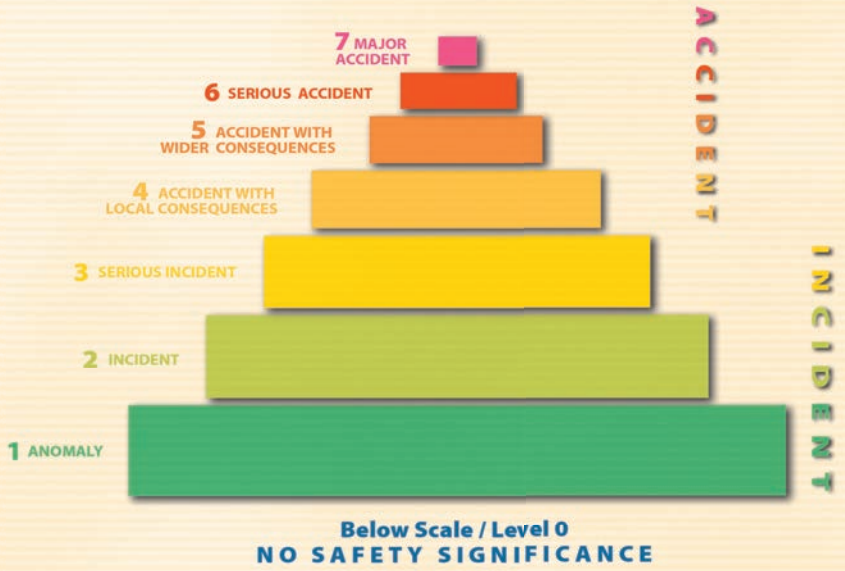
The Use of the International Nuclear and Radiological Event Scale (INES) for Event Communication

Guidelines and Good Practices for Setting up a National Framework on the Effective Use of INES for Event Communication



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THE USE OF THE INTERNATIONAL NUCLEAR AND RADIOLOGICAL EVENT SCALE
(INES) FOR EVENT COMMUNICATION
INES–EVENT COMMUNICATION

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FOREWORD

The IAEA's International Nuclear and Radiological Event Scale (INES) was developed in 1990 by international experts convened by the IAEA and the OECD Nuclear Energy Agency with the aim of communicating the safety significance of events at nuclear installations. Since then, INES has been expanded to meet the growing need for communicating the safety significance of events giving rise to radiation risk. At present, INES is used for communicating to the public, in a consistent way, the safety significance of an event associated with sources of radiation, whether or not the event occurs at a facility. INES covers a wide spectrum of practices, including industrial uses such as gammagraphy, the use of sources of radiation in medicine, activities at nuclear power plants and research reactors, activities at spent nuclear fuel and radioactive waste management facilities, and the transport of radioactive material.

INES has become a widely used tool for putting the safety significance of radiation events into proper perspective. The number of countries using INES has risen steadily over the past five years. As a result, there is a need to ensure the harmonized application of this scale worldwide.

Up to now, international activities regarding INES have focused more on developing guidance on rating events than on the ways of using INES. This publication is the first to provide guidance on establishing or improving a national framework for the effective use of INES during event communication. It has been prepared on the basis of national experience with communicating events that have occurred since the introduction of INES. This publication also includes, in Annex I, lessons learned from the application of INES during and after the accident at the Fukushima Daiichi nuclear power plant, Guidance on the Use of INES in Evolving Severe Accidents.

The IAEA officers responsible for this publication were F. Baciu and J.-F. Lafortune of the Incident and Emergency Centre, Department of Nuclear Safety and Security.

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1. INTRODUCTION

1.1. BACKGROUND

The International Nuclear and Radiological Event Scale (INES) is a tool for communicating to the public, in a consistent way, the safety significance of events associated with sources of radiation. INES was developed in 1990 by international experts convened by the International Atomic Energy Agency (IAEA) and the Organisation for Economic Co-operation and Development's Nuclear Energy Agency (OECD/NEA) to facilitate the communication of the safety significance of events at nuclear installations. Since 1990, the scope of the application of INES has been expanded to meet the growing need for communicating the safety significance of events giving rise to radiation risk. At the time of publication, the scope of the application of INES includes events associated with sources of radiation, whether or not the event occurs at a facility.

INES covers a wide spectrum of practices, including industrial radiography, the use of sources of radiation in medicine, activities at nuclear power plants and research reactors, activities at spent nuclear fuel and radioactive waste management facilities as well as the transport of radioactive material. It also includes the loss or theft of radioactive sources or packages and the discovery of orphan sources, such as radioactive sources discovered in scrap metal. For medical applications, INES is applied to rate events that result in actual exposures of workers (doctors, nurses, technicians, etc.) or members of the public (but not patients) as well as events resulting from deficiencies in safety provisions. INES is currently not applied to events involving actual or potential consequences for patients exposed to radiation as a result of medical procedures.

INES is only intended for use in civilian (non-military) applications and only relates to the safety aspects of events. It is not recommended to use an INES rating as a means of deciding on an emergency response. Emergency response actions are taken to proactively protect people and the environment, while events are rated on INES retrospectively.

In September 2008, the IAEA General Conference adopted a resolution that, welcomed the endorsement of the new INES User's Manual by the INES Advisory Committee and the INES national officers representing INES Member States as a tool to communicate the safety significance of events to technical communities and the public, and urged Member States to designate INES national officers and utilize the scale.

Each Member State is invited to designate an INES National Officer. INES National Officers normally meet every two years at a Technical Meeting convened by the IAEA. This meeting provides a forum for the INES National Officers to share experience, to debate issues and concerns and to agree on actions to enhance the use of INES. To facilitate the full utilization of the scale in a consistent way, the INES National Officers at the 2008 Technical Meeting recommended the elaboration of The International Nuclear and Radiological Event Scale User's Manual, 2008 Edition (INES User's Manual) [1] supporting material and tasked the INES Advisory Committee to undertake this work.

Up to now, the focus of international activities on INES has been more on developing guidance for rating events than on the ways of using INES. This publication is the first to provide guidance on how to establish or improve a national framework for the use of INES. It is drawn from the wide international experience gained from over twenty years of using INES and shared by the INES National Officers during Technical Meetings. Guidance is also drawn from information collected through a questionnaire completed by countries where INES is extensively used.

Following the accident at the Fukushima Daiichi Nuclear Power Station (the Fukushima accident), a number of questions were raised about INES and its use. It was agreed that the development of the supporting material should take into account the lessons learned from that accident with respect to the use of INES. At the 55th IAEA General Conference, the IAEA Action Plan on Nuclear Safety recommended that the IAEA Secretariat and Member States, in consultation with the OECD/NEA and the IAEA INES Advisory Committee, review the application of the INES scale as a communication tool.

Annex I of this publication includes the lessons learned from the Fukushima accident with respect to the use of INES.

1.2. OBJECTIVES

This publication is intended to assist Member States to establish or improve their national framework to effectively use INES as an integral part of their communication strategy. The objective is also to provide

examples of existing practices to illustrate the breadth of approaches that can be adopted to meet the fundamental goal of INES, which is to effectively and consistently communicate the safety significance of an event.

1.3. TARGET AUDIENCE

This publication is intended for those with responsibilities in the establishment or maintenance of national arrangements to use INES, including reporting the event information[1], analysing it and communicating it to the general public and technical community, including INES National Officers, employees of the operating organizations, civil service personnel and senior government officials.

1.4. SCOPE

This publication addresses the framework needed to effectively use INES as part of the communication strategy in case of an event. It discusses the functional elements (what needs to be done) and the infrastructure components (what needs to be in place) necessary to achieve the goals associated with each functional element, i.e. reporting the information of an event, analysing it and communicating it to the public using INES.

Not every event leads to an emergency. This publication addresses the use of INES both in emergency and non-emergency situations, recognizing that emergencies call for different mechanisms and processes that may take precedence over, or be managed in parallel with, the use of INES in communication. The current IAEA safety standards in emergency preparedness and response are contained in the IAEA Safety Standards Series publication, Preparedness and Response for a Nuclear or Radiological Emergency [2], which is supported by two General Safety Guides, Arrangements for Preparedness for a Nuclear or Radiological Emergency [3] and Criteria for Use in Preparedness and Response for a Nuclear or Radiological Emergency [4].

Detailed guidance on INES rating methodology and public communication during radiation emergencies is not provided in this publication, as these topics are covered respectively by the INES User's Manual [1] and Communication with the Public in a Nuclear or Radiological Emergency [5]. This publication does, however, complement documents on INES rating and public communication with regard to the specific use of INES.

1.5. DEFINITIONS

In this publication, the standard definitions listed in the IAEA Safety Glossary, Terminology Used in Nuclear Safety and Radiation Protection: 2007 Edition [6], are used unless otherwise indicated.

1.6. STRUCTURE

This publication is divided into six sections and contains two annexes. Section 1 is the introduction. In Section 2, the overall process for the effective use of INES is presented. Sections 3 to 5 describe the functional elements and the infrastructure components required for the effective use of INES. Section 6 provides guidance on the training programmes needed to support the national framework. There are two annexes: one that provides guidance on the use of INES in evolving severe accidents, and one that provides an overview of the INES administration, and of the Unified System for Information Exchange in Incidents and Emergencies (USIE) and the Nuclear Events Web-based System (NEWS), two IAEA channels for the communication of event information at the international level.

1.7. BEFORE STARTING

1.7.1. Uses of INES

INES provides a systematic, simple and internationally applied means of identifying the safety significance of an event, using a sound technical basis. When used appropriately, it can be a powerful tool for communication and can provide distinct benefits, for example:

- INES covers near miss events and failures in processes, systems and safety management with no actual consequences, i.e. events where the defence in depth is reduced but not lost.
- INES focuses on the degradation of the approved design rather than the adequacy of the approved design against some particular standard.

[1] For the simplicity of this publication, the term 'reporting the event information' is used to encompass the process of collecting relevant information about an event and sharing it among involved stakeholders.

— INES allows regulatory bodies to use a consistent scale for describing the safety significance of events for all the activities that they regulate.
— INES provides a mechanism to understand the safety significance of events from other countries.

INES has been used for other purposes as well. Although there are no strict rules as to whether or not INES can be used for other purposes, one has to be careful that these uses are appropriate and do not lead to adverse effects. The following paragraphs provide some examples of other uses of INES, including their advantages and disadvantages.

Some countries have found INES to be an appropriate means to reach an agreement between the operating organization and the regulatory body on the safety significance of events because it uses a systematic approach. However, caution should be exercised when using the scale this way: there may be pressure for the operating organization to underrate the event or for the regulatory body to assign a higher rating than justified.

Some countries have also used INES ratings as the basis of defining reporting criteria (for example, only those events rated at Level 1 and above need to be reported to the regulatory body). However, events rated at Below scale/Level 0 may still attract media interest. In such cases, there is a demand to know more about them. They may not need reporting with respect to the regulatory requirements, but the regulatory body may need to be informed of the occurrence of such events.

Countries could be tempted to use INES ratings to screen events that should be reviewed in an operational feedback system. This is not recommended as there could well be plant performance lessons learned from Below scale/Level 0 events or even from events to which INES is not applicable.

Some operating organizations have used INES ratings as some form of performance indicator. This ranges from producing annual reports with graphs of the number of events and their associated INES ratings, to using numbers of events at certain ratings in a performance related scheme. However, the more that INES ratings are used as performance indicators, the more pressure there might be to justify a lower rating, which can lead to either an inappropriate rating or to wasting time agreeing on a rating. The time spent agreeing on a rating, and the impact of the delay in communicating it, are in general greatly disproportionate to the significance of the event. For example, a lot of time can be spent discussing whether an event should be Below scale/Level 0 or Level 1, while the main message to be given to the public should be that the event is not particularly significant.

As stated in the INES User's Manual [1], it is not appropriate to use INES to compare safety performance between facilities and operating organizations within a country or between different countries. On one hand, arrangements for reporting minor events to the public vary from one country to another, and on the other, there are too few higher level events to provide a statistically meaningful comparison.

It is also inappropriate to use INES ratings as part of any decisions related to emergency response. Decisions on emergency response actions take into account a wide range of factors, such as facility conditions, radiological conditions, weather conditions, population densities, evacuation capabilities and other protective actions. The INES rating only considers some of these factors and, therefore, is not appropriate as a means of deciding emergency response actions. Conversely, the emergency response actions taken should not be used to automatically rate an event.

It is important to keep in mind that events are rated on INES retrospectively. The INES rating methodology provides an explanation of the safety significance of the event and its consequences, in hindsight, when sufficient information is known and understood to determine the actual consequences and the safety significance of the event. The INES rating of an event is only one input into communication about the event; it needs to be complemented by other information of interest to the intended audience.

1.7.2. Administration of INES

Each participating Member State decides how to implement INES ratings on the basis of guidance provided in the INES User's Manual [1] and this publication.

At the international level, the INES administration is managed by the IAEA Secretariat through the Incident and Emergency Centre (IEC). The Secretariat also manages the NEWS and USIE communication channels where INES National Officers can post relevant events. Although information sharing on INES is not mandatory, Member States in general agree that events rated at Level 2 or above, and events attracting international media attention need to be communicated internationally through the IAEA.

The IAEA Secretariat, at the request of Member States, conducts train-the-trainers workshops and facilitates training, for example, on the INES rating methodology.

2. OVERVIEW OF THE PROCESS OF USING INES

National arrangements for the effective use of INES in event communication enable Member States to carry out the process illustrated in Figure 1. This process can be flexible. Specific arrangements will vary from country to country; however, it is recommended that the following functional elements are always included:

- Reporting the event information: this is the process of identifying events and distributing the appropriate information to the appropriate recipients within an appropriate timeframe, based on the severity of the situation or on the public interest that may arise from the event.
- Analysing: this is the process of analysing the information for two purposes, rating the event on INES and determining the specific communication strategy for the event.
- Communicating: this is the process of communicating the information about the event, including the INES rating, to the audiences targeted by the communication strategy.

This publication does not address guidance on how to perform public communication tasks, but it discusses how INES can be incorporated in the message to the public.

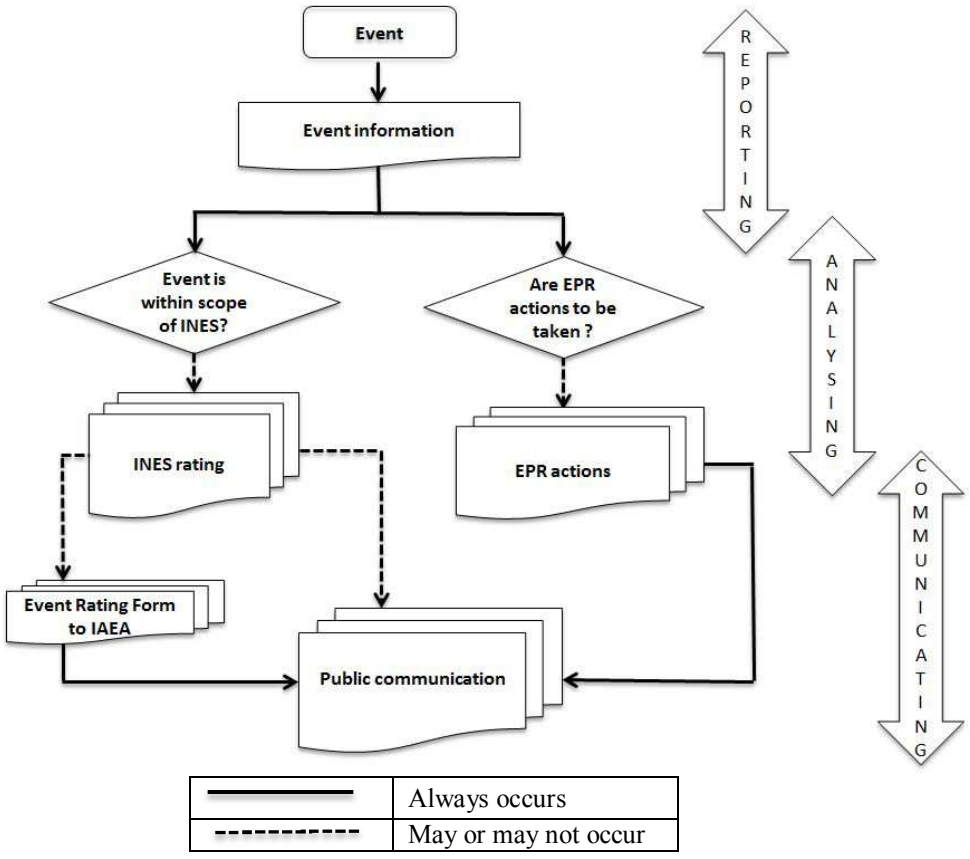

FIG. 1. Overview of the use of INES for event communication.

Sections 3 to 5 describe in detail the intended goal of each of these three functional elements and the infrastructure components that need to be established to support them.

The process also needs to have certain characteristics that will enhance its effectiveness.

Openness and trust

As in any communication with the public, it is important to build trust between the operating organization, the regulatory body, the media, local and national government officials, public interest groups and the public in general. Such trust needs to be built on honest and open communication about all events. Even

events of negligible safety significance may need to be communicated; otherwise rumour and misunderstanding could destroy the trust that has been built over time.

Consistency

Consistency with the use of INES ratings is essential to building trust and understanding. Consistency is needed in the messages for similar events from different facilities or occurring at different times, as well as in communication between major players, e.g. regulatory bodies and operating organizations.

Timeliness

Public communication about an event should not be delayed by the INES rating process. However, there will be an expectation that an INES rating will be provided as soon as possible, when sufficient information is available. An early statement that, for example, the rating is no higher than Level 2 can be effective to prevent rumours.

Good interface between regulatory bodies and operating organizations

The public will expect to hear from both the operating organization and the regulatory body organizations and will expect to see consistency in their messages.

Graded approach

While the use of INES in communication needs to be applicable to all events, it also needs flexibility in dealing with different events. Some events will require very little attention, just a brief explanation as a part of routine communication, while others will require urgent and more detailed communication.

Placing the INES level in context

The public needs to be reminded that INES is a 7 level scale and that Level 7 is the highest level. It might be possible to say, “The event is rated as a Level 3 event using INES, which is a 7 level scale, with Level 7 being the highest.”

3. REPORTING THE EVENT INFORMATION

3.1. GOAL

The goal is to get the right information to the right people at the right time about an event that needs to be communicated.

3.2. CONTEXT

A clear process for reporting[2] events needs to be developed, agreed upon and understood by all stakeholders involved. This process needs to recognize the importance of reporting all events, even minor ones, and events with degradation of safety provisions without actual consequences. This section covers the part of the process from when the event occurs up to the moment when the required reporting actions are completed.

The need to report, and the extent of reporting, depends on the type of event. For example, there could be an internal report within the operating organization, a report to the regulatory body, communication with the public or a combination of these. Some events might lead to an emergency, which brings into play a different process with its own communication protocols. Specific guidance on public communication in radiation emergencies is contained in Communication with the Public in a Nuclear or Radiological Emergency [5].

Some events require immediate reporting, while others allow for more time. Some events could be very complex and evolving. In such cases, at the time of reporting, not all necessary information may be available for determining the INES rating, but the reporting process must not be delayed by the wish to provide an INES rating.

For nuclear facilities, the importance of an effective reporting culture and the features of good reporting are described in the following IAEA publications: Safety of Nuclear Power Plants: Commissioning and Operation [7], A System for the Feedback of Experience from Events in Nuclear Installations [8] and Best Practices in Identifying, Reporting and Screening Operating Experience at Nuclear Power Plants [9]. These publications may also be of value to operating organizations for purposes other than nuclear facility operations.

3.3. RESPONSIBILITIES AND REPORTING CRITERIA

The process for reporting an event should be predefined and should apply a graded approach that takes into account the nature, impact and severity of an event. The reporting process needs to cover:

- What should be reported;
- Who has to report;
- To whom should the event be reported;
- What the timescales for reporting are;
- Whether, and if so, how and when the public should be informed.

It is also important that the definition of an event be described in simple terms to ensure that it is easy to understand. The reporting process needs to define clear criteria for what is to be considered a reportable event.

In general, the person who realizes that a reportable event is taking place is the most appropriate person to initiate the reporting process. For example, at nuclear facilities, this could be the plant operator or a member of staff who notices an event. For large operating organizations, for example with facilities at several sites, this could be a designated person based either at the facility or at a central office. For events of greater significance, where rapid reporting is required to trigger the correct actions, the reporting chain must not introduce undue delays in the reporting.

The recipients of the report generally vary depending on the type of event. For example, the regulatory body could be the only one needing the report for low level events, while higher level events may also need to be reported to emergency response authorities. Therefore, the reporting process needs to clearly define for whom

[2] The term ‘reporting’ is used in a non-restrictive way in this publication to encompass not only regulatory reporting and reporting through other official channels, for example the IAEA USIE website, but also communication and sharing of information about an event among all stakeholders.

the report is intended. In some countries there may be a need to report to several organizations[3], or several regulatory bodies.

Although the initial responsibility for identifying an event lies with the person realizing that a reportable event is taking place, the reporting process needs to foresee that once the initial notification has been carried out, the operating personnel need to be able to return to their primary role of managing the operations. The reporting process should not interfere with operations. This is particularly important during emergencies.

The timescales for reporting need to be clearly defined, again with a graded approach. For major facilities, these timescales are sometimes included in the operational limits and conditions (also referred to, for example, as the operating envelope or technical specifications). Depending on the size and structure of the organization doing the reporting, the reporting process may be more or less complex. However, in all cases, the reporting process should be based on the need to report events as soon as reasonably possible.

For events that are evolving, the information generally becomes available gradually. The process needs to define how this is managed and how this can be taken into account in the rating and communication processes. More guidance on evolving severe accidents can be found in Annex I.

The INES rating does not need to be included in the initial report. In many cases, the person or organization doing the initial reporting does not perform the INES rating. The initial report should be factual, complete and clear to allow a proper understanding of the safety significance and a subsequent accurate rating on INES (see the next section). When more than one recipient needs to receive the report, the needs of each should be addressed in the content of the report. For example, a report may need to be sent to the regulatory body (with information about safety systems, component failure and procedures) and the ministry of health (with information about injuries and exposure).

3.4. GOOD PRACTICES

The following examples were identified as good practices based on information collected through a questionnaire completed by countries where INES is extensively used:

- There are clear definitions of which type of events need to be reported and appropriate reporting routes and requirements.
- There are regulations in place that contain clear criteria of what to report, who is responsible to submit a report and to whom, the format for reporting and the content of a report as well as timescales for reporting.
- Policies and processes for internal reporting of all abnormal conditions are developed within the operating organizations through a systematic approach that covers how to get the information, how to record and analyse it and how to assess its safety significance.
- Regulatory reporting requirements not based on INES ratings.
- Users of radioactive sources and transporters of radioactive material comply with reporting requirements consistent with those of nuclear facilities.
- Adequate resources are available to receive and evaluate reports.
- Actions required following an event do not depend on the INES rating.

[3] In this publication, the term ‘organization’ if not specified, is used in a non-restrictive way and can, depending on the context, mean operating organization, regulatory body, other government services such as the police and/or other institutions.

4. ANALYSING THE EVENT INFORMATION

4.1. GOAL

Determine the INES rating and decide how the rating fits in the communication strategy for an event.

4.2. CONTEXT

All events need to be analysed, regardless of their safety significance. Analysis in the context of this publication means determining the significance of the event in terms of both regulatory perspective and public perception. Some aspects of the analysis are related to regulatory or emergency response requirements, while others are related to the INES rating and how this rating will be used in communications. This section does not describe how to do the rating since this is explained in the INES User's Manual [1]. Instead, it describes the responsibilities and mechanisms that need to be implemented to determine the INES rating. This section also emphasizes the need to include the use of INES in the communication strategy.

4.3. DETERMINING THE INES RATING

The national framework needs to describe at least the following aspects related to the INES rating:

- Who performs and/or approves the rating;
- The methodology used to agree on a rating;
- The policy regarding the use of provisional ratings.

There is no one answer to the question of who performs or approves the INES rating. It may involve more than one person. It may depend on the type and the severity of the event. It may be different persons for different facilities or different practices. It may even involve people from different organizations.

The responsibilities for performing or approving the rating need to be clearly identified within the national framework. The framework needs to ensure that the persons performing the rating have received sufficient training in the INES rating methodology and have sufficient technical knowledge to understand the severity of the event. The same applies for those persons who approve the rating or take the final decision on the rating. The national framework needs to provide a robust mechanism for determining a rating that is accepted by everybody, and to clearly identify who makes the final decision.

The boundary between Below scale/Level 0 and Level 1 can at times be subjective and it is important not to spend time arguing over which is the appropriate rating, nor to forget that the intended message to the public is that the event is of very low safety significance in both cases.

The considerations that need to be addressed within the national framework for an effective and efficient rating process are that the person or organization doing the rating must have the right knowledge, must regularly practise and must be trusted.

Some of these factors could, to an extent, lead to incompatible requirements. For example, the operating organization may well be the most knowledgeable, but during an event, may not be the most trusted. Ultimately, the process has to be a compromise that best addresses all needs, which are further discussed below.

Knowledge

The INES rating methodology has a strong technical basis. For all events, and in particular for those involving degradation of defence in depth with no actual consequences, the rating methodology requires a good understanding of the event, the safety systems and the safety justification for the facility or practice. The national framework should take this aspect into account when determining the responsibilities for rating and approving the rating.

Practice

The application of INES requires familiarity with the rating methodology. In order to provide the rating as soon as possible, there is sometimes a need for judgement in some areas. Both of these factors may make it difficult to provide a quick and expert rating unless the person is familiar with the details of the INES User's Manual [1]. Since the best way to achieve familiarity is through practice, these people should be regularly involved in performing ratings in order to maintain their knowledge. They should also take part in initial and regular refresher training courses.

Trust

There needs to be trust in the person or organization rating the events. This trust needs to be built over time. Absence of trust will lead to an INES rating being challenged. One possible way to ensure the acceptance of the rating is to have a dedicated person, or section within the organization, systematically perform the rating and maintain confidence in its accuracy.

One of the strengths of INES is that it puts the safety significance of an event into perspective by using a single number and distinct terminology (i.e. accident[4], incident, anomaly). The national framework should provide means to strengthen this aspect by clearly identifying the responsibilities for performing or approving the rating. Long discussions and major disagreements on the rating should be avoided in particular in a public forum. For example, the INES National Officer may be responsible for making the final decision when there is disagreement on the rating.

The framework should also provide the means to ensure that the description of the event and its significance are consistent with the INES rating. For example, communications should not refer to a Level 2 event as an 'accident[4]' or as a 'no safety significance event' since the description of a Level 2 event is an 'incident'.

When insufficient information is available to confidently provide a rating, or when the event is still evolving and the final outcome is not yet clear, the use of provisional ratings has to be foreseen in the national framework. When it is necessary to provide a provisional rating, it should be based on the best judgement possible for what the final outcome will be. It is detrimental to trust when a lower provisional rating is increased, or a higher provisional rating is reduced. At times, it may be necessary to amend the provisional rating, but too many changes, whether up or down on the scale, will hurt the credibility of the use of INES. The framework should clearly stipulate when a provisional rating can be provided. If a provisional rating is used, the impact of the provisional rating should be evaluated. The general goal is to issue a final, rather than provisional, rating to maintain trust and to avoid having to adjust event ratings.

4.4. DECIDING ON THE COMMUNICATION STRATEGY

The national framework needs to include an overarching strategy for the communication of events.

The communication strategy needs to consider the needs at the local, national and international levels, depending on the event. The INES rating should be a part of that strategy. For example, the rating could influence the following aspects of the communication strategy:

- The need to communicate: e.g. only communicate to the public on events Level 1 or above.
- The audience: only internal to the operating organization and regulatory body, local and/or national public or international audiences. In case of an international audience, the framework needs to include communication to the IAEA as well.
- The type of communication: e.g. communication on the website of the operating organization/regulatory body, press release, extensive report or press conference.
- The timing of the communication: e.g. a country could decide to communicate low level events on a periodic basis (e.g. quarterly report) instead of communicating on each event.

During emergencies, the communication strategy will be driven by other factors. The INES rating, although still useful, will become less important. Communicating protective actions to the local public will be more important than the INES rating itself.

The INES rating should not be used to determine the need for protective actions during an emergency. It is important to stress again that INES looks backwards at an event and that the INES rating methodology provides a complete analysis of the event and its consequences, in hindsight, when sufficient information is

[4] The INES definition of 'accident' applies in this case: "An event…that involves a release of radioactive material off-site likely to cause public exposure at least of the order of authorized limits or requiring countermeasures to be taken, or causes significant damage to the installation, or results in exposure of workers on-site to such a degree that there is a high probability of early death." (IAEA Safety Glossary, INES [6]).

known and understood to determine the safety significance of the event. During emergencies, the main priority is to be proactive by taking the necessary measures to protect people and the environment.

4.5. GOOD PRACTICES

The following examples were identified as good practices based on information collected through a questionnaire completed by countries where INES is extensively used:

- Organizations allocate sufficient resources (time, training, competence and personnel) for analysis related to INES.
- As far as practically possible, the operating organization proposes the rating or at least has a significant role in the INES rating process. For practices where there are many operating organizations (e.g. source use), the INES rating is provided by the regulator rather than by the operating organization.
- The national practice foresees that all INES ratings, even the ratings of Levels 0 and 1, are agreed to by the regulatory body.
- The role of the INES National Officer within the national practice is clearly defined.
- Where there is more than one INES National Officer, coordination arrangements are in place (e.g. common interpretation of criteria, training, public communication).
- The circumstances when a provisional rating is acceptable are clearly defined within the national practice.
- A small number of people in each organization perform the rating to ensure familiarity and consistency.
- INES ratings are regularly reviewed to receive feedback and review lessons learned about the evaluation and assessment of event reports and INES ratings.
- The INES National Officer regularly reviews the ratings of Below scale/Level 0 and Level 1 events and provides quality control by questioning specific events.
- There are established criteria for determining when there is significant international public interest to issue an Event Rating Form (ERF) and press release via the IAEA USIE/NEWS system.
- Regular reviews of experience are carried out and important lessons are communicated to all involved, including feedback from IAEA Technical Meetings of INES National Officers.
- A streamlined approval process has been developed to avoid delays in rating.
- Rating that is performed by the operating organization is carried out by independent personnel (personnel not involved in operations), for example, staff in a quality assurance or oversight function.
- Timescales for finalizing the rating are defined.

5. COMMUNICATING THE EVENT RATING

5.1. GOAL

The goal is to effectively use an INES rating as part of communication to convey the safety significance of a particular event to the public.

5.2. CONTEXT

INES is only one tool for effective communication. It is not the intent of this publication to provide guidance on communication (which is covered in a number of other publications, such as Communication with the Public in a Nuclear or Radiological Emergency [5]). The intent is for INES to be an integral part of communication and for public information officers, spokespersons, the public and media to be aware of INES.

The target audience for any communication of an event may include the operating organization, the local community, the general public or the local, national and international media. The principles for achieving an effective use of an INES rating for event communication are applicable regardless of the target audience.

It is important that the description of the event, the actions that have been or are being taken as a result of the event and the INES rating of the event, all be consistent regarding the safety significance. INES refers to well defined terms and concepts. As pointed out earlier, an event rated as INES Level 2 should not be described as 'of no safety significance' since that is the description of a Below scale/Level 0 event. Similarly, a Level 1 event should not be described as 'an accident' since only events with an INES rating of Level 4 or above are termed accidents.[5] The definitions and descriptions of the INES levels in the INES User's Manual [1] contain key words and concepts that can be used for event communication, thereby reducing the risk of the message being inconsistent with the INES rating.

5.3. ROLES AND RESPONSIBILITIES

The need to clearly define the roles and responsibilities with respect to analysing an event, approving the INES rating and including the rating of the event in communications is defined in Section 4. Public information officers and spokespersons of regulatory bodies and operating organizations are likely to be responsible for initiating and disseminating information or responding to requests for information about an event within their respective organizations. The effective use of INES requires close cooperation between the public information officers and spokespersons and the individual(s) responsible for determining and approving the INES rating within the organizations. There needs to be a mutual understanding of each other's responsibilities and needs. This could be achieved, for example, by specific training and awareness building activities. Regular use of INES during emergency exercises is another effective way to achieve this understanding.

During emergencies, the responsibility for communicating about an event may change and another institution may take charge of communicating with the public and the media. Mechanisms for incorporating an INES rating in communications and media releases during emergencies, irrespective of which institution is in charge of communication, should be clearly determined in advance.

The public information officers and spokespersons should only use an INES rating that has been provided by the authorized approver. The national framework needs to define who this person or organization is.

5.4. PUBLIC AWARENESS

Most radiation events are of low safety significance and are rated below Level 2 on INES. Nevertheless, it is important that those events be communicated to demonstrate transparency and raise awareness of INES. Regular communication of minor events and their INES rating also allow the public and media to become familiar with INES. Additionally, regular use of INES builds trust between the operating organization and the

[5] The INES definition of 'accident' applies in this sentence: "An event…that involves a release of radioactive material off-site likely to cause public exposure at least of the order of authorized limits or requiring countermeasures to be taken, or causes significant damage to the installation, or results in exposure of workers on-site to such a degree that there is a high probability of early death." (IAEA Safety Glossary, INES [6]).

public and media as it becomes clear that the operating organization deals with and is open about each abnormal occurrence at its facility.

Another way to build public awareness is to publish background information on INES on the regulatory body's website, and to let the public know about this website at each opportunity when an event is communicated. INES could also be introduced in schools in special areas or programmes, for example through the involvement of the regulatory body in the development of school courses.

The media

It is essential that the media understands INES and is confident using it. This confidence will not come from a single activity, but from a series of regular communications about events. However, some initial awareness activities are important, including the opportunity for local journalists to ask questions and discuss examples. Activities for journalists should focus on the purpose of INES, what an INES level means to them, how they will hear about INES and examples of events.

Experience in Member States has shown that it can be difficult to get national journalists to attend a briefing event on INES, unless they can use it to produce an interesting headline. It may be possible to include information about INES in other briefings of interest to journalists.

The informed public

It is worth considering how INES can be explained to special interest groups, local groups or those with a scientific background. Schools and teachers should also be considered. The possible important role of these groups can be considered in the development of the communication strategy. The content of any explanation should be tailored to the targeted audiences.

The general public

It is unlikely that briefing events will be appropriate for the local or general public, but information about what INES is could be included in other communications from facilities or organizations. For example, information about INES could be available on the regulatory body's website. Information on INES could be systematically included in annual reports of the operating organization and the regulatory body, or be included as part of the regular public information campaigns conducted by nuclear facilities or included in public information activities on emergency preparedness and response arrangements.

5.5. COMMUNICATION

Arrangements should be established to ensure that the following practices are incorporated in the use of INES for the communication of events:

- An INES rating should be included in the communication of events. If the rating is not available, reference to it can be made and the rating should be provided as soon as possible.
- Descriptions and ratings of minor events should be part of regular operating organization publications for nuclear facilities with a public communication programme.
- There should be established criteria for determining when there is significant international public interest to issue an ERF and press release via the IAEA USIE/NEWS system.
- Event information transmitted to the public should include the INES National Officer's or the organization's public information officer and/or spokesperson's contact information.
- Event description and the INES rating should be available on the regulatory bodies' and/or operating organizations' public websites.
- INES should be kept for its intended purpose of communicating the significance of events to the public and not used for other regulatory purposes or for emergency response.

If a provisional rating is used, the message should clearly state why it is provisional and when an update and final rating can be expected. The use of provisional ratings can be particularly useful in the case of evolving severe accidents. More guidance on such accidents is contained in Annex I.

The preparation of templates for the messages that will be communicated to the public would facilitate developing and distributing those messages in an emergency [5]. Such templates should include consideration of when and how the INES rating will be included. Even when events do not result in the activation of emergency response arrangements, communication may still be required, whether for internal, local, national or international

audiences. It is possible to prepare a list of key phrases that are consistent with the INES rating of the event to be included in communications.

When an event needs to be reported internationally, the INES National Officer should have access to sufficient information to be able to develop an event description that can be used for completing the INES event rating form (ERF).

The following list presents key elements of a good event description:

- Clear heading;
- Date;
- Facility name and location, if applicable;
- Operating organization, if known;
- Brief overview of the event;
- Clear, factual event description, including current status and actions being taken;
- Safety significance, including the provisional or final INES rating placed in the context of the INES scale (e.g. Level 1 of a 7 level scale with a link to the INES website), as a conclusion to the event description;
- Contact information of the person sending information (name, email, telephone, website).

5.6. GOOD PRACTICES

The following examples were identified as good practices based on information collected through a questionnaire completed by countries where INES is extensively used:

- Policies are established to determine which events should be communicated to the public.
- INES is used routinely and seen by everyone as a tool to help communicate the safety significance of an event to the public and media and not as a tool for safety regulation.
- There is a graded approach to communicating events (e.g. Below scale/Level 0 events could be communicated only locally, Level 1 events could be posted on the websites of regulatory bodies and operating organizations, Level 2 events and above could be communicated nationally and internationally).
- Any public information, including that provided on an ERF, is coordinated with public information staff to ensure that appropriate information is issued to the public in a timely manner.
- The INES User's Manual is available in the national language[6].
- The event description and the INES rating are available on the regulatory body's public website.
- INES ratings of events are included in periodic reports published by the regulatory body.
- Ideally, a final rating is reached within no more than six months.
- There are procedures to properly interpret and correctly distribute event information and the associated INES rating.
- Timescales for communicating the INES rating are defined.
- The regulatory body is committed to promptly publishing the event on its website (e.g. within one day of receiving official notification).
- There is a programme to keep stakeholders informed of recent developments in the use of INES.

[6] Permission must be obtained to translate any IAEA publication in printed or electronic form. It will be subject to an agreement, with signatories from the IAEA, the translating organization and the relevant national authority (if different to the translating organization).

6. TRAINING

6.1. CONTEXT

The successful use of INES requires a number of people to receive training in its use. Training programmes need to cover the three functional elements of the use of INES, namely event reporting, analysis and communication to the public.

6.2. TRAINING PROGRAMME

The target groups for training (in regulatory bodies and operating organizations) include those organizations involved in reporting event information and assessing, approving and communicating the INES rating. The approach to training for each of these groups is different.

Those involved in reporting the event information

Persons involved in reporting the event information are usually the front line workers in an operating organization or in organizations that may encounter events that involve a radiation aspect (such as police officers or fire fighters). They need to be aware of what constitutes an event that should be reported, what information would be needed to support event reporting and to whom they would need to report. The training needs to be refreshed often and could be incorporated in initial and ongoing employee training programmes. This training can also be supported, for example, by awareness posters.

Those involved in assessing the INES rating

The individuals assessing the rating need to understand the INES User's Manual in detail [1]. It is important that any training course includes working sessions to rate events and discuss the application of INES methodology. It is also important that these people be continuously involved in rating events to maintain their knowledge. Regular refresher training sessions should also be arranged.

Because detailed guidance for rating events under defence in depth criteria varies for nuclear facilities, uses of all sources of ionizing radiation, radioactive waste management activities and transport of radioactive material, it may be necessary to organize separate training sessions for each of these practices.

Training materials are available from the IAEA, some of which are available in multiple languages.

Those involved in approving the INES rating

In many operating organizations and regulatory bodies, senior managers may be involved in the approval process for the rating of events, particularly for those events that are rated at the higher levels. Experience has shown that it is very important to ensure that these managers have a good understanding of the principles of INES. An overview course should be provided for such persons, either as a stand-alone event, or as part of a wider training course (e.g. the first or last part of a training course for those rating events) or as part of a different event (reviewing lessons learned or improving communication skills).

Those involved in communicating the INES rating

Some of those involved in communicating the INES rating may be the same senior managers as discussed above, but others may include public information officers and spokespersons. Again, these people need an understanding of the principles of INES and the basis of rating events in order to communicate in a way that is consistent with the INES scale. An overview course similar to that provided for senior managers would be appropriate and could be included in a course on how to effectively communicate about events.

6.3. GOOD PRACTICES

The following examples were identified as good practices based on information collected through a questionnaire completed by countries where INES is extensively used:

- Reporting of the occurrence of events is included in the initial and refresher training for employees of operating organizations and regulatory bodies.
- There is periodic training for the media as part of regular (annual) media seminars. This includes basic information on INES, the rating methodology and a description and ratings of recent events.
- Training on INES methodology is available in the national language.

— Regular refresher training is provided, including reviews of rated events, discussion of difficult areas or areas of inconsistency.
— Training involves discussions on ratings among the operating organization, regulatory body and public information staff.
— Emergency exercises include the use of INES.

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Annex I
GUIDANCE ON THE USE OF INES IN EVOLVING SEVERE ACCIDENTS

I–1. BACKGROUND

The International Nuclear and Radiological Event Scale (INES) plays an important role in communicating to the public the safety significance of any radiation event. Events of low safety significance, rated on INES as incidents, happen from time to time. For such events, the INES rating is a particularly effective means of communicating the safety significance of the event, without the need for the public and media to have specialized prior knowledge to understand the technical aspects of the event. While it is always necessary to explain in plain language what has happened and what actions are being taken to mitigate the event, the rating of events at Level 1 or Level 2 communicate clearly that these events are, in terms of safety significance, several orders of magnitude less significant than a major accident, i.e. a Level 7 event.

INES also plays an important role in communicating the safety significance of severe accidents. A severe accident refers to accident conditions that are more severe than a design basis accident and that involve significant core degradation [I–1]. A severe accident can be a dynamic process, characterized by evolving conditions leading to a more severe situation. Information about such an accident and its changing, evolving conditions may only be available with limited accuracy and completeness. In this publication, such an event will be referred to as an evolving severe accident.

It is important to recognize that establishing a specific INES rating for an evolving severe accident is difficult. It may be necessary to speak of a range of ratings and to update the rating as new information becomes available. As noted in The International Nuclear and Radiological Event Scale User's Manual, 2008 Edition (INES User's Manual) [I–2], "It is recognized that there will be occasions when a longer time scale is required to know or estimate the actual consequences of the event. In these circumstances, a provisional rating should be given with a final rating provided at a later date." It is also important to recognize that INES represents only one tool within the overall communication strategy during an emergency. Communications issued as part of the emergency response, for example, that a situation is developing that could require protective actions, can effectively convey the safety significance in the early stages of the accident, particularly to the local public. However, an inappropriate use of INES can add to confusion and unjustified concerns, rather than help to achieve the purpose of communicating the safety significance of the accident.

I–2. PURPOSE AND SCOPE

The purpose of this Annex is to provide guidance on the use of INES in communication during evolving severe accidents and for events involving multiple facilities on one site. It complements the guidance in the INES User's Manual [I–2] and the guidance presented in the main body of this publication by providing additional details and examples of potential questions by the public and media as well as possible answers.

I–3. PREPARATORY ACTIVITIES RELATED TO THE USE OF INES IN EMERGENCY PREPAREDNESS AND RESPONSE ARRANGEMENTS[7]

I–3.1. Methods for estimating the amount of radioactivity released and the extent of core damage needed for an INES rating

The definitions of the INES rating for large radioactivity releases (Impact on People and the Environment criteria) are based on the total airborne activity released into the environment and the doses to individuals. The definitions of the criteria for reactors under Impact on Radiological Barriers and Controls are based on the total release of activity from the fuel of the reactor. Directly measuring the release to the environment could be very difficult depending on the type of accident, and there are no methods for direct measurement of the release from fuel assemblies. Hence, during the early stages of the accident, it can be difficult to assess the INES rating. However, models exist or can be developed that can estimate the amount of radioactive material released and the extent of core damage, based on measurable indicators.

There are various models for estimating the 'source term'. Some models are based on plant modelling from known or estimated accident scenarios, plant conditions and release paths. Others are based on

[7] See also Section 4.3. of the main body of this publication.

measurements of isotopic content and activity of samples collected from the environment. The results of these models can be validated with actual environmental radioactivity data that is usually available shortly after the release has occurred.

All countries with nuclear power plants and large nuclear installations are encouraged to establish the capability to run such models, which could facilitate prompt source term estimations and would allow INES ratings to be provided once measurements on or off the site are available to confirm source term estimation at that time. This is usually done when the situation has (sufficiently) stabilized. Since these models often contain a high degree of conservatism, the way in which the INES ratings are derived needs to be carefully considered. The actual accident scenario and the assumptions built into the models need to be examined in order to achieve a reasonable degree of confidence in the results and to avoid excessive conservatism.

However, it is important to understand that the use of such models is only suggested for the purpose of determining an INES rating, and not for determining where protective actions for the public should be implemented. In Actions to Protect the Public in an Emergency due to Severe Conditions at a Light Water Reactor [I–3] it is clearly stated that, "The control room operators cannot predict the timing, magnitude, composition, effective height and duration of most severe releases warranting urgent protective actions off the site. In addition, such a release could occur over several days resulting in very complex deposition patterns off-site. Consequently, dose projection models cannot be effectively used for making decisions concerning urgent protective actions that need to be taken before or shortly after the release in order to be most effective."

In the timescales required for communicating the event and assessing the INES rating, it will never be possible to know the exact extent of damage to the reactor core. However, if the nature of the accident has to do with a failure to provide cooling to the nuclear fuel, melting is likely to occur in most fuel assemblies. Thus, if there is a reasonable degree of confidence that there has been a widespread failure to cool fuel, a rating of Level 5 (defined as a release of more than a few percent of core inventory from fuel assemblies, under the Impact on Barriers and Controls criteria) is likely to be more appropriate than a rating of Level 4.

I–3.2. A defined process for approving and communicating an INES rating

As elaborated in the main body of this publication, there needs to be an effective process to allow the prompt assessment, approval and communication of a proposed INES rating. This process needs to be developed, agreed, approved and communicated to all interested parties in advance. While this is true for all events, the evolving nature of, and the uncertainty associated with, severe accidents make this need even more important. The arrangements to issue an INES rating during severe evolving accidents might be different from those for more minor events; therefore, they should be established in advance. A process for approving and communicating an INES rating during evolving severe accidents needs to be developed and integrated within the communication plans and national emergency response plans, and exercised on a regular basis.

I–4. THE USE OF INES IN COMMUNICATION DURING AN EVOLVING SEVERE ACCIDENT

I–4.1. General advice

For evolving severe accidents, the persons responsible for keeping the public and media informed, and for coordinating all sources of official information, will likely have extensive communication to ensure that a consistent message is being provided before, during and after the accident. As information becomes available, the safety significance will need to be quickly communicated in plain language to the public in the vicinity of the accident. Providing consistent, concise and clear information and advice at regular intervals will help the public cope with the effects of the accident.

The focus of early communication will be on issues that are important to the people directly affected. However, given the speed of modern communication, it may soon be necessary to issue statements to address wider national and international interests.

For each communication, a decision needs to be made about what to say concerning the INES rating. The decision may be very dependent on the scenario. Although this guidance has been developed for evolving severe accidents, it may also be helpful for other evolving events.

General guidance for communicating with the public in nuclear or radiological emergencies is provided in the IAEA publication Communication with the Public in a Nuclear or Radiological Emergency [I–4].

There could be pressure on other organizations and other countries to comment on the event rating, but as stated in the INES User's Manual [I–2], the country where the event occurs is best placed to provide the rating and it is the responsibility of that country to rate the event.

I–4.2. Dealing with uncertainty in assessing the INES rating

In order to indicate the safety significance of an event using INES, the rating must take all the INES criteria into account.

In an evolving severe accident, information relating to some of the INES rating criteria is limited or contains uncertainties. The rating should, however, be based on all three main criteria identified in the INES User's Manual [I–2] and not just focus on those criteria that are known with more certainty.

This can be illustrated using the experience made available by the Japanese authorities from the Fukushima accident considering each of the INES rating criteria (Table I–1).

TABLE I–1. INES RATING CRITERIA
(Criteria and considerations on possible rating levels in the first days after 11 March 2011)

Rating for each of the INES criteria			
Impact on people and the environment	Impact on radiological barriers and controls	Impact on defence in depth	Overall rating
No information on release size: rating between Levels 0 and 7	No information on core melt: rating between Levels 0 and 5	No cooling: rating at Level 3	Between Levels 3 and 7

During the Fukushima accident, due to the absence of cooling, it was clear from the first day that the rating for the Impact on Defence in Depth criteria would be Level 3 (the highest rating for these criteria). Judging by the available measurable reactor parameters, it was obvious that the integrity of fuel rods was compromised, but it was not clear whether some degradation of the fuel had already occurred or to what extent. Therefore, the rating according to the Impact on Radiological Barriers and Controls criteria could have been at Level 4 or 5, but it could also have been below the minimum criteria for Level 4, if degradation of fuel had been prevented. Initially, there was no knowledge about the size of the release. It was possible that there had been a large release, but it could not be confirmed based on the available information. This meant that the rating for the Impact on People and the Environment criteria could not be determined at that stage.

In these circumstances, it was not possible to accurately rate the event. It was known that the rating was at least Level 3, but it could have been somewhere between Level 3 and Level 7. In such a situation, it might be possible to say, "The event is at least Level 3. There may have been a release of radioactive material and we are seeking to establish the magnitude in order to provide a more accurate INES rating. In the meantime, the appropriate measures are being taken to mitigate the consequences of the accident and protect the public."

Later on, when it became clear that core melting had occurred, the extent of the core melt and the size of the release were still not known. At this later stage an accurate rating could still not have been given, but it might have been appropriate to say that the rating was 'at least Level 5'.

I–4.3. Initial communication of the INES rating

The INES rating needs to be consistent with the other information being provided.

If the initial statements are that, "a major event has occurred, the emergency plan has been activated, we are working to find more information and a further report will be provided in a few hours," it is clearly inappropriate to 'guess' an INES rating or to give a rating that does not correspond to a 'major event'. It is more appropriate to say that an INES rating cannot be established at this stage, as more information is required to do so. A possible statement in such a situation for the local public could be, "Appropriate actions to protect workers and the public are being taken. The detailed situation at the facility is still being assessed and an INES rating will be provided as soon as more information becomes available."

An INES rating is based on a firm technical basis and, therefore, needs appropriate information to be determined. If this has been explained to stakeholders in advance as part of a regular interactive process, the stakeholders will probably accept that the rating takes time and requires certain key information.

It is also important to stress that any communication regarding INES rating:

— Does not affect the provision of warnings to the public regarding protective actions to be taken;
— Does not relate to the need for such warnings;
— Does not represent an emergency response mechanism or arrangement.

In the very early stages of an evolving severe accident, when the situation is uncertain and changing, care needs to be taken to avoid giving a misleading picture of the safety significance of the event.

If all that is known is that the rating is between Levels 3 and 7, it may be better to say that the rating is at least Level 3 (for example) and to focus on the key issues for the public (such as state of the plant, what actions are being undertaken to solve the problem and what is being done to protect the public). Clearly state that there is not enough information available to provide a meaningful rating at that moment, that a rating will be issued when the situation is clearer and indicate, if possible, when this will be.

The most relevant information to the public will depend on the stage of the evolving severe accident and whether communication is aimed at the national or international media and public. Relevant information may include:

— Description of the evolving severe accident;
— Response efforts;
— Property/equipment damage;
— Casualties;
— Relief efforts;
— Radiological health hazard.

For a more comprehensive list, refer to the IAEA publication, Communication with the Public in a Nuclear or Radiological Emergency [I–4], page 20.

I–4.4. Using provisional INES ratings and a range for the ratings

It is important to provide an INES rating as soon as possible.

The use of a provisional INES rating or a statement that 'rating is at least' can help communicate the safety significance of an event when not enough information is available or the uncertainty of the data is too high to provide a final INES rating. A provisional INES rating, or a likely range of INES ratings, need(s) to be used during an evolving severe accident and need(s) to be provided as soon as sufficient information becomes available.

The aim is to prevent speculation and rumour by issuing information about a provisional rating as quickly as possible, once there is enough information to do so. In an evolving severe accident, it may not be possible to provide an INES rating in the first few hours. It is important to agree on and approve an INES rating quickly, as soon as sufficient information is available. A delay caused by debate about whether to issue the rating is not helpful and will only serve to feed rumours and speculation.

If there is a reasonable degree of confidence that the release of radioactive material during an evolving severe accident will not get worse and an estimate has been made, then an INES rating, or range of ratings, needs to be provided based on the assessed release and the level of uncertainty and conservatism.

In general, a single rating level would be ideal but would need to reflect the best estimate of the true safety significance of the accident. Consideration needs to be given to the likelihood and impact of revising the INES rating at a later date, whether towards a higher or lower level.

If the level of uncertainty is so high that only a range of ratings can be established, it should still be communicated promptly. The following examples show how statements regarding a range of ratings might be used:

— If there has been a release inside the facility, but it is contained, it might be helpful to say that detailed information is still being assessed but the INES rating is likely to be Level 3 or 4, which indicates that the impact of the event will be local (if that is a reasonably probable outcome).
— If it is clear that there has been a reactor core melt but the extent of it is not known, the following statement could be made: "More information is needed to determine the final rating of the event, but it is clear that it will be rated at least at INES Level 5".
— If a conservative assessment of the rating suggests it is less than Level 4, it may be worth saying that, even though such a statement could introduce considerable uncertainties.

I–4.5. Revising provisional INES ratings

It is important to continue to communicate regularly.

Even if there is no new information, and the previous statement about the INES rating is still the current situation, saying so may avoid second guessing by other organizations or individual experts. It may be possible to give an update on whether the INES rating (or range of ratings) is likely to change and even when that may be.

If the situation changes, what has happened should be explained, a revised rating should be provided, if needed, and it should be clearly stated whether the new rating is still provisional. The reasons for the revision should be made clear, i.e. whether the accident has further evolved (for better or worse in terms of consequences), whether it is unchanged but further information has become available or whether the assessment has been refined (for example the initial estimate of release was too high based on conservative/bounding/pessimistic assumptions).

However, frequent changes of rating, as each new piece of information gradually becomes available, may affect public confidence. Frequent changes in the rating may give the impression that the situation is not understood and not under control.

I–4.6. Issuing a final INES rating

At an appropriate point, the INES rating needs to be finalized.

The use of provisional ratings can continue for some time without loss of public confidence. However, at some point the rating must be finalized. It is recommended that a final rating only be issued when there is confidence that it will not change. This will probably be once emergency response operations have ended and operations at the facility have returned to a non-emergency status. This may mean that more than one provisional rating is issued before the final one.

I–5. GUIDANCE ON INES RATING OF EVENTS INVOLVING MULTIPLE FACILITIES ON ONE SITE

In general, events caused by technical failures at a facility, such as equipment failures, will only affect the unit or units using such equipment. However, external events could simultaneously affect all the units on a site in some way. The following paragraphs give guidance on when it would be best to issue a single rating for the site, when it would be best to issue a rating for each unit and how to communicate the rating or ratings.

If a single event (e.g. an external hazard such as an earthquake or hurricane) results in a release from multiple facilities on a site, the total estimated release from all the facilities needs to be used to rate the event under the Impact on People and the Environment criteria, in the section on Activity Released criteria, as one rating. The INES rating indicates the safety significance of an event to the public. The key issue, as far as Impact on People and the Environment criteria is concerned, is the total activity released.

If the event results in a release of radioactive material that is contained within the site boundary or in high radiation fields on the site, then the criteria of Impact on People and the Environment, under the Doses to Individuals (workers) section, and the criteria of Impact on Radiological Barriers and Controls need to be used. These situations are plant and unit specific and do not necessarily represent a combined threat to the public as there is little or no release to the environment outside the facility. The rating needs to be assessed for each unit separately.

If the event can be characterized only by meeting the Impact on Defence in Depth criteria, again the event needs to be assessed separately for each unit.

If an overall rating for the site has been assessed, the press statements need to describe the overall situation and an overall INES rating needs to be announced. Later on, it may be appropriate to use INES ratings to indicate the extent of damage for each unit, particularly if some units have suffered much less damage.

Where the event is rated separately for each unit, there is still a decision to be made about how the event will be communicated. For example, if in one unit there has been a core melt, and in another it has just been avoided, the reactor with the core melt will be of most concern to the public. In such a situation, unless there is a release, each unit is to be rated separately, but a press statement covering both units might be most appropriate.

How the rating or ratings at multi-facility sites will be communicated is a national decision and depends on a number of factors. In general, this decision is not related to the use of INES. If separate public statements are communicated, then each needs to use the appropriate INES rating. If a combined statement is issued that covers all the units, the statement may indicate how each unit has been affected and give the highest rating, or it may give the rating for each unit, or it may give a range of ratings for the units.

If an event affects more than one site, then in general these need to be considered as separate events with separate ratings. If a common cause situation is found affecting a number of identical or similar units, solely under Impact on Defence in Depth criteria, then a country may decide to issue a single event notice covering all the sites (according to the concept of a 'generic event'). Again this is a national decision. It is interesting to note that such variations in communication philosophies reinforce the statement made in Section 1.7.1 of the main body of this publication that comparing the number of events between countries is meaningless.

I–6. POTENTIAL QUESTIONS FROM THE PUBLIC AND MEDIA AND PROPOSED ANSWERS FOR USE DURING AN EVOLVING SEVERE ACCIDENT AT A NUCLEAR FACILITY

This section proposes responses to questions that might arise during an evolving severe accident at a nuclear facility. They are specific to that type of accident. The proposed answers can serve as background information in discussions with national and international stakeholders.

Q1: You know you are in an accident situation, but cannot yet provide an INES rating — why not?

A1a: The INES rating has a firm technical basis and, therefore, needs appropriate information to be available to determine a rating. We need more detail on the [size of the release], [the status of core cooling and containment], before we can determine the INES rating. An INES rating will be determined as soon as we have this information.

You can take the Fukushima accident as an example. As a result of the earthquake, no off-site power was being supplied to the site. Then, after the tsunami struck, the diesels were flooded and no longer provided on-site power. In a matter of hours, the batteries were exhausted and at that point there was no power supply to any of the plant instrumentation and measurement sensors. Hence, there was no information available on the plant status and specifically no information on the status of the safety functions that keep the reactors shut down and the fuel cool. At that stage it was not possible to determine an INES rating.

A1b: We are in the initial stages of responding to the accident that has occurred. We have declared a [site emergency] [general emergency] and actions are being taken to stabilize the situation, to monitor the environment and to protect the public. The public and media have been provided with information about the event and on the actions to take. We are working to find more information and a further report will be provided in a few hours, possibly including an INES rating.

Q2: Why have you changed the INES rating?

A2a: We have now been able to analyse the information more thoroughly and as a result, the provisional rating has increased/decreased [add some more information about the specific information that has changed].

A2b: [We have successfully stabilized the accident], [We unexpectedly lost power supplies], [A structure unexpectedly failed]. As a result, we have a new value for the INES rating.

A2c: We have received [additional information] [confirmation by additional data] and are now capable of issuing an updated rating.

Q3: What does it mean when you say the rating is provisional?

A3: The INES rating has a firm technical basis and it relies on the assimilation of a significant amount of data. As a result, we cannot provide a final rating until the event has been fully analysed. Therefore, we are providing a provisional one.

Q4: How can the consequences of accidents rated at INES Level 7 be so different?

A4: The INES rating for accidents rated at Level 6 and 7 is exclusively based on the amount of radioactive material released to the environment. The threshold for Level 7 is at a value that is well below that of the two Level 7 accidents to date. The INES rating is an indication of the severity of what happened at the site and is deliberately not based on potential consequences. It is not dependent on the wind direction, the population density, or the success of protective actions, although these factors will clearly affect the consequences of the release to the public and the environment.

Q5: How long will it take to provide an INES rating? There is a lot of international interest in knowing the safety significance of this accident.

A5: We cannot predict when the information we need to determine the rating will become available. We will communicate the rating as soon as it can be assessed. The key issue at this point is to ensure we are doing everything to manage the accident, to assess the environmental conditions and to identify and implement (if deemed necessary) [further] protective actions for the public [and emergency workers]. Our main concerns at this stage are for those directly affected by the accident. Information about the event will be available on our website as well as that of the International Atomic Energy Agency.

Q6: Level 7 is the highest rating level on INES. Does that mean there is a high chance of deaths from cancer?

A6: No, it does not. The INES rating for accidents at Levels 6 and 7 is exclusively based on the amount of radioactive material released to the environment, not on the expected or potential consequences for the public. We are monitoring the activity in the environment and have taken [will take] appropriate protective actions to reduce the radiological health hazard, and thus to avoid or decrease the possibility of any radiation induced cancers.

Q7: How should non-accident countries respond to requests for information or comment on INES ratings?

A7: In accidents involving widespread radiological consequences, where news of the event will spread rapidly around the globe, international organizations and national regulatory bodies may be requested to assess the INES rating of the accident in another country. Since the mitigation of the consequences and the release of public information on the accident is a national responsibility of the accident country, it is strongly recommended that non-accident countries refrain from 'second guessing' or offering opinions on the rating. For such non-accident countries it may be worth developing a standard response statement such as:

"The determination of the INES rating requires understanding and assessment of detailed information about activity release and the state of the plant. This can only be done by the organizations responsible for the management of the event. We are confident that they will want to communicate the INES rating as soon as it can be assessed. The key issue for them at this point is to ensure everything is being done to manage the accident, to assess the environmental conditions and to identify any actions required to mitigate the consequences of the accident and to protect the public. We have offered any help required for these tasks. They are aware of the international interest, but their key concerns at this stage are rightly for those directly affected by the accident. [We are quite sure as of now that there is no direct impact for our country]."

Q8: How do you know that the plant is in a stable and safe condition?

A8: The plant is said to be in a stable and safe condition when it has achieved a complete cold shutdown, and has the capacity to remove residual heat in the long term.

REFERENCES TO ANNEX I

[I–1] INTERNATIONAL ATOMIC ENERGY AGENCY, IAEA Safety Glossary Terminology Used in Nuclear Safety and Radiation Protection 2007 Edition, IAEA, Vienna (2007).

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[I–3] INTERNATIONAL ATOMIC ENERGY AGENCY, Actions to Protect the Public in an Emergency due to Severe Conditions at a Light Water Reactor, EPR - NPP Public Protective Actions, IAEA, Vienna (2013).

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Annex II
OVERVIEW OF THE INES ADMINISTRATION

This Annex describes arrangements for using the International Nuclear and Radiological Event Scale (INES) nationally and internationally.

II–1. INES NATIONAL OFFICERS

Participation in the INES system is voluntary. IAEA Member States are requested to make known in a written communication to the IAEA, either through their Ministry of Foreign Affairs or Permanent Mission to the IAEA, its designation of an INES National Officer [II–1]. Designated INES National Officers are expected to be experts in the areas of application of INES in their respective field of work. Due to the wide range of application of INES, some countries have designated more than one INES National Officer and/or one or more alternates.

INES National Officers are expected to fully represent the views of the Member State's relevant authorities. They are usually responsible for the following:

- Defining and monitoring the national process for rating events using INES and incorporating the INES rating into event communication, including the process for resolving any conflicting views on the rating;
- Assessing, processing and approving event information;
- Rating events, usually at least a final review of rating, sometimes an initial rating of an event as well;
- Communication of events to the international community, via the Unified System for Information Exchange in Incidents and Emergencies (USIE) and the Nuclear Events Web-based System (NEWS);
- Communication of events domestically in cases when an INES National Officer also has spokesperson functions;
- Promoting the wide use of INES for all relevant activities;
- Providing a good understanding of the purpose and meaning of INES with all relevant stakeholders;
- Organizing training as required so that all relevant organizations have appropriate training;
- Attending the meetings of INES National Officers and providing feedback from these meetings to national stakeholders.

INES National Officers normally meet every two years at a Technical Meeting convened by the IAEA. This meeting provides a forum for the INES National Officers to share experience, to debate issues and concerns and to agree on actions to enhance the use of INES.

As INES is only one of the tools that can be used to provide to the media and the public a consistent message about an event, the INES National Officers need to work closely with public information officers and/or spokespersons in their countries.

II-2. THE INES ADVISORY COMMITTEE

The INES Advisory Committee (INES AC) is a standing body of senior experts with high professional competence and long term experience in the assessment and rating of nuclear and radiological events on INES. The objective of the INES AC is to strengthen and sustain the application of INES as a tool to facilitate communication and understanding between the technical community, the media and the public on the safety significance of events. The INES AC provides advice to the IAEA Secretariat and to the INES National Officers on, inter alia, clarification of the rating procedures in The International Nuclear and Radiological Event Scale User's Manual, 2008 Edition (INES User's Manual) [II–2], the development and revisions to the INES User's Manual [II–2] supporting documents and training materials on INES, the effectiveness of INES in communicating the safety significance of events and the consistent application of INES by the Member States.

The INES AC regularly reviews the events reported internationally with an aim to identify areas where additional guidance or clarification is required and provides a report to each INES National Officers [Technical Meeting. It is not intended that INES AC provide an authoritative rating of an event when it occurs — this is the responsibility of each individual country.

The INES AC consists of a reasonable number of people who are familiar with the application of the INES Users' Manual [II–2] and provides expertise in: (a) activities at nuclear power and research reactors, (b) activities at spent nuclear fuel and radioactive waste management facilities, (c) the use of sources of radiation in

industry and medicine, and (d) the transport of radioactive material. It should also include at least one expert on public communication of nuclear related matters.

The INES AC meets as necessary, but as a minimum before each INES National Officers Technical Meeting. The IAEA provides for INES AC secretarial support.

II–3. OVERVIEW OF USIE/NEWS SYSTEM

Since 2001, NEWS has covered significant events reported at nuclear power plants, research reactors, or nuclear fuel cycle facilities, and reported occurrences involving radiation sources or the transport of radioactive material. In 2011, this system was redesigned and is now part of the USIE/NEWS system.

The Unified System for Information Exchange in Incidents and Emergencies (USIE) is an official IAEA web portal provided by the IAEA's Incident and Emergency Centre for Contact Points of States Parties to the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in Case of a Nuclear Accident or Radiological Emergency and IAEA Member States to exchange urgent information during nuclear and radiological incidents and emergencies, and for officially nominated INES National Officers to post information on nuclear and radiological events rated using INES.

Access to USIE is limited to users at Contact Points and to INES National Officers. The broader technical community, the media and the public have no access to USIE, but can access a subset of the information available on USIE through the public website NEWS.

INES National Officers on USIE submit Event Rating Forms with INES ratings. These forms are then automatically posted on NEWS for the public. As persons officially designated by their respective countries, the INES National Officers are responsible for all published content.

NEWS, the information channel on radiological and nuclear events, is a webpage where subscribed users from the public and the media can access the information provided by INES National Officers through email dissemination of event notifications. Anyone subscribed to the website www-news.iaea.org can access the information on recent events (i.e. events posted in the past year). Also, anyone can register in NEWS to subscribe for email notifications of newly posted events and updates. The INES National Officers are authorized to grant access to archives and technical information posted on NEWS to the users from their country.

II–4. IMPORTANT CONSIDERATIONS

USIE/NEWS is designed to serve as a communication channel, not as a safety assessment tool. As such, it would be wrong and misleading to try to compare safety performance among reporting countries based on the information available on these websites.

Events published on NEWS do not signal warnings or trigger response actions in nuclear or radiological incidents and emergencies. Such communication is done solely through restricted USIE channels among the IAEA and Contact Points (National Warning Points, National Competent Authorities and Permanent Missions) according to the Convention on Early Notification of Nuclear Accidents.

REFERENCES TO ANNEX II

[II–1] INTERNATIONAL ATOMIC ENERGY AGENCY, Operations Manual for Incident and Emergency Communication, EPR - IEComm, IAEA, Vienna (2012).

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Technical Meeting of the INES National Officers

Vienna, Austria: 16–20 July 2012

Consultants Meetings

Vienna, Austria: 17–21 November 2008, Vienna, Austria: 23–25 November 2009,
Vienna, Austria: 23–27 September 2013

INES Advisory Committee Meetings

Rio de Janeiro, Brazil: 14–16 June 2010; Paris, France: 11–13 July 2011; Vienna, Austria: 6–8 March 2012;
Vienna, Austria: 12–13 July 2012; Vienna, Austria: 12–14 June 2013

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