POLICY ISSUE

(NEGATIVE CONSENT)

August 28, 1989 SECY-89-266

For: The Commissioners

From: James M. Taylor
Acting Executive Director for Operations

Subject: EVENT SEVERITY SCALES FOR COMMERCIAL POWER REACTOR FACILITIES

Purpose: To inform the Commission of a proposed NRC position regarding international development of an event severity scale for commercial power reactor facilities.

Background: An increased interest in the development of event severity scales for commercial power reactor facilities has been recently expressed by various national and international organizations. Committees have been formed by the International Atomic Energy Agency (IAEA) and the Organization for Economic Cooperation and Development (OECD) Nuclear Energy Agency (NEA) to investigate the possible needs and uses of severity scales. Several meetings have been held and several more are planned for the near future. Individual member countries of these organizations have also studied the potential development of severity scales and France and Japan have implemented severity scale systems on a trial basis. NRC personnel have attended these international meetings, and have evaluated the potential benefits and impacts associated with implementation of an international severity scale.

A severity scale for events at commercial power reactor facilities is intended to categorize events ranging from routine occurrences to severe accidents. To date, the primary purpose for developing severity scales has been to facilitate communication to the media and improve public understanding of the significance of events at commercial

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power reactor facilities. Severity scales offer a proposed solution for countries wanting or needing to improve communications with the media and the public regarding operational events. In this regard, however, it is important to point out that the U.S. has benefitted from a long-term policy of extensive and open communications to the media and public on all operational events at U.S. nuclear power plants.

The characteristics of an international scale and the classification criteria are currently under review by a joint IAEA/NEA committee. For example, experience to date with the scales developed in France and Japan and the U.S. system are part of the review by the IAEA/NEA committee.

The French severity scale system was developed to clarify the significance of nuclear reactor incidents and accidents to the media and general public. The scale is graduated from 1 to 6 in ascending order of severity. A more detailed description of the French scale and reports regarding the trial period are provided as Enclosure 1. The structure of the Japanese severity scale is similar to the scale developed in France. The Japanese scale consists of nine levels. A more detailed description of the Japanese scale is provided as Enclosure 2.

The U.S. system of reporting and classifying events at nuclear facilities is comprised of reporting regulations, four emergency response categories, and the subsequent evaluation of events by the NRC and nuclear industry. The U.S. system identifies a significance or safety perspective with consideration given to the release of radioactive material, personnel exposure, degradation in facility safety systems, and other criteria. A major advantage of the U.S. approach is that the same reporting system and emergency classes are used for incident response action and for public information purposes. A more detailed description of the U.S. system is provided as Enclosure 3.

Discussion:

Since most countries have well established systems for event reporting to and event evaluation by the regulating agencies, the severity scale systems (including France and Japan) are being developed solely to serve public information goals. The intent is for the public to become familiar with the scale, much like the familiarity with the Richter scale for earthquakes, and thereby have a better understanding of the significance of events reported by the media or described in publicly available information. The existing technical and regulatory functions, including emergency response, are considered to be separate functions from implementation of severity scales.

The principal U.S. comment provided at the meetings held to date has been that any severity scale system developed for public information purposes should be as consistent as possible with the emergency response classifications. Having two separate event classification systems, one for emergency response by technical authorities and the other for public information, could cause confusion, and, in fact, could cause the opposite effect than is intended. Another comment expressed by the U.S. participants has been that implementation of a severity scale concept may be useful and appropriate for those countries where there are public concerns regarding the extent of communication about operating events, and as a result, new initiatives are desired to improve public communication. However, for those countries which have well established public notification systems and open access to information regarding nuclear facility events, the cost and effort to implement a new severity scale, particularly one that does not correspond to established emergency classifications, is not considered justified and may, in fact, have an adverse impact.

For example, the existing U.S. system of reporting and responding to emergencies has been evolving for nearly a decade via the rulemaking process, actual use in response to events, and the many exercises conducted and planned. The system is well entrenched in the training and procedures used by licensees, state/local governments, and other federal agencies. Replacement of the existing emergency response system is thus not considered by the staff as practical or appropriate.

Therefore, the primary question regarding implementation of such a scale in the U.S. revolves around the need or advantages for a parallel and separate scale for public information purposes. Introduction of a numerical severity scale for public notifications, independent from emergency response classifications, introduces various problems and opportunities for confusion. The first problem to resolve would be which party in the process should assign the severity rating to events. Licensee classification would be the most timely, but for other reasons is probably not practical. These reasons include a potential perception of conflict of interest, inherent inconsistencies due to differing judgments, and the need for rulemaking if licensee classification was to be mandatory. Representatives of the Nuclear Utility Management and Resources Committee noted that an industry task force reviewing emergency action levels has concluded that implementation of accident severity scales in the U.S. does not appear to offer any advantages over the existing system and is not supported.

The NRC classification of events for such a numerical severity scale would likely involve a delay of several days. Consequently, in order to promptly inform the public of significant events, it would be necessary to maintain the current system of licensee and/or NRC press releases and press briefings for events involving noteworthy safety significance or public interest. Further, implementation of a severity scale would overlay the current event classifications such as Significant Event classifications reported in the Performance Indicator program and Abnormal Occurrence classifications reported quarterly to Congress. These types of evaluations and classifications are available to the public via reports and the Public Document Room, but are not routinely the subject of individual press releases.

Additionally, it was noted that should an international scale be developed for use in international communications, it would be possible to provide a pre-established conversion relationship between the existing U.S. event classification and the proposed international scale.

Summary:

The evaluation of the possible use of severity scales in the U.S. concluded that the benefit would be negligible and there is a potential for confusion and adverse impacts on existing emergency response reporting and response systems. Thus, the cost and effort of implementation of a replacement or parallel scale is not considered justified.

As a result, the proposed U.S. position to be expressed at future IAEA/NEA meetings is as follows:

1. The U.S. supports the implementation of such systems for countries without established public notification systems.

2. Severity scales should be the same or at least consistent with emergency response classifications to reduce the likelihood of confusion in a true emergency.

3. The U.S. wishes to be involved in the discussions of severity scales, but is unlikely to adopt such a system for routine use.

Recommendation: That the Commission note that the staff intends to develop presentations and express the above positions in upcoming IAEA/NEA meetings and other forums discussing numerical severity scales unless otherwise instructed by the Commission. The first of these meetings is IAEA Reactor Safety meeting the week of September 25, 1989.

James M. Taylor
Acting Executive Director
for Operations

Enclosures:
1. Description of French Severity Scale
2. Description of Japanese Severity Scale
3. Description of U.S. Reporting and Emergency Response Systems

SECY NOTE: In the absence of instructions to the contrary, SECY will notify the staff on Wednesday, September 13, 1989, that the Commission, by negative consent, assents to the action proposed in this paper.

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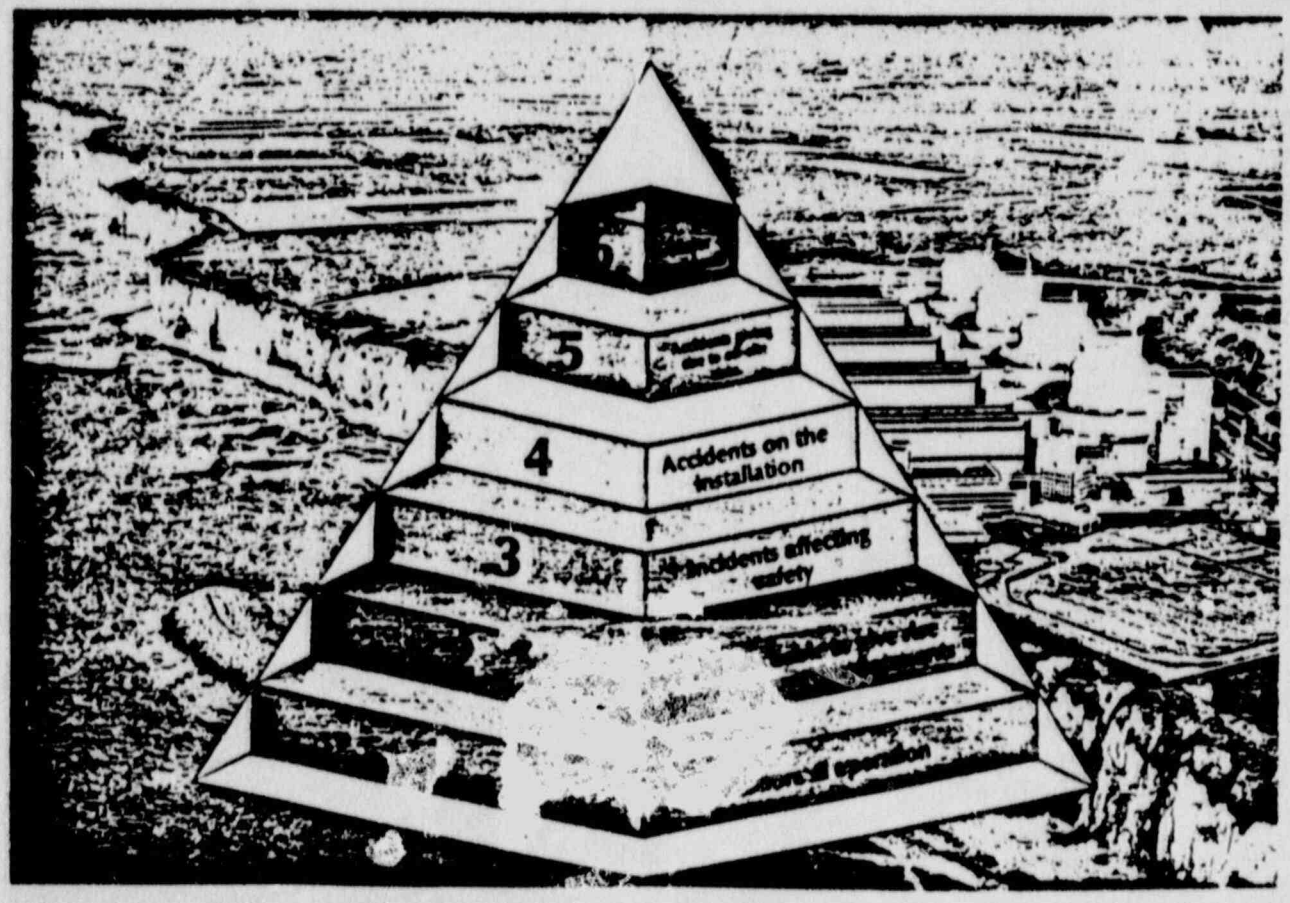
SEVERITY SCALE



Severity scale for rating nuclear power plant incidents and accidents

DESCRIPTION OF THE SCALE

This scale is designed to bring about greater mutual understanding and harmony between specialists of the nuclear industry and public opinion. To do so, it uses a simple and comprehensible classification of the severity of nuclear incidents and accidents.

It is not intended to be either definitive or restrictive. It will first of all be applied on a trial basis. It can then be modified in accordance with the reactions of the two parties concerned : nuclear specialists and public opinion.

This scale does not replace the criteria already in force for the definition and technical analysis of nuclear incidents and accidents, and which are found particularly in the field of nuclear safety regulation.

Its main purpose is to avoid misunderstandings and to clarify the presentation of nuclear incidents and accidents in the eyes of all. Events which are not associated with the nuclear operation of the installations will therefore be classified as "off-scale".

On 20th April 1988, the minister in charge of industry announced the implementation of this scale for incidents and accidents occuring in nuclear power plants. It can be referred to by the public.

Reading the scale

The scale is graduated from 1 to 6. The most severe accidents are classified at the top end of the scale (level 6), the least severe incidents being situated at the bottom (level 1).

The accident levels are differentiated according to the degree of risk of radioactive release outside the installation where the accident has occured.

The term incidents applies to those events in which the level of radioactive release is less than the authorized annual limit. It also covers operational problems which, although not involving direct radioactive risk, may indicate weaknesses in the installation which should be remedied.

Incidents related to nuclear operation the severity of which is less than level 1 may also be announced but will be classified as "below-scale".

HOW TO USE THE SCALE

General rules

This scale does not replace the criteria adopted for the definition of events relating to the safety of nuclear power plants which must be declared by the operators (ref. SIN / 1732-82 of 7th April 1982). These declarations remains an integral part of the procedures to which the operators are subjected by the safety authorities, the primary purpose of which is the detailed technical analysis of operational experience as a whole, and the resulting lessons to be drawn for safety.

The scale defines and classifies, in decreasing order of severity, those events relating to nuclear safety which are systematically and rapidly brought to the attention of the general public by the operators and the authorities.

Classification directives and comments

General

Certain events which will naturally be published do not come into any of the scale s categories (eg, deaths, persons injured or damage to property in a non-nuclear part of the installations of the site). This information should figure explicity in the corresponding publications : non-nuclear event, **off-scale** on the severity scale.

It is not always possible to give a very precise definition of the limits of each category in such a general classification of complex technical events. Judgement plays a certain part in the fixing of levels. Where necessary, a justification of the classification can usefully be added to the description of facts and consequences.

An event which possesses characteristics common to several levels is classified in the most severe level.

Comments on the levels

The table comprises columns headed "criteria" and "examples" specifying the definition of the levels.

The three "accident" levels (6, 5, 4) are defined by reference to their radiological consequences according to external release criteria.

- Level 6 refers to an "equivalence" of fission products released in terms of radiological noxiousness in relation to iodine 131 which is the most significant radionuclide for short term consequences. This presentation is a simplified one. In reality, it will be necessary to take into account all the radioactive products released and evaluate their noxiousness in terms of attack routes and time.

- Level 5 covers accidents which effectively lead to considerable radioactive releases into the environment (Windscale) and also those in which the releases remain at the "threat" stage but which are however considered sufficiently serious for protective measures outside the site to be taken (Three Mile Island).

- Level 4 comprises three categories of accidents, the effects of which remain limited to the installation itself and to its personnel :

- accidents resulting in significant but limited radioactive releases which do not require measures for the protection of the public and the environment. The reference values taken, in terms of order of magnitude, are the authorized annual release rates,

- accidents causing partial damage to the core of the installation, which is not sufficiently severe to represent a serious threat to the exterior but which necessitate difficult repairs, with radiological protection problems,

- accidents resulting in the exposure of plant personnel to ionizing radiation at doses which require the need for specialized medical treatment to be considered, i.e. exposure above a threshold of 100 rem (1 Sv).

he three "incident" levels (3, 2, 1)
) refer to the "defence-in-depth"
em installed for the prevention of
idents and which, although main-
ing its overall efficacy, is more or
seriously damaged.

vel 3 comprises 4 categories of
dents :

idents giving rise to low levels of
rnal release, i.e., several tenths
the authorized annual release
s. These releases are not signifi-
in terms of danger to health, but
reveal a defect in the state of the
riers" placed between the radio-
e products and the environment.
orollary releases of less than one
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nselves constitute a classification
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nalysed,

idents leading to the presence of
gnificant quantity of radioactivity
e installations in areas where it
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s"). Quantitatively, reference is
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ng a period of more than 24
s, from "green" zones to "red"
s. Such incidents will require
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nizing to a certain degree,

idents which result in the expo-
of plant personnel to ionizing
tion at levels greater than the
fixed for 1 year for workers, 5
(50 mSv),

dents which involve a significant
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affected. The importance to
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must be appreciated by evalua-
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conditions of the installation.

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s which, although not directly
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quent reevaluation of the safety
gements : these include :

- common mode failures in systems important to safety,
- independent multiple failures of systems important to safety during one single sequence,
- human errors in cases where they reveal deficiencies in "safety culture" liable to have consequences,
- fires in the nuclear island involving relatively significant external resources (internal emergency plan, level 1),
- incidents affecting equipment important to safety and resulting in an unavailability of more than 1 month,
- incidents of a nuclear nature which have significant consequences for the installation (prolonged shutdowns, long and difficult repairs, etc.). The sodium leak detected in 1987 in the fuel storage drum of Creys-Malville is a typical example.

– **Level 1** concerns functional or operational anomalies which do not involve any risk but which are significant in terms of the lessons which can be drawn from them : deviation from authorized functional domains defined by the technical specifications for operation, justified actuation of safety systems. All events which have caused a radioactive release, even at a very low level, into the groundwater table will be classified at least at level 1. These come automatically into the category of deviations from the authorized domain. Depending on the quantity of radioactivity and the results of the measurements carried out, they may be classified by the SCPRI (central service for protection against ionizing radiations) at a higher level. Level 1 will include in particular :

- anomalies important to safety discovered fortuitously and not observed during the normal periodic inspections and tests,
- deviations from the technical specifications without passage to fallback state and non-observance of the technical specifications without justification,
- justified actuation of the safety systems, such as the safety injection, containment spraying, starting the diesel generator sets in the event of loss of the external electricity sources,
- abnormal development of an automatic shutdown sequence,
- tripping of the fire protection in the nuclear island.

The events occuring during the period between fuel loading and power increase (before the formation of significant quantities of fission products) will, depending on each individual case, be classified at level 1 (non-observance of specifications) or level 2 (serious incident affecting an equipment). Events endangering the control of radioactivity must be subjected to special examination in order to evaluate the potential risk involved.

– **Below-scale :** a certain number of events declared to the safety authorities do not appear on the scale as it can be considered that they are part of the normal operation of a large industrial installation and are covered by the usual procedures. This is the case, for example, of spurious operation of the safety systems, following which the installation is started up again according to normal procedures. The following list summarizes a certain number of examples :

- random single failure in a redundant system *,
- single human failure of no consequence *,
- unavailability or anomaly, outwith common mode, discovered during periodic inspections or tests *,
- automatic shutdown sequence proceeding normally,
- technical specification limits reached and normal passage to fallback state,
- spurious operation of the protective systems and normal return to operation,
- incident immobilizing an item of equipment important to safety,
- a non-significant degradation of the barriers (leak rate less than specifications),
- working accident in a nuclear environment not involving an installation fault.

* Assuming that it illustrates no significant lesson relating to safety, in which case it would be classified at level 1.

SEVERITY SCALE FOR RATING NUCLEAR POWER PLANT INCIDENTS AND ACCIDENTS

LEVEL	DEFINITION	CRITERIA	EXAMPLES
6	**Major accidents**	External release of a significant fraction of the core inventory in the form of fission products (equivalence in terms of iodine 131 : several hundred thousand to several million curies).	Chernobyl, 1986
5	**Accidents giving rise to off-site risks**	Accidents necessitating off-site protective measures in the event of releases or the threat of releases (equivalence in terms of iodine 131 : several thousand to several ten thousand curies).	Windscale, 1957 Three Mile Island, 1979
4	**Accidents in the installation**	Accident giving rise to external releases of the same order of magnitude as the authorized annual limits, involving no significant health risks for the public and / or partial core damage and / or irradiation or radioactive contamination of workers, at a level requiring specialized medical care.	Saint-Laurent A2, 1980 *(cf. bulletin SN No 14)*
3	**Incidents affecting safety**	Incidents giving rise to releases greater than or equal to one tenth of the authorized annual limits and / or significant internal radioactive leaks and / or degradation of the safety barriers or systems and / or irradiation or radioactive contamination of workers to a level greater than the authorized annual dose.	Bugey 5, 1984 *(cf. bulletins SN No 40 & 48)*
2	**Incidents liable to give rise to subsequent developments**	Incidents with potentiel consequences for safety and / or necessitating prolonged repairs or works.	Fuel storage drum of Creys-Malville, 1987 *(cf. bulletins SN No 56, 60 & 63)*
1	**Operational anomalies**	Deviation from the domain authorized by the technical specifications and / or justified use of safety systems.	Tricastin, 1987 *(cf. bulletin SN No 55)*

The "bulletin sur la sûreté des installations nucléaires" (nuclear installation safety newsletter) is published by the minister in charge of industry (ministère de l'industrie et de l'aménagement du territoire) - 101, rue de Grenelle, 75700 Paris (France).

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ENCLOSURE 2

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

JUL 17 1989

MEMORANDUM FOR: Chairman Carr
Commissioner Roberts
Commissioner Rogers
Commissioner Curtiss

FROM: James R. Shea, Director, GPA/IP

SUBJECT: JAPAN'S USE OF AN "EVENT EVALUATION SCALE"

On July 10, the Japan Ministry of International Trade and Industry (MITI), responsible for the licensing and safe operation of nuclear power reactors in Japan, began a one-year trial use of an event evaluation scale. The primary purpose for the scale is to inform the Japanese public of unusual events at nuclear power reactors and not as an emergency response tool. The evaluation scale, not referred to as a severity scale, uses nine levels and three criteria. This would categorize TMI at Level 5 and Chernobyl at Level 8.

Attached is the MITI June 26 Press Release on the use of the scale and a copy of the evaluation scale. The response from the media to the evaluation scale has been neutral.

Attachments:
As stated

cc: EDO
OGC
GPA
SECY

Press Release Information	Nuclear Power Safety Administration Division, ANRE/MITI

"Evaluation Scale" for Incidents and Failures in Nuclear Power Plants

June 28, 1989

1.Purpose

(1) Major incidents and failures in nuclear power plants in Japan has been released positively to the public including minor ones. However, there might have been some occasion in which proper understanding by public on the extend of effects to the safety of overall nuclear power plants have not been obtained, because the information released contained technical and specialized explanation which caused difficulties for public to understand immediately in some instances.

(2) In the atmosphere in which public interest on the nuclear power generation is growing up, ANRE/MITI introduces the indicator (Evaluation Scale) which explain simply and clearly the positioning of each incident and failure in the safety of nuclear power plants in order to promote further wide and proper understanding by public of incidents and failures.

This "Evaluation Scale" differ from the criteria in the safety regulation of nuclear power plants in its purpose and contents.

2. Process of Establishment

Through six times of meeting ("Committe on the Evaluation Scale of Incidents and Failures on Nuclear Power Plants " (Chairman : Professor Kondo of Tokyo University) which consisted of technical specialists of the related field , and has been established in the NUPEC) since December of 1988, the "Severity Scale"(draft) has been established.

In the course of the work, the results of discussion have been explained to the Nuclear Safety Commission, Nuclear Power Generation Technical Advisory Committee and so on, and their recommendations were reflected. ANRE/MITI has received the proposal of "Severity Scale"(draft) from the committee, and instituted them.

3.Evaluation Scale

Detail of "Evaluation Scale" instituted is described in the attachment. In the process of classification of events, each event are evaluated through the three categories of critera (the criterion No.1, the criterion No.2 and the criterion No.3) in the "Evaluation Scale", and the level finally assigned is given by the highest level reached by one of the criteria.

(Example)
The level 2 is finally assigned for the following evaluation results : level 0 for the criterion No.1.1 evel 0 for the criterion No.2, level 2 for the criterion No.3.

4. Applicaton Procedure

(1) In the case of the application of this "Evaluation Scale", the incidents and failures are evaluated from the specialized and technical standpoint in the neutralized organization at the appropriate time after the event, and after that, ANRE/MITI releases the final evaluation results based on that report.

ANRE/MITI will try to release the tentative evaluation results within allowed range, even at the time of event occurence.

(2) Even after the starting of application of the "Evaluaton Scale", this framework will be reevaluated based on the comments on them. (1 year trial use)

Evaluation Scale for Incidents and Failures of Nuclear Power Plant

Scale	Criterion - 1 Influence of Radioactive Materials to the Outside of Reactor Facility	Criterion - 2 Unplanned Exposure of Workers engaged in Radiation related Works	Criterion - 3 Status of Reactor Facility
Level 0	Case of no significant release of radioactive materials due to the event to the outside of reactor facility	Unplanned exposure dose of workers engaged in radiation related works (hereafter called as "unplanned exposure") is less than 5mSv	Event which does not related to the safety of reactor facility
Level 1	Case of release of radioactive materials due to the event to the outside of reactor facility and predicted radiation exposure dose at the surrounding monitering area boundary is less than 0.01mSv	"Unplanned exposure" is more than 5mSv and less than 10mSv	Event which does not influence on the safety of reactor facility but may relate to it
Level 2	Predicted radiation exposure dose at the surrounding monitering area boundary(hereafter called as "predicted exposure") is more than 0.01mSv and less than 0.05mSv	"Unplanned exposure" is more that 10mSv and less than 50mSv	Event which does not influence on the safety of reactor facility but relates to it
Level 3	"Predicted exposure" is more than 0.05mSv and less than 0.1mSv	"Unplanned exposure" is more than 50mSv and less than 0.1Sv	Event which influences on the safety of reactor facility
Level 4	"Predicted exposure" is more than 0.1mSv and less than 1mSv	"Unplanned exposure" is more than 0.1Sv and less than 0.25Sv	Event which exceeds the event of level-3
Level 5	"Predicted exposure" is more than 1mSv and less than 5mSv	"Unplanned exposure" is more than 0.25Sv	
Level 6	"Predicted exposure" is more than 5mSv and less than 10mSv		
Level 7	"Predicted exposure" is more than 10mSv and less than 0.1Sv		
Level 8	"Predicted exposure" is more than 0.1Sv		

U.S. EVENT REPORTING AND EMERGENCY CLASSIFICATION SYSTEM

The United States (U.S.) system of reporting, classifying and responding to events at nuclear power plants and other facilities has evolved to serve both the short-term and long-term activities for minimizing risks to public health and safety. The short-term activities deal with ensuring that adequate responses are taken to inform and protect the public from possible radioactive releases which have occurred or are likely to occur as a result of an ongoing event. The long-term activities involve the review and analysis of events to identify generic concerns, trends, and otherwise minimize the probability and/or consequences of future events. An important aspect of the U.S. system, indeed a basic premise, is openness to the public. The reporting requirements, immediate incident response, longer term analysis and evaluation, and a summary of public information are discussed below.

Reporting Requirements

The immediate actions taken by the licensee and government agencies (federal, state, and local) in response to an event are determined based upon the assessed risk to the public. To facilitate determination of the appropriate response, the licensees are required to evaluate any unplanned event and classify the event into one of the following categories:

1. Not Reportable/Inconsequential

2. Reportable (Non-Emergency)

3. Emergency Class

    a. Notification of Unusual Event
    b Alert
    c. Site Area Emergency
    d. General Emergency

The 10 CFR 50.72 requires reporting to NRC whenever an event is classified into one of the emergency categories based on criteria provided in NUREG-0654 and certain other events within either one or four hours of the occurrence. NRC personnel review the event and determine if any immediate response by government agencies is warranted. Those events which are required to be reported to the NRC, but do not warrant inclusion in the emergency classes are primarily described in 10 CFR 50.72, 10 CFR 50.73, and 10 CFR 20.403. The 10 CFR 50.72 reports and the written reports required by 10 CFR 50.73 are used to trigger followup actions, evaluate plant-specific performance and determine generic concerns or trends.

A matrix constructed from the reporting requirements and criteria is provided in Table 1.

Events which are not required to be reported to the NRC generally involve items such as the random failure of single components, problems with balance of plant equipment, or other occurrences which pose no significant threat to the general public. Although not reported directly to the NRC, such events may be important in licensee and/or nuclear industry tracking of items related to plant reliability and efficiency. Plant specific component failure data

maintained by industry on a reactor unit basis in the Nuclear Plant Reliability Data System are directly accessible to the NRC staff under a memorandum of understanding and a contract with the Institute of Nuclear Power Operations.

Incident Response

Upon the decision by the licensee that an event should be classified within an emergency class, notifications are made to state/local response agencies as well as to the NRC. The level of response of the agencies will be based upon the classification by the licensee and independent assessments, as appropriate, by the various agencies. Examples of the type of events which result in an emergency classification are described in NUREG-0654. Actual classifications will be based upon specific plant conditions or events detailed in plant-specific emergency response plans. The four levels of emergency classifications are discussed below.

Notifications of Unusual Events are events which are indicative of a potential degradation of the level of safety of the plant. No release of radioactive material requiring offsite response is expected. The purpose of the notifications is to heighten the awareness of offsite personnel. The licensee may augment on-shift resources but staffing of offsite response facilities is not necessary. Communication with the public regarding a specific event classified as a Notification of Unusual Event is usually not required, but the licensee and/or the NRC may issue press releases if the event or other circumstances involving the plant might generate public interest.

Alerts are events which involve an actual or potential degradation of the level of safety of the plant that is deemed to be substantial but radiation releases, if any, are expected to remain well below safety guidelines. The purpose of the notifications is to ensure that emergency response personnel are readily available to respond if the situation becomes more serious and to provide offsite authorities periodic plant status information. The licensee might augment onsite operational support and place the offsite operations facility in a standby status. State and local response agencies are notified and may place primary response centers on a standby status. The NRC is also notified and may escalate to a standby status and arrange for continuous communication with the licensee. Communication with the public regarding a specific event classified as an Alert will usually consist of press releases issued by the licensee and/or NRC.

Site Area Emergencies are events which involve actual or likely major failures of plant functions needed for protection of the public. Although in-plant radiation releases are likely, radiation releases are not expected to result in offsite exposures exceeding guidelines. The purpose of the notifications are to ensure response centers are staffed, monitoring teams are dispatched, and involved organizations are prepared to take appropriate actions. The licensee will staff onsite and offsite operational support and response facilities and provide continuous plant data and dose assessment data to other response organizations. State and local response facilities will become staffed and will provide prompt notification to the public near the plant via emergency notification networks (sirens, radio stations, etc.). The NRC will staff the

Headquarters and regional response centers and dispatch personnel to the affected site. Other federal agencies such as FEMA, DOE, HHS, USDA, FDA, etc., may become involved with the response at the Site Area Emergency classification. Periodic press releases will be made and press briefings will be held. Procedures have been established to coordinate information released by the licensee and other response organizations in order to minimize the potential for conflicting statements which might confuse the public.

The responses to General Emergencies are basically the same as those described for Site Area Emergencies, but offsite radiation releases that may exceed protective action guidelines are more likely. Licensee and government response centers will be staffed and the public near the plant will be notified via emergency notification systems. The general public outside the emergency planning zone will be kept informed via periodic news releases and press briefings. Information released will be coordinated between the licensee and other response organizations to minimize the potential for conflicting information.

The classification system described above has been incorporated into the procedures and training of licensees, state/local agencies, and the federal response agencies. The years of experience associated with the day-to-day use of the system have revealed relatively few significant problems. A summary of the number of events within the various classifications occurring over the last several years is provided in Table 2. In addition to the routine use of the U.S. system, hundreds of exercises have been conducted to assure that the various aspects of the incident response plans are effective. Lessons learned from the exercises and routine use of the system are incorporated as necessary to ensure the plans provide an effective response capability. A NUMARC working group has examined recent experience with emergency action levels and is developing guidance to further improve consistency of classification of emergencies. The staff has discussed the proposed guidance and suggested promulgation as an industry standard or topical report.

Analysis and Evaluation

Notifications of events made to the NRC are evaluated and used to identify potential safety concerns and trends for the industry and specific licensees. The evaluations result in feedback to the licensees which recommend or require inspections and possible actions, reports to Congress, and input to the assessments of licensees' performance. For example, in 1988 approximately 2,500 Licensee Event Reports (LERs) were provided to the NRC and over 3,000 events were reported to the NRC Operations Center. These reports are available to the public and occasionally used by the media.

The analysis of a specific event or group of similar events can result in the NRC issuing an information notice, bulletin, or generic letter. Information notices are used to inform licensees of potential problems which might impact plant safety. No specific actions or responses by the licensees are required. Bulletins and generic letters are issued to identify significant safety concerns, request licensees to take specific actions and obtain information

needed by the NRC regarding findings and potential problems. Although specifically directed at licensees, notices, bulletins and generic letters are available to the public. In many cases, press releases are issued highlighting the actions being taken.

Analysis of a specific event, routine inspections, special inspections, summaries of operating histories, identification of generic concerns or trends, or other evaluations are routinely published as detailed reports and are available to the public. Such reports may address problems with specific components or systems, operating procedures, and/or trends in plant or system performance.

Quarterly, the NRC prepares a report to Congress which describes those events which are considered to involve major degradations in the protection to the public and health. These events are called Abnormal Occurrences. The report also serves to inform licensees, other government agencies and the general public of the events considered to be the most significant. The criteria used in classifying events as Abnormal Occurrences include exposure to or release of radioactive materials in excess of regulatory limits, degradation of safety-related equipment, and deficiencies in design, construction, or operation of a facility. Abnormal Occurrences at nuclear power reactor facilities have declined in number over the past several years from seven to ten a year to about three a year currently.

Events reported to the NRC by licensees are evaluated to identify and assess potential accident precursor events. Precursor events are identified by consideration of criteria related to failure of plant safety systems, degraded redundancy for safety functions, or occurrence of potential initiating events such as high energy line breaks, loss of offsite power, or other plant transients which proceeded in a manner other than expected. The precursor data are used to better quantify the risk of reactor core damage and equipment and/or design problems which contribute to that risk. Reports of these analyses are published annually and are publicly available.

Data from events reported to the NRC are also used to assess the performance of licensees in key areas. The data used as performance indicators include reactor trips, safety system actuations, safety system failures, plant and equipment outages, collective radiation exposures, significant events, and event causes. Significant events are determined by comparison to criteria associated with degradation of safety equipment, plant response to transients, design deficiencies, or degradation of fission product barriers. Approximately 100 events per year are classified as significant events. The performance indicators are used as an objective view of operational performance and facilitate recognition of poor and/or declining safety performance. Performance indicator reports are issued quarterly and are publicly available.

The above analyses and evaluations of information derived from event reports comprise the long-term activities to minimize the probability and/or consequence of future events. The NRC reports regarding the evaluations are available to the public. The result of this openness is that the public has access to facility information including summaries of daily and monthly operation, individual event descriptions, summaries of significant events and

Abnormal Occurrences, and engineering evaluations of possible technical issues. With the obvious exceptions of security and safeguards and proprietary information, nearly all information regarding the operation of U.S. nuclear power plants is available to the public.

Summary

The U.S. event reporting and evaluation system involves a systematic and structured approach to meet a number of specific objectives. The threshold for reporting is relatively low, and as a result, about 10 events are reported to the NRC each day. Each of these prompt reports is carefully reviewed to determine whether an immediate response is needed and whether follow-up action is warranted. Subsequently, the more detailed written event report is reviewed and classified as to its significance, and whether it meets the criteria for reporting to Congress as an Abnormal Occurrence.

A basic premise of this system is openness and availability of all reports and evaluations to the public. The NRC routinely makes available its technical judgment regarding the significance and implications of operating events, both in terms of immediate press releases and longer term evaluations and studies. Thus, the public has available evaluated and classified events in addition to the basic input. As a result, a reasonably high confidence has been developed that the public, local and State, and federal authorities will be kept informed of significant safety concerns, issues and events as well as emergency conditions that may involve the need for protective action.

In summary, the U.S. program embodies the following steps and principles:

1. Safety significant events and emergencies are required to be reported to the NRC.

2. NRC aggressively reviews licensee adherence to requirements.

3. Emergency conditions are required to be reported directly to state and local authorities.

4. Utilities and NRC have credibility with media near plants from exercises and real events.

5. National media has general understanding of emergency classification from exercises, NRC seminars, industry information and real events.

6. All event-related information is available in public document rooms for media and special interest groups.

Thus, in the U.S. the public is generally well informed concerning nuclear plant operations and, as a result, a relatively high degree of confidence has developed that they will continue to be kept informed.

TABLE 1 MATRIX OF EVENT CRITERIA

US REPORTING AND EMERGENCY CLASSES	CRITERIA			
	RADIOACTIVE RELEASE	FISSION PRODUCT BARRIER	PERSONNEL EXPOSURE	DEGRADATION OF SAFETY SYSTEMS
GENERAL EMERGENCY	1 REM WHOLE BODY AT SITE BOUNDARY (>PAG OFFSITE)	CORE MELT SEQUENCE	N/A	EXTENDED LOSS OF POWER LEADING TO CORE DAMAGE LOCA WITH FAILURE OF ECCS LOSS OF HEAT SINK LEADING TO CORE DAMAGE
SITE AREA EMERGENCY	500 MREM WHOLE BODY AT SITE BOUNDARY (<PAG OFFSITE)	RCS LEAK > MAKEUP CAPACITY DEGRADED CORE	N/A	LOSS OF ALL AC OR DC POWER FOR > 15 MINUTES ATWS LOSS OF FUNCTION REQUIRED FOR HOT SHUTDOWN MAJOR LOSS OF ALARMS AND PLANT TRANSIENT
ALERT	10 TIMES TECH SPEC (<PAG AT SITE BOUNDARY)	RCS LEAK >50 GPM 1.0% FUEL CLAD FAILURES, DEGRADATION IN CONTROL OF RADIOACTIVE MATERIAL (RAD INDICATIONS INCREASE X1000 W/I FACILITY)	N/A	MAJOR LOSS OF INDICATION/ALARM FUNCTIONS LOSS OF FUNCTION REQUIRED FOR COLD SHUTDOWN
UNUSUAL EVENT	TECH SPEC	RCS LEAK > TECH SPEC LIMIT 0.1% FUEL CLAD FAILURES	TRANSPORT OF A RADIOACTIVELY CONTAMINATED PERSON TO OFFSITE MEDICAL FACILITY	ECCS ACTUATION LOSS OF OFFSITE POWER PLANT SHUTDOWN REQUIRED BY TECH SPEC
50.72 (1 OR 4 HOUR REPORT)	ANY AIRBORNE OR LIQUID RELEASE WHICH EXCEEDS 2 X PART 20 CONCENTRATION AVERAGED OVER 1 HOUR	N/A	N/A	DEGRADATION IN SAFETY DISCOVERY OF DESIGN, ANALYSIS OR PROCEDURAL INADEQUACIES
20.403 *IMMEDIATE **24 HOUR REPORT	50.72 MORE RESTRICTIVE	N/A	* 25 REM WHOLE BODY ** 5 REM WHOLE BODY	N/A

TABLE 2

US EVENT CLASSIFICATION SUMMARY(1)

EVENT CLASSIFICATION	YEAR					
	1983	1984	1985	1986	1987	1988
30 DAY WRITTEN REPORTS (50.73)	--	2462	3034	2889	2908	2424
UNUSUAL EVENT	205	224	312	209	231	212
ALERT	7	8	11	9	9	6
SITE AREA EMERGENCY	0	0	0	0	0	0
GENERAL EMERGENCY	0	0	0	0	0	0

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

OFFICE OF THE
SECRETARY

November 7, 1989

MEMORANDUM FOR: Teresa Neville, Acting Chief
Public Document Room

THRU: Sandy Showman, Chief
Correspondence and Records Branch

FROM: Andrew Bates, Chief
Operations Branch

SUBJECT: RELEASE OF DOCUMENT TO PDR

Attached for placement in the PDR is a copy of:

SECY-89-266 - Event Severity Scales for Commercial Power Reactor Facilities

This document is being placed in the PDR at the EDO's request with concurrence by Commissioners' offices.

Attachment:
As stated

cc: EDO
OPA
DCS - P1-124

DF02
1/1