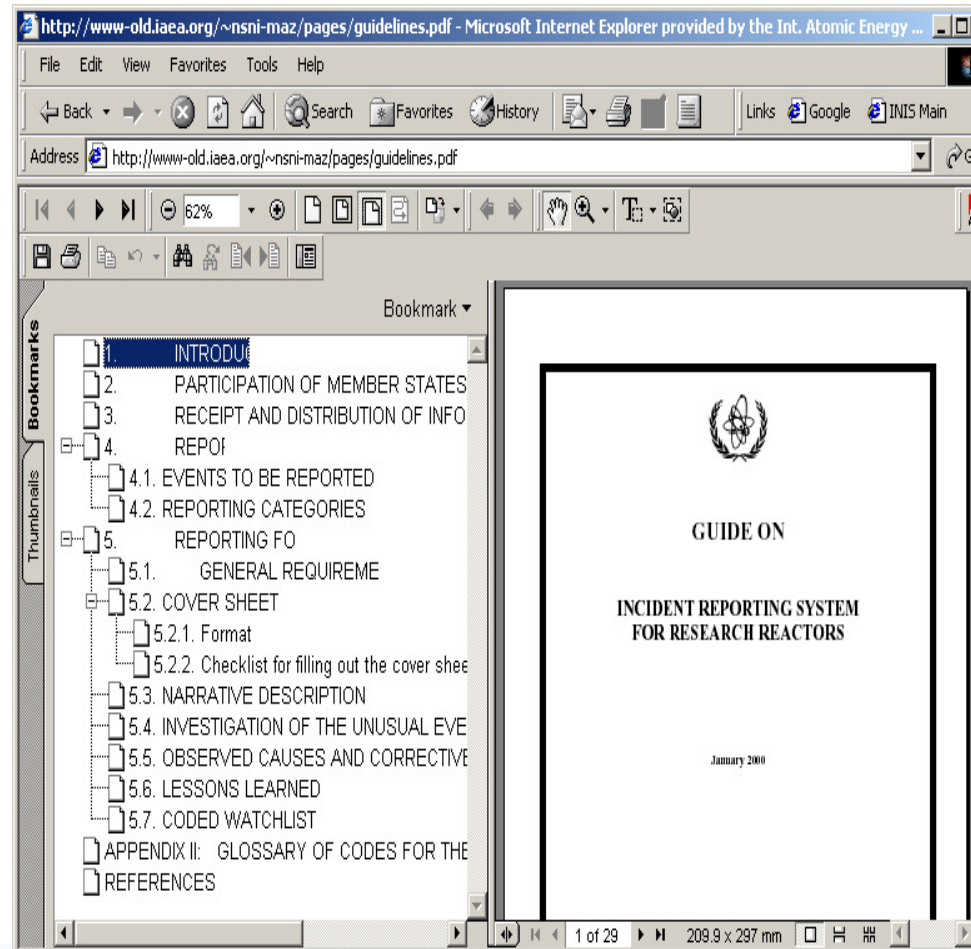
International

- [EC-NIS Network Nuclear Fission Safety Project](#)
- [EPTA - European Parliamentary Technology Assessment Network](#)
- [ERRICCA - European Research into Radon in Construction Concerted Action](#) [EN](#)
- [ESTO - European Science & Technology Observatory](#)
- [EuRaTIN - European Research & Technology Information Network](#)
- [Euratom Research & Training in Nuclear Energy](#)
- [European Round Table for Synchrotron Radiation & Free Electron Laser Facilities](#) [EN](#)
- [The ExternE Project](#)
- [IAEA Research Reactor Database](#)
- [IAM - Institute for Advanced Materials](#)
- [IARC - International Agency for Research on Cancer](#)
- [IPTS - Institute for Prospective Technological Studies](#)
- [IRC - Innovation Relay Centres](#)
- [IRMM - Institute for Reference Materials & Measurements](#)
- [ITU - Institute for Transuranium Elements](#)
- [JCCEM - US-Russian Joint Coordinating Committee for Environmental Restoration & Waste Management](#)
- [JCCES - US-Poland Joint Coordinating Committee for Environmental Systems](#)
- [JCCRM - US-Argentina Joint Coordinating Committee for Radioactive & Mixed Waste Management](#)
- [JRC - European Commission Joint Research Centre](#)



IRSRR Guideline: EVENT PARAMETERS

- Reporting category
- Plant status prior to the event
- Failed/affected systems
- Failed/affected components
- Cause of the event
- Effects on operation
- Characteristics of the incident
- Nature of failure or error
- Nature of recovery actions



IRSRR Guideline: lessons learned from the events

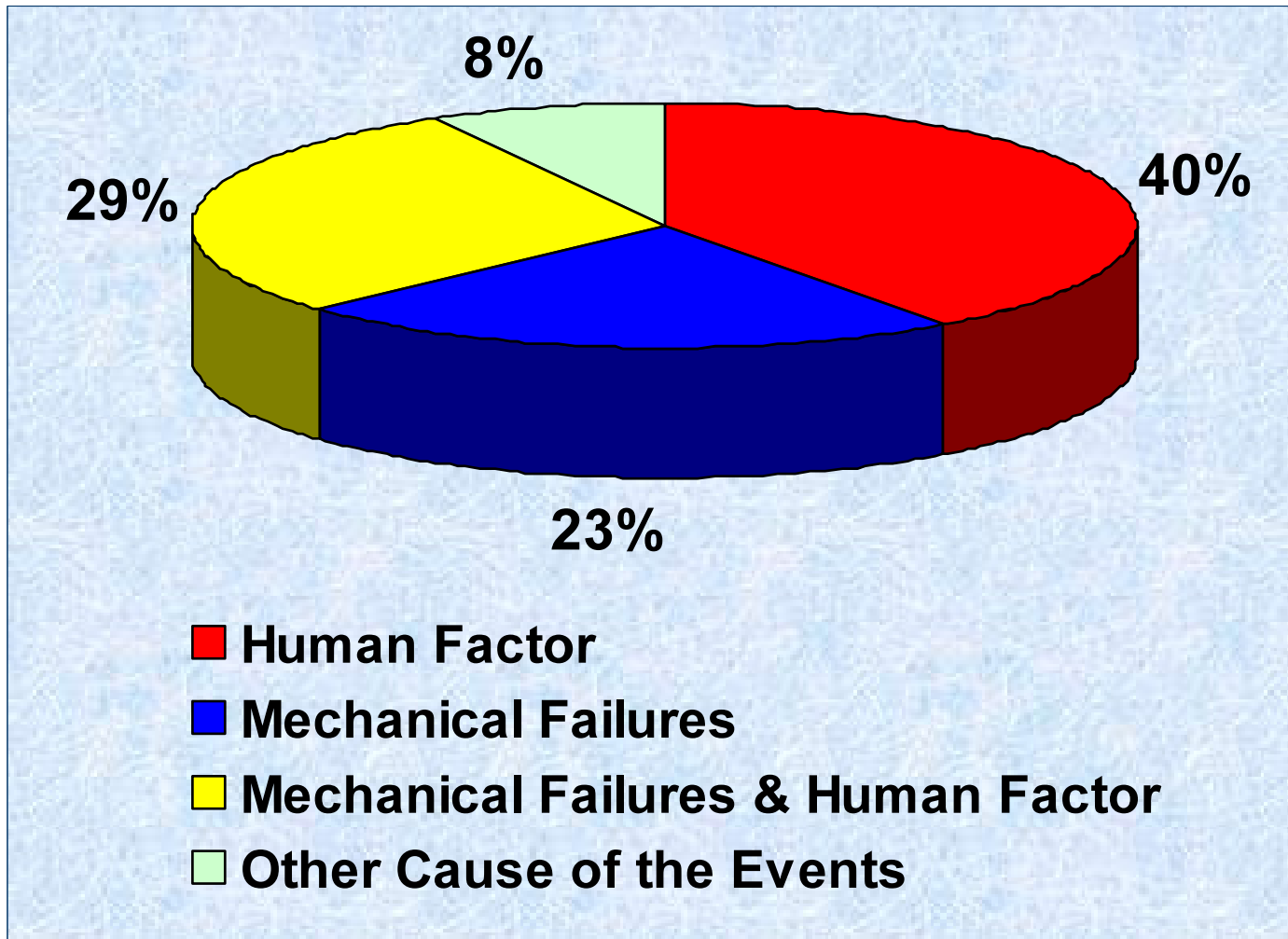
- Classification
 - Design and construction
 - Safety analysis
 - Operational Limits and Conditions
 - Maintenance and Periodic Testing
 - Procedures
 - Utilization
 - Radiation protection
 - Emergency planning
 - Quality Assurance
 - Personnel training and qualification
 - Equipment

Use of IRSRR

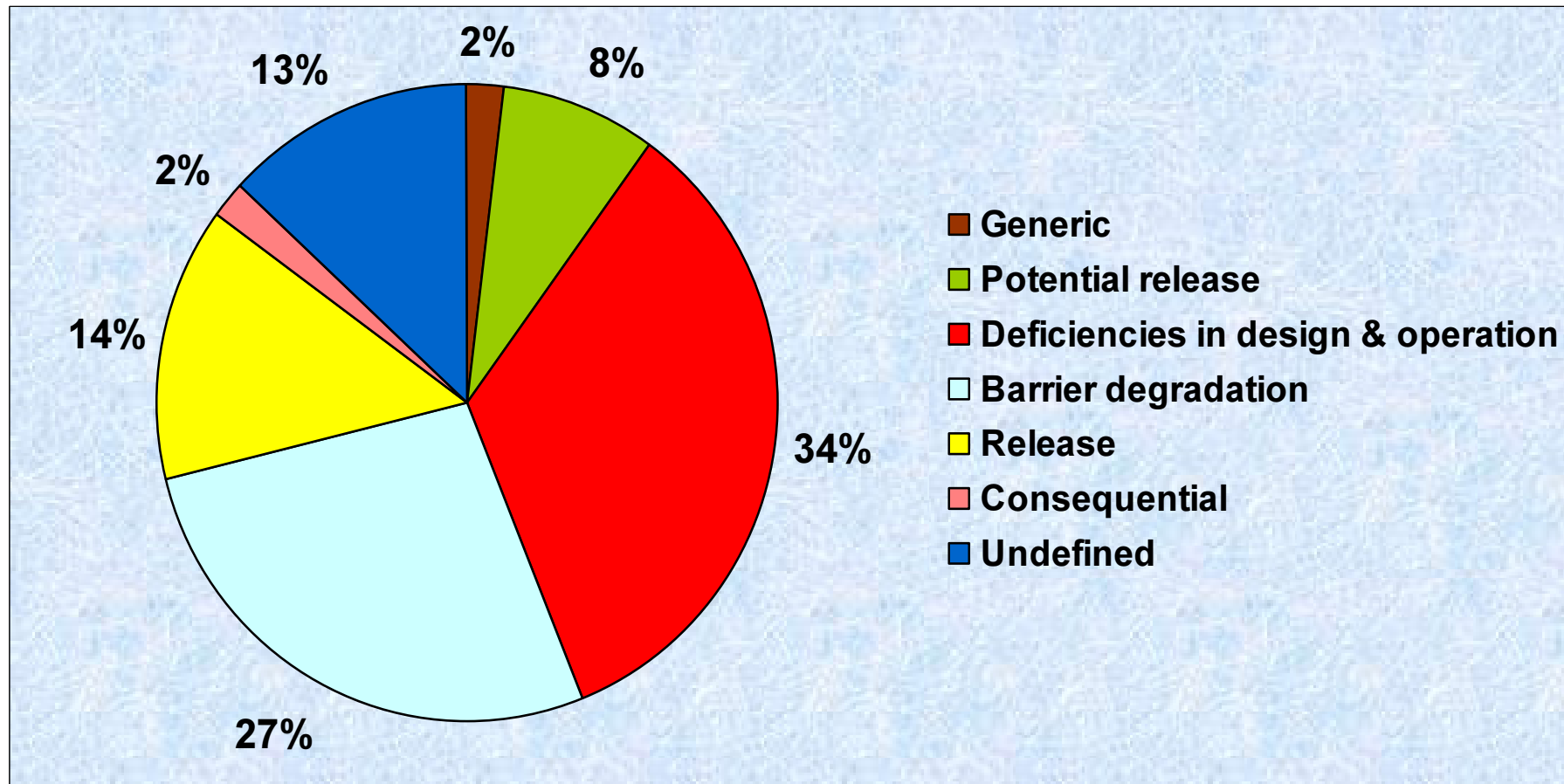
- Data from the IRSRR could be used by Member States for:
 - Review of SAR;
 - Collection of reliability data for PSA;
 - QA;
 - Training of operators, regulators and designers;
 - Identification of PIE;
 - Design improvements;
 - Safety culture enhancement.



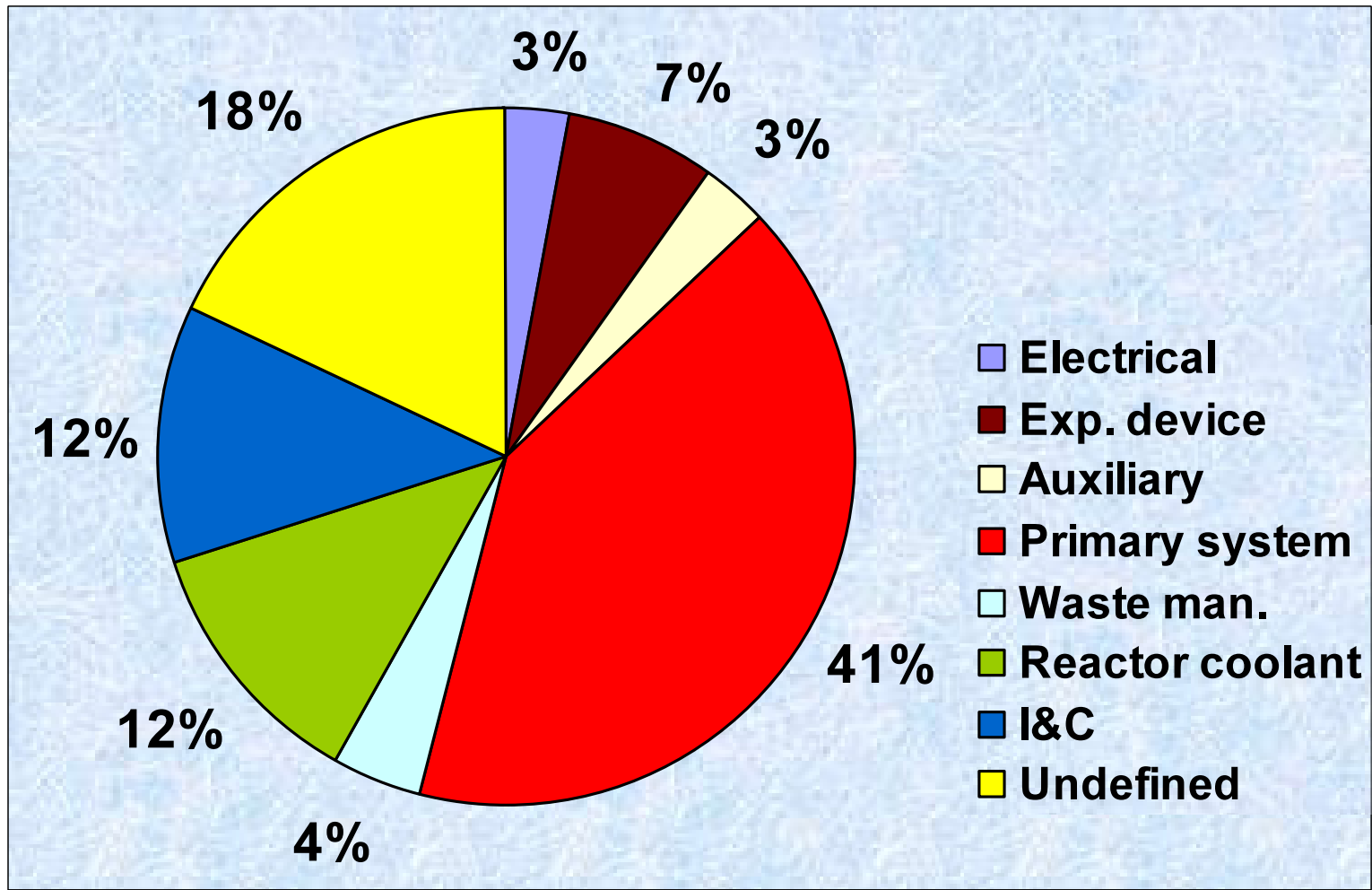
IRSRR Statistics: Cause of the Events



IRSRR Statistics: Reporting Type (Cause / Consequence)

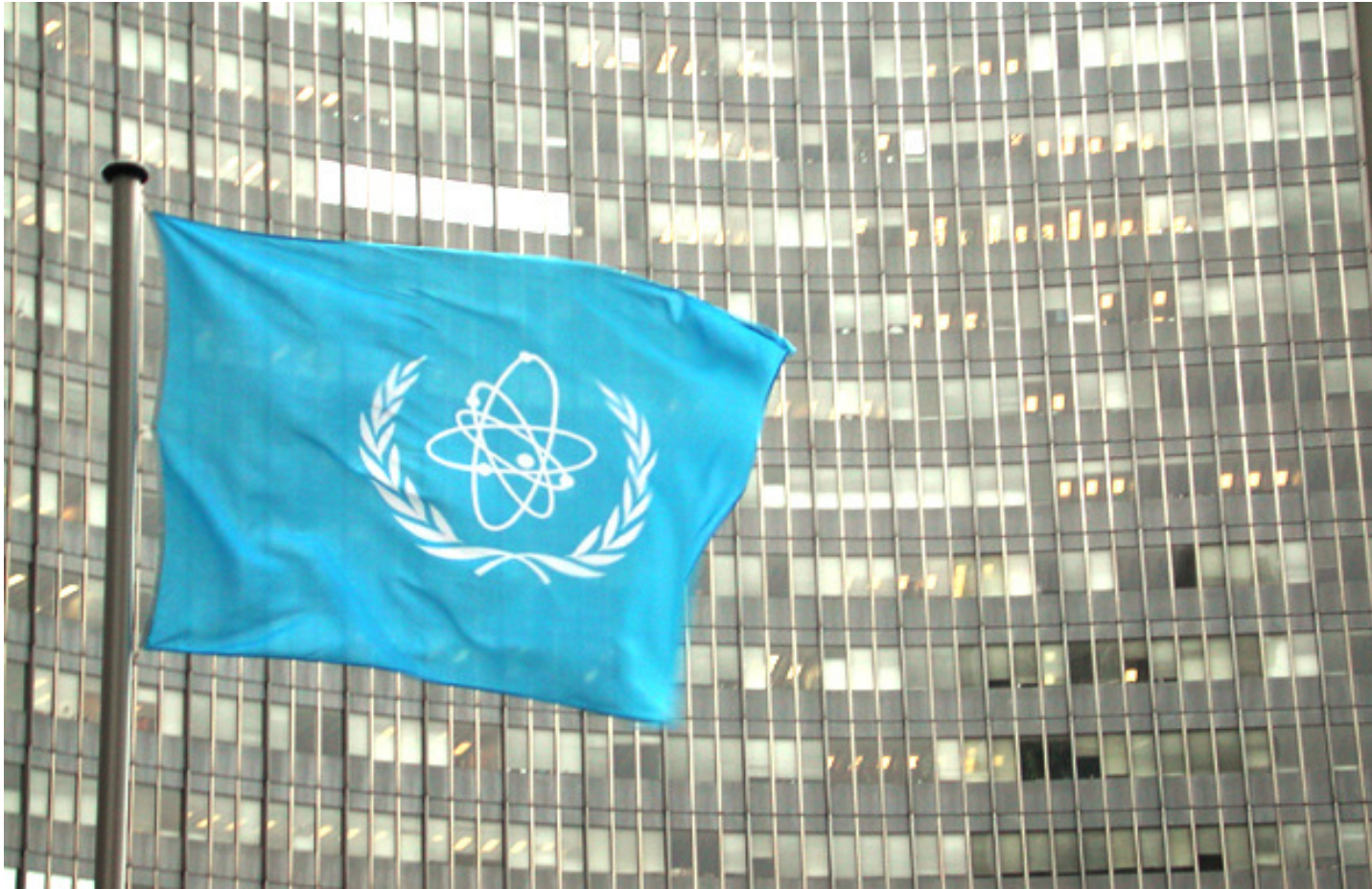


IRSRR Statistics - Failed system (cause)



List of MS participating in IRSRR

Argentina	Czech Rep.	Italy	Norway	Syria
Australia	Egypt	Jamaica	Pakistan	Thailand
Austria	Finland	Japan	Philippines	Tunisia
Bangladesh	France	Jordan	Poland	Turkey
Belgium	Germany	Korea	Portugal	Ukraine
Brazil	Ghana	Latvia	Romania	UK
Bulgaria	Greece	Malaysia	Russia	United States
Canada	Hungary	Mexico	Serbia	Vietnam
Chile	Indonesia	Morocco	Slovenia	
China	Iran	Netherlands	South Africa	
Congo	Iraq	Nigeria	Sweden	



...Questions and comments?