Significant Event Evaluation and Information Network (SEE-IN) Program Description

INPO

SIGNIFICANT EVENT EVALUATION
AND INFORMATION NETWORK
(SEE-IN)
PROGRAM DESCRIPTION

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INSTITUTE OF NUCLEAR POWER OPERATIONS

FOREWORD

The Institute of Nuclear Power Operations (INPO) manages the Significant Event Evaluation and Information Network (SEE-IN) for the benefit of its members and participants. As suppliers and users of SEE-IN information, each member utility is a part of the SEE-IN Program through its operating experience program.

This edition of the SEE-IN Program Description supersedes the previous edition dated December 1989

(INPO 89-015). The SEE-IN Program is continually changing and evolving, and this program description is revised periodically to reflect the changes. This revision to the SEE-IN Program Description includes updates to the second reviewer process and the NUCLEAR NETWORK® section and revisions to reflect current INPO reference documents.

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SECTION 1

INTRODUCTION

1.1 Background

The Significant Event Evaluation and Information Network (SEE-IN) Program has been in existence since early 1980. It was developed to fulfill a nuclear power industry need for a systematic means of sharing operating experience among plants. As the number of nuclear power plants increased, informal and ad hoc methods of information exchange were no longer adequate to ensure that every plant would be made aware of significant plant events occurring throughout the industry.

The SEE-IN Program was developed jointly by INPO and the Nuclear Safety Analysis Center at the Electric Power Research Institute (EPRI). The first product from the SEE-IN Program was a Significant Event Report (SER) issued in May 1980. The SER was designed to provide a concise description of significant events identified from the screening of plant events occurring throughout the nuclear industry. Other types of SEE-IN documents also have been developed to communicate comments and recommendations based on operating experience to the power plants. A computer-based communications system, NUCLEAR NETWORK®, was created to allow rapid dissemination of information to and from the nuclear power plants.[1]

Since its inception, the SEE-IN Program has continuously evolved to meet the expanding needs of the nuclear power industry; however, its primary focus on providing a means for utilities to share operating experience has not changed.

Following the reactor accident at Chernobyl in April 1986, utilities operating nuclear power plants worldwide formed an organization to expand the international sharing of operating experience information. This organization, called the World Association of Nuclear Operators (WANO), facilitates the exchange of operating experience worldwide. The INPO SEE-IN Program interfaces with the WANO information exchange program to ensure that INPO members benefit from international experience and also to share U.S. nuclear industry experience with other countries.

1.2 SEE-IN Program Objective

The objective of the SEE-IN Program is to improve nuclear plant safety and reliability by allowing each plant to learn from the operating experience of the world community of nuclear plants. Experience has shown severe events usually were preceded by precursor problems or events that occurred at the same or other plants. When the root causes for these precursors are left uncorrected, the events can repeat, and, in unanticipated circumstances, can lead to an event of major safety significance. The goal of the SEE-IN Program is to identify such event precursors and report them to all INPO members and participants so corrective actions can be taken to prevent events recurring at nuclear power stations.

Figure 1 is a diagram of the SEE-IN Program. The principal elements of the program include screening of selected nuclear plant operating experience information, identifying and evaluating the important or significant events and their precursors, and reporting the lessons learned to member utilities and INPO supplier participants (i.e., nuclear steam supply system (NSSS) suppliers, architect/engineers, and constructors). The program is conducted on an international level through cooperation with INPO international participant countries and in coordination with WANO.

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[1] Detailed description and usage instructions for NUCLEAR NETWORK are covered in the *NUCLEAR NETWORK® Users Manual*, INPO 91-005. A brief summary of the information topics available on NUCLEAR NETWORK is provided in section 4.

Figure 1. Significant Event Evaluation and Information Network (SEE-IN)

The SEE-IN Program interfaces with member utilities primarily through their individual operating experience review programs. Each U.S. nuclear utility has an operating experience review program that uses the results from the SEE-IN Program, along with in-house experiences and information from other sources, to improve the safety and reliability of its plant(s). It is the role of these individual plant programs to ensure that utility personnel are made aware of pertinent operating experience in a timely manner. Furthermore, these programs should ensure that applicable industry experience is analyzed and plant-specific corrective actions are taken. INPO follows up with member utilities during plant evaluations and accreditation team visits to ensure that operating experience shared through the SEE-IN Program is used effectively.

SECTION 2

SEE-IN PROGRAM OPERATION

2.1 Operating Experience Information Input

The SEE-IN Program process begins with the input of plant operating experience information. Many sources of plant operating experience information are used. The information normally is obtained through agreements between INPO and industry or regulatory organizations (i.e., utilities, the Nuclear Regulatory Commission or NRC, supplier participants, international participants, and WANO). Use of these varied information sources ensures that important U.S. and (when applicable to INPO members) international plant operating experiences are included in the SEE-IN Program.

2.1.1 Event Input Sources

The majority of plant operating experience information is supplied to INPO in the form of written reports. Some of these documents are written by the utilities to fulfill regulatory requirements; many are transmitted on NUCLEAR NETWORK as an exchange of operating experience. Reports routinely supplied to INPO are briefly described below. All these reports undergo a systematic review as part of the SEE-IN Program.

- *NUCLEAR NETWORK operating plant experience entries*
  All nuclear utilities (both domestic and international) are requested to report promptly, in NUCLEAR NETWORK's operating plant experiences topic (OE), any important events that occur at their units. This system informs INPO and the rest of the industry of operating events in a timely manner. When INPO learns of an important plant event not reported on NUCLEAR NETWORK, INPO requests that the utility make an operating experience entry describing the event on NUCLEAR NETWORK. Guidance on the type of information that should be reported is provided in INPO 89-005, *Guidelines for the Use of Operating Experience.*

- *Licensee event reports*
  For each licensed U.S. nuclear facility, certain events must be reported to the NRC as licensee event reports. Reporting requirements are stated in Title 10, Part 50.73 of the Code of Federal Regulations (10 CFR 50.73). NUREG-1022 and its Supplement No. 1 provide guidance on preparing licensee event reports.

  Licensee event reports are mailed concurrently to INPO and the NRC by all U.S. nuclear utilities. INPO maintains all licensee event report abstracts on a computer data base for analysis and trending and also has access to the NRC licensee event report data base of full text information.

- *Preliminary notification of event or unusual occurrence (PNO)*
  Each of the NRC regional offices issues PNOs on events believed to be potentially significant or of high public interest. The PNO normally is prepared by the NRC resident inspector on the day the event occurs, and a copy is provided to INPO the same day. INPO relays entries that pertain to plant operational safety and reliability to the industry via NUCLEAR NETWORK.

- *NRC information notices, bulletins, and generic letters*
  The NRC uses information notices, bulletins, and generic letters to inform plants of problems of potential generic significance; to solicit supplemental information from plants; and/or to require specific plant actions in response to identified concerns. INPO receives a copy of all information notices, bulletins, and generic letters from the NRC.

- *NRC daily plant status*
  The NRC maintains a computer information network that includes information on the status of every U.S. nuclear unit. The status indicates power level, reasons for shutdowns or power reductions, expected restart dates, and any reportable occurrences (e.g., 10 CFR 50.72). INPO accesses this information directly from the NRC computer and relays entries that pertain to plant operational safety or reliability to the industry via NUCLEAR NETWORK.

- *AEOD reports*
  The NRC Office for Analysis and Evaluation of Operational Data (AEOD) provides INPO with copies of engineering evaluations it prepares on selected important occurrences at nuclear plants.

- *Supplier participant information*
  INPO supplier participants provide INPO with copies of service bulletins, letters, and other reports pertaining to issues and problems associated with the systems they supply or install. These reports often include recommendations to the utilities on how to correct particular hardware or procedural problems.

- *Safety defect reports*
  Title 10, Part 21, of the Code of Federal Regulations requires plants and their suppliers to report safety defects and noncompliances to the NRC. The NRC provides copies of these reports to INPO.

- *Construction deficiency reports*
  Title 10, Part 50.55(e), of the Code of Federal Regulations requires utilities to report nuclear plant construction deficiencies to the NRC. These reports are mailed concurrently to INPO and the NRC by utilities with plants under construction.

In addition to the above reports provided on a routine basis, occasionally other operating experience is input to the SEE-IN Program. This may include, for example, telephone calls from members and participants and special investigation or analysis reports performed by a utility, INPO, EPRI, NRC, or international organizations.

The Nuclear Plant Reliability Data System (NPRDS) also serves as a source of information for the SEE-IN Program[2]. INPO analysis of the NPRDS data may identify adverse industrywide component reliability problems and trends. When such problems and trends are identified, the group of component failure reports is input to the SEE-IN Program.

Additional documents processed by the SEE-IN Program are event analysis reports (EARs), event notification reports (ENRs), and event topic reports (ETRs) received from the four WANO regional centers (located in Atlanta, Moscow, Paris, and Tokyo). These documents describe significant events that have occurred at nuclear plants outside the United States. WANO reports applicable to INPO member utilities will be issued as Significant Event Reports, Significant Event Notifications, or Significant Operating Experience Reports (see section 2.4.1).

2.1.2 Event Report Tracking System

INPO receives several thousand event reports (these include actual events and reports on deficiencies discovered by analysis, testing, etc.) each year that are input to the SEE-IN Program. Information about each report is entered into a computerized tracking system to index the reports, track and ensure timely event screening, and record the disposition and actions taken with regard to each event. The information is coded in data base fields that can be computer-searched and retrieved. All event reports entered into the tracking system are retained on microfilm. In addition, abstracts and other information from the licensee event reports are input to a separate computer data base.

2.1.3 Utility Contact System

In addition to the event report sources previously discussed, another important information source is direct contact with power plant technical personnel. Each U.S. utility designates a SEE-IN contact (see section 3.2) to respond to questions from INPO on plant events. The majority of such communications are handled over the telephone or via NUCLEAR NETWORK.

2.2 Screening Process

After the event reports have been entered into the tracking system described above, they are screened for significance. The objective of the screening process is to identify those relatively few events that are significant to nuclear safety or plant availability and

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[2] An overview of NPRDS, as well as detailed reporting and information retrieval guidance, is provided in the *NPRDS Reporting Guidance Manual*, INPO 89-001, and the *NPRDS Plus! Information Retrieval Guide*, INPO 87-024.

reliability from the several thousand reports input to the process. **The significance of a particular event (including the discovery of a serious deficiency) lies in the actual or potential consequences of the event or in the probability that it is a precursor to a more serious event.** Appendix A provides guidance for identifying significant events. Management, technical, and operational lessons to reduce the number, severity, and recurrence rate of off-normal events and thereby improve nuclear safety and plant reliability can be learned from every significant event. For example, an event may be considered significant that has caused or has the potential to cause a severe plant transient, loss of a safety function, personnel injury, radiation overexposure, excessive radioactivity release, or major economic or plant availability impact.

2.2.1 Event Report Screening

The event report screening process uses a series of reviews to determine significance. The person conducting the initial review determines the potential significance of a particular event. Screening guidelines and computer interactive screening tools are available to help the reviewer separate those events that are not significant from the events that are potentially significant.

Some reportable events are readily screened as not significant to nuclear safety or plant reliability. The significance of other events may be more difficult to ascertain. For these other events, the reviewer will present the event description and technical aspects to members of the Events Analysis Department in a meeting. This meeting serves as an independent review to ensure that significant events are identified and evaluated for lessons that should be disseminated to the industry. Guidance for those events that should be afforded a second review in a department meeting is provided in a department instruction. The instruction identifies events relating to key systems or components and specific causal factors or consequences that merit a second review. The instruction is updated periodically to reflect current trends or emphasis on certain types of events.

If either the reviewer or the Events Analysis Department staff considers an event potentially significant, the event is evaluated for significance during an interdepartmental event screening meeting (see section 2.2.2). The significance guide in Appendix A is used to assist in determining the significance of a particular event. For potentially significant events, information in addition to that provided in the event report is obtained to help focus on the significant

issues during the event screening meeting. The utility SEE-IN contacts (see section 3.2) are the primary sources for additional information. Supporting information also is obtained by searching the event tracking data bases to identify other similar events. When component failures are involved, the NPRDS data base is searched to identify component failure rates and trends. In addition, SEE-IN, NRC, and WANO reports are searched to determine if a related industry report has been issued previously.

Based on their background and experience, reviewers are assigned a group of plants for event screening. This allows the reviewer to become more familiar with that group of plants and thereby screen the events more effectively. In addition, by working with a group of plants, the reviewer can identify trends or patterns of events that, when taken in the aggregate, may indicate a potentially significant area of weakness.

The event report tracking system is used during the screening process to ensure that event reports are promptly screened. The emphasis on timeliness ensures that significant events are quickly identified for dissemination to the industry.

2.2.2 Event Screening Meeting

A periodic interdepartmental event screening meeting at INPO is used to reach a final determination on the significance of each event screened as potentially significant. The meeting is chaired by the Events Analysis Department manager and is attended by INPO management representatives with expertise in the areas of plant operations, maintenance, plant analysis, equipment reliability, engineering support, outage, events analysis, training, and plant management. Personnel with responsibilities in other areas (e.g., chemistry and radiation protection) attend the meeting when particular events require their expertise. Event reviewers present the events they consider potentially significant along with supporting information. The presentation is followed by an open discussion to help focus on the important issues associated with each event. Following discussion, the attendees recommend an event's significance determination. The final determination of event significance is made by the meeting chairman. A utility SEE-IN contact is informed via a private NUCLEAR NETWORK entry when an event at that utility has been screened significant. Events screened significant are then promulgated to the industry through a SEE-IN program document unless the event is significant only to the plant involved.

2.3 Event Reviews

Experience has shown that on-site reviews obtain the best perspective and understanding of the lessons that can be learned from some events. This allows preparation of more useful and timely SEE-IN documents. These event reviews also have assisted utilities in completing their internal event investigations.

When INPO identifies an event that is likely to result in a SEE-IN document, consideration is given to the need for an on-site event review. When an on-site review is appropriate, the affected utility is contacted to make the administrative arrangements to support the event review. The utility is asked to designate a point of contact to help in the arrangements for the plant visit, including obtaining unescorted access for the team members.

A small INPO review team of individuals knowledgeable in areas related to the event, in root cause analysis, and in the analysis of human performance deficiencies is assembled. Industry peers from another utility and/or an individual from the plant staff are sometimes requested to participate in the event review. The team proceeds to the site as quickly as can be arranged. In most cases, the review team becomes an integral part of the utility's event review organization.

During the visit, the review team inspects the equipment involved in the event; conducts interviews; and reviews operating records, procedures, system design, and other data to prepare an event and causal factors chart.[1] Involvement of key plant staff is essential during the process to effectively identify the pertinent facts. The visit usually requires from two to five days. Prior to leaving the site, the team briefs plant management on the results of the review.

Following the on-site review, the team continues to work with the utility to resolve open questions or outstanding comments. The results of the event review typically are documented in a trip report, with a copy provided to the utility. If the lessons learned from the event will be useful to the industry, a SEE-IN document is prepared as described in the following section. The SEE-IN document may also serve as the trip report. The utility reviews and comments on the SEE-IN document before it is issued to the industry.

2.4 SEE-IN Documents

The events screened significant are disseminated to the industry in SEE-IN documents using NUCLEAR NETWORK for convenience and timeliness. SEE-IN documents that address significant events fall into two categories: "reports" that typically require some utility

action and "notifications" that are provided primarily for information.

2.4.1 Document Types

The following is a description of documents issued by the SEE-IN Program:

- *Significant Operating Experience Report (SOER)*
  SOERs transmit INPO recommendations based on operating experiences for a significant problem area important to nuclear safety or plant reliability. An SOER is prepared for problems requiring the most focused utility attention. INPO follows up on utility actions in response to SOER recommendations during evaluations and accreditation team visits (see section 3.3).

  SOERs usually describe several events that highlight the subject of concern. Sections are included that identify the plants at which the events occurred; provide a brief description of the events; and identify the causes, consequences, and necessary corrective actions. Analysis and comments on the events are provided to address generic implications. The final section provides recommendations for preventing or coping with the problem.

  SOERs receive a thorough internal and external review (see section 2.4.2). The external review includes detailed evaluation by members of the appropriate INPO industry review group (composed of utility senior management representatives) and staff members at a number of selected utilities.

  Each SOER is assigned a red or yellow color code to reflect the relative importance and urgency of the recommendations. A red priority SOER indicates that immediate management attention is required to complete the review for applicability and to determine actions necessary to address the intent of the recommendations within 90 days of the SOER issue date. A yellow priority SOER indicates that the applicability review and determination of action necessary to address the intent of the recommendations should be completed within 150 days of the SOER issue date. SOERs are distributed by mail and via NUCLEAR NETWORK to the senior management at INPO member utilities and

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[1] See section 2.4.2

participants. Recommended utility management distribution and INPO information contacts are identified at the end of the SOER.

As SOER recommendations are issued and utility actions are reviewed, the INPO staff evaluates the issues for incorporation into INPO 90-015, *Performance Objectives and Criteria for Operating and Near-term Operating License Plants,* and/or into INPO guidelines.

- *Significant Event Report (SER)*
  SERs report significant events and lessons learned identified through the screening process. Each SER identifies the plant at which the event occurred and provides a brief description of the event and its causes, consequences, and corrective actions. When similar events have occurred at different plants, the circumstances for each event may be discussed in the same SER. Analysis and comments on the event are provided in the SER to address generic implications and the corrective actions that should be considered to prevent a similar event. SERs are disseminated via NUCLEAR NETWORK with recommended utility management distribution and INPO information contacts identified. SERs are issued for utility review and implementation of corrective actions where necessary to avoid similar events. Although comments are often included in SERs, INPO typically does not follow up on the specific actions taken by each utility. However, follow-up on corrective actions completed by the plant at which an event occurred are conducted during the next plant evaluation. Furthermore, if a plant is observed to be experiencing difficulties in an area covered by an SER, a review will be conducted to ascertain the utility's response to the SER.

- *Significant Event Notification (SEN)*
  SENs provide utilities with a brief description of one or more significant events but usually do not include comments or recommended corrective actions. SENs are issued for information and utility use as desired, and they are disseminated via NUCLEAR NETWORK with INPO information contacts identified as well as a recommended distribution.

SENs are issued in one of two forms as follows:
  — Significant Event Notification—An SEN alerts utilities in a timely manner that a potentially significant event has occurred. Because an SEN is issued within a few days after an event, many details of the event may not yet be available. Further information may be provided in a follow-up SEE-IN report.
  — Significant Event Notification-Recurring —The SEN-Recurring notifies the industry of the recurrence of significant events similar to previously documented ones, both in the circumstances surrounding the event and lessons that can be learned from the event. Recurring SENs are issued periodically with a brief summary of events and a reference to the previously issued SEE-IN documents that address the appropriate corrective actions.

- *Significant by Others (SO) Report*
  SO reports identify significant events that already have been adequately documented by recognized organizations (e.g., NRC, NSSS vendor) or reported by a utility as a NUCLEAR NETWORK operating experience entry, but the report may not have been provided to all affected members or may not have received the management attention typically given to INPO and NRC documents. An SO report prevents duplication of effort and documentation while ensuring that the industry is properly informed. SO reports are disseminated periodically (normally quarterly) on NUCLEAR NETWORK with an INPO information contact identified. The SO reports identify operating experience documents the utility should review and then implement corrective actions where necessary to avoid similar events. INPO considers the events in SO reports significant and equivalent in importance to SERs.

- *Operations and Maintenance Reminder (O&MR)*
  In the process of screening plant event reports and reviewing equipment failures reported to NPRDS, INPO sometimes identifies information that may be of special interest to other stations but is not significant as determined

by the INPO screening process. This information may be reported in an O&MR and transmitted via NUCLEAR NETWORK with recommended utility management distribution and INPO information contacts identified. O&MRs should be reviewed for applicability, and a determination made of the appropriate use of the information.

- *Special documents*
  Occasionally, INPO documents are published on special topics identified from work in the SEE-IN Program. Examples of topics that have been covered in such documents include root causes of events reported in SERs, scram reduction practices, valve mispositioning events involving human error, and industrywide operational performance of reactor protection and auxiliary feedwater systems.

SEE-IN documents describe the small fraction of events occurring worldwide that deserve special attention by nuclear utilities. The documents are intended for use by utilities in identifying and correcting deficiencies at plants that could lead to events similar to those described. It is the responsibility of the individual plant and utility management to determine how a problem discussed in a SEE-IN document applies to its specific situation. Experience has shown that, in some cases, plants may consider a SEE-IN report or a problem with a piece of equipment not used at their plant irrelevant. However, closer examination may identify functional similarities (e.g., different equipment but a similar function) that make the report applicable to the plant. For example, a problem with the turbine-driven auxiliary feedwater pump at a PWR also may have applicability to the turbine-driven reactor core isolation cooling pump at a BWR. Similarly, human performance problems associated with an event or equipment problems may also have applicability to other plants regardless of equipment type.

Therefore, it is important that every SEE-IN report receives a comprehensive review by each utility to identify needed corrective actions. SEE-IN documents clearly applicable to a particular reactor vendor or equipment manufacturer are annotated to reflect such information. All SEE-IN documents identify INPO information contacts who can provide additional information.

In a few cases, an event may be screened significant, but the lessons learned are applicable only to the plant that had the event. This would be the case, for example, when the problem is unique to a particular plant design or component. In these cases, the utility SEE-IN contact is notified of the determination, and a SEE-IN document is not issued.

2.4.2 Document Preparation and Review

SEE-IN documents are prepared to describe the event occurrence succinctly, including the contributing equipment and human performance problems that caused or complicated the event. The documents also are written to emphasize programmatic or underlying causes that experience has demonstrated are precursors to significant events.

Various resources are required to prepare a SEE-IN report, including any or all of the following:

- event reviews

- written event review and corrective action reports from the affected plant

- telephone contact with the affected plant, the NSSS vendor, associated equipment manufacturers and suppliers, and/or the architect/engineer

- INPO event data bases

- NPRDS

- previous SEE-IN and WANO reports

- plant drawings and procedures

- NRC data base (i.e., data base of NRC public documents)

- other material, such as EPRI reports and equipment supplier reports

The first three items are the major resources used in preparing SEE-IN documents. INPO event data bases are used to identify other similar events that have occurred and could provide more information for the SEE-IN document. These data bases also may be used to identify any specific trends or problems associated with the event, such as an increasing or decreasing rate of occurrence or applicability to a

particular plant design. Events at non-U.S. plants are included in these data bases and in the analyses performed using these data bases.

NPRDS analyzes the failure rate and trends of components that were important contributors to significant events. Failure rate comparisons, such as by plant, component manufacturer and model, and application, identify the magnitude and the industrywide applicability of a problem. Other plants with similar components also can be identi-fied from NPRDS and used as sources of additional information.

Previously published SEE-IN and WANO reports, along with NRC, EPRI, and supplier reports, are reviewed to identify related information that has been issued on similar events. INPO maintains an index of keywords for SEE-IN, NRC, and EPRI reports, computer-accessible by all INPO members and participants, to aid in identifying the related information. This information is then referenced, as appropriate, in the SEE-IN report.

An event and causal factors chart (see INPO 90-004, *Root Cause Analysis*) is sometimes used in preparing SEE-IN reports to assist in identifying the contributing causes to the event. The chart helps focus on the important physical and administrative barriers that failed to prevent the event. For SEE-IN reports written to describe a trend of events or for equipment and design deficiencies identified without an event occurring, the event and causal factors chart is not used.

After preparation, SEE-IN reports undergo extensive internal and external reviews before being disseminated as final documents. Each INPO technical division reviews the reports and provides comments. Preliminary drafts are transmitted for review and comment to the utilities named in the report. In addition, drafts are sent for review and comment to the applicable NSSS vendors, equipment suppliers, and other organizations such as architect/engineers, constructors, and EPRI, as needed.

Upon completion of the review phase, a final copy of the SEE-IN report is written and approved for dissemination to INPO members and participants for input to their operating experience review programs. If additional information becomes available after distributing the report, supplements or revisions to the original SEE-IN report are issued, as appropriate.

Because significant event notifications are provided primarily for information to ensure utility awareness of significant events as they occur or recur, the notifications typically involve less rigorous review and analysis. Likewise, they are subjected to abbreviated technical reviews appropriate to the topic.

2.4.3 WANO Event Reports

WANO event analysis reports (EARs) and event notification reports (ENRs) for non-U.S. nuclear power plants are reviewed for applicability to INPO member utilities. Applicable WANO reports are disseminated to INPO members as SERs, SENs, or SOERs. Similarly, significant events at U.S. nuclear power plants issued as SOERs, SERs, or SENs are reviewed by INPO for applicability to WANO members and, when appropriate, are transmitted to WANO.

SECTION 3

SEE-IN AND UTILITY PROGRAM INTERFACE

3.1 Operating Experience Review Program

By helping utilities exchange and learn from operating experience information, the SEE-IN Program functions as a centralized activity that supports the industry's efforts toward achieving excellence in the operation of nuclear power plants. In addition, it supports utility operating experience programs in meeting regulatory requirements.

The regulatory requirements pertaining to U.S. utility operating experience review programs are included in NUREG 0737, *Clarification of TMI Action Plan Requirements.* Item I.C.5 of NUREG 0737 specifies the following:

> ". . . [each licensee] shall prepare procedures to assure that operating information pertinent to plant safety originating both within and outside the utility organization is continually supplied to operators and other personnel and is incorporated into training and retraining programs."

In early 1982, the NRC issued Generic Letter No. 82-04 that endorsed utility use of the SEE-IN Program. The following is an excerpt from that generic letter.

> "The NRC has now completed its review of the SEE-IN Program, and a letter to INPO endorses utility use of the program. As stated in the letter, use of SEE-IN will relieve individual nuclear plant operators and constructors of the necessity of setting up large staffs to obtain and screen the large volume of raw data pertaining to operational experience throughout the industry. The NRC believes that full participation in SEE-IN will enhance your ability to meet the intent of the procedures approved under TMI Action Plan Item I.C.5."

Therefore, the NRC recognized the SEE-IN Program as an acceptable means of assisting utilities to meet regulatory requirements without having to duplicate this effort at each utility. INPO provides SEE-IN products to the NRC under a formal agreement to exchange operating experience data to improve the overall quality of technical information.

SEE-IN documents are considered proprietary and are not subject to Freedom of Information Act (FOIA) disclosure.

3.2 SEE-IN Contact

SEE-IN contacts coordinate interactions between INPO and a particular utility on matters related to SEE-IN. Each utility or plant has designated a SEE-IN contact with authority to coordinate with INPO personnel. INPO maintains a directory of names, addresses, and telephone and telecopier numbers of SEE-IN contacts. INPO relies on the SEE-IN contact for information on plant events and for coordination of the review of draft SEE-IN reports related to the plant. Effective coordination at this level ensures a mutually beneficial interface between SEE-IN and utility programs. In a similar manner, INPO maintains a directory of designated SEE-IN contacts for each supplier participant. Each utility and supplier participant is requested to notify INPO of any changes to the directory.

3.3 INPO Evaluations and Accreditation Team Visits

INPO periodically evaluates utility use of in-house and industry operating experience in their operating experience review programs and training programs as part of the evaluation and accreditation processes. These evaluations help identify needed improvements in a utility's programs and good practices that can be shared with other utilities. Specific areas examined during these evaluations are identified in INPO 90-015, *Performance Objectives and Criteria for Operating and Near-term Operating License Plants;* INPO 90-020, *Performance Objectives and Criteria for Corporate Evaluations;* ACAD 91-015, *The Objectives and Criteria for Accreditation of Training in the Nuclear Power Industry;* and ACAD 91-016, *The Process for Accreditation of Training in the Nuclear Power Industry.*

The operating experience review portion of INPO evaluations focuses on the implementation of utility programs for both in-house and industry operating experience review. INPO 89-005, *Guidelines for the Use of Operating Experience,* describes key elements

for effective use of operating experience at nuclear power plants and is intended to assist utilities in meeting the INPO performance objectives. The operating experience review portion of INPO accreditation team visits focuses on the incorporation of in-house and industry operating experience into the training curriculum.

INPO evaluations specifically examine the actions that plants have taken on SEE-IN reports. As a result, the implementation status of selected SOER recommendations is reviewed and reported by INPO to utility management in the evaluation report. During the evaluation, emphasis is placed on the effectiveness of utility actions taken on SOERs recommendations issued since the last evaluation and those previous recommendations identified by INPO

as needing periodic review for continued effectiveness of utility corrective actions. SERs and other reports are spot-checked for utility review, handling, dissemination to applicable plant personnel, and appropriate implementation of corrective actions. The entire evaluation team participates in reviewing the implementation of operating experience during the plant evaluation.

In addition to the evaluation process, when INPO identifies the occurrence of an event at a plant that should have been prevented or mitigated by proper implementation of a previously issued SOER recommendation, INPO notifies the utility. This notification may be through the issuance of an SEN describing the recurrence of the significant event and/or by direct contact with the appropriate utility manager.

SECTION 4

NUCLEAR NETWORK®

4.1 An Introduction to NUCLEAR NETWORK

NUCLEAR NETWORK is a computerized international communications system designed for the exchange of information vital to the safe, reliable, and efficient operation of nuclear power plants. The system was created in 1979 in response to the Kemeny Commission's recommendation that "an industrywide international communications network" be established "to facilitate the speedy flow of information." The system is accessed daily by the following members and participants:

- all U.S. utilities with either a construction permit or operating license for a nuclear plant

- the four U.S. NSSS suppliers (Westinghouse, General Electric, ABB-Combustion Engineering, and Babcock & Wilcox)

- several major architect/engineers and constructors of nuclear plants

- international organizations and utilities involved with nuclear power (INPO international participants and WANO)

- the major U.S. nuclear support organizations

Managed by INPO, the system resides on a mainframe and may be accessed using a computer and a modem. Users can send and receive information over telephone lines (called public data networks) that are designed to transmit data and thereby link users throughout the world with the INPO computer.

4.2 The Mechanics of NUCLEAR NETWORK

Information on NUCLEAR NETWORK is separated into subject-specific files called topics (defined in sections 4.3 and 4.4). Users may request access to any or all of these topics.

Once a message has been issued, it may be retrieved according to various retention periods by conducting one of several search methods. Messages in the topic files are retained for specified periods that vary with the nature of the topic (typically two years).

NETWORK's retrieval function allows users over 15 search parameters (e.g., using the name of the message recipient, message originator; organization identification; date; message number; and/or specific words, subject, or text) to choose from while searching the data base for specific operating experience information. For example, NETWORK's SEE-IN topic provides a complete source of all SEE-IN documents issued since 1980.

The *NUCLEAR NETWORK® Users Manual*, which is issued to each user, describes each system function and offers guidance for appropriate system use. Additionally, an on-line tutorial is available throughout the system and offers users immediate assistance and instruction. As a result of NUCLEAR NETWORK's conversion to a full-screen data base in 1991, the system is now similar in appearance and functionality to the Nuclear Plant Reliability Data System (NPRDS). Both systems are accessed using communications software called SimPC, which INPO provides to all authorized organizations.

4.3 The SEE-IN Program

NUCLEAR NETWORK is also the principal mechanism for transmitting and storing Significant Event Evaluation and Information Network (SEE-IN) documents. The recommended distribution for these NUCLEAR NETWORK messages is described under each topic message listed below. In addition, these messages should be forwarded to the plant manager or his designee for review and assignment to the appropriate line managers for action. The topics described below are used by INPO and the nuclear industry to exchange nuclear plant operating experience information.

- INPO SEE-IN Program Information (IS)— INPO uses the IS topic to transmit SEE-IN documents. These documents (e.g., SOERs, SERs, SOs, SENs) provide technical descriptions of events with generic safety implications along with a description of ongoing analyses. The recommended message distribution is defined in the SEE-IN document.

- Operating Plant Experiences (OE)—The industry transmits messages in the OE topic to describe operational events, recurring problems, and corrective actions taken in response to events at operating plants, as entered by the plant/utility staff. The recommended message distribution is determined by station management.

- INPO Operations and Maintenance Reminders (OR)—INPO uses this topic to transmit useful information discovered during the screening and analysis of operational data, (e.g., useful hints to improve component performance or reduce downtime). The recommended message distribution is to the manager specified in the message.

- Emergency Hotline (HL)—Industry and participants use the HL topic to describe plant status during an actual plant emergency, provide information regarding radiological releases (if any), relate corrective actions taken, and request emergency support equipment and personnel (as needed). The recommended message distribution is to the operations manager and appropriate individuals as indicated in the message.

- NRC Daily Plant Status Report (PS)—INPO uses this topic to transmit plant status information obtained by downloading highlights from the NRC's computer each morning. This report provides information on scrams, significant events, and changes in-plant status. The recommended message distribution is determined by station management.

4.4 Additional NUCLEAR NETWORK Topics

NUCLEAR NETWORK also provides subject-specific topics for industry use to ask questions and receive answers from counterparts throughout the world. Correspondence focuses on important industry issues in areas such as operations, maintenance, training, and technical support. The summary provided below defines NUCLEAR NETWORK's additional subject-specific topics.

- Coordination with INPO (CI)—This topic offers a forum for communications between INPO and NUCLEAR NETWORK users for discussing system features, requesting User Ids, or announcing changes in NETWORK coordinators. Recommended message distribution is to NUCLEAR NETWORK users and coordinators.

- Chemistry Information Exchange (CY)—This topic provides for the exchange of information related to chemistry policies, performance standards, and industry experiences. Recommended message distribution is to chemistry, training, and corporate managers supporting plant chemistry programs.

- Design Engineering & Configuration Management (DE)—This topic promotes questions and responses on design-control and design-change issues, configuration management, and engineering problems resulting in conditions or situations outside the plant design requirements. Recommended message distribution is to design engineering managers and maintenance and technical support managers.

- Emergency Planner Information Exchange (EP)—This topic facilitates discussion on emergency response training and preparedness issues. Recommended message distribution is to emergency preparedness department managers.

- Exchange of Miscellaneous Information (EM) —This topic provides for the exchange of information on subjects not belonging in other existing NETWORK topics. Recommended message distribution is specified in individual messages.

- Fire Protection and Plant Security (FS)—This topic enables exchange of information related to fire protection and plant security issues. Recommended message distribution is to security and fire protection managers.

- Good Practices from INPO Evaluation Reports (GP)—This topic enables INPO to issue messages on selected good practices identified during plant visits. Recommended message distribution is to plant managers, plant department managers, and other appropriate plant and corporate personnel.

- Human Performance Information Exchange (HP)—This topic promotes industry discussion on human performance issues; it is also used by INPO to transmit quarterly reports describing specific human performance situations that emphasize why events occur and provide the basis for corrective actions. Recommended message distribution is to human performance enhancement system (HPES) coordinators.

- Industrial Safety Information Exchange (SA)—This topic allows the industry to ask questions and receive information regarding personnel protection practices and standards to maintain a safe working environment. Recommended message distribution is to industrial safety representatives.

- International Information Exchange (IC)—This topic facilitates the coordination of the INPO international participant and international supplier program activities. Recommended message distribution is to as indicated in the appropriate NETWORK entries.

- Maintenance Information Exchange (MI)[4]— This topic enables the industry to send or request information related to plant maintenance, maintenance procedures, and maintenance scheduling or practices. Recommended message distribution is to maintenance managers.

- Meeting Announcements and Summaries (MA)—This topic offers a category for the industry and INPO to announce locations and agendas of upcoming meetings or to summarize past meetings. Recommended message distribution is specified in individual entries.

- NPRDS Information (NP)—This topic provides the industry and INPO with a category for sending or requesting information related to NPRDS scoping, data entry, data retrieval, or data use. Recommended message distribution is to NPRDS coordinators.

- NUCLEAR NETWORK Training (NT)—This topic offers users an opportunity to practice system functions and gain familiarity with various system options and features. The NT topic is also used by the industry to announce emergency drill scenarios. Recommended message distribution is to emergency preparedness department managers.

- Nuclear Quality Assurance Information Exchange (QA)—This topic discusses quality assurance programs, policies, methods, and experiences as well as regulatory positions and interpretations. Recommended message distribution is to quality assurance managers.

- Nuclear Records Management (NR)—This topic provides for the exchange of information on systems and procedures for the management, storage, and retrieval of documents such as plant drawings, health physics records, and quality assurance records. Recommended message distribution is to nuclear records managers and the technical librarians.

- NUMARC - Regulatory Processes and Interactions (NU)—This topic provides a mechanism for information exchange among NUMARC and U.S. nuclear utilities and supplier participants on managing the impacts of regulatory requirements and processes in ways that ensure safety benefits commensurate with implementation costs. The topic supports utility and NUMARC efforts associated with the strategic plan for improved economic performance. Recommended message distribution includes utility managers of licensing and regulatory compliance, vice presidents of nuclear operations or support functions, and NUMARC staff.

- Outage Information Exchange (OI)—This topic facilitates discussion on outage management, planning, and scheduling issues. Recommended message distribution is to outage managers, outage planners, maintenance managers, and ALARA (as low as reasonably achievable) coordinators.

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[4] This topic is available to WANO members for use.

- Operational Reactor Safety Review Information Exchange (SR)—This topic promotes the exchange of information on reactor safety review activities and plant operating review committees. Recommended message distribution is to independent safety engineering group (ISEG), design engineering, technical support managers, plant managers, licensing managers, and plant safety review board members.

- Operations Information Exchange (OP)[5]— This topic provides a category for discussing plant operations, procedures, simulator lessons learned, and shift management issues. Recommended message distribution is to operations managers.

- Probabilistic Safety Assessment Applications (PA)—This topic provides technical and managerial information exchange among utilities related to probabilistic safety assessment applications, methods, techniques, results, and insights. Recommended message distribution is to the independent safety engineering group (ISEG), design engineering members, technical support managers, plant managers, licensing managers, and plant safety review board members.

- Owner's Groups—These topics enable each owners' group to have a separate topic on NUCLEAR NETWORK. The topics are used by the Westinghouse (WO), General Electric (GE), Combustion Engineering, and Babcock & Wilcox (BW) owners' groups to exchange supplier-specific information and to coordinate items such as their programs, meetings, and responses to regulatory requirements. Recommended message distribution is to members of the owners' group.

- Parts and Materials Information Exchange (PM)—This topic coordinates industry efforts to obtain needed parts and materials to support safe and reliable plant operations and provides a category for the industry to submit summaries of vendor notices and bulletins. Recommended message distribution is to maintenance, engineering, materials and purchasing, and quality assurance managers.

- Radiological Protection Information Exchange (RP)—This topic enables industry users to discuss health physics programs and requests for information on radiological protection policies, methods, and experiences. Recommended message distribution is to radiological protection managers, corporate health physics managers, and plant department managers with responsibility for the radiological protection program.

- Regulatory Information Transmittal (RI)—This topic enables INPO to transmit information on NRC generic letters, I&E (inspection and enforcement) bulletins and notices, and other regulatory material to authorized participants. Recommended message distribution is to licensing managers.

- Strategic Plan - Productivity Improvement & Cost Effectiveness (SP)—This topic supports utility, NUMARC, EPRI, and INPO efforts associated with the industry strategic plan for improved economic performance. The topic provides a mechanism for information exchange among utilities on actions to improve operational cost-effectiveness. Recommended message distribution is to utility senior line managers, vice presidents of utility nuclear operations or support functions, NUMARC, EPRI, and INPO

- Technical Support Information Exchange (TI)[6]—This topic provides information exchange on surveillance testing, plant modifications, reactor engineering, performance monitoring, and other technical support activities. Recommended message distribution is to technical service managers, reactor engineers, and outage and modification managers.

- National Academy Training and Staffing Information Exchange (TS)—This topic promotes exchange of information related to nuclear utility training, staffing, and INPO Academy projects. Recommended message distribution is to corporate and plant training managers or the managers responsible for nuclear personnel matters.

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[5] This topic is available to WANO members for use.

[6] This topic is available to WANO members for use.

4.5 WANO's Use of NUCLEAR NETWORK

The World Association of Nuclear Operators (WANO) also uses NUCLEAR NETWORK to exchange operating experience information with utilities in over 30 nations. WANO uses 10 dedicated topics to communicate event reports and query other WANO members on issues relevant to the safe and reliable operation of nuclear power plants. In 1993, one NETWORK-dedicated topic, the Operations Information Exchange (OP) topic, was opened to allow direct information exchange between WANO and INPO members.

The topics used by WANO members are described below.

- Coordination with Atlanta (CA)—This topic is reserved for use by members of the Atlanta region for general information exchange.

- Coordination with Moscow (CM)—This topic is reserved for use by members of the Moscow region for general information exchange.

- Coordination with Paris (CP)—This topic is reserved for use by members of the Paris region for general information exchange.

- Coordination with Tokyo (CT)—This topic is reserved for use by members of the Tokyo region for general information exchange.

- Coordination with WANO (CW)—This topic is used by all WANO members for general information exchange.

- WANO Miscellaneous Plant Event (ME)—The WANO regional centers use the miscellaneous plant event topic to transmit information on events not meeting the event selection criteria of the WANO Policy Guideline but still considered of interest to other regions and their members. In order to provide flexibility in reporting, reports issued in this topic have no specified format.

- WANO Event Reports (WE)—This topic is used by regional centers and the coordinating center to transmit event notification reports (ENRs) and event analysis report (EAR) information for other topic members to read.

- WANO Information (WI)—This topic provides for general communication among all WANO members. Additionally, the WI topic is designed to provide information releasable to the public and to identify an information contact for additional inquiries, responses, or other feedback.

- WANO Regional Centers and Coordinating Center Communication (WR)—This topic provides a category for information exchange among regional centers and the WANO Coordinating Center in London.

- WANO Event Topic Reports (WT)—This topic is used by the regional centers to transmit event topic reports (ETRs) to members.

SECTION 5

SEE-IN PROGRAM EFFECTIVENESS

5.1 SOER Effectiveness Reviews

To ensure that the SEE-IN Program continues to identify industry-significant operating experience problem areas and that actions are taken to reduce the number, severity, and recurrence rate of significant events, INPO may periodically assess the effectiveness of SOERs. The purpose of this review is to assess overall SOER effectiveness in preventing recurrence of problems and to recommend corrective actions to resolve any weaknesses identified. The assessment of an SOER's effectiveness is based on the industry recurrence rate of similar events or precursors to similar events, and evaluations of the implementation of the SOER's recommendations. These reviews may be performed on selected SOERs until the frequency of such events indicates there is no longer a need for such a review. If the problems are not industrywide but continue to occur at a few plants, INPO works with the individual utilities involved to ensure the problem is corrected.

5.2 SEE-IN Program Effectiveness Reviews

A SEE-IN Program Effectiveness Review Committee made up of both on-loan and INPO personnel biennially performs an in-depth effectiveness review of the SEE-IN Program that includes assessments of the following:

- Screening of operating experience is technically accurate and thorough in determining the applicability of the information and the potential for the problem to occur.

- SEE-IN documents are timely and accurate, and they address the important issues contributing to events.

- SEE-IN documents are properly and efficiently disseminated to INPO members and participants and to appropriate INPO personnel.

- Pertinent operating experience information is incorporated into INPO evaluator training.

- NUCLEAR NETWORK is used effectively to exchange operating experience.

The effectiveness review may incorporate the following techniques to perform the assessment.

- observations of and interviews with INPO personnel to identify problem areas and training needs

- review of industry recurrent events to determine if appropriate comments and recommendations have been provided to the industry to reduce the recurrence frequency

- audits of the events screening results and data base accuracy

- analysis of selected significant events to determine if precursor events had occurred and the extent to which the lessons learned from precursor events were effective in reducing the probability of recurrence

The committee accepts comments and suggestions from employees and utility members on possible improvements to the SEE-IN Program and recommends program improvements to INPO management. In addition, the Analysis and Engineering Industry Review Group (IRG) periodically reviews the highlights and recent developments in the SEE-IN Program and provides feedback for improvements.

APPENDIX A

EVENT SIGNIFICANCE GUIDE

EVENT SIGNIFICANCE GUIDE

1. Severe or Unusual Plant Transients

A change to plant operating conditions that involved any one of the following:

a) Required a reactor scram and the need for operation of one or more safety systems (such as emergency core-cooling, primary system over pressure protection, extended use of emergency power systems).

   Note: Events that include only expected operation of post-trip decay heat removal systems (such as PWR auxiliary feedwater or BWR reactor core isolation cooling systems) are typically not considered significant.

b) Caused major equipment damage (such as damage to important valves or major piping).

c) Caused by unusual external conditions (such as earthquake, fire, flood, plane crash, gas explosion, or other external causes).

d) Required unusual actions to manage the event (such as actions not specified in abnormal or emergency operating procedures) or was misdiagnosed by the operators.

e) Proceeded in an unexpected way (such as different from the safety analysis or not in conformance with operating procedures).

f) Involved inappropriate operator actions (or inactions) or equipment performance (or modifications) that affected

proper control of core reactivity or heat removal.

g) Included multiple equipment malfunctions or personnel errors that affected the severity of the transient (such as malfunctions or errors in addition to the first one that directly caused the shutdown).

h) Involved a plant condition that severely inhibited the operator's ability to control or reduce the severity of the event or its consequences.

2. Safety System Malfunctions or Improper Operation

A significant degradation in the ability of a safety system* to perform its function during a test or plant transient, due to any of the following:

   Note: Single failures in single- or multi-terrain systems are typically not considered significant as long as the safety function could still be accomplished. However an event should be considered potentially significant if there were a single failure or other condition that concurrently affected (or had the potential to concurrently affect) the operability of components in multiple safety systems, or more than one independent train or channel within a safety system (e.g.,

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* Safety systems must operate under normal and/or accident conditions and are used to perform the following:

- Shut down the reactor and maintain it in a safe shutdown condition.
- Remove residual heat.
- Control the release of radioactive material.
- Maintain containment integrity.

common cause failure of components).

a) equipment failures (such as failure of a pump to start or continue running)

b) actuation failures (such as failure of actuation circuitry or logic to actuate equipment)

c) alignment or calibration errors (such as valve mispositioning or miscalibration of set points) that resulted in failure of equipment to perform its intended function

d) improper operation by control room or equipment operators (such as premature termination, inappropriate operation, or actuation that aggravated a transient)

e) unusual conditions (such as damage by lightning, physical impact from other equipment, corrosion, flood, fire, or support system failures)

3. Major Equipment Damage

A malfunction that resulted in damage to major plant equipment and caused any of the following:

a) lengthy unplanned plant outage or operation at significantly reduced power level (such as 10 effective full-power days or longer)

b) replacement or extensive repair to major equipment (such as steam generator, turbine, reactor coolant pump)

c) fuel rod failure that required a shutdown

4. Other Events Involving Nuclear Safety or Plant Reliability

An event involving plant safety or reliability deemed significant due to its causes or consequences. This may include events that had a strong potential to be more severe if different conditions that could be reasonably expected had been present. Events that may be included are those involving the following:

a) two or more concurrent failures of redundant components

b) failure of two or more important barriers[**]

c) problems that could easily have escaped detection

d) problems that resulted from a fundamental misunderstanding of plant performance or safety requirements

e) severe water chemistry excursion requiring prompt corrective action

f) problem trends, patterns, or failure rates that have a strong potential to lead to a significant event as defined in items 1 through 3

g) improper or nonconservative decisions by operators or plant management that reduced the margin of nuclear safety

h) other human performance problems that caused a reactor scram or other event or

complicated recovery from an event

5. Deficiencies in Areas such as Design, Analysis, Operation, Maintenance, Testing, Procedures, or Training

Discovery of a deficiency in one of those areas (such as design, analysis, operation, maintenance, testing, procedures, or training) that is likely to cause a significant event as defined in items 1 through 3 or 6 through 8

6. Fuel Handling or Storage Events

A fuel handling or storage event that involved any of the following:

a) damage to a nuclear fuel assembly that released radioactivity from the fuel

b) substantial uncontrolled loss of water from any area where fuel is required to be submerged (such as the spent fuel pool, fuel transfer canal, or reactor refueling cavity)

c) unanticipated loss or degradation of neutron absorber that increased the effective neutron multiplication factor (k-eff)

7. Excessive Radiation Exposure or Severe Personnel Injury

An incident involving personnel at the plant that led to any of the following:

a) exposure to ionizing radiation in excess of regulatory limits or unplanned exposure exceeding one REM

b) a work-related accident (not illness) that resulted in any one of the following:

- a fatality
- hospitalization (overnight or longer) of several people
- a permanently disabling injury (such as loss of a limb)

c) an incident that had a strong potential to result in an event (such as 7.a or 7.b) if different conditions that could be reasonably expected had been present

8. Excessive Discharge of Radioactivity

Any release off-site of radioactivity in solid, liquid, or gaseous form in excess of regulatory limits
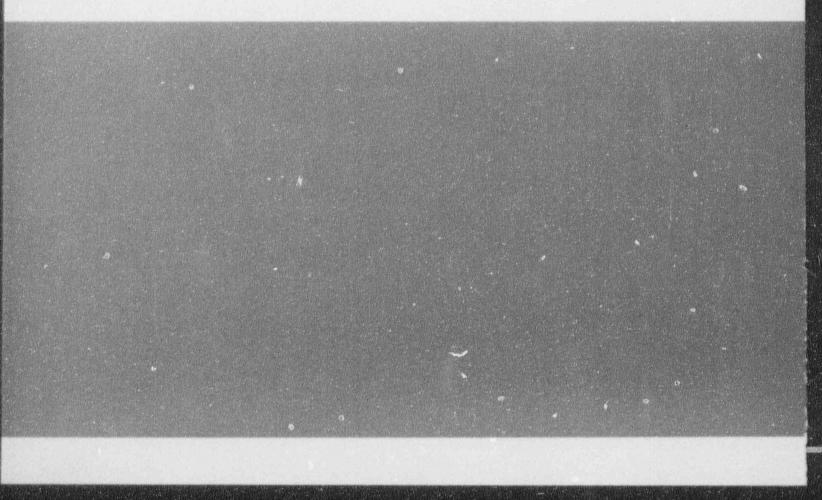

[**] Barriers are the physical, administrative, procedural, or other controls that should have prevented an event from happening.

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February 8, 1994

MEMORANDUM FOR: Darlene Huyer
Anstec, Inc.

FROM: Tremaine Donnell, INPO Coordinator
Records and Archives Services Section
Information and Records Management Branch
Division of Information Support Services

SUBJECT: ESTABLISHMENT OF DATA RECORD FOR INPO DOCUMENTS

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