



# The Updated IAEA International Nuclear Event Scale Reporting System

Cynthia G. Jones, Ph.D.  
U.S. INES National Officer  
U.S. Nuclear Regulatory Commission  
Washington, D.C., U.S.A

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# Overview

- History & recent revisions
- Main features of the INES Scale
- Basic Structure
- Event rating examples
- Worldwide & U.S. experience (2002-2008)
- Conclusions



# INES History & Improvements

- 1990: Initially for events at nuclear power plants
- 1992: First INES Manual with methodology for rating events at nuclear facilities
- 2001: INES Manual – for rating events at nuclear facilities and related to transport of radioactive material
- 2006: Additional guidance for rating radiation source and transport was endorsed for official use
- **2008: Revised INES Manual** – consolidates the previously approved material and other clarifications and comments of the INES member countries



# INES Main Features

- **Prompt** communication to the public
- **Consistency** in terms of safety significance
- Operating successfully in **more than 60** countries
- Can be applied to **any event** associated with radioactive material
- Events are classified on a **scale from 1 to 7**



**U.S.NRC**

United States Nuclear Regulatory Commission

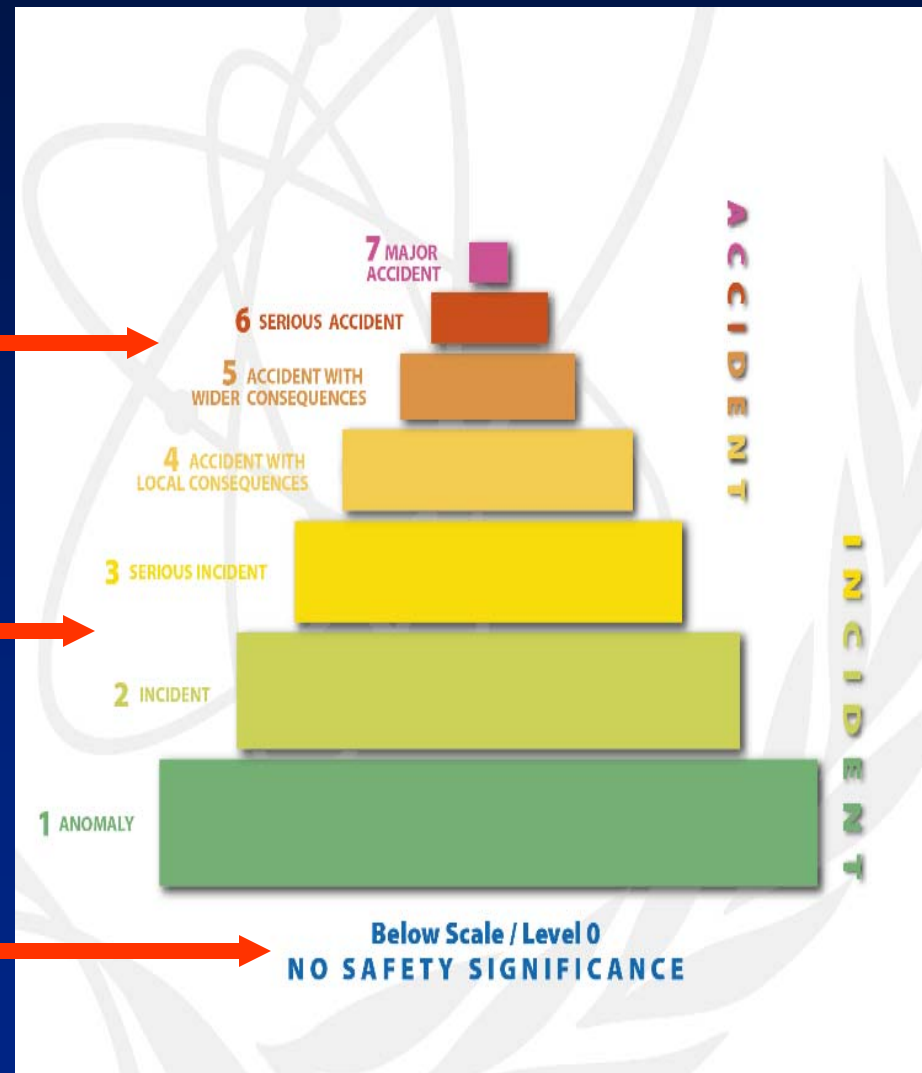
*Protecting People and the Environment*

# INES Classification

**Levels 4 to 7 - “Accidents”**

**Levels 1 to 3 - “Incidents”**

**Level 0 – “Deviations”**





# INES Criteria

3 different areas considered in evaluating the event:

***1. People and the environment***

***2. Radiological barriers and controls at facilities***

***3. Defence-in-Depth***

## What INES does...

- **Contributes to common understanding of incidents and accidents**
- **Events of public interest are disseminated transparently**
- **Brings uniform terminology**
- **Increases credibility and reassurance**



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*Protecting People and the Environment*

## What INES **does not do...**

- Does not replace the existing national criteria for the reporting of events
- Cannot be used to compare safety or regulatory programs between countries





# Previous INES Events

**Chernobyl**





# Previous INES Events

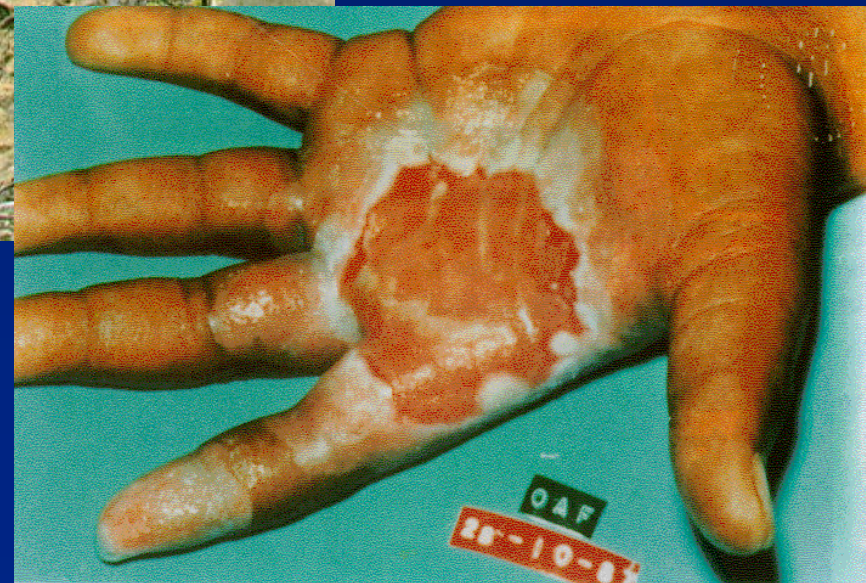
## Kyshtym

- A violent explosion on 29th September 1957 in the southern Urals, in a highly active waste tank
- The explosion resulted from failure of the cooling system in the tank
- Contaminated a large area ( $>1000 \text{ km}^2$ ) later called the "Kyshtym footprint"
- 90% fell in the vicinity of the tank, whereas the remaining activity (74,000 TBq) formed a kilometer-high radioactive cloud

# Previous INES Events



Goiânia





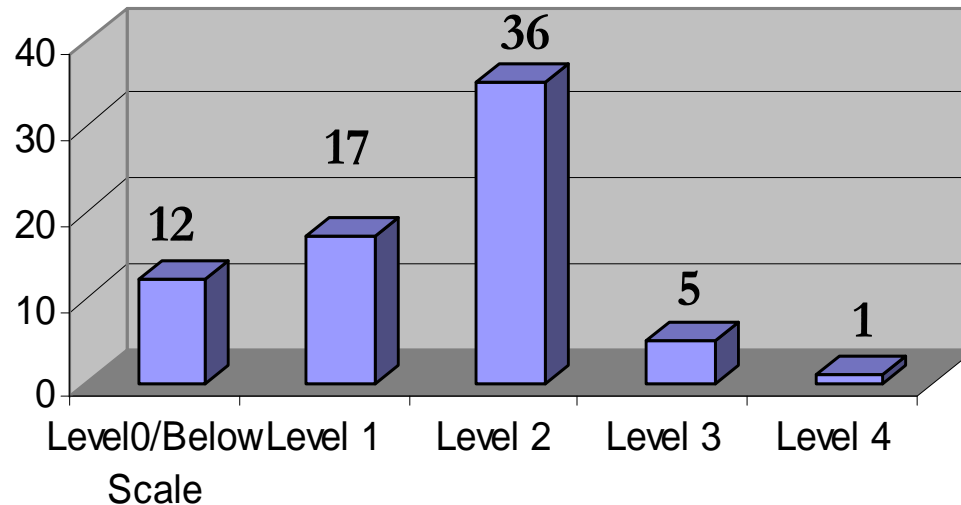
# INES Examples of Previous Events

Event	Rating
Chernobyl (1986)	7
Kyshtym (1957)	6
Windscale (1957)	5
Goiânia (1987)	5
Three mile island (1979)	5
Tokaimura (1999)	4
Vandellos (1989)	3
Industrial radiographer worker overexposure	2



## Continuously improving:

- Less than 200 users when it started in 2001
- More than 1200 users
  - Increasing number of visits to NEWS
- 70 events posted worldwide (2006-08)





# U.S. Experience - INES

NRC responsible for licensing, inspection & oversight of:

- Nuclear Power Plants
- Gaseous Diffusion Plants
- Fuel Cycle Facilities
- ~3750 Materials licensees in 15 States
- Began limited participation in INES in 1993
- In 2001, NRC increased INES participation to reporting of all Level 2 events and above

## 35 Agreement States

- Responsible for licensing, inspection & oversight of  
~18,250 Materials licensees
- Began participating in INES in 2002

## U.S. Experience – INES 2004-08

Year	Power Reactor Events	Research Reactor Events	Fuel Cycle Events	Materials Events	TOTAL
2004	0	0	0	6	6
2005	2	0	0	9	11
2006	0	1	1	8	10
2007	0	0	0	3	3
2008	0	0	0	4	4

## Summary of Materials Events (30)

### U.S. Experience – INES 2004-08

Year	Radiography	Radiation Sources	Irradiators
2004	2	3	1
2005	8	1	0
2006	6	2	0
2007	2	1	0
2008	3	1	0



# Distribution on INES Scale

## U.S. Experience – INES 2004 – 2008

LEVEL	Number of Events
0	1
1	4
2	28
3	1

# Conclusions



*Thank you!*  
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