

**U. S. Nuclear Regulatory Commission  
Reactor Operating Experience Program  
Management Directive Handbook 8.7**

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## Part I

### Introduction

In 1999 the agency implemented a significant strategic change and dissolved the Office of Analysis and Evaluation of Operational Data (AEOD) and transferred its core operating experience (OpE) functions to the Offices of Nuclear Reactor Research (RES) and Nuclear Reactor Regulation (NRR). Summarily, the short term OpE functions were assigned to NRR and the longer term efforts assigned to RES.

By mid-2002, both RES and NRR acknowledged that post-AEOD OpE program needed reassessment. This acknowledgment, coupled with findings of the Davis-Besse Lessons Learned Task Force (DBLLTF), which found substantial shortcomings in the agency's OpE activities, led to NRR and RES jointly chartering an interoffice Reactor Operating Experience Task Force (ROETF) to formally assess the agency's OpE activities, establish objectives and attributes for the agency's OpE efforts and make recommendations for improvement.

The ROETF completed its efforts and published its findings in November 2003. The report (ML033350063) with its establishment of objectives and attributes and 23 recommendations, forms the foundation for Management Directive (MD) 8.7 and this Handbook. For a complete historical perspective on the agency's OpE activities, refer to ROETF report, Section 2.

Based on the ROETF report, the agency adopted the objectives of the agency's OpE activities as:

- C OpE information is collected, evaluated, communicated, and applied to support the agency goal of ensuring safety.
- C OpE is used to improve the effectiveness, efficiency, and realism of NRC decisions.
- C The public, Congress, and other external stakeholders are provided with accurate, timely, and balanced information regarding operational experience, including actual or potential hazards to health and safety.

To establish an effective OpE program and to accomplish these objectives, the following seven attributes will be applied:

1. Clearly defined and communicated roles and responsibilities. Management expectations are clearly articulated and communicated and organizational roles and responsibilities clearly defined. Organizational responsibilities include collection, screening, evaluation, corrective action, and followup activities. Responsibilities for internal and external coordination and communications are also clearly defined, including the interfaces between the organizations reviewing OpE and the inspection, licensing, and research organizations. A single point of contact is established to provide overall coordination for responsibilities distributed throughout the agency.
2. Efficient collection, storage, and retrieval of OpE. Sources of OpE for collection, storage, and retrieval are identified. These sources include OpE from industry and foreign sources, as well as agency-generated information. The sources of OpE are sufficiently comprehensive and of sufficient quality to meet specific user needs and the collection and storage minimizes duplication by multiple organizations. Data systems provide user-friendly retrieval capabilities for a wide range of users.
3. Effective screening of OpE for followup evaluation. OpE is promptly screened for followup using appropriate criteria and thresholds to determine whether the OpE is, or could be, risk significant; has, or could have, generic implications; or is, or could be, important from a public confidence perspective. Priority is assigned for evaluation commensurate with the overall significance of the OpE.
4. Timely communication of OpE to stakeholders for information or evaluation. OpE is communicated to stakeholders in a timely manner for information or evaluation. The communication clearly and concisely identifies the issue of concern and puts its significance in proper perspective.
5. Timely and thorough evaluations of OpE to identify trends, recurring events, or significant safety issues for appropriate followup actions. Timely and thorough evaluations of OpE will involve both short-term and long-term efforts to identify trends, recurring events, or significant safety issues. Timely short-term evaluations are necessary to promptly initiate regulatory actions aimed at resolving immediate safety issues and precluding or correcting similar conditions at other facilities. Long-term evaluations to assess safety performance typically use a broader range of OpE input, including reports on individual events and conditions, performance measures, and retrospective

information. Long-term evaluations also identify trends and safety issues and their implications for NRC programs. Evaluations are sufficiently thorough to understand the event or condition, contributing factors, root causes, safety significance, and generic implications. Appropriate internal and external organizations are involved, as necessary, to ensure evaluations are complete and accurate.

6. Timely decisions on implementation and appropriate followup resulting from the review of OpE. Timely decisions and actions are taken in response to short-term and long-term evaluations of OpE. The decisions address the need for externally directed regulatory actions as well as appropriate changes to NRC programs. The OpE program identifies activities or actions necessary to ensure timely implementation and followup in response to a regulatory determination. The OpE program also assesses the effectiveness of regulatory and licensee actions taken in response to a lesson learned from the OpE program.
  
7. Periodic assessments of the OpE program to determine its effectiveness and to identify needed improvements. Periodic assessment of the OpE program is conducted to determine how effective the agency has been in using OpE to reduce the severity or recurrence rate of industry events. An effectiveness review provides feedback from stakeholders to agency management and recommends corrective actions to address identified deficiencies.

It is a fundamental premise that a properly constructed and implemented OpE program based on these attributes will ensure that the agency OpE program objectives are met.

## **Part II**

### **Core Reactor OpE Program Infrastructure & OpE Information Processing**

Numerous organizations within the agency, including the Offices of NRR, RES, Regions, Nuclear Safety Incident Response (NSIR), Chief Information Officer (OCIO), and Human Resources (HR), have substantial responsibilities in meeting the objectives of the reactor OpE program. The OpE *Clearinghouse* has been adopted by the agency as the focal point for implementing the elements of the OpE process that are described in OpE program attributes 2 through 6. The *Clearinghouse* provides a centralized function within the agency to collect, store, screen, prioritize, and distribute OpE information to interested users; facilitate and track OpE evaluation and application activities; facilitate communication of OpE lessons learned; and coordinate NRC OpE activities among organizations performing OpE functions. This *Clearinghouse* resides in the Operating Experience Section (OES), Reactor Operations Branch (IROB), Division of Inspection Program Management (DIPM) of NRR and functions in coordination with other NRC organizations to ensure that activities necessary to achieve the program objectives and attributes are effectively implemented.

The preceding description of the reactor OpE program infrastructure and information processing is largely based on processing OpE issues that are provided as inputs to the overall process. The OpE inputs consist of new information that depicts a recent event or condition at a plant or a number of plants or analyzed OpE information stemming from detailed reports or studies depicting longer-term analyses and evaluation. RES conducts studies that directly address OpE-related issues and studies that contain OpE-related information. These studies are then reviewed by the RES staff working in OpE arena to distill and package readily useful OpE insights and prepare them as inputs to the reactor OpE program information process.

#### **Definitions**

*Application* (of or *Applying* OpE information) -- Taking actions, based on insights and/or recommendations resulting from OpE *evaluations*, that could involve communicating with internal and external stakeholders, taking regulatory actions, and/or influencing agency programs. The *Application* phase is the last of the four phases that constitute the OpE process.

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*Clearinghouse* -- A team within OES that provides a centralized function within the agency to collect, store, screen, prioritize, and distribute OpE information to interested users; conduct and facilitate OpE *evaluation* and *application* activities; facilitate communication of OpE lessons learned; and coordinate NRC OpE activities among organizations performing OpE functions.

*Designated Representatives* -- Individuals within the Offices of Nuclear Reactor Regulation (NRR), Nuclear Regulatory Research (RES), Nuclear Security and Incident Response (NSIR), Chief Information Officer (OCIO), Human Resources (HR), and the Regions, assigned as advocates for the OpE program within their organization.

*Evaluation (of or Evaluating OpE Information)* -- A review of *screened-in* OpE information by the *Issue Manager* and/or by NRR, RES, or NSIR staff to determine the significance of OpE information and to glean OpE insights and lessons learned that could be applied toward agency *application*. (Note: The issue manager generally makes the first attempt at performing the *evaluation*. If the *evaluation* requires expertise beyond the capability of the Issue Manager or the Clearinghouse, the *evaluation* is *handed-off* to an appropriate technical expert in NRR, RES, or NSIR). The *evaluation* should be provided in writing according to the guidelines provided by NRR Office Instruction, LIC-401, "NRR Reactor Operating Experience Program." The written *evaluation*, in addition to insights and lessons learned, should contain recommendations for *applying* the subject OpE information. *Evaluation* phase is the third of the four phases that constitute the OpE process.

*Hand-off* -- A transfer of responsibility for the *evaluation* and/or the *application* of a given *Issue for Resolution* from the *Clearinghouse* to various agency technical and program staffs. For cases involving *hand-off*, the *Issue Manager* project manages the *Issue for Resolution* through the *Evaluation* and *Application* phases in support of established schedules.

*Issue Manager* -- An individual within the *Clearinghouse* responsible for tracking and project-managing an "*Issue for Resolution*" through the *Evaluation* and *Application* phases of the OpE process.

*Issue for Resolution* -- a matter involving OpE information that becomes captured by the screening and trending phase of the *Clearinghouse* OpE process and will be further processed for subsequent *evaluation* and/or *application*.



*Screening* -- The first review of OpE information that is entered into the OpE process as OpE input. The purpose is to determine its potential for significance based on risk assessment and/or qualitative judgment that considers degradation in safety margin, defense-in-depth, or other safety or agency concerns. The *Screening* phase is the second of the four phases that constitute the OpE process.

### **Core Reactor OpE Program Infrastructure and Information Processing Overview**

The diagram shown in Exhibit 1 depicts the NRC Reactor OpE Program infrastructure and how OpE information is processed. The following are the key points of this process flow diagram:

- C The objective of the process is to ensure OpE information is collected, stored, *evaluated*, communicated, and *applied*.
- C Communication of OpE to internal stakeholders occurs throughout the process.
- C Many NRC organizations have a role in the process.
- C *Application* of OpE information means taking actions that could involve informing internal and external stakeholders, taking regulatory action, and/or influencing agency programs.

As shown in Exhibit 1, the role of the Reactor OpE *Clearinghouse* is central to this program. The NRR, RES, Regional Offices, and NSIR contribute significantly to the program at various phases of the OpE process. The NRR Program Management, Policy Development, and Planning Staff (PMAS) and the OCIO, as necessary, provide unique contribution to the program by establishing and maintaining IT tools and interfaces that are vital to running the OpE program.

The Reactor OpE program consists of a process for handling OpE information from the time that it first becomes available to the final action of applying significant OpE information to the agency's regulatory activities. As shown in Exhibit 2, the facilitation of this process involves four phases to accomplish this purpose: (1) collecting, storing, and making available new OpE information, (2) *screening* and trending OpE information, (3) *evaluating* of OpE information and (4) *applying* OpE lessons learned from the *evaluations*. Each of these phases is discussed, in detail, in subsequent sections.



Reactor OpE Program Attribute 4 addresses the need for timely communication of OpE to stakeholders for information and evaluation. Communicating OpE information is an essential element of all four phases of the process. The program leverages the use of information technology (IT) to efficiently and effectively communicate OpE to internal stakeholders.

Exhibit 3 shows the task of communicating appropriate OpE information to internal stakeholders at various points along the OpE information process. Internal stakeholders communication is intended to promptly inform appropriate staff and/or management of significant OpE information and to share details, insights, and lessons learned from events in a timely manner. These activities include: briefing the NRR ET/LT every morning, promptly communicating relevant OpE information to agency management and technical experts (e.g., RES, regions, NSIR, and NRR) involved in the OpE process through continual advancements in IT, issuing OpE Quarterly Reports, and providing monthly operating events briefing. Communication tools such as Director's Highlights, Plan of the Week, and EDO Daily Notes, as appropriate, are used to inform internal stakeholders of OpE generic communication prior to their release.

The *Clearinghouse* team meets on a periodic basis with the NRR technical program divisions' *Designated Representatives* to discuss the status of current issue-assignments within their organizations as well as other OpE-related issues of concern within the technical or program divisions that the *Clearinghouse* has not identified as *Issues for Resolution*.

The *Clearinghouse* team meets periodically with RES OpE staff to be updated on RES's work related to providing distilled results of OpE-related studies and distilled evaluations of other RES studies (not directly related to OpE) that contain OpE-relevant information. Other benefits of these periodic meetings include exchange of ideas and lessons learned from various OpE *evaluations* or other important OpE-related information as well as identifying other important OpE issues that have not been previously identified as *Issues for Resolution*.

External stakeholder communications inform external stakeholders (e.g., licensees and the public) of significant OpE information. Examples include: coordination and issuance of generic communications, Morning Reports, Preliminary Notifications, and notifications made available through the web; coordination of NRR input to the Abnormal Occurrence (AO) program reports and the INES ratings/Incident Reporting System reports (IRS); assessment and reporting of the INES ratings for

all power reactor events; development and reporting in accordance with IAEA Incident Reporting System.

### **Reactor OpE Process Phase 1: Collecting, Storing, and Making Available OpE Information**

The first phase of the OpE process involves collecting, storing, and making available OpE information to the NRC staff. The OpE information made available serves as inputs to be processed in the reactor OpE program information process. In addition, the OpE information is being made available to every NRC staff via IT tools for their information and use. The OpE information made available to the staff is categorized into two general areas.

The first category of OpE information includes those inputs considered new information that depict recent events or conditions at a plant or a number of plants. The most notable sources through which this type of OpE information is provided to the staff are the Event Notifications and the Licensee Event Reports provided by the licensees in response to reporting requirements in 10 CFR 50.72 and 50.73, respectively. Other sources include 10 CFR Part 21 reports, Morning Reports, Preliminary Notifications, daily morning conference calls between NRR/DLPM Project Directorate management and regional management, foreign reports (International Nuclear Event Scale [INES] events, Incident Reporting System [IRS] reports), and Headquarters Operations Officer security reports. The information gleaned from these sources is typically preliminary and requires gathering of additional information to assess their significance.

The second category of OpE information is previously “analyzed” OpE information that typically contains insights and lessons-learned related to the subject OpE topic. Sources of this type of OpE information include generic communications (e.g., information notices, regulatory issue summaries), inspection findings (from inspection reports), Institute of Nuclear Power Operations (INPO) Significant Event Evaluation Information (SEE-IN) reports, and numerous reports and studies generated by RES that are germane to reactor OpE (e.g., Accident Sequence Precursor reports and system studies).

The third category includes OpE information or concerns initiated by the staff. Any OpE-related issue not captured by (or inadequately addressed in) the two general categories of OpE information sources can be brought in as an input to the OpE process for screening by any NRC staff. These OpE inputs are expected to have sufficient background information and written basis expressing the OpE concerns at

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hand. An OpE issue raised by the staff that has the support of Branch Chief level management or higher within NRR, RES, NSIR, or the regional offices may automatically become *Issue for Resolution* (see discussion Phase of the OpE process).

Table 1 provides a list of sources through which OpE information is made available to the staff. All content generated by these OpE information sources are reviewed on a routine basis as inputs to the overall OpE process.

Table 1. OpE Information Sources

Defined Scope of OpE Information Sources		
“New” OpE Information	“Analyzed” OpE Information	Staff initiatives
Event Notifications (10 CFR 50.72)	Generic Communications - Information Notices - Regulatory Issue	Individual staff concerns
Licensee Event Reports (50.73)	Summary - Generic Letters - Bulletins	Staff concerns supported by Branch Chief level or higher (e.g., Staff concerns raised through Task Interface Agreement that is germane to OpE)
Preliminary Notifications	Inspection findings	
Morning Reports	INPO SEE-IN reports - SOER	
Part 21 Reports	- SER - SEN	
HOO security reports	- O&MR	
Foreign reports - INES events - IRS reports	RES feeds (RES reports that have been distilled and packaged as inputs to the process) - ASP reports - component and system studies - various other research studies	
Daily morning calls with Regions		

The *Clearinghouse* is responsible for ensuring these sources of OpE information, with the exception of verbal sources, are made available to the NRC staff through a centralized web portal available on the NRC's Intranet or via other electronic media. NRR/PMAS in conjunction with OCIO, as necessary, provides IT support to ensure best web practices and database tools are utilized to make OpE information available in the most efficient manner.

It is noted that the list of OpE information sources listed in the above table contains information that are germane to plant events and conditions. The agency also provides other OpE-related products that may provide this type of information but their main purpose is to serve as databases (e.g., Common Cause Failure Database, EPIX) or analytical tools (e.g., Sapphire, SPAR models) to assist the staff in screening or evaluating OpE information. These databases and analytical tools are not part of the information sources that the Clearinghouse reviews on a routine basis; rather, they are tools and information sources available to the staff for their OpE analyses.

### **Reactor OpE Process Phase 2: Screening and Trending OpE Information**

The second phase of OpE information processing involves the *Clearinghouse* staff to review a new piece of OpE information (typically depicting a recent event or a changed condition at a plant or previously analyzed OpE information from various reports or studies) to determine if the subject OpE input has potential significance. The task is to *screen*-in those OpE information that may need to be formally *evaluated* to determine their safety significance, generic applicability, recurring or trend pattern, to identify new failure mode or material degradation, or to address other relevant agency concerns.

Oftentimes, OpE information gleaned from the sources listed in Table 1 may not contain sufficient information for the Clearinghouse staff to perform a *screening* analysis. For these situations, additional information can be obtained from the regional inspection staff, the licensee, INPO or other industry or owners groups. If the information is to be obtained from the regional inspection staff, the *Clearinghouse* staff should communicate with the regional Projects Branch Chief for the reactor site in question. If it is to be obtained from the licensee or the owners group, the *Clearinghouse* staff should work through the respective NRR/DLPM Project Manager. The *Clearinghouse* staff interfaces directly with INPO counterparts to exchange OpE-related information via their weekly conference calls.

A set of screening guidelines that considers risk and qualitative factors such as potential existence of generic implication, adverse trend, new phenomena (e.g., novel failure mode, material degradation) are applied to screen-in those OpE inputs that are potentially significant and are subject to detailed *evaluation*. The screening guidelines are detailed in NRR Office Instruction, LIC-401, “NRR Reactor Operating Experience Program.”

The *Clearinghouse* team decides if an OpE input meets any of the guidelines during the daily OES morning meetings. OpE information that does not meet any of the guidelines is *screened* out and typically does not require any follow-up actions. However, the team can decide if certain *screened*-out OpE information should be communicated to relevant technical expert or inspection staff for information only.

Two types of OpE information are considered to be automatically screened-in when they are submitted as inputs to the OpE process. The first type is an OpE issue raised by the staff that has the support of Branch Chief level management or higher within NRR, RES, NSIR, or the regional offices. These inputs will be processed by the Clearinghouse as automatically screened-in inputs since it is presumed that the significance of the subject OpE issue would already have been considered and noted.

The second type consists of RES OpE feeds. These inputs are the concisely packaged OpE-related information that have been distilled from RES staff’s review of RES studies. These inputs will also be screened-in automatically since they would represent analyzed OpE information that could be important. Moreover, it is anticipated that the content of the distilled inputs would already contain evaluation of issues with insights and lessons-learned contained in the input package, along with recommendations for applying such OpE information toward agency functions.

If OpE information is *screened*-in as potentially significant, it is, then, labeled as “*Issue for Resolution*.” One member of the *Clearinghouse* staff, is, then, assigned the task of project-managing the *Issue for Resolution* through the remaining phases of the OpE process. The assigned “*Issue Manager*”, then, gathers additional information, as necessary, in preparation for the next phase, *evaluation*.

As shown in Exhibit 4, tracking for recurring events is an integral part of the *screening* portion of OpE process. Although it is expected that a majority of OpE input will not be *screened*-in, the *Clearinghouse* has a separate task to track all screened (in or out) OpE inputs to identify any adverse trend that may be present.

Any OpE inputs or set of inputs that show a recurring or an adverse trend pattern will be fed back into the *screening* portion of the process to determine whether they should be *screened-in* per the guidelines and be subject to further *evaluation*. It is noted that this tracking function to identify recurring events or adverse trend is not a program aimed at developing a long-term trend, rather, the task is viewed as a tool to identify short-term recurring events.

### **Reactor OpE Process Phase 3: Evaluation of OpE Information**

After OpE information is *screened-in* (and is thus labeled *Issue for Resolution*) and has been communicated to various stakeholders in the process, it is then *evaluated* to clearly determine the significance of its impact on plant operation and safety.

The first form of *evaluation* that must be performed for issues that the regional or headquarters staff recognize as potentially significant, is the *evaluation* to determine whether a reactive inspection would be necessary, and if so, the type of reactive inspection that would be most appropriate. Guidance and instructions on this process are contained in MD 8.3, "NRC Incident Investigation Program" and Manual Chapter 0309, "Reactive Inspection Decision Basis for Reactors."

Another type of evaluation that must be performed is the INES evaluation. MD 5.12, "International Nuclear Event Scale Participation" commits NRR to evaluate reactor events per the INES scale and report to the international community those that are rated level 2 or higher within 2 business days. It is noted that the INES evaluation should be conducted for all notable OpE inputs and not just for the ones that have been screened-in.

Regardless of whether the OpE information is evaluated for a reactive inspection, an *evaluation* is conducted to glean OpE insights and lessons-learned that could be applied toward agency action. The *Issue Manager* has the responsibility to ensure that the *evaluation* is performed within schedule. The *Issue Manager* is expected to serve as the primary evaluator for the *Issue for Resolution*.

However, for cases requiring technical expertise or capability beyond that of the *Issue Manager* or the *Clearinghouse* staff, the *Issue for Resolution* is *handed off* to a technical expert (in NRR, RES or NSIR) for the task of providing an evaluation. For cases that are multi-faceted, the *Issue for Resolution* may be *handed off* to additional technical experts, as needed. For example, an issue that represents a materials degradation within reactor coolant system that has a potential for causing high risk condition may need separate evaluation from staff members with expertise



in materials engineering, reactor systems, and risk analysis. For these cases, the assigned *Issue Manager* handles the *hand-off* and functions as a project manager from that point on to ensure that the *evaluation* is completed within schedule.

The objective of *evaluating* OpE information is two-fold. The first is to assess the significance of the subject OpE to glean important OpE lessons. The second is to make recommendations, if any, on how to *apply* the lessons learned. The *evaluation* should assess, as applicable, attributes that are similar to those considered for the *screening* guidelines. These include a determination of the risk significance and/or qualitative determination of other safety or agency concerns for the subject OpE information as described in NRR Office Instruction, LIC-401, "NRR Reactor Operating Experience Program."

When *evaluating* quantitative risk associated with OpE information, the following information, at a minimum, should be reported: risk metric(s)/measures, dominant sequences and cutsets, and assumptions applied in the analysis - sensitivity analysis is acceptable if sufficient information is not available to support analytical assumptions. A more detailed guidance is provided in NRR Office Instruction, LIC-401, "NRR Operating Experience Program."

An *evaluation* report should be generated for every *Issue for Resolution*. The *Issue Manager* (whether he or she serves as a sole evaluator/author or functions as a project manager for a *hand-off* to technical experts) has the overall responsibility for packaging and delivering this report to the OES management. If technical experts are tasked to provide the evaluations, they should submit an input of their findings to the *Issue Manager* in a report form. The input should contain, as necessary, recommendations for applying lessons-learned or insights gleaned from such information in future regulatory activities (see Attachment 3). The *Issue Manager*, then, incorporates or references the experts' input in the final evaluation report.

Recommendations could involve any or combinations of the following actions: communicating lessons learned to various internal and external stakeholders; taking a regulatory action in the form of requiring responses from licensees pursuant to 10 CFR 50.54(f); influencing agency oversight, licensing, incident response, security, or launching research programs. If a decision is made by the *Clearinghouse* not to pursue further *evaluation* of OpE information, then the task associated with the subject OpE information should be closed out by the assigned *Issue Manager*, citing a basis for the closure.



It is noted that OpE issues that evolve into separate higher level initiatives outside the scope of the reactor OpE program or other agency processes are *handed-off* to those respective programs or processes for further *evaluation* and *application*. Examples of these programs and processes include the agency's Generic Issues Program, the Task Interface Agreement process, and the rulemaking program.

#### **Reactor OpE Process Phase 4: Applying Lessons Learned from OpE Evaluations**

Once the *Issue Manager* or the technical expert completes the *evaluation* of OpE information and submits a report containing the *evaluation* analysis, findings, and recommendations to the *Clearinghouse*, the *Clearinghouse* Team reviews the recommendations (with the *Issue Manager* serving as the advocate) to decide whether further action is warranted. The *Clearinghouse* Management decides, in consultation with other appropriate NRC managers when necessary, whether or not to adopt the recommendations for applying the subject OpE information.

The options for *applying* the lessons learned consist of: (1) communicating OpE lessons learned to various internal and/or external stakeholders, (2) taking a regulatory action to require responses from the licensees pursuant to 10 CFR 50.54(f) or issuing orders for actions and/or (3) influencing agency programs.

For Option 1 above, internal communications can be provided through various mechanisms including Quarterly Reports, monthly OpE briefings, Reactor OpE Program subscription e-mail service, Reactor OpE Program web posting, and formal training. Formal external communications will be performed using the Information Notice or the Regulatory Issue Summary forms of generic communications in accordance with NRR Office Instruction, LIC-503, "Generic Communications Affecting Power Reactors

Option 2 can include collecting information from the licensee through the Bulletin or Generic Letter options of generic communications in accordance with NRR procedure, LIC-503, "Generic Communications Affecting Power Reactors." Or under more serious circumstances, the agency can issue an order or a CAL.

Option 3 could affect changes to various regulatory programs, including inspection, oversight, licensing, incident response, security, rulemaking, or research programs. It could also include launching new programs or studies to better understand the challenges presented by the subject OpE information (e.g., RES study, Generic Issues Program).

With respect to applying lessons learned in the inspection program, there are generally three actions that can be performed. They include: (1) informing or educating the inspection staff, (2) issuing a Temporary Instruction, or (3) revising inspection procedures. The Chief of the Inspection Program Branch (IIPB) will determine in which manner the inspection program will be influenced.

The assigned *Issue Manager* serves as the advocate for ensuring that OpE information is applied toward the development of an *application* output. The project management role of this task depends on the type and complexity of the products. The responsibility of certain outputs, e.g., generic communications, are already under the domain of the OES staff and are thus amenable to the *Issue Manager* to project manage the *application* through its completion. However, for other *application* products, e.g., rulemaking, which could require a prolonged period of development, the task may be *handed off* completely to the rulemaking staff.

### **Resolving Potential Management Challenges in Phases 3 and 4**

The *evaluation* of OpE Information and *applying* lessons learned from the *evaluations* (i.e., Phases 3 and 4) may involve expertise and human resources beyond the control or influence of the *Clearinghouse* staff. Since OpE *evaluation*, by its nature, is reactive, conflicts related to resource and schedule management could arise. Resources needed to execute *evaluations* and to *apply* proposed recommendations may not be readily available. Additionally, responsible managers may not always agree on the need to provide an *evaluation* report requested by the *Clearinghouse* and similarly, disagreements could arise with respect to *application* of the lessons learned. To handle these situations in a formal and systematic way, the model shown in Exhibit 5 should be used to address these potential management challenges in Phases 3 and 4.

### **Reactor OpE Knowledge Transfer**

To support the agency's knowledge transfer of significant reactor OpE information, the *Clearinghouse* coordinates with the Technical Training Center of the Office of Human Resources and the agency's IT staff (NRR/PMAS and/or OCIO) to develop methods for OpE knowledge transfer. The *Clearinghouse* team provides, on an as needed basis, OpE information (reviewed and approved by the OpE program manager) that has been *evaluated* and *applied* to this coordination effort in order to help package the information for an appropriate training medium.

The *Clearinghouse* also coordinates with Office of Human Resources to apply its Knowledge Management (KM) initiative to the reactor OpE program activities. The objective of KM is to capture critical information and make the right information available to the right people at the right time.

### **Assessing Effectiveness of NRC Reactor OpE Program**

The OpE senior manager, also serving as the director of Division of Inspection Program Management, is responsible for assessing the effectiveness of the newly revised OpE program described in MD 8.7 and in NRR Office Instruction, LIC-401, one year after implementing the new program. The OES staff supports this task by assisting in the development of methods to assess the program's effectiveness as well as providing essential data and information to be applied in the methods. Thereafter, a periodic assessment is to be performed about every three years by a group external to the *Clearinghouse*. The OpE senior manager will identify this group and solicit their agreement to conduct these periodic reviews.

Assessment methods could include any one or a combination of the following options: tracking to ensure accounting, decision-making, and *application*, as necessary, of every OpE input in the OpE process; reviewing safety significant events during a given time period and assessing the role of the OpE program in identification and effective followup of those events; interviewing agency staff or informally testing them (without accountability) through a training program to determine their awareness of some of the significant lessons learned from OpE; and reviewing how OpE *evaluations* are applied to support staff's regulatory activities.

## **Part III**

### **Other Reactor OpE Program Activities**

There are other inter-office OpE functions and activities that are essential to the agency's overall OpE program, but are not directly related to the core OpE information processing infrastructure described in Part II. These functions and activities are described below.

#### **RES Reactor OpE-Related Programs and Activities**

The reactor OpE-related programs and activities conducted by RES are described below.

##### **Operating Experience Database Systems**

Several databases provide the basic inputs for the Division of Risk Analysis and Applications/RES analysis activities and serve as the agency's source of data for use by staff analysts. The database systems include the Integrated Data Collection and Coding System, Reliability and Availability Data System (RADS), Common-Cause Failure (CCF) Database, Fire Events Database, Accident Sequence Precursor (ASP) Events Database, and the Human Event Repository and Analysis database. Data are collected from Licensee Event Reports, Licensee Monthly Operating Reports, NRC inspection reports, and industry databases. The data collected include component and system failures, demands on safety systems, initiating events, fire events, common-cause failures, and human factors. PRA parameters estimated from RADS and CCF are used by NRC PRA analysts to update SPAR models. The industry uses this data to update plant-specific PRA models.

##### **Trending Analysis of Operating Experience Information**

Division of Risk Analysis and Applications/RES research supports the Industry Trends Program by analyzing and trending OpE data. This includes updating data on initiating events, component and systems unavailability, common-cause failures, and fire events to examine any trends that might exist in these data.

NRR uses this data to: (1) monitor trends and reports results to Congress; (2) monitor industry-wide safety performance and provide feedback to the ROP; and (3) enhance plant inspections of risk-important systems. NRR uses data and trends to support risk-informed technical reviews. RES uses data for input to NRC PRA models. The analyses results are available to stakeholders on the Reactor Operational Experience Results and Databases web page on the NRR web site. Analyses findings and insights are used to develop instructions and guidance for licencing staff.

### **Risk Evaluations of Reactor Operational Events**

Under the Accident Sequence Precursor (ASP) Program, the risk associated with operational events and/or conditions is evaluated by systematically reviewing and evaluating OpE to identify precursors to potential severe core damage sequences, documenting precursors, categorizing them by plant-specific and generic implications, and providing a measure of trending nuclear plant core damage risk. The objectives of the ASP program are to determine the safety significance of events and their regulatory implications; provide feedback to improve PRA models; and provide NRC Strategic Plan performance measures and ASP precursor occurrence rate trending for the annual Performance and Accountability Report to Congress.

The results of the ASP analyses are used by the Industry Trends Program in monitoring the trend in precursor events. ASP results are provided to NRC staff, the annual SECY paper on ASP Program status, ADAMS, and the ASP Events Database. Utilizing risk evaluation findings, RES develops standard procedures and methods for risk assessments of inspection findings and reactor incidents under the Risk Assessment Standardization Project.

### **Risk-based Performance Indicators**

RES supports the ROP assessment activities by providing risk related measures of plant-specific performance. RES develops risk-based performance indicators, tests the indicators using reactor operational data, and assists the ROP and industry in pilot testing improved indicators.

### **PRA Model Development and Updates**

Division of Risk Analysis and Applications/RES develops risk assessment models known as Standardized Plant Analysis Risk (SPAR) models. SPAR models are plant-specific probabilistic risk assessment models that model accident sequence progression, plant systems and components, and plant operator actions. They are tools that permit the NRC staff to perform risk-informed regulatory activities by independently assessing the risk of events or conditions at operating nuclear power plants.

### **NRR Reactor OpE-Related Program Activities**

The reactor OpE-related programs and activities conducted by NRR are described below.

#### **Significant Events Determination**

NRR provides input to the Industry Trends Program (ITP).  
NRR/DIPM/RORB/OES provides the Significant Events input to the ITP.  
Significant Event is defined if one or more of the following criteria is met:

- Significance Determination Process finding of Yellow or Red.
- Conditional core damage probability or increase in core damage probability of  $1 \times 10^{-5}$  or greater.
- INES Rating of 2 or greater.
- Any event determined to be an Abnormal Occurrence

#### **INPO Coordination**

NRR/DIPM/RORB/OES coordinates with INPO Events Analysis Division to discuss current OpE issues and products under development. This coordination is governed by the Memorandum of Agreement between INPO and NRC.

#### **Generic Communications Program**

NRR/DIPM/RORB/OES manages the agency's generic communication program in accordance with Management Directive 8.18, "NRC Generic Communications Program."

### **NUREG 1022 Management**

NRR/DIPM/RORB/OES provides guidance on interpreting NUREG-1022, “Event Reporting Guidelines 10 CFR 50.72 and 50.73,” Rev 2, to ensure consistent implementation of reporting requirements.

### **Joint NRR/RES Activities**

The reactor OpE-related programs and activities conducted by both RES and NRR are described below.

### **International Activities**

NRR/DIPM/RORB/OES implements the INES ratings for reactor pursuant to Management Directive 5.12, “International Nuclear Event Scale Participation.”

NRR/DIPM/RORB/OES provides the input to the IAEA’s Advanced Incident Reporting System and NRR/DIPM/RORB/OES and RES/DSARE/ARREB supports IAEA activities related to OpE.

NRR/DIPM/RORB/OES and RES/DSARE/ARREB support the OECD/NEA Working Group on OpE.

### **Abnormal Occurrence Program**

RES/DSARE/OP&RWB manages the agency’s Abnormal Occurrence Program in accordance with Management Directive 8.1, “Abnormal Occurrence Reporting Procedure” and NRR/DIPM/RORB/OES coordinates the NRR input.



**Part IV**  
**Functional Responsibilities of Offices Processing  
Operating Experience Information**

**Director, Office of Nuclear Reactor Regulation (NRR)**

Leads the agency reactor OpE program.

Provides a senior manager as a single point of contact to coordinate overall reactor OpE program activities and measure effectiveness.

Directs prompt review and analysis of significant domestic and international OpE

Identifies internal communication needs and mechanisms.

Provides resources to ensure that OpE information is appropriately evaluated and applied in support of core office programs: licensing, oversight, rulemaking, and incident response.

Serves as sponsor for the communication of OpE through the web and other IT, in coordination with OCIO as necessary, and ensures that IT technology applied in OpE is reviewed and approved in accordance with the agency management policy for capital planning and investment control.

Provides process for ensuring OpE is properly incorporated into regulatory programs, e.g., oversight, licensing, rulemaking, and incident response.

Provides for periodic assessment of OpE program

Provides program for assessing external effectiveness of OpE program, e.g., ensuring generic communications are effective.

Coordinates with NSIR, as necessary, to identify reactor OpE information that could impact nuclear security, or security events that could impact nuclear safety.

Deputy Director, Office of Nuclear Reactor Regulation (NRR).

Provides oversight for all NRR OpE international activities.

Associate Director for Project Licensing and Technical Analysis, Office of Nuclear Reactor Regulation (NRR/ADPT)

Adequately funds the Technical Issue Resolution Planned Accomplishment (PA Code: 101-113B) to ensure OpE information that become *Issues for Resolution* can be efficiently and effectively resolved through technical staff *evaluation* and *application* of recommendations.

Directs changes to the licensing program necessary as a result of OpE *evaluations*.

Ensures that Division of Licensing Project Management activities that involve OpE, such as the technical interface agreement (TIA) program, are appropriately provided as inputs to the OpE *Clearinghouse*.

Ensures that the closure process for Bulletins, Generic Letters, and Regulatory Issue Summaries, as appropriate, address any changes recommended to the core NRR programs of licensing, oversight, rulemaking, and incident response.

Director, Division of Inspection Program Management, Office of Nuclear Reactor Regulation (NRR/DIPM)

Serves as the single point of contact and agency manager to ensure agency wide implementation of MD 8.7, "Reactor Operating Experience Program."

Provides management and oversight of the OpE *Clearinghouse* to facilitate the OpE process of collecting, *screening*, communicating, *evaluating* to a limited degree, and project managing *Issues for Resolution* throughout the *evaluation* and *application* phases.

Provides adequate resources to ensure Operating Experience Section and *Clearinghouse* can fulfil their mission and objectives.

Budgets resources to the Event Followup Planned Accomplishments (PA Code: 101-122).

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Serves as focal point for communication of OpE through web and other IT, in conjunction with OCIO as necessary.

Provides for program metrics aligned with strategic plan to measure internal program effectiveness.

Directs changes to the inspection program as necessary as a result of OpE *evaluations*.

Provides for program metrics aligned with strategic plan and the OpE program attributes to assess internal program effectiveness.

Provides for periodic assessment of the OpE program.

Provides program for ensuring that generic communications are effective.

Coordinates with NSIR as necessary to identify reactor OpE that could impact nuclear security.

Director, Division of Licensing Project Management, Office of Nuclear Reactor Regulation (NRR/DLPM)

Directs changes to the licensing program necessary as a result of OpE *evaluations*.

Ensures that Division of Licensing Project Management activities that involve OpE, such as the TIA program, are appropriately provided as inputs to the OpE *Clearinghouse*.

Ensures that the closure process for Bulletins, Generic Letters, and Regulatory Issue Summaries, as appropriate, address any changes necessary to the core NRR programs of licensing, oversight, rulemaking, and incident response.

Provides resources, as necessary, to facilitate obtaining additional information from licensees that may be necessary to support OpE *evaluations*.

Provides DIPM *Clearinghouse* representatives access to “Morning Calls” in accordance with the DLPM Handbook.

Budgets resources to the Event Followup Planned Accomplishments (PA Code: 101-122B) and the Technical Issue Resolution (PA Code: 101-113B).

Director, Division of Engineering, Office of Nuclear Reactor Regulation (NRR/DE)

Ensure Division understanding that the transfer of responsibility for the *evaluation* and or *application* of OpE *Issues for Resolution* from DIPM/IROB/OES may be required for issues that are “*screened-in*” from the OpE process.

Recommend agency *application* as a result of *evaluations* performed by DE.

Budgets resources to the Event Followup Planned Accomplishments (PA Code: 101-122B) and the Technical Issue Resolution (PA Code: 101-113B).

Director, Division of Systems Safety and Analysis, Office of Nuclear Reactor Regulation (NRR/DSSA)

Ensures Division understanding that the transfer of responsibility for the *evaluation* and or *application* of OpE *Issues for Resolution* from DIPM/IROB/OES may be required for issues that are *screened-in* from the OpE process.

Recommends agency *application* as a result of *evaluations* performed by DSSA.

Budgets resources to the Event Followup Planned Accomplishments (PA Code: 101-122B) and the Technical Issue Resolution (PA Code: 101-113B).

Director, Program Management, Policy Development and Planning Staff, Office of Nuclear Reactor Regulation (NRR/PMAS)

In conjunction with the Office Director, ensures that the Office is adequately staffed and budgeted to fulfill the requirements of MD 8.7, “Reactor Operating Experience Program,” and NRR Office Instruction, LIC-401.

Through the Organizational Effectiveness Branch, ensures that an efficient work control process is provided to help facilitate the *hand-off* function in the *evaluation* and *application* phases of the OpE process.

Through the Information Management Branch, ensures that best web practices and technologies are applied to assist the DIPM *Clearinghouse* in making OpE available to the entire NRC staff and to the extent appropriate, the public. Coordinates with OCIO as necessary.

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Supports the Clearinghouse by providing IT system(s)/solutions necessary to process OpE information throughout the OpE process.

Chief, Reactor Operations Branch, DIPM, NRR (NRR/DIPM/IROB)

Supports the Section Chief, Operating Experience Section, in staffing the section such that the requirements of MD 8.7, "Reactor Operating Experience Program" can be implemented.

Assists in resolving responsibility issues with respect to *evaluation* and *application* of OpE information.

Section Chief, Operating Experience Section, IROB, DIPM, NRR (NRR/DIPM/IROB/OES)

Manages the OpE *Clearinghouse* function within a single organization to: collect, screen, prioritize, and distribute OpE information to the NRC staff; facilitate and track OpE *evaluations*, decisions, and *applications*; facilitate communication of OpE lessons learned; and coordinate overall NRC OpE functions.

Coordinates the implementation of MD 8.7, "Reactor Operating Experience Program," and Office Instruction, LIC-401, "NRR Reactor Operating Experience Program."

Effectiveness assessment responsibility - To be added.

Chief, Inspection Program Branch, DIPM, NRR (NRR/DIPM/IIPB)

Decides when it is appropriate to change the Reactor Oversight Process (ROP) in response to recommended *applications* stemming from OpE *evaluations* and directs those changes to be made. Changes to the inspection component of the ROP as a result of OpE will generally fall into one of the following categories: (1) change inspection procedures; (2) develop Temporary Instruction; (3) inform inspection staff and/or inspection program staff (and capture useful information for future inspection staff); or (4) no action. Changes to the Performance Indicator Program as a result of OpE lessons learned should also be considered.

Chief, Information Management Branch, PMAS, NRR (NRR/PMAS/PIMB)

Ensures that best web practices and technologies are applied to assist the DIPM Clearinghouse in making OpE information available to the entire NRC staff and to the extent practical, the public. Coordinates with OCIO as necessary.

Supports the Clearinghouse by providing IT system(s)/solutions necessary to process OpE information throughout the OpE process.

Chief, Organizational Effectiveness Branch, PMAS, NRR (NRR/PMAS/POEB)

Provides work control system to assist in the transfer of responsibilities, *hand-off*, for *evaluation* and *application* of OpE information as part of the OpE process.

Provides IT support to enable the *Clearinghouse* to efficiently and effectively track OpE decision making and effectively search OpE sources

**Director, Office of Nuclear Regulatory Research (RES)**

Directs the long-term reviews and analyses of significant domestic and international OpE.

Conducts OpE *evaluations* to identify trends, recurring events, or safety issues for appropriate followup actions and develops lessons learned to provide feedback to the regulatory programs.

Provides evaluations of RES studies directly related to reactor OpE by distilling insights and lessons-learned along with recommendations for application and packaging the information to be fed into the OpE information process.

Provides evaluations of RES studies that are not directly related to OpE, but could provide insight into OpE related matters by distilling OpE-related information from the studies and packaging the information to be fed into the OpE information process.

Coordinates with NRR to verify adequate resolution of issues of concern arising from OpE *evaluations*.

Coordinates with NRR to provide OpE information through web and other IT.  
Provides LER search system.

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Responsible for coordination with Institute of Nuclear Power Operations (INPO) for Equipment Performance Information and Exchange System (EPIX) data.

Implements the agency's Generic Issues Program.

Oversees development of risk analysis tools and models.

Director, Division of Engineering Technology, Office of Nuclear Regulatory Research (RES/DET)

Supports agency OpE program by conducting in-depth studies or evaluations pertaining to materials and engineering related OpE issues.

Conducts research on materials, components, and systems related issues using OpE data and supports the OpE process in the product development associated with the research.

Manages modifications to and develops the NRC codes and standards that could impact OpE product development.

Division of Systems Analysis and Regulatory Effectiveness, Office of Nuclear Regulatory Research (DSARE/RES)

Conducts the NRC long-term OpE assessments with the goal of improving NRC programs/processes to achieve outcomes of enhanced safety, efficiency or effectiveness.

Through long-term evaluation of OpE, assesses the effectiveness of selected NRC programs.

Manages the NRC Generic Issues Program including the screening, prioritizing, tracking, and the periodic reporting to stakeholders including Congress and Commission.

Division of Risk Analysis and Applications, Office of Nuclear Regulatory Research (DRAA/RES)

Coordinates with the Institute of Nuclear Power Operations (INPO) access for the Equipment Performance Information and Exchange System (EPIX) data.



Manages research program to develop, advance the state of the art, and apply risk assessment methods to provide a basis to focus regulatory activities on the most risk significant aspects of licensed activities.

Provides research to improve NRC's understanding of human performance relate to OpE.

Assesses OpE information to determine risk trends and assesses performance indicators based on OpE information.

Develops and implements the NRC programs for power reactor performance indicators and accident sequence precursors and maintains data bases covering reliability data.

**Director, Office of Nuclear Security & Incident Response (NSIR)**

Manages the Incident Response Division which provides the program to receive and disseminate OpE information reported to the agency's Operations Center.

Coordinates the agency's emergency response to significant reactor operating events and conditions.

Coordinates with other NRC program offices as necessary to identify security related issues that could impact reactor safety.

**Regional Administrators (RA)**

Coordinate regional efforts with other NRC offices that share responsibility for evaluating OpE that has been identified as sufficiently significant, applying lessons learned from OpE *evaluations* to improve regulatory programs and activities, and providing feedback on the effectiveness of the *application* of OpE information to improve reactor operations and regulatory programs and activities.

Identifies reactor safety issues that would likely require evaluation by the OpE program.

Provides resources to support the OpE program in obtaining additional information necessary to facilitate OpE screening or evaluation.

Provides feedback on the effectiveness of OpE communication tools.

Specifies regional needs with respect to OpE program.

Provides designated representatives to support the OpE program.

Verifies licensee commitments to generic communications pursuant to inspection program guidance.

**Director, Office of Human Resources (HR)**

Manages the Technical Training Center which supports the NRR OpE Clearinghouse and other program offices for providing knowledge transfer of significant OpE through training.

Through the TTC, supports the OpE Program and other program Offices for providing knowledge transfer of significant OpE through training.

Manages the agency's Knowledge Management (KM) program and coordinates with OpE program, as necessary, to implement KM tools in the transfer of OpE knowledge.

**Director, Office of Administration (ADM)**

Provides translation services for foreign documents associated with operational safety data to NRC offices, as requested.

Provides for prompt security support when requested or, as appropriate, in the review, handling, and protection of classified or sensitive unclassified documents on operational safety data in accordance with Management Directives in Volume 12, "Security," 3.12, "Handling and Disposition of Foreign Documents and Translations," and 3.7, "Unclassified Staff Publications in the NUREG Series."

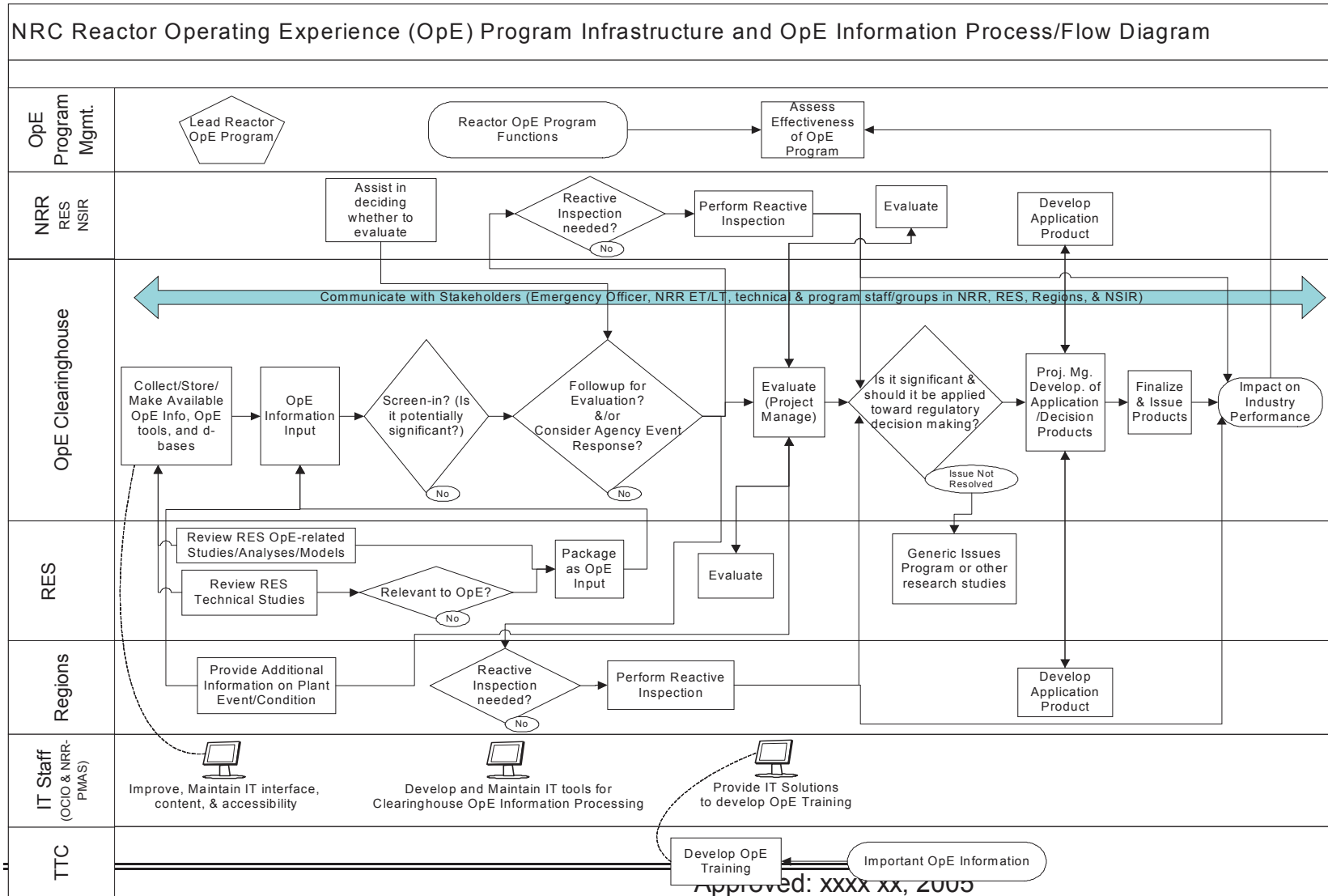
**Chief Information Officer (CIO)**

Manages the agency's ADAMS system to capture and store OpE information.

Supports, as necessary, the offices of NRR, RES, NSIR, and regions in providing efficient IT solutions to the agency's OpE program.

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Exhibit 1. NRC Reactor OpE Program Infrastructure and OpE Information Process/Flow Diagram

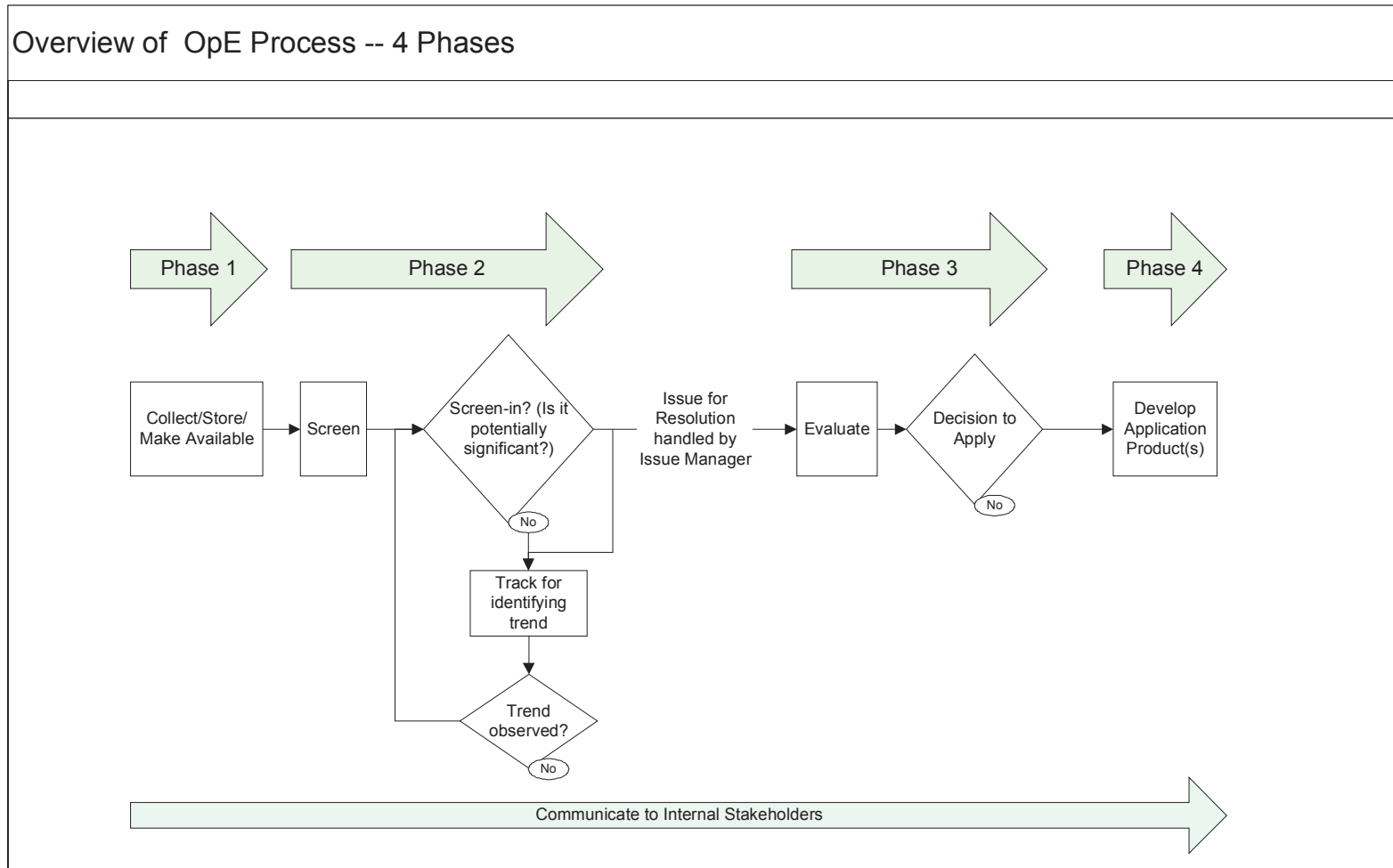


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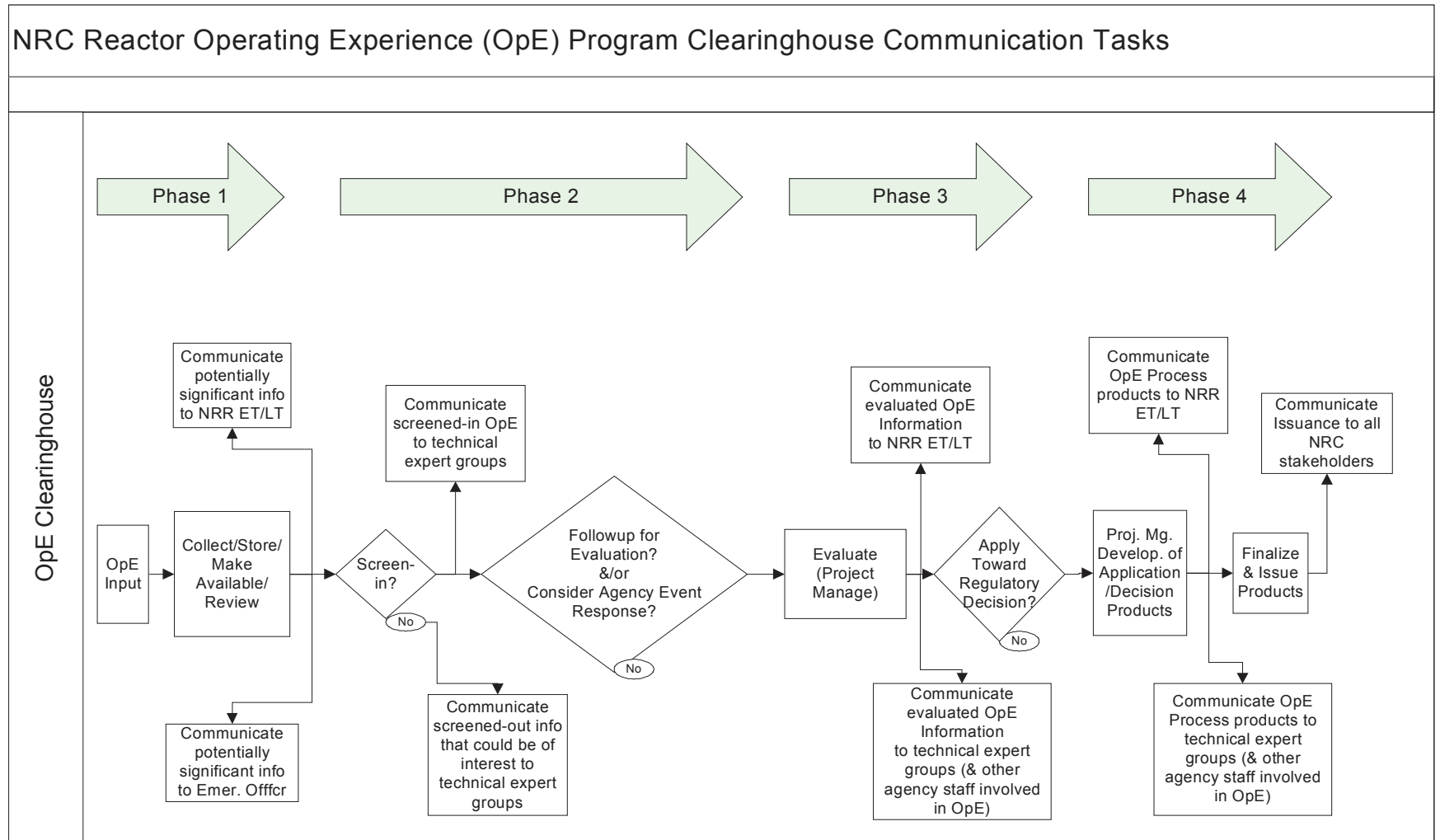
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Exhibit 2. Overview of OpE Process – 4 Phases



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Exhibit 3. Reactor OpE Program Clearinghouse Communication Tasks

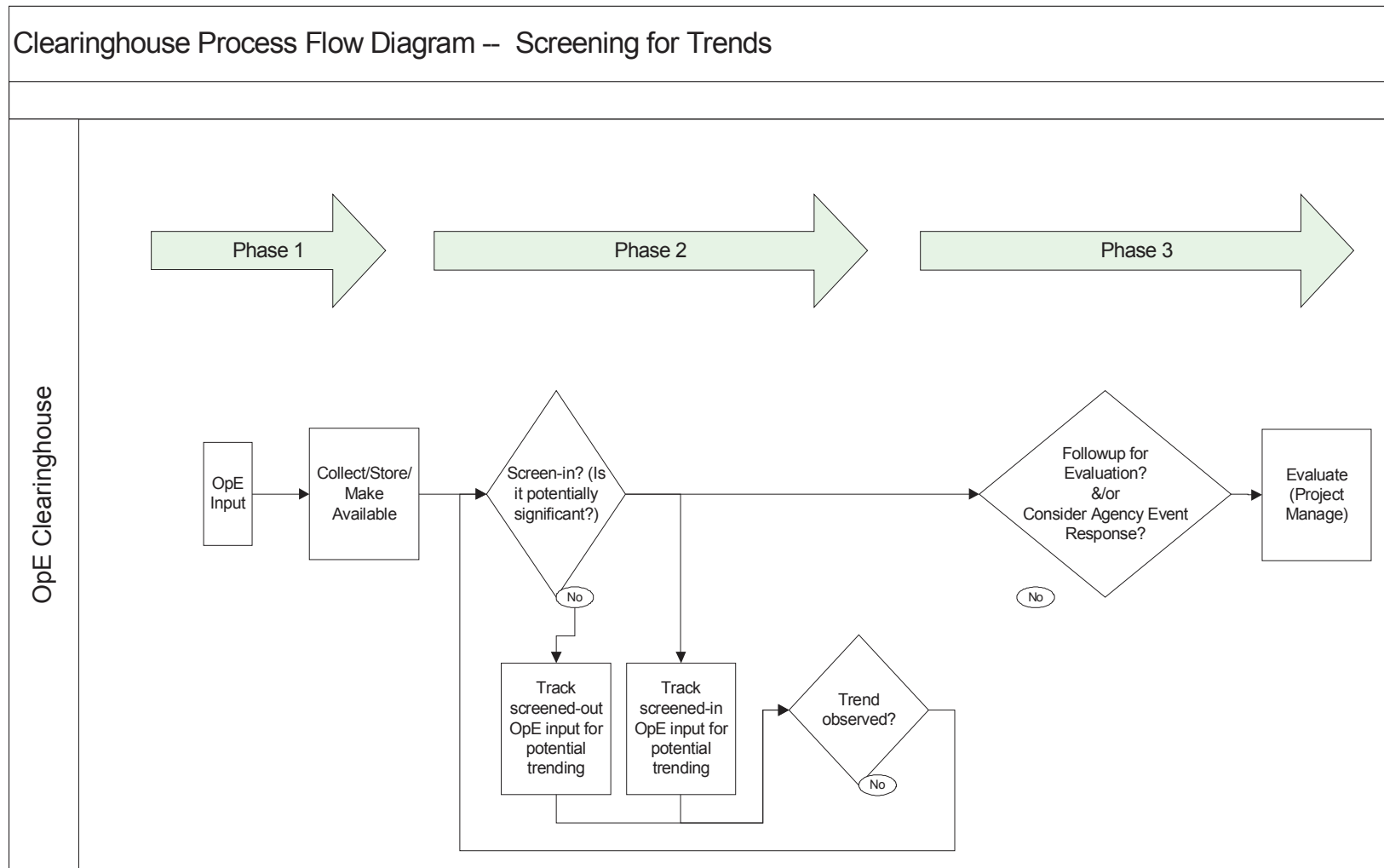


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Exhibit 4. Clearinghouse Process/Flow Diagram – Screening for Trends



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Exhibit 5: Resolving Potential Management Challenges in Phases 3 and 4 of the OpE Process

