



ONR GUIDE			
LC7 Incidents on the site			
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1 INTRODUCTION

1.1 Many of the licence conditions attached to the standard nuclear site licence require, or imply, that licensees should make arrangements to comply with regulatory obligations under the conditions. ONR inspects compliance with licence conditions, and also with the arrangements made under them, to judge the suitability of the arrangements made and the adequacy of their implementation. Most of the standard licence conditions are goal-setting, and do not prescribe in detail what the licensees' arrangements should contain; this is the responsibility of the duty-holder who remains responsible for safety. To support inspectors undertaking compliance inspection, ONR produces a suite of guides to assist inspectors to make regulatory judgements and decisions in relation to the adequacy of compliance, and the safety of activities on the site. This inspection guide is one of the suite of documents provided by ONR for this purpose.

2 PURPOSE AND SCOPE

- 2.1 This TIG has been prepared as a guide to inspections performed by ONR inspectors during which they judge the adequacy of licence condition compliance arrangements and their implementation.
- 2.2 A key contribution of any effective safety regime is that of organisational learning, including learning from incidents and events on the site, as well as from other relevant external sources.
- 2.3 It is essential that Licensees collect information on incidents occurring at nuclear installations, including deviations from normal performance by systems and by personnel, which could be precursors to more significant events. It is also important that safety significant incidents and events are notified to the regulators and other organisations as necessary, to ensure they are aware of safety performance on licensed sites.
- 2.4 The site's Operational Experience (OE) or equivalent process may provide the arrangements to comply with LC7. However the Management of Health and Safety at Work Regulations 1999 (MHSWR), international conventions and nuclear safety standards incorporate provisions that go beyond the requirements of LC7 in the use of OE. The purpose of the additional requirements is to identify corrective actions, prevent recurrences, learn lessons from incidents and disseminate lessons learned to others who may benefit.
- 2.5 The guidance covers the following main elements:
- The purpose of the Licence Condition.
 - Guidance on arrangements for LC7.
 - Guidance on inspection of the arrangements.
 - Guidance on inspection of implementation of the arrangements.
 - Other reporting and OE processes.

3 LICENCE CONDITION 7: INCIDENTS ON THE SITE

3.1 **7(1)** The licensee shall make and implement adequate arrangements for the notification, recording, investigation and reporting of such incidents occurring on the site:

- a) as is required by any other condition attached to this licence;
 - b) as ONR may specify; and
 - c) as the licensee considers necessary.
- 3.2 **7(2)** The licensee shall submit to ONR for approval such part or parts of the aforesaid arrangements as ONR may specify.
- 3.3 **7(3)** The licensee shall ensure that once approved no alteration or amendment is made to the approved arrangements unless ONR has approved such alteration or amendment.

4 PURPOSE OF LICENCE CONDITION 7

- 4.1 The purpose of this licence condition is to ensure that incidents on the site are notified, recorded, investigated and reported by the licensee. ONR anticipates that only incidents with the potential to have an adverse effect on safety are notified to ONR.

5 GUIDANCE ON ARRANGEMENTS FOR LICENCE CONDITION 7

5.1 General

- 5.1.1 The arrangements should be documented within the licensee's system for managing safety, and clearly stated in the site licence compliance arrangements. The arrangements should be readily available and remain current, be authorised by an appropriate senior manager and be controlled under the quality management system to comply with the requirements of LC17 (Management systems).
- 5.1.2 The arrangements should use clear and consistent terminology and should define important terms used. In the case of the term "incident", this should include events, near-misses, event sequence precursors, events caused by plant failures, human error or procedural failings, and if considered appropriate matters of minor safety significance where there is an opportunity to learn from adverse conditions.
- 5.1.3 The arrangements should employ a system for the reporting and categorisation of incidents by type and safety significance.
- 5.1.4 The categorisation system should take into account the requirements of LC23(3), LC28(8) and LC34(2) in respect of incidents which may affect safe operation or condition of plant, or leakage of radioactive material or waste. The direct notification requirements of LC13(10) should also be covered by the arrangements. Where formal notification to ONR is appropriate this should be through direct licensee communication to ONR head office, and its timing determined by safety significance and assigned category, taking account of consequences, potential consequences, INES rating, etc. If the significance of an incident only becomes apparent following a detailed investigation then retrospective notification may be necessary.
- 5.1.5 The arrangements should outline the notification, recording, investigation, reporting and any other requirements for each category of incident in accordance with the following sections of this guidance. Figure 1 illustrates the main elements of a typical OE process.

5.2 Notification

- 5.2.1 Operating organisations should identify and record all events based on their actual and reasonable foreseeable consequences. Reportable events should include low level events and near misses, potential problems related to equipment failures, short comings in human performance, error likely situations and opportunities that need to

be addressed to prevent undesired effects, procedural deficiencies, inconsistencies in documentation as well as good practices that are relevant to safety and enter them into their OE programme.

- 5.2.2 Issues involving non-conforming, counterfeit, fraudulent or suspect items or parts should also be identified and reported within the OE system. Consideration of potential consequences of events is also applicable to new build projects on licenced sites, for instance where a safety functional design requirement has been challenged but there is not yet any nuclear inventory.
- 5.2.3 Management should foster a culture in which reporting is encouraged and reinforced throughout the organization, fostering an atmosphere of a questioning attitude and learning from experience.
- 5.2.4 The arrangements should ensure that details of incidents affecting safety on the site are notified to ONR, indicating the reason for notification in relation to the categorisation system and include reference to the current national and international reporting criteria e.g. INES. Arrangements should identify the person responsible for informing ONR with all notifications made in a timely manner; within limits specified by the arrangements. The arrangements should make reference to the ONR Incident Notification Form (INF 1) reporting process and include clear links across to the ONR incident codes [Ref. 7.8].
- 5.2.5 In particular the arrangements should reinforce the need for ONR to be notified of incidents prescribed under relevant legislation such as the Nuclear Installations Act 1965; Nuclear Installations (Dangerous Occurrences) Regulations 1965; Ionising Radiations Regulations 1999, Radiation (Emergency Preparedness and Public Information) Regulations 2001 and including notifications required by specific LCs. Guidance on events that should be notified to ONR (including events which meet Ministerial Reporting Criteria in accordance with Ministers instructions to licensees) is contained within the ONR guide on notifying and reporting incidents and events [Ref. 7.8].
- 5.2.6 In addition to reporting incidents related to control, use and potential effects of ionising radiation, licensees also have a statutory duty to report other events occurring on licensed sites under more generally applicable legislation e.g. RIDDOR. The licensee's arrangements for such notifications should include provision for ensuring that any additional reporting as is required is made in accordance with the specific regulations, and ONR is informed.
- 5.2.7 Informal notification of incidents by licensees may be by any available means, but is frequently made directly to the site inspector, in these circumstances the inspector should consider if the event needs further internal ONR or wider reporting, if appropriate. Some licensees have arrangements which include periodic notification of events to ONR and these should be reviewed to ensure that action taken by licensees in the interests of safety is adequate, and internal ONR reporting requirements are satisfied. The category allocated to an incident should be included in the consideration of whether further regulatory attention is appropriate.

5.3 Recording

- 5.3.1 The arrangements should ensure that sufficient details of incidents are adequately recorded to enable a permanent record of incidents occurring to be maintained, and provide data to assess an incident's safety significance. The records made should be suitable to allow ranking, analysis and trending of the incidents recorded.
- 5.3.2 The incident categorisation system should be used to allocate a rating to reflect the safety significance appropriate to the incident.

5.3.3 The arrangements should include the option for licensees to bring to the attention of the Nuclear Safety Committee details of the most safety significant incidents for its consideration and advice.

5.4 Investigation

5.4.1 The arrangements should identify screening criteria to consistently select and prioritise events for further investigation and should also identify requirements for: -

- nominating suitably qualified and experienced staff to carry out investigations;
- identifying the scope and/or terms of reference of the investigation;
- confirming the extent of condition;
- recording the outcome from the investigation including root cause identification, where appropriate and
- recommending actions in the interests of safety.

5.4.2 The arrangements should ensure that any implications for design, procurement, commissioning, operation, maintenance, decommissioning, training, human factors and organisational factors are evaluated.

5.4.3 The arrangements should include the methods for identifying the apparent, direct and root causes of incidents and should ensure that corrective actions are clearly identified to address the causes of an event. The actions should be intended to correct an adverse condition, prevent recurrence and enhance safety, where appropriate.

5.4.4 LC7 does not explicitly refer to corrective action in response to incidents notified under the LC, but the expectation is that where appropriate, the licensee's arrangements will include requirements to rectify conditions adverse to safety identified from their incident investigations and consideration of other relevant OE information. There are obligations set out in the MHSWR, International Conventions and nuclear safety standards in this respect. The arrangements should therefore identify the systems used to record, implement and track any corrective actions identified as a result of an investigation, and ensure that an auditable trail for completion of actions placed and closure of the incident response is provided.

5.4.5 Corrective actions should be directed towards the root and contributory causes and should be aimed at strengthening the weakened or breached barriers that failed. Too many actions may overwhelm the intended beneficiary and some actions may be left pending too long. Consistent screening should ensure that learning is not outweighed by the burden of too many corrective actions. Actions should therefore be prioritised, scheduled and effectively implemented. Actions may be immediate, interim or long term with a need for detailed evaluation.

5.4.6 Factors to be considered when formulating corrective actions include the following:

- Does the proposed corrective action addresses the fundamental problem.
- What adverse consequences may result from the implementation of the corrective action?
- Is the corrective action compatible with other corrective actions that have been implemented previously?

- If it is a repeat event, what were the previous corrective actions and why did they fail to prevent or mitigate the current event.
- If the corrective action is an interim solution or a partial solution, then there should be additional actions that provide a complete solution.

5.5 Reporting

5.5.1 The arrangements should ensure that a documented report is produced following an investigation into the circumstances surrounding an incident on the site. The reports should contain the following information as appropriate:

- a. time, date, and place of the incident;
- b. site and plant affected, and duty shifts involved;
- c. a description of the circumstances of the incident;
- d. details of any casualties or otherwise affected persons
- e. estimation of any radiological effects or contamination spread
- f. condition of the affected plant and suitability for service;
- g. assessment of the consequences or potential consequences for safety in the short and long term (including the INES rating);
- h. details of initial action taken to eliminate, control, contain or mitigate the hazard;
- i. requirements for preservation of scene;
- j. details of categorisations, organisations notified and feedback obtained;
- k. investigation undertaken;
- l. identification of the direct and root causes;
- m. assessment of extent of condition;
- n. identification of repeat events, including contributory factors and review of previous corrective actions taken;
- o. corrective actions recommended, with their target completion dates;
- p. learning opportunities for similar operations, plants or facilities; and
- q. details of relevant OE.

5.5.2 The arrangements should identify how lessons learned from incidents are disseminated on-site, reported to other sites and to other interested parties, including stakeholders and international organisations.

6 GUIDANCE ON INSPECTION OF ARRANGEMENTS AND THEIR IMPLEMENTATION

6.1 This section provides guidance to assist Site Inspectors in judging the adequacy with which a licensee implements arrangements which enable it to comply with LC7. More detailed guidance on conducting LC7 and related inspections is provided in Annex 1 where the material is presented in the form of good practice for different elements of a process suitable for promoting learning from events.

6.2 General Arrangements

- 6.2.1 Obtain a copy of the licensee's LC7 arrangements and confirm that the arrangements for notification, recording, investigation and reporting of incidents on the site are adequate, appropriate, authorised by an appropriate senior manager and are in date.
- 6.2.2 Check that the arrangements make provision for submissions for approval to ONR of such part or parts of the arrangements that ONR may specify.
- 6.2.3 Check whether ONR has approved parts of the LC7 arrangements under LC7(3) and, if so, confirm that the approved arrangements are in place, implemented and subject to configuration control and oversight.
- 6.2.4 Confirm that arrangements identify management expectations for all staff with regard to reporting events. Check that reporting requirements are communicated to all staff (including contracting staff) during initial and refresher training.
- 6.2.5 Check that the roles and responsibilities of people directly involved in the OE process are adequately specified.
- 6.2.6 Check that the level of management team involvement set out within the arrangements is appropriate and further, is adequately reflected in the implementation.

6.3 Notification

- 6.3.1 Confirm that the licensee is discharging its statutory duty to report certain events to ONR and to ministers. Check by sampling lower tier event and near miss reports that they have been correctly categorised and determine if there are any events that should have been reported to ONR that were not. Verify the timeliness of notifying ONR of events.
- 6.3.2 Talk to individual staff at different levels of the organisation to ask whether they are aware of their responsibilities for notifying events and whether they would know how to do this. Ask whether they have notified any events themselves and, if so, whether they had any subsequent feed-back.
- 6.3.3 Check by inspection if there is any physical evidence in the plant of unreported deficiencies, event pre-cursors or error likely situations (e.g. defective equipment, poor material condition, poor or unsafe working practices, uncontrolled operator aids, etc.).
- 6.3.4 Check that the Nuclear Safety Committee is notified of significant events.

6.4 Recording

- 6.4.1 Confirm by sampling that events are adequately recorded to enable a permanent record of incidents occurring to be maintained, and provide data to assess an incident's safety significance.

- 6.4.2 Evaluate how accessible event report information is to plant personnel and whether information is collected centrally in a manner that is suitable for timely retrieval, collation and subsequent analysis.

6.5 Investigation

- 6.5.1 Confirm that screening criteria are established and that there are clear responsibilities for decision making in relation to screening. Confirm by sampling that events are screened consistently to ensure that the appropriate level of investigation is undertaken based upon the potential significance of the event and/or the learning that may be derived. Confirm that the persons or group undertaking the screening have the necessary breadth of experience and sufficient knowledge of the plant or process.
- 6.5.2 Confirm by inspection of a range of investigation reports that investigation methods utilised are adequate to identify direct and root causes, together with contributory factors. Evaluate whether all direct and root causes are identified along with contributory factors. Check that human error is not being identified as the root cause without understanding of the factors leading to the human error. Check if failed barriers, organisational weaknesses and error likely situations are considered.
- 6.5.3 Confirm that members of the investigation teams are suitably qualified and experienced to adequately investigate and analyse the event information. It is not just members of the investigation team who need to be suitably qualified and experienced but also others who interact with the process (for instance senior managers who review and sanction corrective actions, or those involved in sentencing meetings).
- 6.5.4 Ask if there is a process for adverse trends triggering an investigation or whether this would be actioned by a significant event only.
- 6.5.5 Confirm that investigations are conducted and completed in a timely manner with arrangements in place to ensure that information is gathered as soon as possible after the incident has taken place.
- 6.5.6 Verify that similar internal or external events are considered during the investigation and evaluated to determine if previous corrective actions were effective.
- 6.5.7 Confirm that the screening and investigation process considers extent of condition across the site. Extent of condition is the extent to which similar conditions could be present across the organisation in other systems, equipment, programmes, processes or human performance.
- 6.5.8 Confirm that the results of investigations are used to develop corrective actions that are implemented in due time to avoid any recurrence of the events. Confirm that the appropriate level of management is held accountable for completion of the corrective actions and that closure is recorded and formally closed out. Confirm that corrective actions have been reviewed and approved in accordance with defined arrangements before implementation.
- 6.5.9 Evaluate if the types of corrective actions being implemented are unduly biased (for instance too many actions focused on individual training and/or procedures may suggest systemic causes are being missed).
- 6.5.10 Confirm that there is a system in place for the review of progress of closure of corrective actions. Confirm that there is a procedure to review the effectiveness of corrective actions.
- 6.5.11 Ask staff at all levels for examples of what has changed as a result of learning from investigation of events and subsequent corrective actions.

6.6 Reporting

- 6.6.1 Confirm that investigation reports are completed, comprehensive and authorised.
- 6.6.2 Check the accessibility of event report information to plant personnel. Is the information apparent in the plant (e.g. OE bulletins, notices, posters, etc.)? Check that applicable learning is disseminated to appropriate staff in a timely manner.
- 6.6.3 Check for evidence that learning from investigations is fed back into safety cases. Confirm that significant events prompt a review of key assumptions in safety cases.

7 FURTHER READING

- 7.1 IAEA Safety Standard NS-G 2.11 A System for the Feedback of Experience from Events in Nuclear Installations.
- 7.2 Convention on Nuclear Safety (CNS).
- 7.3 Management of Health and Safety at Work Regulations 1999.
- 7.4 IAEA – TECDOC – 1581: Best Practices in Identifying, Reporting and Screening Operating Experience at NPPs.
- 7.5 IAEA – TECDOC – 1600: Best Practices in the Organization, Management and Conduct of an Effective Investigation of Events at NPPs
- 7.6 IAEA – TECDOC – 1477: Trending of low level events and near misses to enhance safety performance in NPPs
- 7.7 IAEA – TECDOC – 1458: Effective corrective actions to enhance operational safety of nuclear installations.
- 7.8 ONR Guidance: Notifying and Reporting Incidents and Events to ONR. ONR-OPEX-GD-001 Revision 4.
- 7.9 ONR Technical Position Statement on Organisational Learning.

8 DEFINITIONS

INCIDENT: Any unintended event, including operating errors, equipment failures, initiating events, accident precursors, near misses, potential mishaps, or unauthorised acts, malicious or non-malicious, the consequences or potential consequences of which are not negligible from the point of view of protection or safety

Note: For the purposes of this guidance the term event, which is used frequently in licensees' arrangements and by the IAEA, can be considered as synonymous with the term incident.

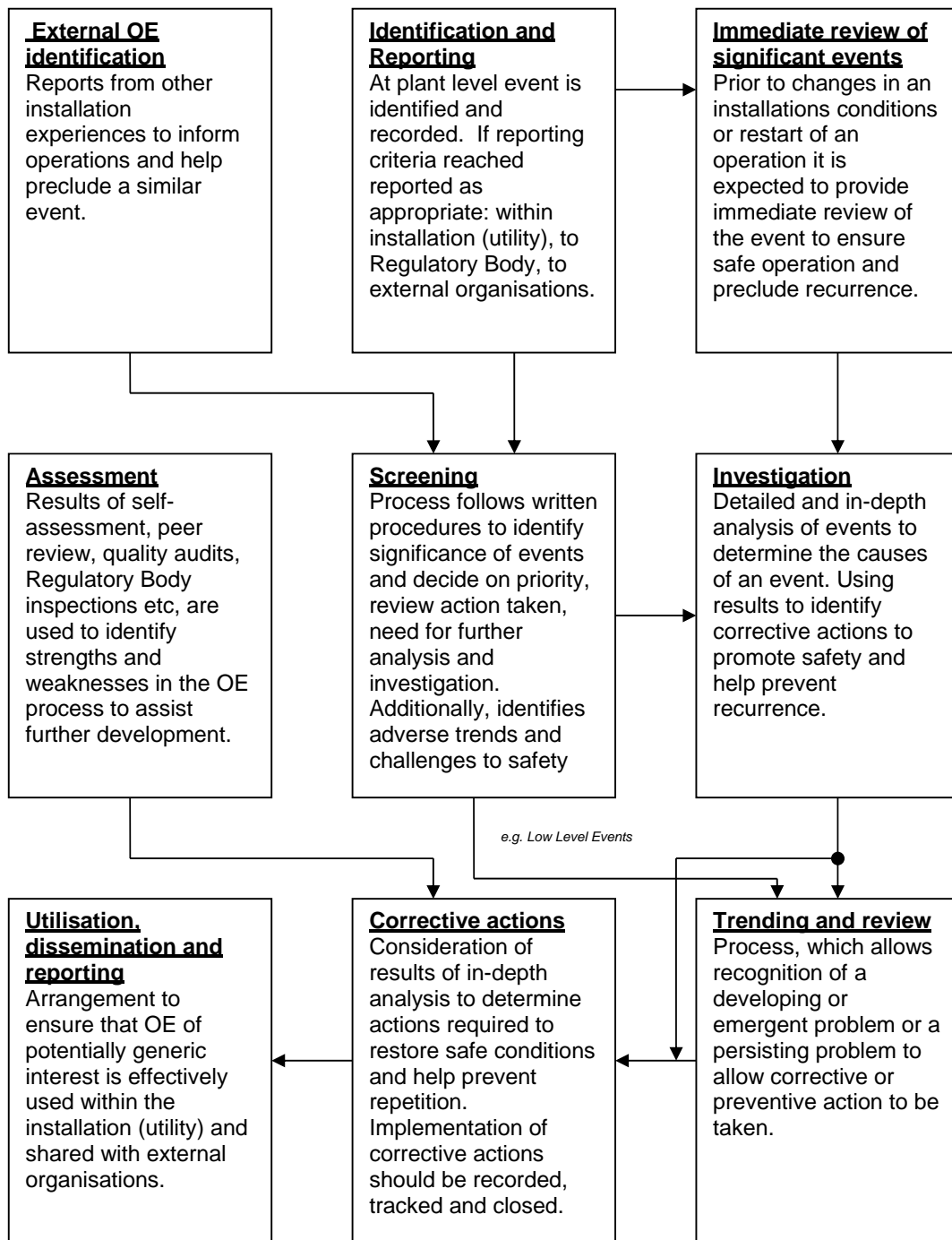
NEAR MISS: A potentially significant event that could have occurred as the consequence of a sequence of actual occurrences but did not occur because of prevailing plant conditions.

PRECURSOR: An event, event sequence, or a situation that, if a small set of behaviours or conditions had been slightly different, would have led to a more significant adverse event.

DIRECT CAUSE: The latent shortfall that allows or causes the observed cause of an initiating event to happen, including the reasons for the latent shortfall.
(Corrective actions designed to address direct causes are sometimes termed repairs.)

ROOT CAUSE: The fundamental cause of an initiating event, correction of which will prevent recurrence of the initiating event (i.e. the root cause is the failure to detect and correct the relevant latent shortfall(s) and the reasons for that failure. (Corrective actions designed to address root causes are sometimes termed remedies or remedial actions).

FIGURE 1: MAIN ELEMENTS OF A TYPICAL OE PROCESS



ANNEX 1 – DETAILED GUIDANCE ON INSPECTION OF LC7 AND RELATED OE PROCESSES

A1. GENERAL CONSIDERATIONS FOR LC 7 ARRANGEMENTS AND RELATED OE PROCESSES

A1.1. Often a licensee's arrangements for LC7 represent one component of a more comprehensive process for collecting and analysing information concerning incidents which occur on licensed sites. The overall process may be influenced by a number of sources including industry recommendations and published international guidance. Inspection of licence condition compliance, including obligations under other legislation, may therefore include consideration of a more comprehensive process for collation of OE and feedback to plant operations to secure improvements in plant performance and safety to ensure they are deemed adequate; this constitutes the basis for an OEF process.

A1.2. Short form guidance is provided in Section 6 of the main body of this Technical Inspection Guide. This Annex provides more detail in the form of good practice for different elements of a process suitable for promoting learning from events and aligns with guidance contained within IAEA Safety Standards. The following aspects are covered in this Annex:-

- General expectations for an OEF process;
- Management and Organisation for OEF;
- Notification and Recording of OE;
- Other sources of OE information;
- Screening of incidents, events and other OE;
- Investigation and analysis of OE;
- Corrective actions;
- Use of OE information;
- Trending of OE information;
- Assessment of effectiveness of the OEF process.

A1.3. An effective process for using OE is characterised by the following features: -

- Management aligns the organisation to effectively implement the lessons learned from the OEF process in order that plant safety and reliability are improved.
- Incidents and events are promptly reported at sites.
- Incidents and events and other OE is screened on the basis of safety significance, to select items requiring further investigation or action.
- Investigation and analysis is performed on significant events, to ensure root causes and corrective actions are identified.
- Corrective actions are defined, prioritised, scheduled and followed up to ensure effective implementation and effective improvement of plant safety and reliability.

- OE information is fed-back throughout the plant, to other plants and internationally, where appropriate.
- OE information is analysed and trended, and the results are used to improve plant safety and reliability.
- Assessments and indicators are effectively used to review and monitor the arrangements to assess the effectiveness of the OEF process in improving plant performance and safety.

A2. MANAGEMENT AND ORGANISATION FOR OEF

Expectations

- A2.1. Policy, goals, objectives and management expectations for OEF are clearly defined and communicated. The process is developed in procedures for the management of internal OE, including for low level events and near misses, precursors, external OE, periodic assessment of OEF activities and process review.
- A2.2. Duties, responsibilities, authorities and lines of communication within the plant organisation are clearly defined and understood. Duties, responsibilities, authorities, lines of communication and interfaces of corporate organisations as well as other external organisations in the OEF process are clearly defined and understood.
- A2.3. Effective use of OE contributes to the safety culture on the site. Management is committed and involved in promoting and reinforcing the use of OE to improve plant safety and reliability.
- A2.4. Adequate resources and tools, such as data handling systems, are provided to support the OEF process. A group is identified to manage and coordinate the process.
- A2.5. Active participation in OEF activities is implemented throughout the plant in an environment of openness in which people are encouraged to report adverse conditions, and rewarded for providing information promoting safety improvements.
- A2.6. Supervisors and managers reinforce effective use of OE information by personnel. Personnel perform effective investigations and analysis and implement lessons learned from OE information.
- A2.7. The effectiveness of the OEF process is monitored regularly. A clear process exists in which the results of the monitoring are transmitted to the responsible groups affected by the results, thereby providing feedback on the outcome from OE.

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Functions and responsibilities

- A2.8. Confirm that LC7 and other legislative requirements are contained within the extant OEF process for the site. Ensure that the process is adequately documented in the management system, and refers to the means by which legal obligations are met. Check that the scope of the OEF process includes the reporting of low-level and near miss events and a requirement to trend and review OE to determine unresolved safety issues. Check whether these reviews include operational data other than plant event/deviation reports (e.g. quality assurance non-conformances, plant operational performance data, task risk analysis results, external events). The process should include consideration of OE from external, including international, sources.

A2.9. Check that the roles and responsibilities of personnel involved in processing operational safety performance data are adequately specified. Confirm that the roles and responsibilities of personnel responsible for event investigation, analysis, corrective action development and implementation are adequately specified.

A2.10. Confirm that the OEF process is clearly understood by plant personnel.

Interfaces with other on-site and off-site groups

A2.11. Check that specialist staff (other than dedicated OEF personnel) are involved in the analysis of OE information and the development of corrective actions. Verify that relevant plant and off-site organizations are involved in the OEF process.

A2.12. By interviewing plant staff, at different levels, determine their general awareness and involvement in the OEF process and the extent of their understanding of their responsibilities for incident and condition reporting.

Qualification of personnel

A2.13. Check that dedicated OEF personnel are suitably qualified with adequate experience and training. Verify that root-cause investigators are suitably trained to adequately investigate and analyse the event information.

Management role in operational experience feedback

A2.14. Review the overall strategy of the plant for the use of operational performance information, in order to determine whether there is a clearly expressed management expectation committing the plant staff to enhancing the prevention of operational failures through the use and feedback of OE information. Confirm that there is a declared policy of trust and openness in reporting safety related events.

A2.15. Check that management expectations of personnel are specified with regard to reporting abnormalities. Check whether measurable goals and objectives are specified regarding effectiveness of the OEF process (such as back-log of corrective actions, timeliness of analysis, number of reworks/recurrent deficiencies). Check that regular effectiveness reviews are undertaken to monitor the effectiveness of the process and the achievement of specified goals and targets. Check management commitment to the OEF process e.g. attendance at screening meetings; reporting incidents themselves; management board considerations and response to OE.

A2.16. Determine the involvement of the corporate organization and plant safety committees in the OEF process, and confirm that their responsibilities are clearly defined and understood by plant and corporate personnel. Check that the NSC is informed of significant events and that its advice is accepted or rejected and notified as such to ONR.

A2.17. Confirm that adequate resources are devoted to the OEF processes eg data handling systems, personnel and finance.

A2.18. The following questions could be used as prompts to test how well leaders and managers are leading by example:

- Ask what changes leaders or managers have made to their own behaviours or thinking in response to something they have learned from recent events.
- Ask what leaders and managers have personally done to encourage challenge and learning from events.

- Ask how much time leaders and their leadership teams set aside for learning from events and other sources.

A3. NOTIFICATION AND RECORDING OF OE

Expectations

- A3.1. Identifying OE in the form of incident/event/condition reporting is strongly encouraged and reinforced at all levels in the licensee's organization.
- A3.2. Notification to regulators and other government bodies is timely and meets external expectations.
- A3.3. Safety significant incidents and events, minor events, near misses and potential problems are identified and reported by staff in a timely manner according to established criteria and procedures. Records made of incident or event reports should include inter alia; equipment failures, human performance problems, procedural deficiencies and documentation inconsistencies.
- A3.4. Dissemination of OE to plant personnel and dissemination of significant experience to other nuclear installations is undertaken in a timely manner consistent with its safety significance (including potential consequences).

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- A3.5. Evaluate whether incident reporting is comprehensive. Check that reporting of minor incidents, low level events, adverse conditions and near misses is actively encouraged. Review the internal and external reporting criteria and confirm that the reporting threshold is low enough to accumulate sufficient material to draw realistic conclusions.
- A3.6. Review whether reporting of deviations, events, precursors, etc. is carried out by all levels of personnel, sections, departments, etc. throughout the plant organization. Verify that staff in all areas contribute to reporting in a reasonably uniform manner. Confirm that there is a declared and understood policy of open and frank reporting. Evaluate the staff's perception to verify that the environment is considered to be open and just; not punitive to individuals who report incidents.
- A3.7. Confirm that the reporting process is readily accessible to all persons on site (including contractors) and is user-friendly. Check that relevant plant personnel and contractors are fully aware of the process. Check that the reporting requirements are communicated to plant personnel during initial and refresher training. Review what other methods are used to convey management's expectations on reporting.
- A3.8. Review whether there is a tendency in reporting either equipment, procedural or personnel deficiencies. Check if there is physical evidence in the plant of unreported deficiencies, event precursors or error likely situations (e.g. defective equipment, poor material condition, poor or unsafe working practices, un-controlled operator aids, lack of document control, etc.). Check whether OE is captured and introduced in work control activities. Evaluate how comprehensive event reporting is and whether information is collected centrally on a suitable database.
- A3.9. Evaluate how accessible the event report information is to plant personnel. Check that applicable OE information has been disseminated to appropriate personnel in a timely manner. Check whether the workers/engineers have received this information and considered it; through, for example, critical task briefs, tool-box talks, just-in-time briefs etc.

- A3.10. Confirm that the licensee is discharging its statutory duty to report certain incidents to regulators and ministers. Review whether the criteria for reporting to external organizations (ONR, other utilities, international organizations, etc.) comply with the requirements of external organizations in ensuring learning opportunities are maximized.
- A3.11. Check whether there had been events that should have been reported off-site that were not. Evaluate whether there had been events reported off site that were not appropriate. Evaluate the timeliness of sharing events with the external community.
- A3.12. Verify the timeliness of notifying ONR of incidents. Ask for the ratio of late reporting by the site to ONR.

A4. OTHER SOURCES OF OE INFORMATION

Expectations

- A4.1. Sources of industry OE are identified, access to these sources are formally established and systematically screened. These sources include relevant organizations (IAEA, NEA, WANO, INPO, Owners Groups, Vendors and Manufacturers etc.). OE information should include those from international and industry databases, such as INES, IRS, FINAS, Regulatory Letters or Notices; Vendor and Manufacturers equipment problem alerts and Industry event reports). Sources of OE should also include good practices as a useful source of information. OE from other high hazard industries should also be considered as it may be relevant or contain lessons applicable to the safety of nuclear installations.

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- A4.2. Determine the relationship of the utility/plant with national and international organizations (IAEA, NEA, WANO, INPO, etc.).
- A4.3. Review the availability and accessibility to these and other relevant sources by the plant OE group and other operational experts. Assess if they are taken into account effectively in the screening process for further consideration and use in the OEF process.

A5. SCREENING OF INCIDENTS, EVENTS AND OTHER OE

Expectations

- A5.1. OE is appropriately and consistently screened, to select and prioritise the information for further investigation. Screening criteria for in-house and industry OE information are clearly established and the criteria for the subsequent level of investigation and distribution are defined.
- A5.2. The screening is performed in a systematic, timely and consistent manner. The sources for screening and their corresponding frequency of screening are defined. Screening is performed by individuals with a broad knowledge of plant operations or by a multi-disciplinary group.

Guidance for Inspectors

- A5.3. Check that the threshold for exclusion/inclusion of events is established. If so, evaluate whether that threshold is appropriate. Review whether the plant reporting criteria are adequately defined and they are comprehensive. Review the screening process of in-house events and verify the screening includes low-level events, near misses and precursor events.

- A5.4. Check that screening criteria for in-depth investigation and root cause analysis are established. Verify that responsibilities for this decision making are clear. Evaluate whether screening is completed in a timely and consistent manner to: establish the plant's 'extent of condition' required to inform conservative decision making and meet the requirements for notification/reporting. Check if there is a backlog of events to be screened or analysed and if so, how significant these events are.
- A5.5. Review the comprehensiveness of the screening criteria for notifying/reporting to the regulator and whether they cover all safety significant events.
- A5.6. Check that when screening criteria are met, the priorities and actions to be taken are specified in writing. Evaluate whether all reported safety relevant deviations are currently identified in the screening process and analysed to learn the lessons.
- A5.7. Determine how external experiences are made known to the plant. If a pre-screening is done outside the plant, for example by a corporate office organization, determine what criteria they use. This is necessary to ensure all applicable information is forwarded to the plant. Verify that external OE reports are screened adequately. Review whether the amount of OE introduced into the plant is adequate (neither too little nor too much). Evaluate whether it can all be assimilated or on the contrary there are missed opportunities.
- A5.8. Review how staff determines whether an external OE report is relevant to the plant. Evaluate whether relevant external OE reports are adequately assessed and promptly circulated for information and action if appropriate.
- A5.9. Check whether the personnel responsible for screening have the necessary breadth of experience. Confirm that they have adequate resources to conduct their duties.

A6. INVESTIGATION AND ANALYSIS OF OE

Expectations

- A6.1. Investigation and/or analysis is performed on selected OE, including incidents or events, in accordance with their safety significance to ensure that direct or apparent causes, root causes and corrective actions are identified. Criteria for performing a full root cause analysis, a simplified analysis, or a trending analysis are clearly defined and documented in the arrangements.
- A6.2. For significant plant incidents/events, and important human performance and equipment problems, a rigorous investigation with full root cause analysis is performed, including identification of causal factors, generic implications, and discrepancies between expected and actual plant responses and or personnel actions.
- A6.3. For minor incidents/events and near misses and any other error condition reported, the level of analysis required is clearly defined such that generic implications, precursors of declining performance and root causes of adverse trends can be identified.
- A6.4. Personnel who have appropriate knowledge, experience and skills perform investigations/analysis. Event participants are involved in developing and implementing corrective actions, as necessary. Newly trained investigation staff would also be expected to receive mentoring and support in initial investigations.
- A6.5. Investigation of events is initiated promptly to preserve information and physical evidence and to interview participants while the events are fresh in their memories. Investigations are completed in a timely manner without compromising quality.

A6.6. Investigations take account of previous similar events and precursors from both internal and external sources. Investigations are subject to objective review to ensure that root causes have been identified, which are then addressed by implementing effective corrective actions.

Guidance for Inspectors

Methods used for Investigation and analysis

A6.7. Check that the investigation methods utilised are adequately defined and appropriate to the significance of the event. When necessary do the methods identify direct and root causes, together with contributory factors. Evaluate whether the methods used address plant, procedural and personnel issues adequately. Check if failed barriers, organizational weaknesses and error likely situations are considered.

A6.8. Verify that similar internal or external events are considered during the investigation/analysis process. Confirm that the sources or database of information relating to similar events or precursors are easily accessible, retrievable and easy to use by those carrying out the investigation/analysis. Evaluate if effectiveness of corrective actions taken to previous similar events are considered during an event investigation.

A6.9. Verify that analyses of events or group of low-level events and near misses are performed to identify root causes or precursors of declining performance. Confirm that periodically the database is reviewed and that a methodology is established to perform root cause analysis to an accumulation or trend of low-level events and near misses in the same area or with a similar pattern.

Quality of investigation and analysis

A6.10. Confirm that the plant has sufficient suitably trained, knowledgeable and experienced investigators/analysts to adequately process the event information. Review a sample of full root-cause investigation reports for the quality of the information available in them. Check whether they contain: -

- The date time and place of the incident; (when and where it happened)
- The purpose and scope of the investigation;
- A description of the incident progression and relevant circumstances, including any injury or radiation exposure to personnel (what happened and how it happened);
- The direct and root causes identified from the investigation (why it happened);
- Whether there are any lessons for similar plant or operations; and
- The corrective actions deemed necessary to help prevent a recurrence (what is to be done to stop it happening again).
- Relevant OE (including effectiveness of any relevant corrective actions from previous events)

A6.11. Evaluate whether all the direct and root causes are identified, together with contributory factors. Check that human error is not being identified as the root cause without an understanding of the factors leading to the human error. Confirm that the corrective actions proposed are clearly targeted at resolving of the causes.

A6.12. Check whether there is a management process to review the quality of the investigation reports. Check to ensure that analysis of significant events or group of events or trends are reviewed by the plant safety review committee (or other suitable

body) on a regular basis and verify their concurrence with the recommended corrective actions from the analysis.

Timeliness of investigation and analysis

A6.13. Review whether the investigations are conducted in a timely manner and completed in accordance with times set out in the arrangements. Check if there is a procedure for gathering information from event participants and the scene as promptly as possible after the occurrence and that where necessary scene preservation was in evidence.

A7. CORRECTIVE ACTIONS

Expectations

A7.1. The results of OE reviews, investigations and analysis are used to identify corrective actions. Corrective actions address fundamental causes of problems, rather than the symptoms to avoid recurrence of events.

A7.2. Corrective actions are prioritised, scheduled for implementation, and effectively implemented. Dates for actions are commensurate with the importance of the item, site priorities, operational and maintenance constraints and the consideration of preventing a recurrence. Operating shift crews are promptly briefed on events and compensatory measures are taken to prevent recurrence.

A7.3. Corrective actions are tracked for completion to verify their final implementation. Review of corrective actions status and effectiveness is periodically done. Management receives feedback on the review results.

Guidance for Inspectors

Identification of corrective actions

A7.4. Check the existence of criteria for conservative decision making to define corrective actions and to set their time schedule. Confirm that appropriate corrective actions from external events are placed and tracked where necessary. Verify that the corrective actions proposed are relevant, specific, comprehensive, realistic, achievable, measurable, and they can be implemented in a timely manner.

A7.5. Review the process for agreeing corrective actions and the time scales for completion. Check whether persons responsible for implementation are involved in the development of the actions and the corrective action programme.

A7.6. Check that corrective actions are systematically prioritized to specific criteria. Evaluate whether these criteria consider relevance to safety. Review how the prioritisation of actions is decided and what criteria are considered.

A7.7. Confirm that appropriate short term corrective actions/interim arrangements are put in place to correct significant problems in advance of longer-term corrective action completion.

Implementation of corrective actions

A7.8. Evaluate whether corrective actions resulting from immediate reviews of events with significant plant impact are implemented in a timely manner. Check if deficiencies, which have an immediate effect on safe operation, have been considered and rectified prior to continued operation. Verify that operating shift crews are promptly briefed on events to prevent recurrence.

- A7.9. Check if every corrective action is assigned to a responsible group or person to own, coordinate, follow-up and review its effectiveness. Check if meetings are held with responsible personnel where progress against targets is reviewed and these are effective in monitoring progress. Find the number of outstanding corrective actions and the number of overdue actions and check if they are concentrated in one department.

Tracking of completion of corrective actions

- A7.10. Confirm that an effective system is in place for tracking the progress of outstanding corrective actions. Check whether any corrective actions have been closed before verifying their effectiveness. Check if any issues have been closed prior to the completion of a corrective action. Check whether any issues have been considered closed following the development of a plan to implement corrective action, rather than following full implementation of corrective action. Check whether any actions have been transferred to other systems where tracking and monitoring of action close-out is less rigorous.

Review of effectiveness of corrective actions

- A7.11. Confirm that there is a procedure to review the effectiveness of corrective actions. Check whether corrective actions effectiveness is evaluated in practice. Review selected fully implemented corrective actions. Evaluate whether previous corrective actions have been effective in eliminating the direct causes, root causes and contributors to events (e.g. initiating events, flawed defences, and organizational weaknesses). Verify that previous corrective actions have prevented recurrence of the event to which they relate and if not, why have they not been effective.

A8. USE OF OE INFORMATION

Expectations

- A8.1. OE information is used throughout the licensee organisation. Personnel are aware of management expectations to use OE information.
- A8.2. OE information is easily accessible to personnel. Personnel are aware and knowledgeable on how to access it.
- A8.3. Use of OE in personnel work activities (e.g. just-in-time (JIT) or pre-job briefings, work planning, shift briefings etc.) is carried out to remind the personnel involved of lessons learned and precautions identified from OE, to enhance the personnel alertness and to reduce risks.
- A8.4. OE information is used in training. It is compiled in training modules for operators' simulator training and in training of plant personnel in other areas.
- A8.5. Pertinent OE information is used in developing new processes, reviewing existing processes, planning new activities or starting new projects.

Guidance for Inspectors

Availability of information on OE

- A8.6. Review that plant personnel are knowledgeable of recent relevant significant events, both internal and external. Check that relevant OE information is readily available to all concerned plant personnel. Check if the information is apparent in the plant (OE bulletins, notices, posters, etc.). Check whether there are regular meetings of plant personnel at different levels where relevant in-house and industry event information is presented and discussed.

- A8.7. Determine the involvement of the corporate organization in the OEF process and their effective and coordinated use of the information to support the plant activities and communicate with other corporate utilities and external organizations. Determine how much workers/engineers are aware of significant incidents/accidents in the nuclear industry, especially those involving similar technologies affecting the plant.

Application of OE

- A8.8. Search for evidence of prompt decision and action regarding the use of OE following events with significant plant impact. Check that lessons learned from previous events are disseminated and used in pre-job briefings. Evaluate whether the information is provided in a timely manner and pre-job. Review whether the lessons learned from immediate reviews of events with significant plant impact have been promptly disseminated by pre-operation briefings, directed reading programmes, etc. Verify that industry OE information is used during in-house events analysis.
- A8.9. Check that management/supervisory staff carries out regular staff briefings on safety issues and lessons learned. Attend OE meetings to observe and verify the involvement of participants and the effectiveness of the meetings. Attend OE screening and other meetings to observe and verify if OE issues are addressed and receive appropriate attention.
- A8.10. Determine the extent of use of good practices in the activities of the plant. Check if good practices are considered when reviewing procedures or issuing new procedures.

Use of OE in training

- A8.11. Confirm that lessons learned from recent external and internal events are included in refresher training (e.g. simulator training). Check that other disciplines than operations (e.g. maintenance) are included in the agenda. Attend training sessions to observe and verify if OE issues are addressed and included in the training programme.

A9. TRENDING OF OE INFORMATION

Expectations

- A9.1. For significant events, low level events (minor events), and near misses (non consequential events, potential problems) database trending system parameters are established to provide data presentation that facilitates a review of performance, identification of patterns, identification of abnormal trends and identification of reoccurrences.
- A9.2. Trend analysis is carried out on regular basis and results of analysis are reported to management. Actions are taken to correct identified adverse trends with the potential to affect safety.

Guidance for Inspectors

- A9.3. Check whether events are categorised or coded in any way (e.g. plant code, equipment, personnel, procedures, management process, direct causes, root causes, significance, reporting criteria met, etc.). Evaluate whether the criteria for categorisation or coding are specified adequately for trending purposes. Check if the application of consistent categorisation/coding is apparent.
- A9.4. Evaluate whether the database and trending system utilised is comprehensive in specification (equipment, personnel, and processes, etc.). Check that the system is capable of allowing user friendly and flexible searches on trends to be conducted.

Confirm that regular trend reviews are carried out. Review the reports prepared and summaries issued. Evaluate whether they are relatively timely and relevant.

A9.5. Verify that adverse trends are reviewed and corrective actions are identified and implemented. Check whether routine management reviews and significance reviews are carried out and actions are taken based on the results of the reviews. Check whether this is evident in the action plans of the plant.

A9.6. Review what are the unresolved key safety issues identified by the trending process. Evaluate whether these unresolved safety issues show a weakness in: the ability to identify issues before they result in failures or events, the ability to adequately and comprehensively analyse the identified issues, or a failure to implement appropriate and comprehensive corrective measures in a timely manner.

A9.7. Check whether the significance to safety of the consequences of the events has been trended over several years. Check whether positive or adverse trends have been acted upon by plant management.

A10. ASSESSMENT OF EFFECTIVENESS OF THE OEF PROCESS

Expectations

A10.1. Self-assessments and independent evaluation/audit are periodically performed to determine the effectiveness of the OEF process and the effective use of OE information. Self-assessment evaluates all aspects of the OEF process. Management receives feedback on the self-assessment results. Results of self-assessment and independent audits are used to identify areas for improvement in the OEF programme and these are acted upon.

A10.2. Indicators are used to monitor the safety performance of the plant. The trends of indicators are evaluated during self-assessment. Examples of these indicators are: recurrent safety systems unavailability, volume of low-level waste, radiation doses etc.

A10.3. Safety performance indicators are used to track the effectiveness of the OEF process. Examples of these indicators could include:

- average time for initial screening of incident reports and other OE information;
- number and age of reports awaiting investigation;
- number and age of corrective actions awaiting implementation.

A10.4. The site's Management Review arrangements should include consideration of relevant information on the overall effectiveness of the OEF process.

Guidance for Inspectors

A10.5. Check whether self-assessment or independent audit of the effectiveness of the OEF process is conducted on a routine basis. If not, review how the plant determines the effectiveness of its arrangements to enhance the prevention of operational failures.

A10.6. Check that the overall timeliness of OEF process activities in responding to events is regularly reviewed. Check if the overall timeliness of corrective actions progress is regularly reviewed. Check whether the overall quality of analysis and adequacy of developed corrective actions is regularly reviewed. Check whether effectiveness of the corrective actions is validated.

- A10.7. Check whether the recommendations from previous self-assessments or independent audits and reviews have been acted upon and consequent improvements made. Check if the results of previous reports are compared with the present situation.
- A10.8. Confirm that the site's annual safety review reports cover OEF process effectiveness. Check whether corporate (including internal regulation) and plant management receives regular reviews of the safety performance of the plant and the effective use of OE information. Check whether plant and corporate Safety Committees assess the effective use of OE information to improve the plant safety and performance.