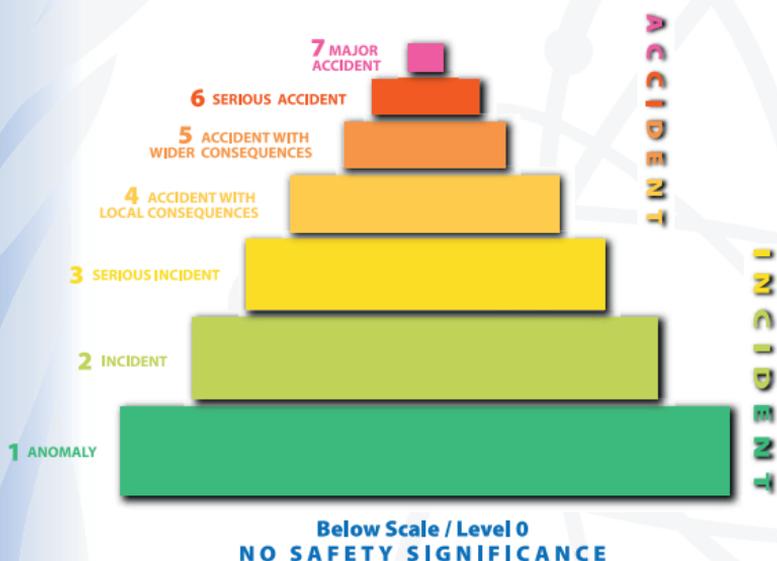


THE INTERNATIONAL NUCLEAR AND RADIOLOGICAL EVENT SCALE

What is INES?

The International Nuclear and Radiological Event Scale (INES) is a scale used for communicating the safety significance of events associated with sources of radiation to the public.



General description of the scale

Events are rated on seven levels.

Levels 1–3 are called ‘incidents’, Levels 4–7 ‘accidents’. In order of increasing severity, the levels are:

- Level 1: anomaly
- Level 2: incident
- Level 3: serious incident
- Level 4: accident with local consequences
- Level 5: accident with wider consequences
- Level 6: serious accident
- Level 7: major accident

Events without safety significance are rated as “Below Scale/Level 0”.

Events not related to radiation or nuclear safety (e.g. injury of a worker in a nuclear power plant by an electrical shock) are not rated on the scale.

How is the INES rating determined?

Events are rated on INES using a methodology that is described in detail in the IAEA INES User's Manual (<http://www-pub.iaea.org/MTCD/Publications/PDF/INES2013web.pdf>).

Each event is considered in terms of its impact on three different areas.

- The impact on people and the environment considers the doses to people or the amount of radioactive material released to the environment.
- The impact on the systems designed to prevent the spread of contamination (radiological barriers and controls) considers the severity of the event at the site of a facility, as well as potential harm to the public.
- The impact on safety systems (defence in depth) considers events where the measures put in place to prevent accidents did not operate as intended, providing an indication of how close the event was to causing actual consequences.

The INES rating is the one that corresponds to the highest of the three.

INES

The International Nuclear and Radiological Event Scale

User's Manual
2008 Edition



Co-sponsored by the IAEA and OECD/NEA

IAEA
International Atomic Energy Agency



What do the different INES ratings mean?

- Below Scale/Level 0 is for events that have no radiation safety significance.
- Level 1 means that there is only degradation of the safety systems designed to prevent the occurrence of events.
- Levels 2 and 3 mean that there are more serious degradations of the safety systems or some, though not severe, consequences for people and the environment.
- Levels 4 to 7 mean there is at least one death from radiation and/or a release of radioactive material that requires, or could require, the implementation of countermeasures.

Examples of INES ratings

Below Scale/ Level 0:

- Discovery of damaged fuel rods during core unloading and fuel inspections, NPP Krsko, Slovenia, 2013
 - Discovery of consumer goods contaminated with ^{60}Co , Colombo, Sri Lanka, 2012
-

Level 1 (anomaly):

- Fast stop of the main circulation pumps and simultaneous loss of their fly wheel systems during reactor scram, NPP Olkiluoto-1 Finland, 2008
 - Exposure of two workers in the nuclear power plant beyond the dose constraints, NPP Rajasthan-5, India, 2012
-

Level 2 (incident):

- Reactor trip due to high pressure in the reactor pressure vessel, NPP Laguna Verde-2, Mexico, 2011
 - Overexposure of a practitioner in interventional radiology exceeding the annual limit, Paris, France, 2013
-

Level 3 (serious incident):

- Release of ^{131}I into the environment from the radioelements production facility, Fleurus, Belgium, 2008
 - Severe overexposure of a radiographer, Lima, Peru, 2012
-

**Level 4
(accident
with local
consequences):**

- Radioactive material in scrap metal facility resulted in acute exposure of scrap dealer, New Delhi, India, 2010
- Overexposure of four workers at an irradiation facility, Stamboliysky, Bulgaria, 2011

**Level 5
(accident
with wider
consequences):**

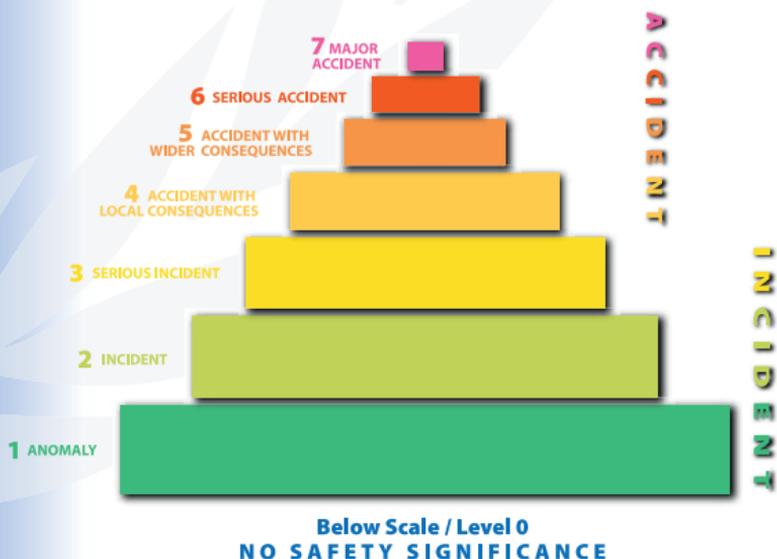
- Severe damage to the reactor core, NPP Three Mile Island, USA, 1979
- Four people died after being overexposed from an abandoned and ruptured high activity source, Goiania, Brazil, 1987

**Level 6
(serious
accident):**

- Significant release of radioactive material to the environment after the explosion of a high activity waste tank Kyshtym, Russian Federation, 1957

**Level 7
(major
accident):**

- Significant release of the radioactive material to the environment resulting in widespread health and environmental effects, Chernobyl, Ukraine, 1986
- Significant release of the radioactive material to the environment resulting in widespread environmental effects, Fukushima, Japan, 2011



Which events are rated on INES?

INES covers events at nuclear facilities, events involving sources in industry and medicine, events during transport of radioactive material, events when radioactive sources or packages are lost or stolen, discovery of orphan sources (such as radioactive sources being found in scrap metal) and events involving the unplanned exposure of individuals in other regulated practices (such as processing of minerals).

When is it not appropriate to use INES?

It is not appropriate to use INES to:

- Assess or compare safety performance between facilities, organizations or countries
- Initiate protective actions to a nuclear or radiological emergency
- Classify emergencies for the purpose of triggering emergency response actions

Do countries have to use INES and who decides on the INES rating?

Participation in the INES is voluntary. INES is regularly used by around 80 countries worldwide. These countries have officially designated an INES National Officer who is responsible for communicating the rating to the IAEA and Member States.

The rating of a particular event is decided by the country where the event occurred and each country designates who has the authority to provide it.

Can the INES rating be changed after it has been communicated to the public?

Yes. Events are dynamic; they start, develop and terminate. Experience has shown that in the early phase of an event, its nature and potential consequences may not be known. If an INES rating is provided during this phase, it might be changed afterward. A provisional rating may be up- or down-rated when the final outcome of the event is fully understood.

What is NEWS?

NEWS stands for 'Nuclear Events Web-based System' and is an IAEA supported communication channel that provides authoritative information about nuclear or radiological events as reported by INES National Officers. It can be accessed at <http://www-news.iaea.org>. NEWS aims to keep the public informed about the occurrence and safety significance of events rated at Level 2 and above, and those attracting international public interest. The IAEA hosts and administers the system, but event reports are filed and updated by INES National Officers in participating countries, who are responsible for all related content.

More information on INES:

Website:

<http://www-ns.iaea.org/tech-areas/emergency/ines.asp>

INES Contact Point: INES.Contact-Point@iaea.org

NEWS Contact Point: NEWS.Contact-Point@iaea.org



IEC
Incident and
Emergency Centre