UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 – 0001

April 23, 2015

Mr. Takao Onuki
Director, Washington Office
Tokyo Electric Power Company
2121 K Street, NW, Suite 910
Washington, DC 20037

Dear Mr. Onuki:

Please accept this letter of thanks for the briefing on the status of your Fukushima Daiichi Nuclear Power Station provided by Mr. Kenji Tateiwa to the Advisory Committee on Reactor Safeguards on April 10, 2015.

Mr. Tateiwa provided us with a detailed and informative presentation on the overall status of Fukushima Daiichi and the ongoing decontamination and decommissioning efforts at the site. The opportunity to discuss directly with Mr. Tateiwa the current Tokyo Electric Power Company operations at Fukushima Daiichi and receive his unique insights was of great value to all of us. His professionalism and preparation, as well as his familiarity with the Fukushima Daiichi issues, were outstanding. Please convey our thanks to Mr. Tateiwa.

Sincerely,

/RA/

John W. Stetkar
Chairman

cc: ACRS Members

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

December 31, 1992

TO: ALL HOLDERS OF OPERATING LICENSES OR CONSTRUCTION PERMITS FOR NUCLEAR POWER REACTORS

SUBJECT: LIMITED PARTICIPATION BY NRC IN THE IAEA INTERNATIONAL NUCLEAR EVENT SCALE (GENERIC LETTER 92-09)

PURPOSE

The U. S. Nuclear Regulatory Commission (NRC) is issuing this generic letter to inform licensees of its recent decision to participate in the International Nuclear Event Scale (INES) of the International Atomic Energy Agency (IAEA). The NRC decided to participate in this program in a limited way to foster international cooperation. The NRC expects that the limited use of INES will have a negligible effect on its licensees or on State and local governments.

The participation of the NRC is not intended to affect emergency classifications, event reporting to the NRC, or communications with the public. Nevertheless, usage of the INES could lead to confusion with the existing four-level emergency response scale used in the United States. This generic letter discusses the measures and conditions of the limited participation to prevent any adverse effect. It supersedes the previous position of the NRC not to participate in the INES program (letter from E. L. Jordan, Director, NRC Office for Analysis and Evaluation of Operational Data, to NRC licensees, dated August 22, 1990).

DESCRIPTION OF THE SCALE

The INES is a tool intended to promptly and consistently communicate to the public the safety significance of reported events at nuclear installations by providing a common terminology among the nuclear community, the media, and the public for describing the events. The INES was designed by an international group of experts convened jointly by the IAEA and the Nuclear Energy Agency (NEA) of the Organization for Economic Cooperation and Development. The group was guided in its work by the findings of a series of international meetings held to discuss general principles underlying such a scale. The INES also reflects the experience gained from the use of similar scales in France and Japan as well as from consideration of possible scales in several other countries.

Events are classified in the INES at several levels. Events of greater safety significance (levels 4-7) are termed "accidents," events of lesser safety significance (levels 1-3) are termed "incidents," and events of no safety significance (level 0 or below scale) are termed "out-of-scale deviations."

DISCUSSION OF LIMITED NRC PARTICIPATION

The IAEA adopted certain precautions on the use of the INES. They are given in a leaflet describing the structure and use of the INES (Attachment 1). NRC licensees or state or local governments do not need detailed instructions for event rating because the NRC will complete and submit event rating forms (Attachment 2) to the IAEA.

The NRC will limit its participation by classifying and submitting forms only for events at nuclear power plants that are classified as an alert or higher on the emergency response scale used in the United States. Not every alert will necessarily have an INES classification, as some may be rated below the INES scale.

When the NRC receives a report of an event, it will delay the assignment of an INES level number for about a week after termination of the event, to consider subsequent developments in assigning the number. This time delay will help prevent any confusion with the U.S. emergency classification. The NRC will notify State and local governments and the affected licensee of its INES classification. The NRC will not request of any of these parties a review or concurrence with the NRC classification. The NRC does not plan to issue a press release associated with the classification, but will provide copies of the transmitted event rating form to the concerned licensee and to the NRC Public Document Room.

The NRC remains bound to the early notification and assistance conventions formally approved by the IAEA General Conference in September 1986. These conventions provide for an international exchange of information, data, and assistance during a nuclear accident or serious radiological emergency.

BACKFIT DISCUSSION

This generic letter conveys information about the participation of the NRC, an agency of the United States, in the international program of the IAEA for classification of nuclear events. By this generic letter, the NRC staff does not request any licensee or applicant to submit information to the NRC, does not recommend any new regulatory action, and does not modify any existing regulatory position of the NRC staff. Consequently, this generic letter does not represent a backfit.

This generic letter requires no specific action or written response. If you have any questions about this information, please contact the technical contact listed below, who is the NRC INES Coordinator.

James G. Partlow
Associate Director for Projects
Office of Nuclear Reactor Regulation

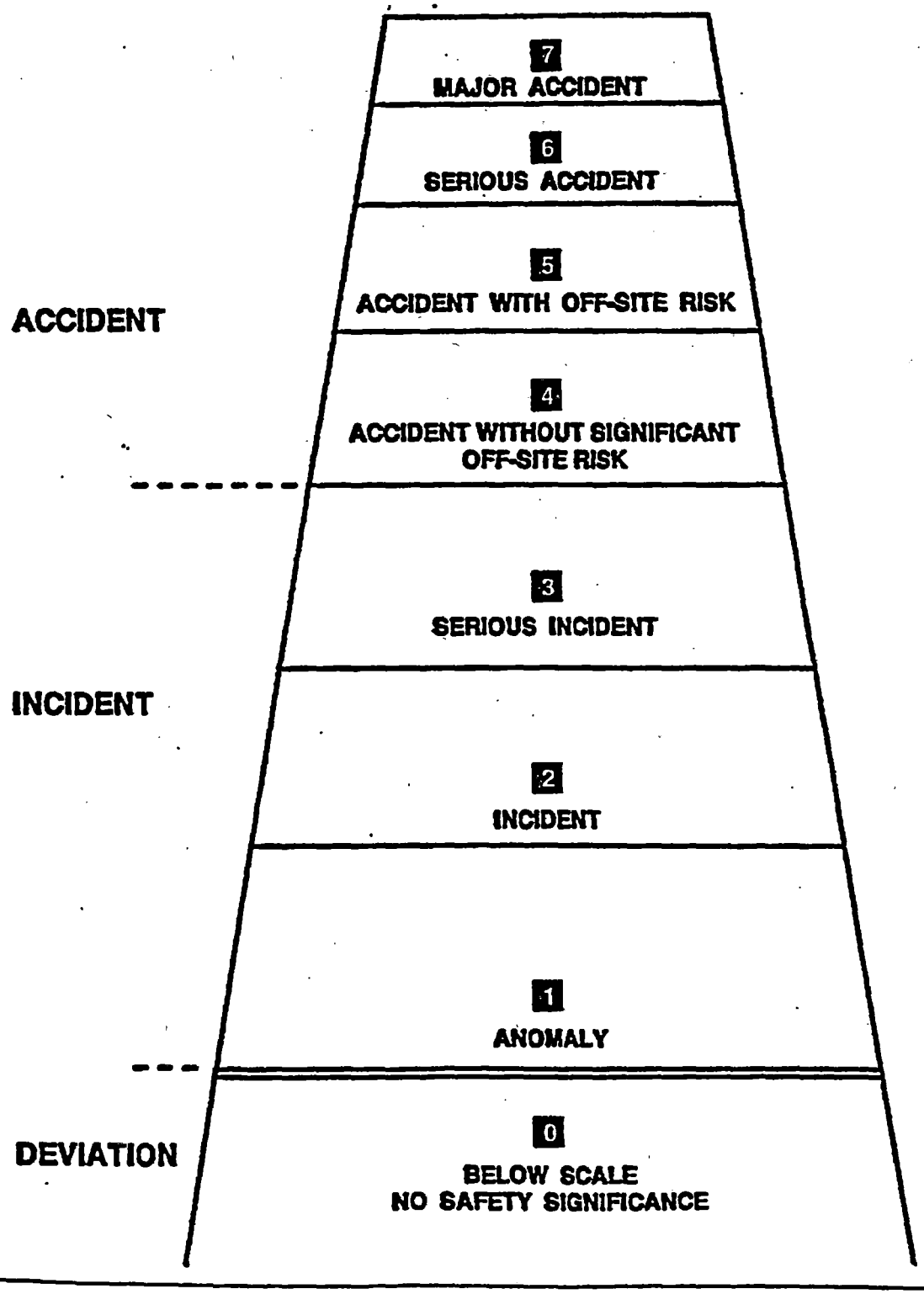
TECHNICAL CONTACT: Denwood F. Ross, Jr., Deputy Director
Office for Analysis and Evaluation
of Operational Data
U. S. Nuclear Regulatory Commission
Mail Stop 3701 MNBB
Washington, D.C. 20555
Telephone (301) 492-7361

Attachments:
1. INES Description
2. INES Event Rating Form
3. List of Recently Issued Generic Letters

See File Jacket

The International Nuclear Event Scale

For prompt communication of safety significance



General description of the scale

The International Nuclear Event Scale (INES) is a tool to promptly and consistently communicate to the public the safety significance of reported events at nuclear installations. By putting events into proper perspective, the Scale can ease common understanding among the nuclear community, the media, and the public. It was designed by an international group of experts convened jointly by the International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency (NEA) of the Organisation for Economic Co-operation and Development. The group was guided in its work by the findings of a series of international meetings held to discuss general principles underlying such a scale. The Scale also reflects the experience gained from the use of similar scales in France and Japan as well as from consideration of possible scales in several other countries.

Initially applied for a trial period to classify events at nuclear power plants, 32 countries participated in the trial and international agencies and user countries monitored progress. The Scale operated successfully and now has been made available for formal adoption by each country. The Scale also has been extended and adapted to enable it to be applied to all nuclear installations associated with the civil nuclear industry and to any events occurring during the transport of radioactive materials to and from those facilities.

Events are classified on the Scale at seven levels. Their descriptors and criteria are shown opposite with examples of the classification of nuclear events which have occurred in the past at nuclear installations. The lower levels (1–3) are termed incidents, and the upper levels (4–7) accidents. Events which have no safety significance are classified as level 0/ below scale and are termed deviations. Events which have no safety relevance are termed out of scale.

The structure of the Scale is shown opposite, in the form of a matrix with key words. The words used are not intended to be precise or definitive. Each criterion is defined in detail within an INES Users' Manual. Events are considered in terms of three safety attributes or criteria represented by each of the columns: off-site impact, on-site impact, and defence in depth degradation.

The second column in the matrix relates to events resulting in off-site releases of radioactivity. Since this is the only consequence having a direct effect on the public, such releases are understandably of particular concern. Thus, the lowest point in this column represents a release giving the most exposed person off-site an estimated radiation dose numerically equivalent to about one-tenth of the annual dose limit for the public; this is classified as level 3. Such a dose is also typically about one-tenth of the average annual dose received from natural background radiation. The highest level is a major nuclear accident with widespread health and environmental consequences.

The third column considers the on-site impact of the event. This category covers a range from level 2 (contamination and/or overexposure of a worker) to level 5 (severe plant damage such as a core melt).

All nuclear facilities are designed so that a succession of safety layers act to prevent major on-site or off-site impact and the extent of the safety layers provided generally will be commensurate with the potential for on and off-site impact. These safety layers must all fail before substantial off-site or on-site consequences occur. The provision of these safety layers is termed "defence in depth". The fourth column of the matrix relates to incidents at nuclear installations or during the transportation of radioactive materials in which these defence in depth provisions have been degraded. This column spans the incident levels 1–3.

An event which has characteristics represented by more than one criterion is always classified at the highest level according to any one criterion.

Using the Scale

- Although the Scale is designed for prompt use following an event, there will be occasions when a longer time-scale is required to understand and rate the consequences of an event. In these rare circumstances, a provisional rating will be given with confirmation at a later date. It is also possible that as a result of further information, an event may require reclassification.

- If a radiological emergency were to occur in the vicinity of a nuclear installation or during the transport of radioactive materials, existing national emergency planning arrangements would be implemented. The Scale should not be used as part of the formal emergency arrangements.

- Although the same scale is used for all installations, it is physically impossible for events to occur which involve the release to the environment of considerable quantities of radioactive material at some types of installation. For these installations, the upper levels of the scale would not be applicable. These include research reactors, unirradiated nuclear fuel treatment facilities, and waste storage sites.

- Industrial accidents or other events which are not related to nuclear or radiological operations are not classified and are termed "out of scale". For example, although events associated with a turbine or generator can affect safety related equipment, faults affecting only the availability of a turbine or generator would be classified as out of scale. Similarly, events such as fires are to be considered out of scale when they do not involve any possible radiological hazard and do not affect the safety layers.

- The Scale is not appropriate as the basis for selecting events for feedback of operational experience, as important lessons can often be learnt from events of relatively minor significance.

- It is not appropriate to use the Scale to compare safety performance among countries. Each country has different arrangements for reporting minor events to the public, and it is difficult to ensure precise international consistency in rating events at the boundary between level 0 and level 1. The statistically small number of such events, with variability from year to year, makes it difficult to provide meaningful international comparisons.

- Although broadly comparable, nuclear and radiological safety criteria and the terminology used to describe them vary from country to country. The INES has been designed to take account of this fact.

Examples of classified nuclear events

- The 1986 accident at the Chernobyl nuclear power plant in the Soviet Union (now in the Ukraine) had widespread environmental and human health effects. It is thus classified as Level 7.

- The 1957 accident at the Kyshtym reprocessing plant in the Soviet Union (now in Russia) led to a large off-site release. Emergency measures including evacuation of the population were taken to limit serious health effects. Based on the off-site impact of this event it is classified as Level 6.

- The 1957 accident at the air-cooled graphite reactor pile at Windscale (now Sellafield) facility in the United Kingdom involved an external release of radioactive fission products. Based on the off-site impact, it is classified as Level 5.

- The 1979 accident at Three Mile Island in the United States resulted in a severely damaged reactor core. The off-site release of radioactivity was very limited. The event is classified as Level 5, based on the on-site impact.

- The 1973 accident at the Windscale reprocessing plant in the United Kingdom (now Sellafield) involved a release of radioactive material into a plant operating area as a result of an exothermic reaction in a process vessel. It is classified as Level 4, based on the on-site impact.

- The 1980 accident at the Saint-Laurent nuclear power plant in France resulted in partial damage to the reactor core, but there was no external release of radioactivity. It is classified as Level 4, based on the on-site impact.

- The 1983 accident at the RA-2 critical assembly in Buenos Aires, Argentina, an accidental power excursion due to nonobservance of safety rules during a core modification sequence, resulted in the death of the operator, who was probably 3 or 4 metres away. Assessments of the doses absorbed by the victim indicate 21 Gy for the gamma dose together with 22 Gy for the neutron dose. The event is classified as Level 4, based on the on-site impact.

- The 1989 incident at the Vandellos nuclear power plant in Spain did not result in an external release of radioactivity, nor was there damage to the reactor core or contamination on site. However, the damage to the plant's safety systems due to fire degraded the defence-in-depth significantly. The event is classified as Level 3, based on the defence-in-depth criterion.

- The vast majority of reported events are found to be below Level 3. Although no examples of these events are given here, countries using the Scale may individually wish to provide examples of events at these lower levels.

Basic structure of the scale

(Criteria given in matrix are broad indicators only)
Detailed definitions are provided in the INES users' manual

	CRITERIA OR SAFETY ATTRIBUTES		
	OFF-SITE IMPACT	ON-SITE IMPACT	DEFENCE IN DEPTH DEGRADATION
7 MAJOR ACCIDENT	MAJOR RELEASE: WIDESPREAD HEALTH AND ENVIRONMENTAL EFFECTS		
6 SERIOUS ACCIDENT	SIGNIFICANT RELEASE: LIKELY TO REQUIRE FULL IMPLEMENTATION OF PLANNED COUNTERMEASURES		
5 ACCIDENT WITH OFF-SITE RISK	LIMITED RELEASE: LIKELY TO REQUIRE PARTIAL IMPLEMENTATION OF PLANNED COUNTERMEASURES	SEVERE DAMAGE TO REACTOR CORE/ RADIOLOGICAL BARRIERS	
4 ACCIDENT WITHOUT SIGNIFICANT OFF-SITE RISK	MINOR RELEASE: PUBLIC EXPOSURE OF THE ORDER OF PRESCRIBED LIMITS	SIGNIFICANT DAMAGE TO REACTOR CORE/RADIOLOGICAL BARRIERS/FATAL EXPOSURE OF A WORKER	
3 SERIOUS INCIDENT	VERY SMALL RELEASE: PUBLIC EXPOSURE AT A FRACTION OF PRESCRIBED LIMITS	SEVERE SPREAD OF CONTAMINATION/ACUTE HEALTH EFFECTS TO A WORKER	NEAR ACCIDENT- NO SAFETY LAYERS REMAINING
2 INCIDENT		SIGNIFICANT SPREAD OF CONTAMINATION/ OVEREXPOSURE OF A WORKER	INCIDENTS WITH SIGNIFICANT FAILURES IN SAFETY PROVISIONS
1 ANOMALY			ANOMALY BEYOND THE AUTHORISED OPERATING REGIME
0 BELOW SCALE EVENT DEVIATION	NO SAFETY SIGNIFICANCE		
OUT OF SCALE EVENT	NO SAFETY RELEVANCE		

THE INTERNATIONAL NUCLEAR EVENT SCALE

for prompt communication of safety significance

LEVEL	DESCRIPTOR	CRITERIA	EXAMPLES
ACCIDENTS 7	MAJOR ACCIDENT	• External release of a large fraction of the radioactive material in a large facility (e.g. the core of a power reactor). This would typically involve a mixture of short and long-lived radioactive fission products (in quantities radiologically equivalent to more than tens of thousands terabecquerels of iodine-131). Such a release would result in the possibility of acute health effects; delayed health effects over a wide area, possibly involving more than one country; long-term environmental consequences.	Chernobyl NPP, USSR (now in Ukraine), 1986
6	SERIOUS ACCIDENT	• External release of radioactive material (in quantities radiologically equivalent to the order of thousands to tens of thousands of terabecquerels of iodine-131). Such a release would be likely to result in full implementation of countermeasures covered by local emergency plans to limit serious health effects.	Kyshtym Reprocessing Plant, USSR (now in Russia), 1957
5	ACCIDENT WITH OFF-SITE RISK	• External release of radioactive material (in quantities radiologically equivalent to the order of hundreds to thousands of terabecquerels of iodine-131). Such a release would be likely to result in partial implementation of countermeasures covered by emergency plans to lessen the likelihood of health effects. • Severe damage to the nuclear facility. This may involve severe damage to a large fraction of the core of a power reactor, a major criticality accident or a major fire or explosion releasing large quantities of radioactivity within the installation.	Windscale Pile, UK, 1957 Three Mile Island, USA, 1979
4	ACCIDENT WITHOUT SIGNIFICANT OFF-SITE RISK	• External release of radioactivity resulting in a dose to the most exposed individual off-site of the order of a few millisieverts.* With such a release the need for off-site protective actions would be generally unlikely except possibly for local food control. • Significant damage to the nuclear facility. Such an accident might include damage to nuclear plant leading to major on-site recovery problems such as partial core melt in a power reactor and comparable events at non-reactor installations. • Irradiation of one or more workers which result in an overexposure where a high probability of early death occurs.	Windscale Reprocessing Plant, UK, 1973 Saint-Laurent NPP, France, 1980 Buenos Aires Critical Assembly, Argentina, 1983
INCIDENTS 3	SERIOUS INCIDENT	• External release of radioactivity above authorised limits, resulting in a dose to the most exposed individual off site of the order of tenths of millisievert.* With such a release, off-site protective measures may not be needed. • On-site events resulting in doses to workers sufficient to cause acute health effects and/or an event resulting in a severe spread of contamination for example a few thousand terabecquerels of activity released in a secondary containment where the material can be returned to a satisfactory storage area. • Incidents in which a further failure of safety systems could lead to accident conditions, or a situation in which safety systems would be unable to prevent an accident if certain initiators were to occur.	Vandellos NPP, Spain, 1989
2	INCIDENT	• Incidents with significant failure in safety provisions but with sufficient defence in depth remaining to cope with additional failures. • An event resulting in a dose to a worker exceeding a statutory annual dose limit and/or an event which leads to the presence of significant quantities of radioactivity in the installation in areas not expected by design and which require corrective action.	
1	ANOMALY	• Anomaly beyond the authorised operating regime. This may be due to equipment failure, human error or procedural inadequacies. (Such anomalies should be distinguished from situations where operational limits and conditions are not exceeded and which are properly managed in accordance with adequate procedures. These are typically "below scale").	
BELOW SCALE/ ZERO	DEVIATION	NO SAFETY SIGNIFICANCE	

** The doses are expressed in terms of effective dose equivalent (whole body dose). Those criteria where appropriate can also be expressed in terms of corresponding annual effluent discharge limits authorised by National authorities.*

International Atomic Energy Agency
Wagramerstrasse 5
A-1400 Vienna, Austria

OECD Nuclear Energy Agency
38, Boulevard Suchet
75016 Paris, France

92-01414

THE INTERNATIONAL NUCLEAR EVENT SCALE (INES)

EVENT RATING FORM (ERF)

to be sent to: IAEA, WAGRAMERSTRASSE 5, P.O. BOX 100, A-1400 VIENNA, AUSTRIA
TELEX: 1–12645, CABLE: INATOM VIENNA, FACSIMILE: 43 1 2309723, TELEPHONE: 43 1 2360 2685

EVENT TITLE		EVENT DATE

RATING	RATING DATE	OUT OF SCALE	BELOW SCALE	ON SCALE 0	1	2	3	4	5	6	7	SAFETY ATTRIBUTE	
PROVISIONAL ☐												DEGR. DEFENCE IN-DEPTH	
FINAL ☐												ON-SITE IMPACT	
												OFF-SITE IMPACT	

COUNTRY		FACILITY NAME		FACILITY TYPE	

ASPECTS OF SIGNIFICANCE TO THE PUBLIC:

ACCIDENT ☐ INCIDENT ☐ DEVIATION ☐

	YES	NO
RADIOACTIVE RELEASES OFF-SITE	☐	☐
RADIOACTIVE RELEASES ON-SITE	☐	☐
WORKERS INJURED BY RADIATION	☐	☐
WORKERS INJURED PHYSICALLY	☐	☐
PLANT SAFETY IS UNDER CONTROL	☐	☐
THE EVENT REPORTED IS A DISCOVERY OF A DEFICIENCY BY ROUTINE SURVEILLANCE	☐	☐
A PRESS RELEASE WAS MADE (IF YES, PLEASE ATTACH IT)	☐	☐

SHORT DESCRIPTION OF THE EVENT:*

CONTACT PERSON FOR FURTHER INFORMATION		
	NAME	
	ADDRESS	
	PHONE	
	FAX	

* PLEASE ATTACH ADDITIONAL INFORMATION ON JUSTIFICATION OF THE EVENT RATING AND DIFFICULTIES ENCOUNTERED, IF NEEDED

LIST OF RECENTLY ISSUED GENERIC LETTERS

Generic Letter No.	Subject	Date of Issuance	Issued To
92-08	THERMO-LAG 330-1 FIRE BARRIERS	12/17/92	ALL HOLDERS OF OPERATING LICENSES OR CONSTRUCTION PERMITS FOR NPRs
92-07	OFFICE OF NUCLEAR REACTOR REGULATION REORGANIZATION	10/10/92	ALL HOLDERS OF OPERATING LICENSES OR CONSTRUCTION PERMITS FOR NPRs
83-28 SUPPLEMENT 1	REQUIRED ACTIONS BASED ON GENERIC IMPLICATIONS OF SALEM ATWS EVENTS	10/07/92	ALL LIGHT-WATER REACTOR LICENSEES AND APPLICANTS
92-06	OPERATOR LICENSING NATIONAL EXAMINATION SCHEDULE	09/06/92	ALL POWER REACTOR LICENSEES AND APPLICANTS FOR AN OPERATING LICENSE
92-05	NRC WORKSHOP ON THE SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE (SALP) PROGRAM	09/04/92	ALL HOLDERS OF OP LICENSES OR CONST. PERMITS FOR NUCLEAR PWR REACTORS
92-04	RESOLUTION OF THE ISSUES RELATED TO REACTOR VESSEL WATER LEVEL INSTRUMENTATION IN BWRs PURSUANT TO 10CFR50.54(F)	08/19/92	ALL BWR LICENSEES FOF OPERATING REACTORS
90-02 SUPPLEMENT 1	ALTERNATIVE REQUIREMENTS FOR FUEL ASSEMBLIES IN THE DESIGN FEATURES SECTION OF TECHNICAL SPECIFICATIONS	07/31/92	ALL LWR LICENSEES AND APPLICANTS
87-02 SUPPLEMENT 1	SAFETY EVALUATION REPORT NO. 2 ON SQUG GENERIC IMPLEMENTATION PROCEDURE, REVISION 2.	05/22/92	ALL USI A-46 LICENSEES WHO ARE SQUG MEMBERS
92-03	COMPILATION OF THE CURRENT LICENSING BASIS: REQUEST FOR VOLUNTARY PARTICIPATION IN PILOT PROGRAM	03/19/92	ALL NUCLEAR POWER PLANT APPLICANTS AND LICENSEES

This generic letter requires no specific action or written response. If you have any questions about this information, please contact the technical contact listed below, who is the NRC INES Coordinator.

James G. Partlow
Associate Director for Projects
Office of Nuclear Reactor Regulation

Technical contact: Denwood F. Ross, Jr., Deputy Director
Office for Analysis and Evaluation
of Operational Data
U. S. Nuclear Regulatory Commission
Mail Stop 3701 MNBB
Washington, D.C. 20555
Telephone (301) 492-7361

Attachments:
1. INES Description
2. INES Event Rating Form
3. List of Recently Issued Generic Letters

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Document Name: INESCALE.WPG		*SEE PREVIOUS CONCURRENCE		
*OGCB:DORS:NRR	*C:OGCB:DORS:NRR	*IRB:AEOD	*AEOD	D:DORS:NRR
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12/02/92	12/07/92	12/02/92	12/02/92	12/16/92
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FJCongel	JGPartlow			
12/10/92	12/22/92			

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D:DRSS:NRR	ADPR			
FJCongel	JGPartlow			
12/10/92	12/ /92			

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James G. Partlow
Associate Director for Projects
Office of Nuclear Reactor Regulation

Technical contact: Denwood F. Ross, Jr., AEOD
(301) 492-7361

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