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| ONR GUIDE | | | |
| TRAINING AND ASSURING PERSONNEL COMPETENCE | | | |
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1. INTRODUCTION

- 1.1 ONR has established its Safety Assessment Principles (SAPs) which apply to the assessment by ONR specialist inspectors of safety cases for nuclear facilities that may be operated by potential licensees, existing licensees, or other duty-holders. The principles presented in the SAPs are supported by a suite of guides to further assist ONR's inspectors in their technical assessment work in support of making regulatory judgements and decisions. This technical assessment guide is one of these guides.

2. PURPOSE & SCOPE

- 2.1 The Office for Nuclear Regulation (ONR) of the Health and Safety Executive (HSE) has the responsibility for regulating the safety of nuclear installations in Great Britain. The Safety Assessment Principles (SAPs) for Nuclear Facilities [\[Ref 1\]](#) provide a framework to guide regulatory decision-making in the nuclear permissioning process. They are supported by Technical Assessment Guides (TAGs) which further aid the decision-making process.
- 2.2 This TAG is principally intended to provide guidance to aid inspectors in the application of SAP EHF8, which states that a systematic approach should be taken to the identification and delivery of personnel competence, and its supporting Para 387. It also assists in the application of other SAPs which set out expectations of licensees' training processes and arrangements for assuring competence.
- 2.3 The TAG also provides guidance to inform inspection activities carried out to judge compliance with Licence Condition 10 (training) and Licence Condition 12 (duly authorised and other suitably qualified and experienced persons). Annex 2 incorporates guidance on inspecting the implementation of arrangements that was previously included within T/INS/10 (LC10) and T/INS/012 (LC12) which are now withdrawn. The guidance in the Annex is complementary to the main body of this TAG and both should be read and applied together as appropriate.

3. RELATIONSHIP TO SITE LICENCE AND OTHER RELEVANT LEGISLATION

- 3.1 The Nuclear Site Licence Conditions place legal requirements on the licensee to make and implement arrangements to ensure that safety is being managed adequately.
- 3.2 All licence conditions are to some extent relevant to the licensee's arrangements for ensuring that staff are appropriately trained and that they are suitably qualified and experienced. However the following licence conditions, and selected sub-conditions, are particularly pertinent:

Licence Condition 10: Training

- 1) The licensee shall make and implement adequate arrangements for suitable training of all those on site who have responsibility for any operations which may affect safety.
- 2) The licensee shall submit to the Executive for approval such part or parts of the aforesaid arrangements as the Executive may specify.
- 3) The licensee shall ensure that once approved no alteration or amendment is made to the approved arrangements unless the Executive has approved such alteration or amendment.

Licence Condition 12: Duly authorised and other suitably qualified and experienced persons

- 1) The licensee shall make and implement adequate arrangements to ensure that only suitably qualified and experienced persons perform any duties which may affect the safety of operations on the site or any duties assigned by or under these conditions or any arrangements required under these conditions.
- 2) The aforesaid arrangements shall also provide for the appointment, in appropriate cases, of duly authorised persons to control and supervise operations which may affect plant safety.
- 3) The licensee shall submit to the Executive for approval such part or parts of the aforesaid arrangements as the Executive may specify.
- 4) The licensee shall ensure that once approved no alteration or amendment is made to the approved arrangements unless the Executive has approved such alteration or amendment.
- 5) The licensee shall ensure that no person continues to act as a duly authorised person if, in the opinion of the Executive, he is unfit to act in that capacity and the Executive has notified the licensee to that effect.

Licence Condition 6: Documents, Records, Authorities and Certificates

- 1) The licensee shall make adequate records to demonstrate compliance with any of the conditions applied to this licence.

Licence Condition 9: Instructions to persons on the site

The licensee shall ensure that every person authorised to be on the site receives adequate instructions (to the extent that is necessary having regard to the circumstances of that person being on the site) as regards the risks and hazards associated with the plant and its operation, the precautions to be observed in connection therewith and the action to be taken in the event of an accident or emergency on the site.

Licence Condition 11: Emergency arrangements

- 1) Without prejudice to any other requirements of the conditions attached to this licence, the licensee shall make and implement adequate arrangements for dealing with any accident or emergency arising on the site and their effects.
- 2) The licensee shall ensure that such arrangements are rehearsed at such intervals and to such extent as the Executive may specify or, where the Executive has not so specified, as the licensee considers necessary.
- 3) The licensee shall ensure that such arrangements include procedures to ensure that all persons in his employ who have duties in connection with such arrangements are properly instructed in the performance of the same, in the use of the equipment required and the precautions to be observed in connection therewith.

Licence Condition 17: Quality assurance

1) Without prejudice to any other requirements of the conditions attached to this licence the licensee shall make and implement adequate quality assurance arrangements in respect of all matters which may affect safety.

Licence Condition 26: Control and supervision of operations

The licensee shall ensure that no operations are carried out which may affect safety except under the control and supervision of suitably qualified and experienced persons appointed to that purpose by the licensee.

Legal requirements for training are also set out elsewhere, for example the Health and Safety at Work Act (HSWA) and the Ionising Radiations Regulations (IRRs). The Management of Health and Safety at Work Regulations require the employer to ensure that employees and temporary workers are provided with adequate health and safety training and that they are not required to carry out work which exceeds their ability to carry out work without risk to themselves or others. The IRRs place duties on the employer to ensure that employees and others working with, or affected by, the employer's work with ionising radiation are given appropriate training. The principal requirements are set out in Regulation 14 of the IRRs.

4. RELATIONSHIP TO SAPS, WENRA REFERENCE LEVELS AND IAEA SAFETY STANDARDS

ONR's SAPs and the WENRA reference levels were re-issued in 2014. This TAG will be updated to reflect these changes in due course and in the meantime inspectors need to check that they are using the correct versions of those publications during their assessments.

Relevant SAPs

- 4.1 ONR's expectations concerning licensee's arrangements for training and assuring personnel competence are set out in a number of SAPs. The primary reference is SAP EHF8 which states:

"A systematic approach to the identification and delivery of personnel competence should be applied".

Para 387 expands upon EHF8:

"The process for identifying and delivering competence should encompass the phases of: job analysis; identification of competence requirements; training needs analysis; training programme design and implementation; formal assessment of competence; and evaluation. The process should be applied to all those whose actions could impact on safety, including employees and other groups of staff such as contractors. Directors, managers and leaders should be included in this process. Appropriate supervision and monitoring should be maintained until individuals are demonstrably competent to perform their tasks".

- 4.2 Other SAPs and their supporting text also make reference to the need for a process to carry out training and assure that appropriate competencies are delivered and maintained. These are summarised in Annex 1.

IAEA Safety Standards

- 4.3 The salient expectations for the provision of training and competence are summarised in IAEA GS-R-3 [\[Ref 2\]](#), which states that “Senior management shall determine the competence requirements for individuals at all levels and shall provide training or take other actions to achieve the required level of competence. An evaluation of the effectiveness of the actions taken shall be conducted. Suitable proficiency shall be achieved and maintained. Senior management shall ensure that individuals are competent to perform their assigned work and that they understand the consequences for safety of their activities. Individuals shall have received appropriate education and training, and shall have acquired suitable skills, knowledge and experience to ensure their competence. Training shall ensure that individuals are aware of the relevance and importance of their activities and of how their activities contribute to safety in the achievement of the organisation’s objectives”.
- 4.4 IAEA GS-R-1 [\[Ref 3\]](#) further states that, before authorising the loading of nuclear fuel or initial criticality, as appropriate, the regulatory body shall complete the review and assessment of ...the arrangements for ensuring training and qualification of plant personnel.
- 4.5 The guidance in this TAG is consistent with the systematic approach to training advocated by the IAEA in [\[Ref 4\]](#), which is referred to in IAEA NS-G-2.8 [\[Ref 5\]](#).

WENRA safety reference levels

- 4.6 The guidance is consistent with WENRA Reactor Safety Reference Levels Issue D: Training and Authorization of NPP staff (jobs with safety importance) [\[Ref 6\]](#), against which it has been benchmarked.

5. ADVICE TO INSPECTORS

- 5.1 It is essential that all personnel whose activities have the potential to impact on nuclear safety are suitably qualified and experienced (SQEP) to carry out their jobs. This includes both those who directly carry out operations and others such as directors, managers, designers, safety case authors etc whose roles, if inadequately conceived or executed, may affect safety in less visible ways – for example, through introducing latent technical or organisational weaknesses. The licensee should therefore put in place robust arrangements for identifying its competence needs and assuring these are met and maintained. These arrangements are needed to comply with the requirements of LC12. The arrangements should clearly define the licensee’s interpretation of SQEP, and should identify those who are required to be SQEP. Staff who discharge nuclear safety roles should be included within the licensee’s organisational baseline -see NS-TAST-GD-065 [\[Ref 13\]](#).
- 5.2 Training is a fundamental mechanism through which personnel acquire, and maintain, the skills and knowledge needed to perform a job to defined standards. In other words, training should be instrumental in developing and sustaining competence. IAEA has defined competence as “the ability to put skills and knowledge into practice in order to perform a job in an effective and efficient manner to an established standard” [\[Ref 4\]](#). ONR concurs with this definition, which is widely accepted within the international nuclear community. Other factors contributing to a person’s competence include the person’s prior experience, aptitudes, attitudes, behaviours, skills and qualifications. Competence can therefore broadly be equated to SQEP. The licensee should have arrangements in place to define and deliver the training needed to sustain competence, and to comply with the requirements of LC10.
- 5.3 LC12 further provides for the appointment of Duly Authorised Persons (DAPs). DAPs are usually identified as individuals who are in direct control or supervision of

operations or activities that impact on the safety envelope of the facility. Their appointments are therefore subject to additional management controls covering areas such as appointment and assessment. Roles for which DAPs must be appointed should be specified in the licensee's LC12 arrangements, and a register kept of such persons (see [Annex 2](#) for further detail). However, the general principle that persons whose activities may impact upon nuclear safety should be appropriately trained, and their competence adequately assured, is similar for SQEPs and DAPs.

5.4 ONR does not assess the competence of licensee staff directly, or authorise, e.g., reactor desk engineers as is the case in some regulatory regimes. ONR's approach is to seek confidence that the licensee has put in place, and is implementing, effective and proportionate arrangements for training and competence assurance for all personnel whose activities may impact upon plant safety. This should cover both licensee employees and others such as contractors whose actions could impact upon nuclear safety. A well-designed training and competence management system should adequately address the following elements:

- analysis of roles and associated competencies
- identification of learning objectives and training needs
- training programme design
- selection of appropriate training methods and media
- assessment of competence
- evaluation of training effectiveness
- organisation and support of the training function

5.5 The above elements are consistent with those identified in the Systematic Approach to Training, advocated by the IAEA in Technical Report 380 [\[Ref 4\]](#), and implicit in other publications (e.g. ACSNI [\[Ref 9\]](#)). ONR expects that at each stage these be applied in a proportionate and targeted manner. This assessment guide presents a summary of the reasons why each element is an important component of a licensee's training arrangements, and sets out the principal factors which should be considered by the ONR Inspector.

5.6 The emphasis that the Inspector gives to assessing different elements of a licensee's training and competence arrangements will depend upon the case being assessed. For example, where the tasks involved in carrying out a role are already well-defined, it may not be necessary to scrutinise closely the processes used to analyse the role and define competence and training needs. Conversely, where new activities are being developed, closer examination of the approach which the licensee takes to analysing these factors may be appropriate. As an overriding principle, the Inspector should consider the safety significance of the activities which the licensee carries out and adopt a proportionate and targeted approach to applying the guidance in this document.

Analysis of Roles and Associated Competencies

5.7 In order to develop a suitable and effective training programme, it is necessary first to identify the roles that must be performed. ONR expects the licensee to show how it has identified all roles that have the potential to impact on nuclear safety. This includes roles discharged by staff who do not have immediate hands-on contact with the facility, such as those who work in plant design and analysis and outage planning, and should cover those working in corporate offices as well as on-site. It should also include managerial roles and should extend up to and including the Board. The

licensee should have in place a process for ensuring that safety roles performed by staff whom it does not employ directly - such as contractors and agency staff – have been suitably identified and that these are subject to the licensee's arrangements. The tasks associated with each role then need to be determined so that competence and training needs can be established.

- 5.8 Identifying the components of a role, and the competencies needed to carry them out, may involve the use of job or task analysis. Where it exists this should build on and extend any existing task analysis that has been developed in support of human factors integration (see NS-TAST-GD-058 [\[Ref 17\]](#)). A range of task analysis techniques are available to the licensee, and the choice of technique should depend on the nature of the activity and the information which the licensee's analyst is seeking to extract. For example, some techniques are oriented towards describing the cognitive demands made by the task, whereas others are better at describing procedural steps or interactions between people. Useful guidance on the selection and use of task analysis techniques is provided in [\[Ref 8\]](#).
- 5.9 The analysis should draw upon sources such as the plant safety case, procedures, staffing levels, statements of personnel responsibilities, the licensee's overriding nuclear policy, regulatory requirements and operational experience feedback. For new facilities, where sources such as operational experience feedback are not available, the analysis may need to place more emphasis on expert judgement, simulation and desk-top exercises. Job and task analysis can be a resource-intensive activity, and it may not be necessary for detailed analysis to be performed for every role. It may also be possible to define "families" in which several related roles are grouped together so that generic competence needs are identified.
- 5.10 For each role and associated task, the competencies needed to carry out the work should be determined. The set of competencies should include both technical elements and others which may be less tangible, but which are no less important, such as decision making, challenge, management and leadership, communication and behavioural skills, etc. The competence requirements for all nuclear safety roles are expected to include an awareness of the importance of sustaining and contributing to a strong safety culture and the importance of attitudes and behaviours in relation to this. All staff should understand why nuclear safety matters and their roles and responsibilities for working in such a way that safety is the overriding priority. Some licensees may define "families" in which roles with similar competence needs are grouped together. The stated levels of competence needed to discharge each of these related roles then vary according to the nature of the work – for example, more qualifications and experience may be required for roles which include authority to make significant nuclear safety decisions. This approach can help the licensee to manage its staff competence and personal development needs and support succession planning.
- 5.11 When considering the range of competencies that are needed to fulfil a designated role, the licensee should consider the full range of operating modes and all fault and accident conditions identified in the safety case, including severe accidents.
- 5.12 The ONR Inspector should confirm that the licensee has a structured process in place to identify the tasks which are to be performed for each role, and the competencies needed to perform the associated tasks. The output of this process should contribute towards the specification of a role profile. An individual post may include a number of roles, and these should be set out in the job description. Where this is the case, consideration should also be given to the integration of these roles within a 'post' to ensure they are compatible and do not either overload individuals or create conflicts in

relation to their requirements. The job description and role profile should explicitly include, or reference, the competencies needed to carry out the associated activities.

- 5.13 In addition to consideration of individual roles and tasks, the analysis should include consideration of the way in which these come together and how, team and organisational performance can impact upon safety. This should input to and be reflected in the process for identification of required competencies.
- 5.14 When considering the range of competencies that are needed to fulfil a designated role, the licensee should consider circumstances where an individual may be called upon to deputise for another person – for example, at times of sickness or holiday. Although the deputy may not possess the full range of competencies required to carry out the work on a long-term basis, the licensee should identify the principal safety-related activities and ensure that the Deputy is, and remains, competent to carry out these activities.
- 5.15 The Inspector should consider:
- i) has a suitable analysis been carried out to identify those roles that may impact on safety, including corporate as well as plant functions;
 - ii) is the analysis sufficiently detailed to provide confidence that all safety-related roles and responsibilities have been identified;
 - iii) does the analysis include consideration of the full range of operating modes and all fault and accident conditions identified in the safety case, including severe accidents.
 - iv) is the analysis current - i.e., has it been maintained to take account of plant, equipment, procedural or organisational changes;
 - v) have the competencies required to carry out the tasks or activities associated with each role in an efficient and effective manner to the designated standards been formally identified;
 - vi) has the identified set of skills, knowledge and competencies been used to inform the selection criteria for specific roles and posts;
 - vi) Do the identified competencies include managerial, leadership and behavioural as well as technical factors? and has consideration been given to the competencies required to support team and organisational performance as well as individual roles.

Identification of learning objectives & training needs

- 5.16 The analyses of roles, tasks and competencies logically give rise to the generation of a set of learning objectives. These objectives should inform the development of a set of training needs, and should be used to derive the criteria, or standards, against which the trainee is assessed during and/or after training.
- 5.17 Although licensees may choose to put their staff through training programmes which cover all the learning objectives identified in this way, this may not be essential. Each person will bring certain skills and experience to their job and a review of these, and application of appropriate selection techniques, may obviate the need for training to be provided in every facet of the job. It is reasonable for the licensee to consider the competencies which a person already has, to carry out a gap analysis and then to target its training effort on those areas where the person is not demonstrably competent. Nonetheless, in circumstances where training is waived, the licensee

should demonstrate that the waiver is warranted – for example, by ensuring that the person is assessed against the learning objectives and shown to be competent, or that his/her level of performance during previous assessments corresponds to the standards set out for the role in question (see “[Assessment of Competence](#)” section later in this TAG).

- 5.18 Although it is important that the licensee’s approach to staff selection is rigorous and effective (see the IAEA guidance in [\[Ref 5\]](#)), ONR places emphasis on the adequacy of the licensee’s training arrangements and, in particular, the measures used to determine, monitor and sustain competence. Regardless of the previous experience and qualifications of the candidate, the licensee should ensure that the competencies needed of each role and post-holder have been identified systematically, and that training is provided for all those areas in which the person is not able to demonstrate an adequate level of competence. As noted above, these should include both technical competencies and other areas such as decision making, management and leadership, communications, behavioural, attitudinal etc.
- 5.19 The Inspector should consider:
- i) has the output of the task analysis been distilled into an outline set of training needs;
 - ii) does the set of training needs take account of the qualifications, skills and experience of the employee;
 - iii) have the standards which should be achieved in order for a person to be considered competent been defined;
 - iv) is the need for refresher training in defined elements of competence acknowledged and formalised?

Training programme design

- 5.20 A training programme should be designed to help develop and maintain the competence of all personnel with safety responsibilities. The starting point for the training programme should be the competence requirements and learning objectives of the role-holder. The training programme should specify how those objectives are to be achieved. The programme therefore needs to take account of all the elements of training considered in this document. In this sense, the training programme can be viewed as gathering the different elements into a focused and coordinated schedule to support the development of competence for a given role. It should include detailed plans setting out the learning objectives and written procedures on how to conduct each training session. As above there may be a need to address team working, command and control, as well as individual task performance (e.g., for control room staff or for those with emergency response roles). It should be recognised that there is a need to inculcate a positive safety culture in all staff, and training programmes should seek to build in and promote an awareness of safety culture and its attributes.
- 5.21 Design of the training programme should give consideration to the most effective means of meeting competence requirements and should consider whether the use of training is appropriate and the role that it plays. This will have overlap with other aspects such as task and equipment design and the development of documentation such as procedures and instructions. Where task analysis is used to inform competence requirements and learning objectives, the same task analysis should be used elsewhere in the design process including the development of procedures and instructions (see NS-TAST-GD-060 [\[Ref 18\]](#)). This helps to provide a clear

demonstration that tasks are controlled either through training or appropriate use of procedures.

- 5.22 **Initial training** programmes should cover all the training needed to enable personnel to work in specified roles and posts. This should include basic induction training which applies to all workers and which covers items such as facility hazards and risks and their control measures, working practices, actions in event of emergencies etc; and job-specific training. In addition to the outputs of the role and task analysis, the plant safety case should be used to identify activities which warrant particular attention during training. For example, tasks upon which significant safety claims are made should be highlighted in training and should be extensively trained to ensure their reliable performance. Tasks which are complex or which are performed infrequently, and hence subject to irregular practice, may also need to be drawn out and given special attention. In the case of infrequent tasks consideration should be given to the timing of training and delivery of this on a 'just in time' basis.
- 5.23 It is important that all personnel, from the Board down, receive training which supports the safety culture of the organisation, by inculcating the right safety attitudes and informing personnel about the behaviours and management arrangements which help to ensure both personal and plant safety. The need for training to reinforce an appropriate safety culture, as well as enabling the acquisition of technical competence, was recognised by ACSNI [\[Ref 7,9\]](#), and is acknowledged by IAEA [\[Ref 5\]](#). Such training should encompass lessons learned from case histories of major accidents and events world-wide, and the underlying organisational and cultural factors. Contractors should be included in such training.
- 5.24 **Continuing training** must also be programmed to help maintain competence, especially for tasks associated with roles which are safety-significant and those which are complex or infrequently performed (e.g. by those deputising for others). Different groups may have differing continuing training needs. For example, operations staff should have the opportunity to rehearse knowledge of the safety case and operating rules, and to engage in team training. Maintenance personnel may require training in the use of equipment needed during infrequently performed activities and in the relevance of their work to the safety case. Supervisors and managers should receive training in management of safety, leadership, communication, and other supervisory skills. Training should be used to update personnel on operational experience feedback and the implications of modifications to plant, operating regime and instructions as well as personal development needs. The periodicity of training required for some activities, such as fork-lift truck driving and fire-fighting, is set out in nationally defined standards. Work to reinforce a positive safety culture should be a consistent feature of continuing training.
- 5.25 Training of staff involved in dealing with emergencies and beyond design basis conditions is an important aspect of continuing training (Licence Condition 11, SAP AM1, para 643). Training should address a comprehensive range of scenarios, both to support the development of personnel competence and to improve the facility's emergency preparedness and response arrangements. This should include consideration of the full range of competencies and include considerations of aspects such as leadership, interpersonal communications, stress resilience and decision making.
- 5.26 The impact of organisational change on training should not be under-estimated. Changes which materially affect individuals' roles – for example, where they move to different jobs or where they take on additional roles – may require different competencies. Instances where the nature of the work carried out on the facility changes – for example, from construction to commissioning, from commissioning to

operations or from operations to decommissioning - may also call for changes in staff competencies. Licensees' arrangements under LC36 should explicitly consider the competencies required during and following an organisational change and should demonstrate that staff affected by the change are SQEP for any changed roles (see NS-TAST- GD -048 – Organisational Capability, [Ref 14]). The management of change arrangements should include reference to training and assessment programmes as part of this demonstration. Licensee Directors and Managers, who are charged with determining the need for, and agreeing, organisational changes, should be trained to understand and manage the organisational change process. They should be made aware of the need to control "organisational drift" arising from successive changes.

5.27 The Inspector should consider:

- i) has the licensee established an initial training programme for all personnel whose activities at work might impact upon safety, including the Board, managers, contractors as well as other staff;
- ii) does the initial training programme include induction training to ensure a basic understanding of the employee's responsibilities, safe working practices, generic safety-related matters and safety management systems;
- iii) does the training programme demonstrate how the role-specific training needs are to be met;
- iv) does the training programme reference task analyses, operating experience and the plant safety case including the PSA, to identify activities which are safety-significant, complex or infrequent and which warrant particular attention during training;
- v) does the training programme recognise the need to address leadership, managerial, behavioural, communication and safety culture issues as well as individual competence;
- vi) has the licensee established a continuing training programme for all personnel whose activities at work might impact upon safety;
- vii) does the continuing training programme take account of the demands of each role: e.g., the safety significance of different tasks; the need to refresh infrequently practised skills or inform changes to plant, equipment or instructions; the need to meet nationally defined standards;
- viii) does the continuing training programme clearly define and justify the training periodicities for different activities;
- ix) does the licensee acknowledge the need to implement training when new systems, processes and plant are developed or to update personnel on operational experience feedback.
- x) does the licensee acknowledge the need to review competence requirements during and following periods of organisational change (and as part of its succession planning arrangements) and put in place training programmes to deliver and sustain appropriate competencies;
- xi) does the training programme identify when training is to be delivered, and how it should be delivered, assessed and evaluated;

xii) is training consistent with, and does it continually seek to reinforce, a positive safety culture?

Selection of appropriate training methods & media

5.28 The training media and methods which are used to develop the competencies required in different roles should be both effective and practicable. This demands that careful attention is given to the choice of training media and to the way in which those training media are then used (i.e., the training method). The licensee should therefore be able to show that it has considered and identified the most appropriate media and methods for use in training different tasks.

5.29 A range of different training media are available, including the following principal examples:

i) **Classroom teaching** may be most suitable for introductory material and where detailed information of a theoretical or conceptual nature needs to be learned. This medium also allows tasks to be talked- or walked-through in a seminar or workshop-style approach. However, classroom teaching allows the trainee limited opportunity to gain hands-on experience in performing a practical task, or to put conceptual learning into practice.

ii) **On-job training** is an essential part of most training programmes and provides a realistic environment for the trainee. However, it can be difficult to ensure systematic and controlled training on the job because the learning environment may be less easily controlled. In addition, concerns about the potential impact of trainee error on safety-significant tasks limit the suitability of this approach for some activities. The licensee should be able to demonstrate that on-job training is properly specified, provided by people suitably prepared to carry out that function, and that adequate control and supervision (LC26) is in place.

iii) **Simulators** allow the rehearsal of practical skills under controlled conditions. Full-scope, high fidelity control room simulators are essential for nuclear power reactors and for other nuclear installations are regarded as a highly desirable, though expensive, requirement to train control room operators to deal with fault and emergency conditions as well as planned plant manoeuvres - the Sizewell 'B' simulator was required by the Layfield Public Inquiry [\[Ref 10\]](#) to be available for training one year before reactor start-up. WENRA [\[Ref 6\]](#) states that control room operators should spend at least 5 days on the simulator per year. Part-task training can be used to focus training on specific elements of the operators' tasks, and part-task simulators, employing varying degrees of physical fidelity, can be used to train either practical or conceptual skills. Simulators and replica equipment may be used to train groups of staff other than control room operators; mock-ups of plant items, for example, are a valuable aid to maintenance staff and others who need to learn about the way in which these items work, and to prepare them out with a potentially hostile environment. This can also help in dose minimisation. Low fidelity task simulation (e.g., table-top exercises) may also be used.

iv) **Open learning techniques**, in which training is provided through structured self-teaching packages, are increasing in popularity as technology developments continue, owing to their flexibility and cost-effectiveness. These techniques may employ advanced technology such as computer-based packages and interactive video as well as more conventional methods. Care must be taken to ensure that open learning is fit for purpose, and that it is not used at the expense of other forms of training without justification and demonstrable benefits.

- v) **Tool-box talks**, which may not be formally structured in the same way as other training approaches, can play an important role in training. These will typically involve discussions, often led by a manager or Team Leader, on factors affecting the way in which jobs are carried out – for example, adherence to procedures, safety culture, communications etc.
- 5.30 Choosing an appropriate training medium does not of itself guarantee that training will be satisfactory. The way in which the training medium is used is of utmost importance. For example, the control room simulator can be used to practise responding to faults as well as undertaking key operations such as reactor start-up or shutdown; training can be given to shift teams or to individuals; classroom instruction can be based around a lecture-style approach or a workshop approach which encourages trainee participation; on-job training is better carried out under the direction of a SQEP individual, working to a set of defined training objectives which may be supported by detailed work instructions, as opposed to a less structured approach of merely watching the activity being performed; feedback on trainee performance can be provided concurrently or via a debrief, and so on.
- 5.31 When the training method has been determined, attention should be given to the **materials** needed to apply the training method and to planning its implementation. The design and use of items such as training manuals, lessons plans, simulator exercise scenarios, data recording sheets and other supporting equipment need careful consideration in order to ensure a structured and effective use of the training method.
- 5.32 The Inspector should ensure that the licensee has considered the choice of training methods, and the way in which these methods are used, as well as the training media. The licensee should be able to demonstrate that the selected training methods and media promote effective development of the learning objectives and competencies which have previously been specified.
- 5.33 The Inspector should consider:
- i) is the licensee's choice of training media and training method based upon a consideration of how best to achieve the learning objectives;
 - ii) are the training methods developed, planned and applied by personnel who are familiar with current practice regarding training/instructional techniques;
 - iii) is training delivered by personnel who have acquired relevant training qualifications or equivalent experience;
 - iv) are the training methods subject to periodic review to ensure that they are appropriate, and reflect best current practice;
 - v) are simulators and other training media kept up-to-date such that they reflect changes to actual plant and equipment;
 - vi) are the methods for on-job training appropriate;
 - vii) does the training method take account of the supporting material which is needed - e.g. lesson plans, simulator scenarios, etc.?

Assessment of competence

- 5.34 Licence Condition 12 requires that each person who carries out activities which may affect the safety of operations on a nuclear site must be suitably qualified and experienced (SQEP). Licence Condition 12 defines three categories of people who need to be SQEP. Whilst there is some flexibility in how this may be undertaken, the requirement to be SQEP applies to all three categories.
- 5.35 For some posts it may also be necessary to designate persons who control and supervise operations which may affect safety as Duly Authorised Persons (DAPs) – see [Annex 2](#). Although training plays an important role in developing the necessary competencies to become a SQEP or DAP, it does not itself guarantee competence: if training is poorly specified or targeted, or the trainee is not suited to the job, then a person may fail to achieve an acceptable level of performance.
- 5.36 For these reasons, ONR regards the assessment of trainee competence and, subsequently, the periodic re-assessment of personnel, as a key element in the process of developing and maintaining the competencies needed to function as a SQEP or a DAP. Assessment serves the following important functions:
- i) properly defined and carried out, it provides a means of demonstrating that learning objectives have been achieved and a level of competence attained;
 - ii) it can point to a need for refresher or additional training through identifying shortfalls in performance;
 - iii) it can indicate whether training has been effective in developing the required competencies. In particular, assessment can point to deficiencies in the identification of training needs, the choice of training methods or the training programme.
- 5.37 The licensee should therefore satisfy itself that all staff and contractors whose actions have the potential to impact upon nuclear safety meet its competence expectations. When an individual is first appointed to a role he/she may not be fully competent to carry out all the duties of that role. The competence assessment process should therefore be used to inform a management decision to restrict the individual's range of tasks to those for which they are competent (e.g. a C&I engineer may be competent to work on most instrumentation but may not be confirmed as SQEP to work on guard lines and is therefore restricted from doing so). Licensee management should also encourage staff and contractors to raise any concerns about their own competence or readiness to carry out a task and to seek further training or advice as necessary.

Assessment methods

- 5.38 Licensees may use a range of different assessment methods. Their suitability will depend upon the training method and the nature of the competency which is being assessed. The classical view of assessment as a paper-based question and answer session may be appropriate for some activities, but will be quite inappropriate for many others. For example, it might be a sound means of assessing a trainee's understanding of principles concerning the transfer of heat across different mediums, but would not necessarily give an accurate indication of a trainee's practical competence in operating a master-slave manipulator arm. Assessment may take place on-the-job, or in a controlled training/assessment environment such as a control room simulator, a workshop or a classroom. It may take place as a specific, defined activity or as a continual assessment in the context of training or actual job performance. An overview of issues relating to competence assessment is provided in 'Competence Assessment for the Hazardous Industries' [Ref 11](#).

- 5.39 In some circumstances, the licensee may wish formally to waive some parts of training. Such waivers should be kept to a minimum, but where training is waived, the licensee should ensure that the affected person is assessed to the same, or an equivalent, standard. This provides a basis for demonstrating that the person is competent, despite not receiving the waived part of training. Where credit is claimed for prior training and competence of contractors, the licensee should be able to show how it has satisfied itself that the contractor's training and competence assurance arrangements are adequate and that they meet the licensee's expectations (and see NS-TAST-GD-077 - Procurement of Nuclear Safety Related Items or Services [\[Ref 15\]](#)).
- 5.40 Assessment may involve carrying out real or simulated tasks or surrogates which have been shown, or are judged by the licensee, to be representative of the real job demands. As such, assessment methods can include written, oral or practical demonstrations of learning or competence. It is preferable that assessment is carried out by persons independent of the training itself. Some of the merits and disadvantages of different approaches to assessment are discussed in [\[Ref 11\]](#).
- 5.41 Nonetheless, for any assessment method, the licensee should be able to demonstrate that the assessment process is:
- a) **valid**; i.e., it provides a reasonable indication of a person's likely performance on the real job. The criteria used to judge performance should therefore remain under review by the licensee;
 - b) **objective**, so far as is possible; i.e., the less judgmental the assessment method, and the criteria used to judge performance, the less uncertainty there will be about the validity of the assessment. This is of particular relevance to on-job assessment;
 - c) **reliable**; i.e., if repeated, the assessment would be likely to produce the same results again.

Frequency of assessment

- 5.42 Assessment should not be regarded as a one-off activity which takes place after initial training, and which "qualifies" a person for the period that he/she subsequently remains in post. A person's competence may change over time as a result of influences such as the frequency with which a task is performed, the varying circumstances under which the task may be performed, or changes to plant or equipment. Loss of memory for the task and the procedures or arrangements which affect the way it is performed may also be compounded by factors such as the development of bad habits, short-cuts etc. Changes to plant operational parameters or procedures may also take place when a person is away for an extended period. All these factors support the case for periodic re-assessment to ensure that personnel are informed about relevant changes, and that they are competent to carry out their jobs.
- 5.43 The frequency of re-assessment should be influenced by consideration of the following issues:
- a) the safety significance of the roles and associated tasks which the person performs, as identified through the job and task analysis and formalised in the safety case;
 - b) the (in)frequency with which the tasks are performed;
 - c) the nature of the task (including whether it changes) and the inherent likelihood of loss of competence over time;

- d) operational experience feedback originating both within the licensee and from other organisations;
- e) compliance with standards defined nationally or by other accredited or authoritative bodies.

5.44 The Inspector should consider:

- i) does the licensee have formally-defined provisions for assessing the competencies of all personnel whose activities impact upon safety;
- ii) has the licensee put in place robust processes for satisfying itself as to the competencies of its contractors where they are not subject to the licensee's competence assessments;
- iii) is assessment carried out during and/or after training;
- iv) where possible, is the assessment carried out by a person who is independent of the training which the trainee has received;
- v) does the choice of assessment method reflect the nature of the competencies which are being assessed, and the training methods and media which are available;
- vi) can the licensee demonstrate that the assessment methods provide a valid, objective and reliable basis for determining competence;
- vii) does the licensee act, in a timely manner, upon deficiencies in performance identified through the assessment or during training;
- viii) has the licensee defined the periodicity of re-assessment which is appropriate for each job or task;
- ix) does the frequency of re-assessment take into account factors such as the safety significance of the task, the nature of the task and the frequency with which it is performed, plant/procedural changes and operational experience;
- x) does the licensee have a defined strategy for addressing failures to meet the required standards following training?

Evaluation of training effectiveness

- 5.45 Training is effective only in as much as the learning acquired through training transfers into the real situation. For example, training on a simulator is of limited benefit if it provides trainees with the skills needed to operate the simulator but not the real plant; and classroom training which equips students with the capability to understand thermal hydraulics is unlikely, in itself, to be sufficient to develop control room operational competence. Licensees should therefore have a well-defined system for monitoring the effectiveness of training, and for identifying areas where training may need to be augmented or revised.
- 5.46 Evaluation of training effectiveness involves an intelligence gathering exercise, the purpose of which is to provide confidence that training has been specified properly, and that it is comprehensive, effective and up to date. As such, it should draw on a range of sources such as:

- i) operational experience feedback from the workplace and from other plants;
 - ii) performance measures from the site;
 - iii) safety reviews and inspections;
 - iv) plant operating procedures and administrative arrangements;
 - v) revised information on training needs;
 - vi) summaries of assessments of trainees, including trainee feedback ;
 - vii) changes in regulatory aspects, plant or procedures;
 - viii) independent reviews, such as those by peers under the auspices of organisations such as WANO or IAEA.
- 5.47 Evaluation of training effectiveness should include review of both individual elements of training as well as the scope of overarching training programmes.
- 5.48 The Inspector should be satisfied that the licensee is "closing the loop" by monitoring the systems which have been put in place to evaluate the effectiveness of each element of training identified in this TAG. Where shortfalls in training are identified (for example via event investigations), consideration should be given to which system elements have contributed to the shortfall, and how the system or process itself can be strengthened.
- 5.49 The Inspector should consider:
- i) does the licensee have in place a formal process to evaluate the effectiveness of training;
 - ii) does the evaluation process take account of information gained through factors such as operational experience feedback, trainees, instructors, plant procedures, safety reviews and inspections, other plants etc;
 - iii) is the way in which training is specified, delivered and assessed monitored regularly;
 - iv) does the evaluation aim to gain information on the effectiveness of all the elements of training, as identified in this TAG;
 - v) do the findings of the evaluation process demonstrably influence the specification or implementation of the training arrangements?

Organisation and support of the training function

Management of Training

- 5.50 The training and competence assurance of personnel with safety roles should be regarded as a priority by licensees. ONR expects the licensee to show that the competence delivery functions are supported by commitment from senior levels in the organisation and by an appropriate management structure (SAP MS2, Para 55). The commitment to competence and training should be embodied in a Policy which recognises the need to develop and maintain the competence of staff in order to achieve safety and which affirms the licensee's commitment to resource and

implement a training system to support the implementation of this policy. A strategy should be put in place to implement this policy. That should recognise the need to accommodate a diverse range of staff and contractors who may have differing development requirements.

- 5.51 The organisation of the training function may differ from licensee to licensee, and it is not the role of ONR to prescribe or define this organisation. However, within any licensee, responsibilities for training should be clearly defined and the licensee should be able to demonstrate that training is being resourced, specified, delivered, assessed, monitored and reviewed effectively. This includes ensuring that training which is delivered by third parties, either on- or off-site, is suitably specified and delivered. There should be a clear reporting route for departments or role-holders charged with responsibility for training which ensures that training issues can be raised at Board level.
- 5.52 The immediate responsibility for ensuring that personnel are competent and medically fit to carry out tasks which impact on safety rests with their line management. This requires that line management are cognisant of the purpose and significance of training and that they appreciate the need to monitor staff performance and to ensure that these staff are subject to regular medical examination.
- 5.53 Where a training department exists as a separate on- or off-site entity, the licensee should ensure that adequate interfaces exist between training and other departments to identify training needs and make personnel available for training. The training department should be actively involved in helping line management to organise the training programmes for their staff and monitoring that line management implements these programmes. The training department may also take an active role in delivering certain elements of training.
- 5.54 The provision of effective training requires that personnel with a training role are themselves suitably qualified and experienced to function in these roles. It is important, therefore, that resources are made available for trainers to maintain and develop their own capability. Where training has been arranged so that it is delivered by a non-specialist (e.g., by an experienced person in the context of on-job training), the licensee should ensure that the trainer is suitably equipped to carry out this role: this should involve training the trainer in instructional techniques and making clear the learning objectives, training methods and assessment criteria which should be used.
- 5.55 In recent years, licensees have placed increasing emphasis on the use of contract resource. Placing work with external contractors or agency staff does not negate or mitigate the licensee's responsibility for ensuring that all personnel whose actions have the potential to affect safety are suitably qualified and experienced.
- 5.56 External contractors may have been trained and assessed to different standards from those of the licensee's directly employed workforce. The licensee should have adequate arrangements to ensure that contractors are competent to work safely and efficiently, and that the standards required of the contractors are consistent with those which would be required of its employees. These should cover both technical competencies and also the other competencies and knowledge which contribute towards safe operation of the plant (e.g., site induction training, communication skills, administrative arrangements and procedures, behaviours, etc.). The licensee should therefore put contractors through its own training and competence assessment programme, or otherwise satisfy itself that the contractor's own arrangements for ensuring the technical and behavioural competence of its staff are adequate (see NS-TAST-GD-049 - Licensee Use of Contractors and Intelligent Customer Capability [[Ref 16](#)]). The latter approach is especially appropriate where the contractor is not simply

replacing the licensee's own staff, but, instead, brings technical competencies which are out with the licensee's own areas of capability. The licensee may therefore need to carry out audits of the contractor's own training arrangements (and see NS-TAST-GD-077 - Procurement of Nuclear Safety Related Items or Services [\[Ref 15\]](#)).

Training records

- 5.57 Licence Condition 6 requires the licensee to make adequate records to demonstrate compliance with any of the conditions attached to the site licence (see NS-TAST-GD-033 - Licensee Management of Records [\[Ref 12\]](#)). ONR regards the design, control and maintenance of accurate training and competence records as an essential requirement in support of Licence Conditions 10 and 12. Such records enable training to be scheduled and delivered against a controlled statement of training needs. They are a vital input to the planning process for training, and provide a traceable means for both licensee and ONR to ensure that training has been given, and competence assessed, for all personnel with safety roles.
- 5.58 The value of training records is related to the quality of information which is entered into them, and the use that is made of this information. The licensee should ensure that this information, and the design of the record system, enable training to be planned, scheduled, delivered and monitored effectively. Some licensees are moving towards the development and implementation of integrated human resources/competence management systems. Such systems are to be welcomed. Properly specified, they can offer considerable benefits by providing a comprehensive and consistent framework for managing a licensee's resource/competence needs and availabilities. They may be used to identify vulnerabilities and assist in activities such as succession planning, and can help the licensee to maintain a current organisational Baseline (See NS-TAST-GD-065 - Function and Content of the Nuclear Baseline [\[Ref 13\]](#)). Ideally, the record system should be able to provide advance warning of the need for repeat/refresher training to ensure that staff competencies remain "in-date".
- 5.59 The licensee should also ensure that the training records are subject to proper quality management system, as stated in SAP MS1, Paras 50-51, Licence Conditions 6 and 17, and NS-TAST-GD-033 – Licensee Management of Records [\[Ref 12\]](#).
- 5.60 The Inspector should consider:
- i) does the licensee have a training policy which sets out the company's commitment to training;
 - ii) does the licensee have a management system for the training of personnel whose actions may impact upon safety;
 - iii) are responsibilities for training clearly defined, and do those responsible for discharging these responsibilities demonstrate an awareness and understanding of modern training standards;
 - iv) Are changes to the training and competence management system properly controlled and authorised;
 - v) does line management recognise its responsibility for assuring the competence of personnel and appreciate the need to make personnel available for training;
 - vi) does the management system define the interfaces between those responsible for training and those with line management responsibility for staff whose activities may impact on safety;

vii) is the training function adequately resourced, in terms of staff numbers and capabilities;

viii) are personnel who conduct training provided with instructional skills and guidance so that they can perform their roles effectively;

ix) if contractors are not subject to the licensee's own training and assessment practices, do the licensee's arrangements ensure that the contractor's own arrangements for maintaining and demonstrating the competence of its staff are adequate;

x) are training records available, and are they controlled in a manner consistent with LC6 and the expectations of NS-TAST-GD-033 [\[Ref 12\]](#)

xi) are the training records reviewed periodically so as to identify training or competence shortfalls or omissions.

6. REFERENCES

- 1) Safety Assessment Principles for Nuclear Facilities, First Edition, Revision 1, HSE 2006. <http://www.onr.org.uk/saps/saps2006.pdf>
- 2) IAEA Safety Requirements: IAEA GS-R-3 - The Management System for Facilities and Activities: IAEA, Vienna, 2006.
- 3) IAEA Safety Requirements: IAEA GS-R-1 - Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety. ; IAEA, Vienna, 2000.
- 4) Nuclear Power Plant Personnel Training and its Evaluation: A Guidebook. Technical Report Series 380, IAEA, Vienna, 1996
- 5) IAEA Safety Guide: IAEA NS-G-2.8 - Recruitment, qualification and training of personnel for nuclear power plants. ; IAEA, Vienna, 2002.
- 6) Western European Nuclear Regulators' Association; Reactor Harmonisation Working Group: January 2008
- 7) Advisory Committee on the Safety of Nuclear Installations; Study Group on Human Factors. First Report on Training and related Matters; 1990.
- 8) A Guide to Task Analysis. Kirwan, B. and Ainsworth, L.K; London: Taylor and Francis. 1992.
- 9) Advisory Committee on the Safety of Nuclear Installations; Study Group on Human Factors. Third Report: Organising for Safety. 1993
- 10) Sizewell 'B' Public Inquiry: Report by Sir Frank Layfield. Dept of Energy, 1987
- 11) Competence Assessment for the Hazardous Industries. HSE 2003
- 12) [NS-TAST-GD-033](#) - Licensee Management of Records
- 13) [NS-TAST-GD-065](#) - Function and Content of the Nuclear Baseline

- 14) [NS-TAST-GD-048](#) - Organisational Capability
- 15) [NS-TAST-GD-077](#) - Procurement of Nuclear Safety Related Items or Services
- 16) [NS-TAST-GD-049](#) - Licensee Use of Contractors and Intelligent Customer Capability
- 17) [NS-TAST-GD-058](#) - Human Factors Integration
- 18) [NS-TAST-GD-060](#) - Procedure Design and Admin Control

7. ANNEX 1: SAPS RELEVANT TO TRAINING AND COMPETENCE

SAP EHF 8: A systematic approach to the identification and delivery of personnel **competence**

Para 55 to SAP MS2:

"Processes and systems should secure and assure maintenance of the appropriate technical and behavioural competence of directors, managers and leaders and all other staff relevant to their safety roles and responsibilities".

Para 82(e) to SAP SC1:

"(there should be **applied**).

Para 387 to SAP EHF8: The process for identifying and delivering competence should encompass the phases of: job analysis; identification of competence requirements; training needs analysis; training programme design and implementation; formal assessment of competence; and evaluation. The process should be applied to all those whose actions could impact on safety, including employees and other groups of staff such as contractors. Directors, managers and leaders should be included in this process. Appropriate supervision and monitoring should be maintained until individuals are demonstrably competent to perform their tasks.

SAP EHF5: Analysis should be carried out of tasks important to safety to determine demands on personnel in terms of perception, decision making and action.

Para 380 to SAP EHF5:

"analysis (of tasks important to safety) should ...provide a basis for developing user interfaces, procedures and job aids, as well as defining operator roles and responsibilities, staffing levels, personnel competence and training needs...".

SAP MS2: The organisation should have the capability to secure and maintain the safety of its undertakings.

Para 55 to SAP MS2:

"Processes and systems should secure and assure maintenance of the appropriate technical and behavioural competence of directors, managers and leaders and all other staff relevant to their safety roles and responsibilities".

SAP SC1: The process for producing safety cases should be designed and operated commensurate with the hazard, using concepts applied to high reliability engineered systems.

Para 82(e) to SAP SC1:

"(there should be).. definition of training and qualification expectations for the formal roles within the process (to ensure that those who undertake the roles are suitably qualified and experienced).

Para 92(h) to SAP SC1:

(the safety case should contain).. the basis for the management of safety for people, plant and procedures by addressing management and staffing levels; training requirements...

SAP SC4: A safety case should be accurate, objective and demonstrably complete for its intended purpose.

Para 92(h) to SAP SC4:

the basis for the management for safety of people, plant and procedures by addressing management and staffing levels; training requirements; maintenance requirements; operating and maintenance instructions; rules and contingency and emergency instructions.

SAP FA14: PSA should be used to inform the design process and help ensure the safe operation of the site and its facilities.

Para 541(e) to SAP FA14:

"Appropriate use of PSA should be made in... developing and changing operating procedures and associated training programmes for managing incidents and accidents (including severe accidents)".

SAP AM1: A nuclear facility should be so designed and operated to ensure that it meets the needs of accident management and emergency preparedness.

Para 643 to SAP AM1:

"Provision should be made for training plant personnel in accident management procedures and implementing the accident management strategies..."

SAP DC7: Organisational arrangements should be established and maintained to ensure safe and effective decommissioning of facilities.

Para 729 to SAP DC7:

"Competence needs for personnel responsible for undertaking decommissioning activities, including contractors, should be identified. Personnel should receive suitable training, and be suitably qualified and experienced, to carry out their duties..".

8. ANNEX 2: GUIDANCE ON INSPECTING THE IMPLEMENTATION OF LICENSEE ARRANGEMENTS

The following “short-form” guidance is provided to assist Inspectors – often Site Inspectors - in judging the adequacy with which a licensee implements arrangements which enable it to comply with LC10 and LC12. In order to promote a consistent regulatory approach, this Annex incorporates guidance previously included within T/INS/010 and T/INS/012, which are now deleted. The Annex complements the more detailed guidance in the main body of this TAG and reference to that material should be made where appropriate. Section 2, below, also expands upon the expectations of a licensee’s approach to defining and managing its DAP requirements. To assist the Inspector, a reference to the relevant supporting section of the TAG is provided for each item of guidance in this Annex.

Note that there is considerable overlap between LC10 and LC12 – for example, a role profile is needed both as a basis for defining competence needs and for specifying training requirements. The Inspector should bear this in mind when deciding upon the scope of an inspection. The Inspector may target different aspects of a licensee’s arrangements for training and assuring personnel are SQEP, and may choose to draw upon different aspects of the guidance.

The Inspector should consider seeking the support of specialist human factors input when carrying out inspections against LC10 and LC12, and where assessment of the licensee’s arrangements is planned.

1. Implementation of LC10 Arrangements

The purpose of LC10 is to ensure that all who carry out roles that may affect safety are adequately trained to carry out the tasks associated with those roles.

General Arrangements (S4.2)

- Obtain a copy of the licensee’s training arrangements. Confirm that the arrangements for identifying, delivering and managing training are adequate, appropriate and in date, and enable the licensee to comply with LC10.
- Check that the arrangements make provision for submission for Approval to the Executive of those part or parts of the arrangements that the Executive may specify.
- Check whether ONR has approved parts of the LC10 arrangements under LC10(2) and, if so, confirm that the approved arrangements are in place, implemented and subject to configuration control and oversight.
- Confirm that the arrangements apply to all personnel whose duties and associated activities have the potential to impact upon nuclear safety on the site.
- Confirm that the training of contractors is considered as part of the LC10 arrangements (and see S4.4, 4.7, 4.13).

Analysis of roles and associated competencies (S4.7)

- Check a sample of posts. Establish that a job description is available for each post, and that this provides an accurate description of the roles carried out by the post-holder.
- Check that role profiles are available. Where possible, these should draw upon the appropriate safety case and involve use of task analysis, and other inputs to defining the activities associated with the role, including work instructions.

- Confirm that the job descriptions are available for all staff from the Board down – including management as well as front-line operations staff.
- Establish that competence needs for the sampled posts and roles are formally defined. These should include general requirements for safety awareness, team-working, supervisory skills and other behavioural attributes, as well as technical competencies.

Identification of learning objectives and training needs (S4.8)

- Establish that training needs for each identified competence have been identified via a formal Training Needs Analysis.

Training Programme design (S4.9)

- Establish that training programmes are in place and establish that they define and address the learning objectives.
- Check that training activities address the general requirements of induction, initial training and the specific needs of site personnel, contractors and visitors.
- Check that the training programmes cover the needs of continuing and refresher training (particularly for infrequently performed tasks), emergency arrangements and general awareness of site developments.
- Confirm that training programmes have detailed plans and written procedures that ensure a consistent approach and quality.

Selection of appropriate training methods and media (S4.10)

- Confirm whether persons giving or assessing the training have relevant qualifications, experience and training to function in such a role (and see S4.13).
- Observe a session of training and make a judgement on the overall effectiveness of the content and presentation of the training and the reaction of the trainees to the training.

Evaluation of training effectiveness (S4.12)

- Confirm that regular reviews of the effectiveness of training are carried out.
- Confirm that review findings are actioned and tracked to closure.

Organisation and support of the training function (S4.13)

- Check that any dedicated training section is appropriately resourced, in accordance with the licensee's organisational Baseline, and that it has clearly defined roles and responsibilities which are compatible with those of line management.
- Confirm that the training section is effective in the support which it offers to line management in supporting the design and delivery of training.
- Confirm that training records are managed in accordance with LC6 and NS-TAST-GD-033 [Ref 12], and that senior management receive regular reports of training achievement. Examine a sample of the training records to establish that training targets are met and that operational requirements have not caused delays in training.

2. Implementation of LC12 Arrangements

The purpose of LC 12 is to ensure that only suitably qualified and experienced persons (SQEPs) perform duties which may affect safety. The safety of the plant is dependent on the individuals who design, construct, operate, maintain and modify etc, the plant. The Licensee is therefore required to put in place, and implement, arrangements to ensure that individuals who perform these activities, and any other activities pertinent to safety, are suitably qualified and experienced. LC12 also provides for the appointment of Duly Authorised Persons (DAPs) to control and supervise operations that may affect safety. Their appointments are therefore subject to additional management controls covering areas such as appointment and assessment.

General Arrangements (S4.1)

- Obtain a copy of the licensee's arrangements for identifying and managing its SQEP/DAP requirements. Confirm that these are adequate, appropriate and in date, and enable the licensee to comply with LC12.
- Check that the arrangements make provision for submission for Approval to the Executive of those part or parts of the arrangements that the Executive may specify.
- Check whether ONR has approved parts of the LC12 arrangements under LC12(3) and, if so, confirm that the approved arrangements are in place, implemented and subject to control and oversight.
- Confirm that the arrangements apply to all personnel whose duties and associated activities have the potential to impact upon nuclear safety on the site.
- Confirm that the competence of contractors is considered as part of the LC12 arrangements (and see S4.4, 4.7, 4.13).

Analysis of roles and associated competencies (S4.7)

- Confirm that where a person has duties outlined in LC12(1) and 12(2) the arrangements require a written job description.
- Check a sample of role profiles or job descriptions for SQEPs and DAPs to confirm that they specify the requisite qualifications, training and experience.

Assessment of competence (S4.11)

- Check a sample of role/post holder records and establish that the individuals holding these roles/posts meet the qualification and experience requirements and that the outcomes of relevant assessments are appropriate and in-date (& see S4.13).
- Talk to a team leader and establish how he/she knows that their staff are SQEP. Check that the SQEP status of contractors is known by the licensee person who is in control of their activities.
- Talk to individuals – do they feel comfortable in raising with their line managers any concerns they might have over their own competence and readiness to carry out a task.

- Check a sample of training modules and establish that assessment of the candidates was completed and that the details of such assessment was passed on to and accepted by the candidate.
- Confirm that assessments are based on specified objectives, employ appropriate procedures and techniques, and are controlled and consistent.
- Confirm that competence assessments, and associated training, have defined periodicities.
- Confirm that contractors discharging SQEP roles are subject to the same competence expectations and standards as in-house SQEPs performing equivalent work, and that these are explicitly set out in the contractual arrangements – and see NS-TAST-GD-049 [\[Ref 16\]](#).

DAPs and SQEPs – definition and appointment (S4.3)

- Check that the arrangements contain satisfactory definitions of a DAP and a SQEP. Examples of such definitions are:

"A Duly Authorised Person (DAP) is an individual who is in direct control or supervision of operations or activities that impact on the safety envelope of the plant. These would include operations that are associated with Operating Rules or Safety Mechanisms in accordance with the safety case. A DAP needs to have sufficient knowledge of the plant's operations, and its associated safety case, to ensure that operations under his/her control and supervision are carried out safely".

"A suitably qualified and experienced person (SQEP) is an individual who has the requisite qualifications, training and experience – effectively, the competence - to carry out tasks that may affect the safety of any operations or activities on the site". It is mandatory under the Licence to appoint a SQEP for the purposes of LC 21(5), 26 and 28(6).

- Confirm that the arrangements cover the appointment of DAPs. Check that they clearly state the duties for which DAP status is required.
- Check that a schedule exists listing roles for which DAP status is needed - e.g. Reactor Desk Engineer, Person with key role in the Emergency Plan etc.
- Check that the arrangements specify the authorisation and notification system for DAPs. Confirm that this ensures a register of all DAPs is maintained on the site and that this covers names, authorised duties, qualifications, training and experience.
- Examine the register of DAPs and establish that all persons listed have valid authorisations. Check the records to establish that the Executive has not objected to that person's appointment as a DAP. Where a person is no longer included on the register of DAPs, confirm that their duties are being completed by an alternative person on the DAP register.
- Confirm that SQEP and DAP records are managed in accordance with LC6 and NS-TAST-GD-033 [\[Ref 12\]](#).
- Check that SQEPs and DAPs are identified in the licensee's organisational baseline - see NS-TAST-GD-065 [\[Ref 13\]](#).

Evaluation of training effectiveness (S4.12)

- Check the frequency and outcome of the licensee's own reviews of its LC12 arrangements, its compliance with the arrangements and DAP and SQEP performance.
- Confirm that review findings are actioned and tracked to closure.