



ONR GUIDE			
LC28 EXAMINATION, INSPECTION, MAINTENANCE AND TESTING (EIMT)			
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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 a suite of documents provided by ONR for this purpose.

2 PURPOSE AND SCOPE

2.1 The purpose of this guidance is to promote a consistent approach to Licence Condition 28 (LC28) compliance inspection and to provide guidance to inspectors in carrying out their duties in this area. The guidance should not be regarded as either comprehensive or mandatory.

2.2 The guidance provided is divided into 4 main elements:

- 1) Purpose of the Licence Condition.
- 2) Guidance on arrangements for LC28.
- 3) Guidance on inspection of arrangements.
- 4) Guidance on inspection of implementation of arrangements.

3 LICENCE CONDITION 28: EXAMINATION, INSPECTION, MAINTENANCE AND TESTING

28(1) The licensee shall make and implement adequate arrangements for the regular and systematic examination, inspection, maintenance and testing of all plant which may affect safety.

28(2) The licensee shall submit to ONR for approval such part or parts of the aforesaid arrangements as ONR may specify.

28(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.

28(4) The aforesaid arrangements shall provide for the preparation of a plant maintenance schedule for each plant. The licensee shall submit to ONR for its approval such part or parts of any plant maintenance schedule as ONR may specify.

28(5) The licensee shall ensure that once approved no alteration or amendment is made to any approved part of any plant maintenance schedule unless ONR has approved such alteration or amendment.

28(6) The licensee shall ensure in the interests of safety that every examination, inspection, maintenance and test of a plant or any part thereof is carried out:

- a) by suitably qualified and experienced persons;
- b) in accordance with schemes laid down in writing;
- c) within the intervals specified in the plant maintenance schedule; and

- d) under the control and supervision of a suitably qualified and experienced person appointed by the licensee for that purpose.

28(7) Notwithstanding the above paragraphs of this condition ONR may agree to an extension of any interval specified in the plant maintenance schedule.

28(8) When any examination, inspection, maintenance or test of any part of a plant reveals any matter indicating that the safe operation or safe condition of that plant may be affected, the suitably qualified and experienced person appointed to control or supervise any such examination, inspection, maintenance or test shall bring it to the attention of the licensee forthwith who shall take appropriate action and ensure that the matter is then notified, recorded, investigated and reported in accordance with arrangements made under Condition 7.

28(9) The licensee shall ensure that a full and accurate report of every examination, inspection, maintenance or test of any part of a plant indicating the date thereof and signed by the suitably qualified and experienced person appointed by the licensee to control and supervise such examination, inspection, maintenance or test is made to the licensee forthwith upon completion of the said examination, inspection, maintenance or test.

4 PURPOSE OF LICENCE CONDITION 28

4.1 The purpose of LC 28 is to ensure that all plant that may affect safety, receives regular and systematic Examination, Inspection, Maintenance and Testing (EIMT) by and under the control of Suitably Qualified and Experienced Persons (SQEPs), and in accordance with written schemes. The purpose of this EIMT is to ensure the nuclear plant remains capable of performing its safety functions, with the required level of reliability. Licensees often divide their overall maintenance catalogue into subsets, for example a maintenance catalogue may comprise some or all of the following subsets:

- a) Items necessary to satisfy the requirements of the safety case (LC 23) (with appropriate reliability) which comprise the EIMT requirements of the Plant Maintenance Schedule (PMS).
- b) Items that have particular statutory examination requirements, e.g. pressure systems or lifting equipment.
- c) Items where EIMT is necessary to satisfy statutory environmental requirements.
- d) Items to support the operational reliability of the plant (without a specific contribution to safety).

4.2 The items important to safety in respect of LC28 should be listed in the PMS. The licensee's arrangements should include the criteria by which EIMT is specified, controlled and changed.

4.3 Historically PMSs have been compiled on the basis of deterministic assessments of Structures, Systems, and Components (SSCs) needed to comply with the requirements of the safety case. Necessary EIMT has then been specified to ensure that SSCs will function with adequate reliability and that the nuclear plant remains within its safe operating envelope. Later PMSs have been influenced by the evaluation of the contribution made by SSCs in reducing the overall risk from the site as measured by the site Probabilistic Safety Assessment (PSA).

4.4 Due to their safety case arrangements, some licensees may argue that some items of lesser safety significance should not be included on the PMS. Where this is justified, adequate EIMT of these items is still a requirement of LC28(1).

- 4.5 LC28(1) provides for the making and implementing of arrangements in respect of all plant (SSCs) that may affect safety.
- 4.6 LC28(4) provides for the preparation of a Plant Maintenance Schedule (PMS) and gives ONR the power to specify submission of the PMS or parts of the PMS for approval.
- 4.7 It is current ONR practice to specify a high level section of the PMS, often termed the preface, for approval. Once ONR approves the PMS preface, subsequent amendments to the main body of the PMS may be made by the licensee, using suitable internal arrangements, without the need to apply to ONR for approval.
- 4.8 LC28(6) requires that all EIMT of SSCs is carried out by SQEPs in accordance with written instructions within a specified time interval. Explicitly it is expected that this time interval will be specified in the PMS. The time interval is significant because failure to complete work within this interval would be a LC non-compliance. ONR has previously taken enforcement action in this area. LC28(6) also provides for the appointment of SQEPs to control and supervise this work.
- 4.9 LC28(7) enables ONR to agree to an extension of any interval specified in the PMS. Although the licensee may change the EIMT intervals in accordance with its LC22 modification arrangements, this primary power is used to allow a 'one-off' extension to a particular interval, without changing the interval generally going forwards. Some licensees have written specific procedures within their PMS preface to allow them to change the schedule and for dealing with extensions to EIMT intervals. In these cases, in order to exert regulatory control, ONR has approved this PMS preface, and issued an agreement, agreeing to extension of EIMT intervals that are controlled in accordance with procedures specified in this PMS preface.
- 4.10 LC28(8) requires that plant safety issues revealed during EIMT are properly notified, investigated, acted upon and reported in accordance with established site arrangements under Licence Condition 7.
- 4.11 LC28(9) requires full and accurate reports of all activities carried out under LC28, ensuring that the record is signed off by the SQEP who controls and supervises the work.

5 GUIDANCE ON ARRANGEMENTS FOR LC 28

- 5.1 Arrangements for regular and systematic EIMT, covering the totality of SSCs that may affect safety, should be provided in accordance with all LC 28 requirements. The arrangements may be defined in a single document or a suite of linked documents.
- 5.2 The PMS should describe the EIMT activity required to support the safety case. This may either be a single document or comprise several tiered parts, each tier perhaps reflecting a different level of safety significance.
- 5.3 Where the contents of the PMS are based on demonstrations of operability/availability and continuing plant reliability, then the EIMT activity identified should be sufficient to achieve adequate compliance with the assumptions contained in the site PSA.
- 5.4 The arrangements should require activities to be carried out within the time interval specified in the PMS. If the licensee wishes to include permitted tolerances to the identified periods these should be clearly defined.
- 5.5 Where an extension of the interval for plant maintenance is required, the arrangements should identify the potential need to request agreement from ONR under LC28(7). The arrangements should define how such an extension would be controlled, as this is

particularly important for PMS activities. Alternatively, provided the PMS is not approved, then the intervals may be extended by following an LC22 modification process.

- 5.6 The licensee's arrangements should include the means of controlling amendments to EIMT requirements in general. This should be via a modification proposal, considered in accordance with the LC 22 arrangements.
- 5.7 Where EIMT activities that are specified in the PMS can only be carried out during a plant shutdown, the maximum operating period between periodic shutdowns should be defined. ONR inspectors should liaise with the licensee to facilitate the timely completion of any regulatory activities, such as the review or witnessing of EIMT if appropriate. The licensee's arrangements should require post outage results to be issued to ONR within 28 days of plant start up.
- 5.8 The arrangements should require that EIMT is carried out on SSCs by suitably qualified and experienced persons (LC 28(6a)) and that an appropriate level of control and supervision is provided.
- 5.9 The arrangements should require all activities to be carried out in accordance with written instructions. The arrangements should include a system for ensuring a clear auditable trail from the specified EIMT requirements, to the work instruction. The instruction should identify all the necessary steps, the work that is required, the acceptance criteria (if appropriate), and the precautions that must be taken to safely undertake the work.
- 5.10 The arrangements may allow for EIMT to be carried out by SQEPs employed by the licensee on the site, or by SQEPs appointed by the licensee who are not directly associated with the site, such as contractors or external agencies.
- 5.11 Records (LC 28(9)) of EIMT carried out on SSCs which may affect safety should be compiled and retained by the licensee.
- 5.12 The arrangements should describe the requirements in LC 28(8) and (9) for notifying, reporting, recording, investigating and remedying defects or deficiencies revealed by EIMT.
- 5.13 The arrangements should allow for SSCs to be taken out of service and ensure that such unavailability is recorded, assessed and drawn to the attention of staff responsible for operating the plant. The arrangements should ensure that plant or systems that have had preventative or breakdown maintenance carried out are reinstated, tested, and accepted by a responsible person prior to being declared operable and available.
- 5.14 The arrangements should ensure that the replacement plant items are controlled with respect to design, procurement, storage, issue, fitness for purpose and installation.

6 GUIDANCE ON INSPECTION OF ARRANGEMENTS

- 6.1 This part of the guidance is to assist inspectors in judging the adequacy of the licensee's arrangements. The following list is neither exclusive nor exhaustive, however it provides a list of aspects of LC28 compliance requirements that might be examined during routine inspections carried out on the basis of sampling.
- 6.2 This part of the guidance identifies KEY ELEMENTS. The inspector should normally inspect against these elements, as being closely aligned to the wording of the licence condition, or as being important regulatory expectations to the goal setting aspects of the licence condition. This part of the guidance also identifies SUPPORTING

ELEMENTS, which the inspector may also choose to cover within the inspection scope.

6.3 Inspectors should endeavour, through a sampling approach, to review the arrangements against the following elements:

KEY ELEMENTS

- The arrangements should describe the methods and criteria for identifying the safety significance of all SSCs, and identify the safety significance of all EIMT activities.
- All SSCs having appropriate safety significance should be included in the PMS, and there should be a clear link from the safety case to the PMS.
- The arrangements should, for each item listed, identify the period for such EIMT activity. Where included, tolerances to the identified periods should be clearly defined.
- Changes to the PMS require a safety justification produced and assessed in accordance with the licensee's arrangements, against LC22.
- Failures to meet PMS requirements should be notified, recorded, and investigated in accordance with LC7. The licensee should also monitor its adherence to the requirements of the PMS.
- Intervals in the PMS should not be extended without the agreement of ONR, unless the licensee has gone through due process in accordance with its arrangements (i.e. using LC22). The arrangements should describe the appropriate control and authorisation measures.
- All EIMT work should be under the control and supervision of a SQEP appointed for that purpose by the licensee.
- All EIMT work should be undertaken in accordance with schemes laid down in writing.
- The requirements for record keeping associated with completed EIMT should be clear.

SUPPORTING ELEMENTS

- The format should be clear to those responsible for implementing the arrangements, should be in line with other licensee document management systems, and should be readily available to those who require them.
- Arrangements should remain valid following any changes, through appropriate configuration control procedures.
- Instructions, methods and quality assurance procedures should have been followed in producing the arrangements.
- Confirm whether the PMS is a single document or comprises several parts. If the latter option is chosen, it should be produced in a tiered format, each tier or part reflecting safety significance.
- Confirm that the arrangements give due consideration to equipment required for emergency situations.
- Where work activities that are specified in the PMS can only be carried out with the plant shutdown, the arrangements should define the maximum operating period between periodic shutdowns.

- Arrangements should include the regular review of EIMT performance, including trend analysis capable of identifying any backlogs.
- The arrangements may allow for EIMT to be carried out by people not directly associated with the site. In this case confirm that the licensee checks and approves qualifications and experience of such workers prior to the work being authorised (in accordance with licensee control of work arrangements).
- When plant is taken out of service it is important that the arrangements ensure sufficient items of plant remain in service or available for use to provide the necessary level of safety that is justified in the plant safety case. This may be informed by assessments of risk by PSA, and may include a contribution from a site "risk-monitor".
- SSCs that have had maintenance carried out should be reinstated, tested and accepted by the responsible person before being returned to service.
- Replacement of plant items should be controlled with respect to design, specification, manufacture, function, procurement, storage, issue, fitness for purpose and installation. The arrangements should require SQEPs to control these aspects and complete appropriate records.

7 GUIDANCE ON INSPECTION OF IMPLEMENTATION OF ARRANGEMENTS

- 7.1 This part of the guidance is to assist inspectors in judging the adequacy of the licensee's implementation of their arrangements. The following list is neither exclusive nor exhaustive, nevertheless it provides a list of aspects of LC28 that can be examined during routine inspections.
- 7.2 This part of the guidance identifies KEY ELEMENTS. The inspector should normally inspect against these elements, as being closely aligned to the wording of the licence condition, or as being important regulatory expectations to the goal setting aspects of the licence condition. This part of the guidance also identifies SUPPORTING ELEMENTS, which the inspector may also choose to cover within the inspection scope.
- 7.3 Inspectors should endeavour, through a sampling approach, to review the implementation of the arrangements against the following elements:

KEY ELEMENTS

- Examine the Plant Maintenance Schedule and associated records to ensure that all necessary EIMT has been completed within the stated timescales.
- Ensure that EIMT has been carried out in accordance with licensee authorised instructions.
- Review the output records from the EIMT activity, and check they have been completed to the detail required by the arrangements.
- Check that the EIMT output records are stored in an appropriate manner and are readily available.
- Check that the PMS is linked to the safety case, through appropriate safety classification schemes.
- For those SSCs that support operating rules, check that the required availability with respect to items important to safety is met, whilst EIMT is undertaken.

- Check the suitability of those undertaking and supervising EIMT activities (i.e. suitably qualified and experienced persons).
- Check that the SSCs are deemed acceptable at the end of the specified activity. Check that any comments from the person who completed the work have been followed up, and that this has been captured within incident reporting arrangements as appropriate.

SUPPORTING ELEMENTS

- Inspectors may also wish to check that the extent of EIMT on the SSC is linked to the reliability claims made within the safety case.
- Review results from the EIMT of SSCs listed in the PMS and compare with the criteria that are required to satisfy equipment qualification schedules, operating instructions, or emergency requirements.
- If repair / refurbishment has been required, confirm that this has been completed, that any tests required were performed satisfactorily, that any test equipment was appropriately maintained and calibrated.
- Establish if the correct stores items have been received, stored and identified as nuclear safety important spares and issue of such is controlled to ensure the correct use. Such control should include an acceptability check by a SQEP on receipt of the item to the stores, and prior to use.
- Establish that appropriate facilities, equipment, and tools are available for undertaking EIMT activities.
- Establish that suitable measures are in place to manage foreign material exclusion during EIMT.
- Sample the records for LC22 to establish whether the modifications procedure was invoked where alternative items have been used during EIMT.
- Check that future EIMT activities identified during shutdown are detailed and included in the programme for the next periodic shutdown as necessary.
- For decommissioning sites, ensure that a progressive review of the PMS is carried out to ensure that the contents relate to the current safety case and hazard, and that changes to the PMS are properly controlled.
- The suitability of maintenance staff may be sampled by:
 - i) Discussions with the person carrying out EIMT;
 - ii) Reviewing with the appropriate section head that those persons controlling and supervising activities have suitable job specifications identifying their responsibilities;
 - iii) Reviewing, with those responsible for training, records to establish that persons responsible for completing activities are SQEP.
- Review the way plant defects are handled:
 - i) Examine a sample of reported defects and check what follow up actions were identified;
 - ii) For defects sampled, check the implications of the defect (specific and generic) and recommended investigation and reporting requirements;
 - iii) Review a sample of defect records and check that any necessary action(s) were completed and signed off;

- iv) Examine a sample of defect records to establish that, for activities with the greatest nuclear significance, defects only occur on an infrequent basis. For other items, establish that there is not a rising trend in the number of defects.
- v) Review any defects of safety significance with the appropriate personnel and establish if changes to the safety case are needed.