Purpose
Article 1-(1) The purpose of this Technical Assessment Guide is to help the personnel assess whether a licensee has adequate technical capabilities and financial resources as well as management arrangements and an organizational structure to discharge its obligations associated with any license granted for any stage of the lifetime of the nuclear power plant (NPP).

Scope
Article 2-(1) This Guide is dedicated to an applicant which intends to be granted the necessary licenses and permissions to install and operate a new nuclear power plant on a proposed site.

(2) Section 4 of the TAG contains arrangements which the licensee should have put in place to demonstrate that it is a capable organization which is able to manage the facility in accordance to regulatory requirements.

(3) Section 5 of the TAG includes guidance for reviewers on the aspects that should be considered when assessing the licensee’s implementation of these arrangements. The licensee’s capability will evolve throughout the lifecycle phases. At each phase of the project lifecycle changes should be implemented in the licensee’s organisation structure and capability to ensure the licensee is ready to transition into the next phase. The review and assessment approach will be graded upon the licensee’s organisation status at each phase.

Regulatory Background
Article 3-(1)

a. Decree on licensing of nuclear installations, No. 18256, Date of issue: 19.12.1983 (TAEK)
b. IAEA GSR Part 2 “Leadership and Management for Safety”
c. IAEA GS-G-3.1 “Application of the Management System for Facilities and Activities”
d. IAEA GS-G-3.5 “The Management System for Nuclear Installations”
e. The regulation on the basic quality management requirements for safety in nuclear facilities (TAEK)
f. The regulation on operating organization, personnel qualification and operating personnel licensing for nuclear power plants (TAEK)
CHAPTER II

Requirements for the organisational capability of the licensee

The applicant as a prospective licensee is required to ensure that is in control of all activities on its site, including those activities undertaken by others on its behalf. The licensee’s management arrangements should provide an integrated safety, security and environmental management system. The licensee’s organisational provisions should ensure that adequate resources and capability are in place to effectively control activities and discharge its obligations.

Article 4-(1) Management system

The IAEA Fundamental Safety Principles SF-1 defines Leadership and management for safety as:

*Effective leadership and management for safety must be established and sustained in an organisation concerned with activities giving rise to radiation risks.*

Article 4-(1.1) Leadership

The following requirements are based on IAEA GSR Part 2 and ONR Safety Assessment Principles

a) Directors, managers and leaders at all levels should focus the organisation on achieving and sustaining high standards of safety and on delivering the characteristics of a highly reliable organisation.

b) The senior management should develop a clear safety policy. The safety policy should demonstrate the commitment at a high level to regulatory requirements. All personnel in the organisation should understand the policy and be aware of their function in ensuring safety. They should know what is expected of them in order to achieve the aims and objectives of the safety policy.

c) The senior management should determine the competences and resources necessary to carry out the activities of the organisation safely and should provide them.

d) Directors, managers and leaders at all levels should demonstrate a visible commitment to safety throughout their activities.

e) The senior management should establish the strategies, policies, goals and standards for safety and ensure that they are followed throughout the organisation.

f) Directors, managers and leaders at all levels should monitor and regularly review safety performance and culture.
g) Directors, managers and leaders at all levels should encourage and welcome the reporting by other individuals of potential safety concerns, incidents and near misses, and should respond to valid concerns promptly and in a positive manner.

h) Directors, managers and leaders influence the culture and ethics of the organization by what they say, but even more importantly by what they do. Good leaders have a major influence on the safety culture in the organization. They should communicate in an open and responsible manner with their employees, and maintain a blame-free reporting culture that encourages full reporting of unsafe practices, incidents and near misses.

i) Managers and supervisors or team leaders should promote good working practices and eliminate poor practices. They should maintain a presence in the workplace by carrying out tours, walk-downs of the facility and periodic observations of tasks with particular safety significance.

Article 4-(1.2) Capable organisation

The following requirements are based on the ONR Technical Assessment Guide NS-TAST-GD-048:

*The organisation should have the capability to secure and maintain the safety of its activities.*

a) The organisation should have adequate human resources. This includes having a sufficient number of competent staff to maintain the capability to fully understand all the issues that affect the safe operation of the plant.

b) The senior management should ensure that the necessary individual competences are available for the efficient operation of the organisation. Senior management should evaluate both present and expected needs for competences against the competences already available in the organization.

c) The organisational structure, roles and responsibilities should ensure collaboration between all individuals and groups involved, including contractors. Roles, responsibilities and accountabilities should be clearly defined and compatible with each other. The functions to be performed by individual departments, and by individual persons in each department, as well as the lines of responsibility, authority and communication should be unambiguous and leave no scope for improvisation in either operational states or accident conditions.

d) Being a capable organisation requires the maintenance of knowledge and expertise so that safety requirements are understood and potential safety concerns are monitored throughout all activities, including those undertaken by contractors at all levels within the supply chain.

e) Systems should be in place to ensure the maintenance of technical and behavioural competence of directors, managers, leaders and all other staff and contractors with safety roles and responsibilities.

f) Knowledge should be captured and communicated within the organisation in a systematic manner to all those who need to make safety decisions. There should be provisions for identifying, updating and preserving documents and records relevant to safety. Such documents and records should be stored securely and should be retrievable and readable throughout their anticipated useful life (e.g.
documents that would assist in the event of an incident, documents relevant to make future modifications or to decommissioning).

**Article 4-(1.3) Decision making**

The following requirements are based on the ONR Safety Assessment Principles:

a) Decision made at all levels in the organisation affecting safety should be rational, transparent, objective and well-considered.

b) Safety should be given a high priority and this should be evident in all decision making processes. The processes should ensure that all relevant data and opinions are collected and considered, respecting and encouraging the contribution of those with divergent views.

c) Decision making should be based on a conservative risk-based approach giving safety the utmost priority, overriding, if necessary, the demands of production and project schedules. Safety decisions should not be delayed unnecessarily (e.g. for commercial reasons) and personnel should be authorized early enough to take timely decisions in the interests of safety.

d) Decisions affecting safety should consider the quality and sufficiency of information, the significance of uncertainties, the questioning of assumptions, the exploration of all relevant scenarios that may threaten safety, the range of options including risks and benefits and the criteria and standards that should be applied.

e) Decisions affecting safety should take into account the potential for error, uncertainty and the unexpected, and those decisions taken in the face of uncertainty or the unexpected should be adequately conservative.

f) The organisation should encourage a questioning attitude from all staff and contractors. Active challenge should occur in all key decision making processes that may affect safety. Active challenge should assume that failure through inadequate design or implementation is possible, and be proactive in looking for ways that things could go wrong.

**Article 4- (1.4) Learning**

The following requirements are based on the ONR Safety Assessment Principles:

a) Lessons should be learned from internal and external sources to continually improve leadership, organisational capability, the management system and decision making.

b) The organisation should have arrangements in place for root cause analysis of incidents, the lessons learned and the follow-up measures taken.

c) An absence of major accidents and incidents does not necessarily indicate that risks are being adequately controlled. Near misses should be considered as opportunities to learn and a culture of
open reporting of deviations and errors should be encouraged. An organisation will not be able to learn from its mistakes if they are not reported.

d) Information should be collected from a range of sources within the organisation, including feedback from workers (e.g. about deviations and errors in safety procedures), maintenance of the plant and its systems, testing and validation of safety procedures, inspection and testing of equipment, monitoring of safety performance indicators, feedback of operational safety experience, review and audit the implementation and effectiveness of the strategies, policies, goals and standards for safety, internal and external assessments.

e) Information should be gathered from external sources, e.g. from other nuclear facilities, to identify learning and improvement opportunities. Sources outside the organisation should include external reviews conducted by experienced industry peers, lessons from the evaluation of incidents in other organisations and benchmarking safety management and learning methods against those of other organisations.

f) The organisation should have procedures in place for the feedback of operational safety experience to the staff, including experience relating to organisational and management failures and to failures in human performance. The lessons learned should be embedded through a structured system for implementing corrective actions in a timely manner.

g) Learning should be facilitated through the ability to recognize and diagnose deviations, to formulate and implement solutions and to monitor the effects of corrective actions.

Article 4- (1.5) Safety Performance and Culture

The following requirements are based on the IAEA GSR Part 2:

a) Individuals in the organisation, from senior managers downwards, should foster a strong safety culture. The management system and leadership for safety should be such as to foster and sustain a strong safety culture.

b) The senior management should provide guiding principles and should reinforce behavioural patterns that promote the continual deployment of a strong safety culture. The management system should establish a working environment in which staff can raise safety concerns without fear of harassment or intimidation.

c) Managers and supervisors or team leaders should examine samples of work practices and related information on a regular basis to identify areas needing improvement. They should also encourage every staff member under their supervision to look for more efficient and effective ways of accomplishing assigned tasks. All individuals of the organisation should be aware of the personal accountability for their attitudes regarding safety.

d) The organisation should foster cooperation between staff members and between staff and managers. The communication both up and down the managerial chain and between managers and staff should be open and clear. Managers should show a continual effort to strive for a good communication, cross-functional and interdisciplinary cooperation and teamwork throughout the organisation.
e) Indicators should be used to monitor the nuclear safety performance in an effective and objective way. There is no one single indicator that provides a measure of the safety of a plant. A range of indicators should be considered in order to provide a general sense of the overall performance of the nuclear power plant and its trend over time.

f) Safety indicators should be tracked, trended and evaluated, taking into account the frequency of unplanned shutdowns of operation, frequency of selected safety system actuations and demands, frequency of safety system failures, unavailability of safety systems, backlog of outstanding maintenance, extent of repeat maintenance, extent of corrective maintenance including repair and replacement etc.

g) An adequate audit and review system should be established to provide assurance that the safety policy of the organisation is being implemented effectively and lessons are being learned from its own experience and from other to improve safety performance.

h) The organisation should establish a safety review mechanism, which provides internal and external assessments, including self-assessments. Self-assessment is an important mechanism which the organisation should use to improve its performance. Successful self-assessment requires open and active reporting of events and near misses within the organisation.

Article 4- (1.6) Resources

The following requirements are based on the ONR Safety Assessment Principles:

The licensee should provide and maintain adequate financial and human resources to ensure the safe operation of the licensed nuclear power plant.

a) The organisation should ensure that adequate resources are available to implement the safety policy. This should include the provisions of safe operating plant, the necessary tools and equipment, and a sufficient number of competent staff.

b) The senior management should ensure that the resources that are essential to the achievement of the organisation’s objectives are identified and made available.

c) To improve the performance of the organisation, consideration should be given to the way resources are managed, including efficient and timely provision of resources, use of information management, knowledge management, enhancement of competence by means of focused training, education and learning, development of leadership skills and profiles for future managers of the organisation, planning for future resource needs.

d) Resource management should include activities for determining the needs for, and sources of, financial resources. The senior management should plan for, make available and control the financial resources necessary for meeting safety standards, maintaining the safety culture and implementing an effective management system. The control of financial resources should include activities for comparing actual usage against plans and for taking necessary action.
e) The senior management should ensure that the necessary individual competences are available for the effective and efficient operation of the organisation. Both present and expected needs for competences should be evaluated against the competences already available in the organisation.

f) The senior management should plan for, make available and control the financial resources necessary for meeting safety standards, maintaining the safety culture, implementing an effective and efficient management system, and achieving the organisation’s goals.

**Article 4-(1.7) Organisational changes**

The following requirements are based on the ONR Safety Assessment Principles:

*The licensee should make and implement arrangements to control any change to the organisation or structure which may affect safety.*

a) The organisation should develop a specific process to manage and review organisational changes. The process should ensure that there is no degradation in the safety culture of the organisation.

b) Changes to the organisation (including to structure, staffing, way of working, resources or competences) should be subject to systematic evaluation and independent review to ensure that they do not compromise safety.

c) Organisational changes should be made in such a way as to maintain clarity about roles, responsibilities and interfaces.

d) The licensee should establish procedures to ensure that the safety significance of any change is assessed in advance, with the level of assessment based on the safety significance of the change.

e) All proposed plant modifications, including organisational changes, should be thoroughly planned. The licensee should clarify how the planned changes will help in continuing to maintain acceptable levels of safety.

**Article 4-(2) Company manual (Vision, Mission, Values and Culture, Leadership Team)**

The following requirements are based on the ONR Technical Assessment Guide NS-TAST-GD-04

a) The applicant’s company manual should describe the company structure and explain the relationship with its shareholders. It should define the company’s vision, mission, values and culture.

b) The applicant’s company manual should outline the corporate governance structure, including governance roles and responsibilities, delegated authority and decision making, employment model (key personnel and other personnel from approved suppliers), assignment of major engineering, procurement and construction works (EPC contract), assurance and oversight arrangements, training approach and competence assessment arrangements.

c) The applicant’s company manual should summarize the organisational structure (number and function of organisational units). It should describe the composition, purpose and
accountabilities of the company’s leading directors and the board members.

d) The company manual should be reviewed and updated as necessary.

**Article 4– (3) Core capability**

The ONR Technical Assessment Guide NS-TAST-GD-049 defines Core Capability as:

“Core capability means the in-house expertise that the licensee should have within its own organisation to be able to maintain control and oversight of the activities on the licensed site and deliver nuclear safety at all times.”

a) The licensee should always be able to demonstrate that it has the core capability needed to understand safety related matters, to manage and make rational decisions on issues affecting nuclear safety, and to demonstrate that it is an intelligent customer for any purchased items or services as well as being in control of contractors working on the site.

b) The most secure source of core capability is direct employment of competent staff. If direct employment is not preferred by the organisation and its core capability includes staff seconded from parts of a parent company, the licensee should be able to demonstrate that it has formal arrangements in place to ensure that it will always have access to sufficient, competent staff and that those staff cannot return to the parent company individually unless alternative arrangements have been made by the licensee to ensure continuity of core capability.

c) The licensee’s board should put arrangements in place to ensure that key decisions relating to the size of the core capability will undergo a strict assessment. The board should also be involved in analysing the implications and monitoring the implementation of proposed organisational changes where key activities with the potential to impact on nuclear safety may be outsourced or the size of the core capability significantly reduced.

d) A new licensee which plans to construct its first NPP should take into consideration that its core capability needs to be in line with the phases of the project. In the pre-construction phase, much of the knowledge of plant design may remain with the responsible designer/plant vendor. The licensee should develop an appropriate core capability to manage the activities on site. This includes having sufficient resources to act as an intelligent customer for the services provided by the responsible designer/plant vendor. Although the responsible designer/plant vendor may have an enduring role, it should always be regarded as a key external resource and not a part of the licensee’s core capability.

e) A new licensee should be able to demonstrate that it understands when and how much core capability it needs as the project progresses. It is expected that the licensee’s core capability will increase and the role of the responsible designer/plant vendor will decrease as the project progresses from pre-construction, construction, commissioning phases into the operation phase.

f) An established licensee which is already holding licenses for operating NPPs should be able to justify the size of its core capability and demonstrate how it is maintaining it. This will include a justification of the level of resources required to fulfil specific roles such as intelligent customer, design authority and nuclear baseline.
g) An established licensee should consider the nuclear safety implications arising from the potential for loss or degradation of core capability over time, particularly if it is considering outsourcing major parts of its technical capability. Such an approach should be subject to scrutiny and shared with the regulatory body.

h) The overall responsibility for the plant safety rests with the licensee. The licensee is not able to delegate this responsibility to contractors, service providers or others who do work on its behalf. The licensee therefore should retain a suitable level of control and oversight of those who are carrying out work on its behalf.

i) In order to maintain this control and oversight, the licensee needs to identify the potential nuclear safety impact of its activities and bear this in mind when making decisions about undertaking those activities by in-house resources or contracting them out.

j) The licensee should establish a clear company policy for making choices between retaining work and activities in-house or contracting them out to the supply chain. This policy should take into account the nuclear safety implications of those activities.

k) If the licensee intends to appoint major engineering, procurement and construction works to a responsible designer/plant vendor, it should be able to demonstrate that it is in control of the new build project and has adequate arrangements and resources to oversee work being undertaken on its behalf by the responsible designer/plant vendor.

l) The licensee should be able to demonstrate that it has systems in place to consider potential organisation vulnerabilities arising from dependence on the specific knowledge of contractors.

m) Where contracted work may create a dependency on specialised contractors for essential safety related work such as maintenance, the licensee is expected to have identified this as a vulnerability as part of a vulnerability assessment and be able to explain what succession arrangements would be in case of a termination of the contract. The vulnerability assessment should result in provisions to mitigate individual vulnerabilities. The vulnerability assessment should be subject to regular review.

n) The core capability includes technical, operational and managerial elements. The licensee’s intelligent customer, design authority and nuclear baseline capabilities will be subsets of the overall core capability.

**Article 4-(3.1) Intelligent customer**

The IAEA GS-G-3.5 defines an Intelligent Customer as:

“The capability of the organisation to have a clear understanding and knowledge of the product or service being supplied.

a) Being an intelligent customer means that the licensee is able to understand, oversee and accept nuclear safety related work undertaken on its behalf by contractors. It means that the licensee is able to demonstrate that the use of contractors in any part of the organisation does not adversely affect its ability to manage safety related activities on the licensed site.
b) As an intelligent customer, the licensee should know what is required, should fully understand the need for a contractor’s services, should specify requirements, should supervise the work and should be able to review, evaluate and accept the output before, during and after implementation.

c) The licensee should have sufficient competent resources within its organisation to be an intelligent customer for any work it commissions externally. The range of functions for which intelligent customer capability is required should be determined. The licensee should know how much staff it needs and which depth of knowledge its staff members should have to retain its intelligent customer capability.

d) The licensee’s safety management system should include a contractor selection and award process. The expectations of the successful contractor in terms of technical delivery, product or service quality, and nuclear safety culture should be clearly specified in the tender documentation.

e) The licensee should ensure that it only allows contracts for work with nuclear safety significance to contractors with suitable competence, safety standards, management system, safety culture and resources.

f) The contractor selection process should include an examination of prospective contractors’ overall ability and capacity to deliver the goods and services required, certification to an appropriate QA standard, and safety performance. These requirements should be applied throughout the supply chain, i.e. in sub-contracts between the main contractor and its sub-contractors.

g) The contractor award process should also ensure that once the contract has been awarded the contractor is only given tasks for which it has been assessed to be suitable and that its performance in delivering the contractual requirements is regularly assessed. The licensee should ensure that it has sufficient resources to oversee and assess the contractor performance throughout the supply chain.

h) The contractor approval process should be a “living” system, which means that the licensee should actively monitor its contractors’ safety management arrangements and performance and that any deviations are reviewed and acted upon as appropriate.

i) Both the customer and the contractor should be ‘intelligent’ meaning both sides should have suitably qualified and experienced staff who understand the requirements specified under the contract. Both parties should communicate effectively with each other. This is particularly important if changes in the contractual agreements should arise where both parties need to be assured that the changes to the contract have been properly analysed and assessed for possible impacts on nuclear safety.

j) The licensee should ensure that contractor and temporary personnel who perform relevant work on safety related structures, systems and components both on the licensed site and at other locations are suitably qualified and experienced to perform their assigned tasks.

k) If contractors are used to perform a safety analysis, the licensee should satisfy itself that the contractor is suitably qualified and experienced, follows an appropriate methodology, and uses the correct data and assumptions. The licensee should have sufficient knowledge to understand the limitations and implications of the analysis, and to oversee and question the contractor’s work.
However, the licensee does not necessarily need to have the depth of knowledge required to undertake the detailed analysis itself.

l) The licensee should provide its contractors with sufficient information and instruction to ensure that contractor staff work safely and understand the limits of what they can do. It is important for contractors to be aware that they share the accountability for the safety of their activities on the licensed site. The contractor staff should be aware of the implications their work could have on nuclear safety.

m) The licensee should ensure that besides the main contractor also the sub-contractors have the same understanding of the nuclear safety implications of their work.

n) Contractors which have a continuing relationship with the licensee, should become an integral part of the licensee’s safety culture and expectation of behaviour. They should be included in safety briefings, working groups, audits etc.

o) The licensee should ensure that there are clear arrangements, which are understood by all parties, for coordination, communication and authorisation of work between the licensee’s own staff, contractors and sub-contractors. In an extended supply chain, there is an increased risk for dilution or misunderstanding of customer requirements.

p) The licensee should ensure that contractors’ work is carried out to the required level of safety and quality.

q) The accuracy of supervising contractors should be depending on the risks of the work. The level of supervision may be reduced if the contractor’s safety management and quality assurance arrangements have been regarded as adequate. However, contracting out work does not reduce the licensee’s legal accountability for the work done on its behalf. The licensee should ensure that contractors’ work is carried out the required level of safety and quality.

r) The licensee should develop its intelligent customer arrangements commensurate with the lifecycle phases of the new build project, i.e. design, procurement, construction, installation, commissioning and operation. These arrangements should be an integral part of its management system. If individuals holding intelligent customer roles change during the project, or intelligent customer responsibilities change as the project moves from one phase to the next, the intelligent customer responsibility should be handed over from one role holder to the next.

**Article 4-(3.2) Design authority capability**

The following requirements are based on ONR Technical Assessment Guide NS-TAST-GD-079:

a) It is comprehensible that in the preconstruction phase the detailed knowledge of the plant design will reside with the responsible designer/plant vendor. However, there needs to be a process for the transfer of knowledge from the designer to the license applicant to ensure it will have adequate design authority capability by the time of licensing. Consequently, the applicant should make and implement arrangements to transfer expert plant design knowledge from the vendor.
b) The organisation should set up and sustain a design authority capability that includes suitable and sufficient experts with a detailed and up-to-date understanding of the safety of its facilities, their design and operation.

c) Design authority should be a defined function within a licensee’s organisation which is independent of operations to avoid a potential conflict of interest with the operations functions.

d) The design authority should have the required knowledge to maintain the design integrity of the nuclear power plant throughout the full lifecycle of the facility. This includes the need for an effective process to transfer and so to maintain knowledge from experienced staff leaving the organisation.

e) The design authority should have a clearly defined reporting line to the board of the licence organisation.

f) The design authority should have the authority and the responsibility to approve or to reject proposed design changes.

g) Proposals for design changes should be subject to scrutiny before being implemented. Design changes should be made with a full understanding of all the design information and the potential impact on nuclear safety of proposed changes. The design authority should be engaged in plant modifications at an appropriate level and have ultimate authority to approve or reject proposed design changes.

h) The capability and authority to reject proposed design changes that do not maintain the design integrity is an important role of the design authority. This role should be clearly defined and documented in the licensee’s management system.

i) The licensee should have a formal design change process which ensures that the actual configuration of the plant throughout its life is consistent with the design.

j) The design authority should have the capability to understand the totality of the plant design and nuclear safety over the full lifetime of the plant (construction, commissioning, operation and decommissioning). The long lifetime of nuclear power plants means that a plant will undergo changes throughout its life. Changes can include physical ageing of the plant’s systems, structures and components, feedback from operating experience or changing engineering or regulatory standards.

k) The design authority should have the resources and capability to assess changes to the plant’s conditions and limits and performance characteristics. Design changes are not limited to plant modifications. Changes can occur to the way in which a plant is operated. The plant operator should be obliged to inform the design authority of any changes it wishes to implement that may have a significant impact on the safety performance of the plant. The design authority should be able to assess the impact of operational and performance related changes and to provide advice and guidance to the operations function.

l) The design authority should have up to date knowledge, skills, experience and resources.
m) The design authority should ensure that a knowledge base of suitably qualified staff is established, maintained and expanded with experience. The knowledge of the design which is needed for the safe operation and maintenance of the plant should be available to all parts of the licensee.

n) The design authority should ensure that the necessary engineering and scientific knowledge, skills and experience are maintained as part of the nuclear baseline, and that sufficient resources are available to fulfil its role.

o) The design authority should regularly assess the adequacy of the plant’s design and safety provisions. This should include full and immediate access to relevant information from all parts of the licensee organisation and responsible designer or plant vendor.

p) Reviews should be carried out covering topics such as plant performance, effectiveness of modifications, structural integrity, plant reliability, maintenance periodicity, system and component common cause failures.

q) The design authority should maintain up to date records of all the drawings, specifications, manuals, design standards, engineering calculations, supporting data and theoretical bases for the plant systems, structures and components.

r) The design authority should have arrangements in place to ensure that it learns from operating experience inside and outside the licensee organisation and have the capability to understand the implications for the plant design.

s) Where the licensee does not have all the detailed, specialised knowledge required of all the systems and components important to safety, it may choose to assign those responsibilities to the responsible designer. However, the design authority cannot delegate all its overall responsibility design integrity of the plant. It should retain sufficient knowledges of all aspects of the design to enable it to understand the results of the responsible designer’s work through its role as an intelligent customer.

t) The relationship between the design authority, as part of the licensee’s organisation, and responsible designer should be formalised under contract. Responsible designer should have a formal contractual responsibility for maintaining their specialised knowledge of design and their competence in the detailed design process. The licensee should maintain sufficient knowledge of all aspects of the design to act as a design authority intelligent customer to enable it to understand the results of the responsible designer’s work and to understand the implications of that work for the plant design.

u) The licensee should have a strategy to anticipate the possible disappearance of some of the responsible designers and should have plans to manage such situations.

v) The design authority should have the following knowledge as a minimum: a detailed understandings of why the design is at it is, experimental and research knowledges on which the design is based, design inputs such as functional requirements, performance requirements, safety goals and safety principles, applicable codes and standards, design outputs such as specification, design limits, operating limits, detailed knowledge of the design calculations, understandings of the inspections, analysis, testing, computer code validation and acceptance criteria.
Article 4-(3.3) Nuclear baseline

The following requirements are based on the ONR Technical Assessment Guide NS-TAST-GD-065:

a) Within its core capability the licensee should also maintain its nuclear baseline to ensure that key nuclear safety roles are fulfilled. The nuclear baseline in particular should specifically identify posts containing roles with the potential to impact on nuclear safety.

b) The licensee should demonstrate that it has suitable and sufficient organisational structures, staffing levels and competences in place to effectively and reliably carry out those activities which could impact on nuclear safety.

c) The licensee should be able to show that it understands the nuclear safety roles that need to be delivered, and that these roles will be carried out by suitable and competent staff. It is not sufficient just to demonstrate that all roles are covered but that those individuals can realistically carry these roles out to the required standard.

d) The nuclear baseline should include all activities with a positive impact on nuclear safety and those activities, which, if inadequately carried out, could have an adverse effect on nuclear safety. The nuclear baseline should show that all safety related roles set out in the management system are adequately covered.

e) The nuclear baseline should not be restricted to roles which are defined in the site’s minimum staffing arrangements. It should also not be restricted to roles which are required to maintain the power plant in a safe shutdown state. It should reflect the roles needed to carry out the full range of activities for which the site is licensed, including normal operation, maintenance, examination and testing, emergency response etc.

f) The nuclear baseline should include roles which involve carrying out or supporting operations, the design and manufacture of nuclear safety related plant and equipment, design authority responsibilities, responding to nuclear incidents and emergencies, intelligent customer responsibilities, control and supervision of contractors carrying out nuclear safety related works.

g) The licensee should set out the number of individuals which it needs within its organisation to discharge the nuclear safety roles. It should then set out the number of individuals which it has in place to carry out these roles (one post-holder may carry out a number of roles). The licensee should be able to show that the roles are all populated and that the post holders have sufficient resources available to meet the expectations of these roles.

h) If there are gaps between the numbers of staff needed and the numbers in post, nuclear safety may be affected. The licensee should be able to show that it understands where such gaps exist and that it has plans to fill the gaps. These plans may involve recruitment of staff or reorganisation, reducing or delaying work, or the use of contractors’ staff. Where contract support is used, this should be overseen by a competent intelligent customer capability.
i) The responsibilities of the roles that a person holds determine whether the role is part of the nuclear baseline, not the characteristics of the role holder himself. If any of the responsibilities held by individual role holders can affect or control nuclear safety, then they should be included in the nuclear baseline.

j) Both the management system and the nuclear baseline have roles to play in demonstrating the organisation’s nuclear safety governance capability. The management system should describe the process in place to ensure that the organisation has the capability to be in control of the operations and governance of the licensed site. The nuclear baseline should refer to the management system and demonstrate that relevant roles are properly identified, and populated with competent persons.

k) Where the licensee engages contract staff to supplement its core capability it should ensure that the balance of employees and contract staff does not disable its capability to discharge its governance responsibilities.

l) The licensee is responsible for demonstrating, through the nuclear baseline, that it has enough people with the right competences to discharge its responsibilities. Where this involves the support of others outside its own organisation, then the licensee should demonstrate that it is and remains an intelligent customer for these skills and services.

m) Contract staff should appear as part of the nuclear baseline when they are embedded within the licensee’s organisation or meet the criteria for holding intelligent customer roles on behalf of the licensee.

n) The licensee may make use of contractors, who do not meet the criteria for embedment within the nuclear baseline for example contractors utilised on a project basis. In such cases, the licensee is expected to ensure that the work of the contractors is properly specified, that arrangements to manage the contract are in place, that the contractor uses a sufficient number of competent people to carry out the work, and that the contractor’s work is subject to scrutiny and supervision.

o) The nuclear baseline should include those roles which are in place to manage contractors and to provide the licensee’s intelligent customer, design authority and oversight functions.

p) The licensee should develop a set of nuclear baseline indicators that provide evidence that the nuclear baseline has the right organisation, staffing levels and competences.

q) The nuclear baseline should demonstrate that the licensee’s organisation and its staffing levels and competences enable it to discharge its nuclear safety responsibilities. A detailed task analysis underpinning the resource/competence allocation for all activities within the scope of the nuclear baseline may be expected.

r) Performance indicators should provide confirmation that nuclear safety roles are being delivered effectively. They should address aspects such as quality and timeliness of work outputs. The indicators should provide measures whether the organisation has enough resources at the right time, and right skills and competences to match the need.

s) The licensee should have arrangements in place through which the nuclear baseline is derived and managed. The arrangements should show how the nuclear safety functions that the licensee needs to
discharge are determined, how the staffing levels and competences required to deliver these nuclear safety functions are identified, that the licensee’s organisation, staffing levels and competences are adequate to meet these needs, and that the licensee maintains effective intelligent customer capabilities to supervise the work of contractors.

t) A new build project will require changing staffing levels, competences and organisational structures. Therefore, a single, fixed nuclear baseline may not be suitable. The licensee should link its work programme with its staffing levels and competence needs at each stage of the project. Prior to starting a new phase in the work programme, it may be appropriate to have ‘hold points’ to confirm that suitable and sufficient skills and competences are in place for the tasks ahead.

Article 4-(4) Safety and licensing functional unit

The following requirements are based on the Technical Assessment Guide NS-TAST-GD-072

a) The licensee should have a safety and licensing functional unit within its organisation which provides assurance of the nuclear safety of the company’s activities.

b) The safety and licensing functional unit should be operationally separate to the delivery functions which must meet the relevant policies and standards.

c) The safety and licensing functional unit should include a nuclear oversight function which delivers independent assurance on the adequacy of the company’s organisational structure and its arrangements to manage nuclear safety.

d) The nuclear oversight function should provide an independent review of documents that are significant to nuclear safety.

Article 4-(5) Requirement policy

The following requirements are based on the IAEA NS-G-2.8:

a) The licensee should develop a workforce plan, by providing a systematic approach to estimate the human resources needed for the new build project, assess the existing level of capability, identify competence gaps and plan for how to fill these gaps according the progress of the project.

b) The licensee should be aware that the recruitment and selection of personnel for a new nuclear power plant can be anticipated in terms of positions and recruitment schedules, so that a workforce plan can be prepared well in advance of the beginning of plant construction.

c) The licensee should begin its recruitment and training programmes for a new power plant at an early stage. Initial recruitment should be completed in sufficient time before the commissioning of the plant to allow staff to gain experience of the design and construction by working alongside contractors and commissioning personnel, and to receive adequate training and familiarize themselves with the plant.

d) The licensee should prepare a schedule showing how initial recruitment and selection of plant personnel will be planned and implemented.
e) Relatively early recruitment of operators and technicians is advisable for a new power plant. Attention should be given to the early recruitment of shift supervisors and senior operators. Operators and technicians should be given sufficient time for accomplishing the training required before they receive the full responsibilities of their positions. Some of these personnel could be assigned to the plant vendor or EPC contractor to acquire experience with new and/or complex equipment during construction.

f) Technicians should work together with the EPC contractor’s personnel and commissioning personnel in the checking and initial operation of equipment prior to fuel loading. Some technicians may be recruited and employed at the site well before the start of operation.

g) While most craftsmen are hired when they are needed, it is advisable that senior craftsmen may receive specialized training at manufacturers during the assembly of special equipment, such as turbines or large pumps. Some craftsmen may need to have particular skills, for example a nuclear welding certification. Recruitment should continue according to operational needs, taking into account the necessary training needs and the opportunities available to give recruits to work in construction and commissioning in order for them to gain first hand experience with the installed equipment and systems.

h) The licensee should contain an adequate number of personnel, with the knowledge, training and skills necessary to supervise and evaluate the work of contractor personnel. Staff of the licensee required to supervise contractors or other temporary staff should be clearly defined.

i) Changes to the organisation (staffing, resources or competences) should be subject to systematic evaluation. Succession planning should be implemented to replace key personnel within the organisation. Succession planning should create a match between the organisation’s future needs, expected changes (e.g. retirement) and the aspirations of individuals.

j) Position descriptions should clearly define the authorities, responsibilities and competences for each position or position category within the licensee as a whole, and within the plant, department and organisational unit.

Article 4-(6) Training policy

The following requirements are based on the IAEA NS-G-2.8:

a) The organization should encourage the involvement and development of its individuals by providing ongoing training and career succession planning, establishing individual and team objectives, facilitating involvement in the setting of objectives and decision making, recognizing and rewarding good performance, facilitating the open, effective communication of information, continually reviewing the need of individuals and obtaining feedback from individuals on a regular basis.

b) The licensee should develop a training plan, which should include a description of the training programme and methods to be employed. Training should be designed to ensure that the training content addresses the specific needs of individuals and the overall organization. This means that training should be planned and carried out using a systematic approach, with established measurable objectives and with a means of evaluating its effectiveness.
c) For each of the positions relevant for safety in the organisation, a set of requirements for each initial and continuing training should be established. The requirements should vary according to the individual position, level of responsibility and specific level of competence required, and should be prepared by persons having specific competence in plant operation and experience in developing training activities.

d) Plant commissioning provides an important opportunity for hands-on training for both operating personnel and personnel in supporting functions. Before fuel is loaded at a new plant, testing of components and equipment can be undertaken with freedom of access, which is not possible later in the plant’s operating lifetime.

e) Training at a plant reference, full scope simulator facility should be provided for control room operators whose actions have an immediate influence on plant behaviour. Trainees should also be confronted with infrequent and abnormal situations which have a low probability of occurrence and therefore cannot be enacted in real plant practice.

f) Training is crucial to the continuing development of personnel. Individual training plans should not be limited to initial qualification but should provide for maintaining proficiency and for progressive improvement. Principle line managers should participate personally in the analysis of training needs, in the review and approval of training programmes and plans, and in the evaluation of the effectiveness of the training.

g) Continuing training should be carried out on a regular basis. A programme should be conducted periodically for all groups of personnel whose functions are important to the safe operation of the plant.

h) For operators, continuing training should be provided at appropriate intervals to ensure that the knowledge and understanding essential to safe and efficient plant operation are retained and refreshed, in particular for dealing with abnormal and accident conditions.

i) In planning for education and training needs, the licensee should take account of changes caused by the nature of the organization’s processes, the competence levels of individuals and the culture of the organization.

j) Attention should be given also to safety culture training. Safety culture training should address the reinforcement of good practices by applying lessons learned from experience. It should focus attention on ‘doing things right the first time’ and on the safety consequences of inadequate or incorrect work.

k) Staff should be trained in the management principles that are of relevance of their work, and in how to promote safety culture and conservative decision making by means of positive feedback and recognition.

l) The training programmes of the licensee should be subject to ongoing review to determine their effectiveness. The training plans should be revised whenever necessary improvements or enhancements are identified on the basis of the results of the reviews.
Article 4-(7) Procurement

The following requirements are based on IAEA Technical Report NG-T-3.1

a) The licensee should have robust arrangements in place for procurement of goods and services which could affect safety. It is the licensee’s responsibility to ensure that the requirements for the purchased product are fulfilled by all contractors throughout the supply chain.

b) The licensee’s procurement processes should consider the potential number of subcontract layers when giving contracts with the objective of avoiding unnecessarily long supply chains. The licensee should also ensure that there is effective communication and interfaces between each link in the supply chain to ensure that its requirements are clearly understood and effectively cascaded to each contractor.

c) It is expected that the supply chain will make every effort to deliver ‘right first time quality. However, from time to time deviations (non-conformances) from the purchaser’s technical specification may occur at any level within the supply chain. The control of any such deviations from the technical specification is fundamental to the achievement of quality and therefore the integrity of the item.

d) The licensee should have arrangements in place which ensure that suppliers at all levels in the supply chain identify and categorise deviations for items or services should they arise. These should include referring any deviations from the technical specification to the Design Authority for assessment and approval.

Article 4-(8) Financial liability

The following requirements are based on the IAEA Technical Report NG-T-4.2 and NG-T-4.1:

a) The licensee should establish a commercial strategy in its business plan. The commercial strategy should detail in particular the corporate structure for promoting the project, including details of the contractual arrangements between various stakeholders and participants for each phase of the project’s life, the funding strategy for raising capita (equity and debt), financing actions to anticipate possible substantial cost overruns, lender requested agreements involving the State and utilities concerning maintaining retail electricity tariffs, support from financial institutions, corporate and ownership structure, electricity sales strategy and arrangements, which will determine the financial feasibility.

b) The licensee should be the legal owner of the plant site having the ultimate right to use the site for the installation and operation of a nuclear power plant. The duration of the ownership of the site should be enough adequate with regard to the lifetime of the NPP.

c) The licensee should have in place financial arrangements for the new nuclear power plant

d) The licensee should have in place adequate provisions for financing continuing liabilities and decommissioning.
e) The licensee should establish and develop a financing strategy and a well-founded business and financing plan and should have arrangements in place for financing the project in consultation with the government authorities and foreign and local sources of finance.

f) It is expected that safety is a primary consideration in the allocation of resources, and that the strategic business importance of safety is reflected in the business plan.

g) The senior management should plan for, make available and control the financial resources necessary for meeting safety standards, maintaining the safety culture, implementing an effective and efficient management system, and achieving the organisation’s goals.

Sources:

ONR Safety Assessment Principles (SAPs)

IAEA GSR Part 2

IAEA Guides & Technical Reports

German best practices

ONR Technical Assessment Guides

CHAPTER III

Review and Assessment Approach

Article 5 - Step-by-step review and assessment approach

The licensing process has been divided into a series of phases reflecting the lifecycle of a nuclear power plant. Each phase is defined by the activities that will occur within that phase, e.g. fuel being loaded into the reactor or completion of pre-operational tests.

The license applicant should develop its organisational capability and management arrangements commensurate with the lifecycle phases of the new build project.

At each phase of the licensing process the license applicant is required to demonstrate to the satisfaction of the regulatory body that it has implemented adequate arrangements to address the matters relating to the licensing step.

Step 1 Owner application phase (Preparatory step)

a) Application documents that need to be submitted
According to Article 6 of the Decree on Licensing of Nuclear Installations the applicant has to submit an application to the Authority with enclosing documents, describing the nature of the installation to be constructed and describing his technical and financial abilities.

1- Application letter including an information about the purpose of the application, the reactor type to be installed and operated, the location of the plant site and enclosing documents.

2- Documents regarding site usage contract, deed of ownership or cadastre register etc. showing that the applicant is the owner of the site (regarding the financial liability of the owner see 4.8) (The submitted documents should have been approved by an authorized body)

3- Trade registration Gazette showing that the applicant is a corporate body (regarding the financial liability of the owner see 4.8.1)

4- Documents showing the equity and debt status of the applicant (terminology -> bank reference letter, bank receipts etc.)

5- Company Manual showing the corporate structure, vision, mission, values and business experiences on nuclear area, general description of the proposed project including an introduction into a reference plant

6- A financial and business plan showing how the project will be financed, including the allocation of costs, risks, rights and responsibilities among the responsible parties.

7- Recruitment and training plan including a general description of how future staff will be recruited and trained.

b) Acceptance criteria

Technical capability of the applicant

1- The application letter should include information about the purpose of the application, outline the reactor type (basic technology) to be installed and operated, the location of the plant site and enclosing documents.

Company Manual (Vision, Mission, Values and Culture, Leadership Team)

1- The applicant’s company manual should describe the company structure and explain the relationship with its shareholders. The company’s vision, mission, values and culture should be defined (regarding the company manual see 4.2).

Leadership and safety management system

1- The applicant should start to build a project management organisation to manage the licensing process (regarding the project management organisation see 4.1.2c).
Capable organisation (Decision making, Learning, Safety Performance and Culture, Resources, organisational changes)

To be added in the final version

Core capability (Intelligent Customer, Design authority capability, Nuclear baseline)

To be added in the final version

Safety and licensing functional unit

To be added in the final version

Recruitment policy

1- The applicant should implement a programme of staff recruitment (regarding recruitment see 4.5).

Training policy

1- The applicant should implement a programme of training (regarding training see 4.6).

2- If the applicant is starting with a zero baseline, it should start to recruit and train staff required for the site license application phase (regarding training see 4.6).

Procurement

To be added in the final version

Financial capability of the applicant

To be added in the final version

Financial liability

1- It is expected that the applicant is the owner of the site which will be used for the installation of a nuclear power plant (regarding the financial liability of the owner see 4.8.2)

2- The usage period of the site should not be less than 49 years (regarding the financial liability of the owner see 4.8.2)

3- It is expected that the applicant is a corporate body (regarding the financial liability see 4.8.1)

4- The equity of the applicant should not be less than 100.000 TL

5- The applicant’s business activities should include the installation and operation of a nuclear power plant.

6- It is expected that the corporate entity is established in Turkey
7- It is expected that the applicant provides general information about its financing strategy and financial plan for each phase of the project’s life (regarding the financial strategy see 4.8.1).

c) Advice to reviewers

Check from the application letter if the purpose of the application, the reactor type to be installed and operated, the location of the plant site and enclosing documents are outlined.

**Sufficiency of Financial liability**

Check from documents (site usage contract, deed of ownership or cadastre register) if the applicant is the owner of the site.

Check if the submitted documents have been approved by an authorized body

Check from documents (site usage contract, deed of ownership or cadastre register) if provisions declaring that the site will be used for the installation of a nuclear power plant are available

Check from documents (site usage contract, deed of ownership or cadastre register) if the usage period of the site contract is not less than 49 years

Check if the applicant has provided a trade registration Gazette

Check from the trade registration Gazette whether the equity of the applicant is not less than 100.000 TL

Check from the trade registration Gazette whether the installation and operation of a nuclear power plant is among the applicant’s business activities

Check from the trade registration Gazette if the corporate entity is established in Turkey.

**Technical capability**

Check from the company manual if the company structure is described and the relationship with the shareholders is explained.

Check from the company manual if the vision, mission and values of the applicant are prioritizing the importance of nuclear safety.

Check from the company manual if a general information of a reference plant is provided.

Check from the financial plan if a strategy is defined to finance the project and if aspects like costs, risks, rights and responsibilities have been addressed for each phase of the project’s life.

Check from the recruitment and training plan if the applicant has set up a plan for recruitment and training of its future staff.
Step 2 Site license application phase

a) Application documents that need to be submitted

1- Updated Company Manual

Update of the information which were given in Step 1, adding a description of the corporate governance structure, including governance roles and responsibilities, delegated authority and decision making, employment model (key personnel and other personnel from approved suppliers) assignment of major engineering, procurement and construction works (EPC contract) assurance and oversight arrangements training approach and competence assessment arrangements

2- Nuclear baseline including roles for managing contractors, representing the intelligent customer, providing the design authority and oversight functions.

3- Plan for the procurement of long lead items (items to be manufactures, contractor selection and award process, selected manufacturer)

4- Management system handbook, including processes for recruitment, training, procurement etc.)

5- Recruitment and training programme showing that the number of staff which has been recruited so far corresponds to the main tasks of this phase.

6- Acceptance criteria

Technical capability of the applicant

To be added in the final version

Leadership and management system for safety

1- The prospective applicant should establish adequate management system arrangements, including an organisational chart, which is adequate to the main tasks of this phase.

Capable organisation (Decision making, Learning, Safety Performance and Culture, Resources, organisational changes)

1- The necessary actions should be initiated to establish and continuously improve safety culture across the organisation.

Company Manual (Vision, Mission, Values and Culture, Leadership Team)

1- The company manual should outline the corporate governance structure, including governance roles and responsibilities, delegated authority and decision making, employment model (key personnel and other personnel from approved suppliers), EPC contract, arrangements for control and oversight of the EPC contractor, training approach and competence assessment arrangements (regarding company manual see 4.2.2).
The company manual should describe the organisational structure (number and function of organisational units, composition and accountabilities of the leading directors and board members), regarding company manual see 4.2.3.

**Core capability (Intelligent Customer, Design authority capability, Nuclear baseline)**

1- The license should make significant progress to develop its organisational capability, including core capability, intelligent customer and design authority (regarding organisational capability see 4.3).

2- Nuclear baseline role profiles should be defined, including roles to manage contractors, to provide the intelligent customer, design authority and oversight functions (regarding nuclear baseline see 4.3.4).

**Safety and licensing functional unit**

To be added in the final version

**Recruitment policy**

1- The applicant should continue to recruit staff to ensure that suitable and sufficient capability is in place to be granted a site license.

**Training policy**

1- The applicant should continue to train staff to ensure that suitable and sufficient capability is in place to be granted a site license.

**Procurement**

1- The licensee should make significant progress to develop its procurement strategy.

2- The applicant should start to develop a strategy for the procurement of long lead items in advance of being granted a site license.

**Financial capability of the applicant**

**Financial liability**

1- Advice to reviewers

Check from the updated company manual if the corporate governance structure, employment model, EPC contract arrangements, training approach and competence assessment arrangements are outlined.

Check from the updated company manual if the organisational structure (number and function of organisational units, composition and accountabilities of leading directors and board members) is outlined.

Check from the nuclear baseline if roles for managing contractors, providing the intelligent customer, design authority and oversight functions are defined.
Check from the recruitment and training plan if the number of staff which has been recruited and trained matches the scope of work needed to be done after site license grant.

Note: The number of technical professionals that the licensee needs during the site license application phase and construction license application phase will depend on the contract structure for the construction of the nuclear power plant.

Step 3 Construction license application phase

   a) Application documents that need to be submitted

   1- Updated Company Manual

   Update of the information which were given in Step 2, adding a description of the roles and responsibilities of construction units, including oversight and control of nuclear construction activities.

   2- Updated Nuclear Baseline

   Update of the information which were given in Step 2, adding key roles associated with construction, supply chain, procurement, safety at work and emergency planning.

   3- Programme to establish and continuously improve the safety culture of the organisation.

   4- Recruitment and training programme showing that the number of staff which has been recruited so far corresponds to the main tasks of this phase.

   b) Acceptance criteria

Technical capability of the applicant

To be added in the final version

Leadership and management system for safety

To be added in the final version

Capable organisation (Decision making, Learning, Safety Performance and Culture, Resources, organisational changes)

To be added in the final version

Company Manual (Vision, Mission, Values and Culture, Leadership Team)

To be added in the final version
Core capability (Intelligent Customer, Design authority capability, Nuclear baseline)

1- The applicant should develop its organisational capability with respect to the oversight and control of nuclear construction activities.

2- The application should grow the organisation in accordance with the nuclear baseline, specifically focusing on the areas of construction units.

3- The applicant should define key roles associated with construction, supply chain, procurement, safety at work and emergency planning.

4- The applicant should continue to control and oversee the EPC contractor.

Safety and licensing functional unit

To be added in the final version

Recruitment policy

1- The applicant should continue to recruit and train staff to ensure that suitable and sufficient capability is in place for the construction phase.

Training policy

1- The applicant should continue to recruit and train staff to ensure that suitable and sufficient capability is in place for the construction phase.

Procurement

1- The applicant should continue to oversee procurement of the fabrication of long lead items, and to make preparations for acceptance, receipt and storage of the first long lead items.

Financial capability of the applicant

Financial liability

c) Advice to reviewers

Check from the updated company manual if roles and responsibilities of construction units, including oversight and control of nuclear construction activities has been described.

Check from the updated nuclear baseline if key roles associated with construction, supply chain, procurement, safety at work and emergency planning has been added.

Check from the recruitment and training programme if the number of staff which has been recruited and trained matches the scope of work needed to be done during the construction phase.
Step 4 Operation license application phase

Step 4a Commissioning permit application phase

a) Application documents that need to be submitted

b) Acceptance criteria

Technical capability of the applicant

To be added in the final version

Leadership and management system for safety

To be added in the final version

Capable organisation (Decision making, Learning, Safety Performance and Culture, Resources, organisational changes)

Company Manual (Vision, Mission, Values and Culture, Leadership Team)

Core capability (Intelligent Customer, Design authority capability, Nuclear baseline)

1- In preparation for the commissioning phase, the applicant should develop its organisational capability in line with the resource plans for the oversight and completion of commissioning activities.

2- The applicant should grow the organisation in accordance with the nuclear baseline, specifically focussing on development and training of operations staff in preparation for the commissioning phase. The focus should be on building the capabilities to successfully commission and start up the plant.

3- The applicant should develop its intelligent customer capability to oversee the equipment supply chain.

Safety and licensing functional unit

Recruitment policy

Training policy

1- It is expected that the applicant has a full scope simulator during this phase in order to support operator training.

Procurement

Financial capability of the applicant

Financial liability

c) Advice to reviewers
Step 4b Fuel loading and pre-operational test permit application phase

a) Application documents that need to be submitted

b) Acceptance criteria

Technical capability of the applicant

Leadership and management system for safety

Capable organisation (Decision making, Learning, Safety Performance and Culture, Resources, organisational changes)

Company Manual (Vision, Mission, Values and Culture, Leadership Team)

Core capability (Intelligent Customer, Design authority capability, Nuclear baseline)

1- The applicant should ensure that an adequate number of trained and certified staff/operators are available by the first load.

2- The applicant should set up a site security organisation in preparation for bringing nuclear fuel to the site.

3- The applicant should implement arrangements to manage nuclear fuel procurement, accounting, transport, assembly, monitoring and waste.

Safety and licensing functional unit

Recruitment policy

Training policy

Procurement

Financial capability of the applicant

Financial liability

c) Advice to reviewers

Step 4c Full power operating permit application phase

a) Application documents that need to be submitted

b) Acceptance criteria

Technical capability of the applicant

Leadership and management system for safety
Capable organisation (Decision making, Learning, Safety Performance and Culture, Resources, organisational changes)

Company Manual (Vision, Mission, Values and Culture, Leadership Team)

Core capability (Intelligent Customer, Design authority capability, Nuclear baseline)

Safety and licensing functional unit

Recruitment policy

1- The applicant should continue to recruit and train staff needed for nuclear power plant operation, maintenance and technical support.

Training policy

1- The applicant should continue to train staff needed for nuclear power plant operation, maintenance and technical support.

Procurement

Financial capability of the applicant

Financial liability

c) Advice to reviewers

Step 5 Operation phase

a) Documents that need to be submitted

1- Report on modifications
   Compilation of all modifications done in the nuclear power plant in the last year, including a short description of the work that has been done and a statement whether the modification was not related with nuclear safety.

2- Report on operation
   Outage time, availability at full power, frequency of scrams, frequency of abnormal situations and safety system actuations, unavailability of safety systems, extents of repeat maintenance, number of radiation accidents etc.

3- Management system handbook
   Revised processes, including requirement, training, procurement, documentation etc.

4- Report on inspections
   Compilation of all inspections conducted by the licensee in the last year, information about deviations occurred during the inspection and about the clearance of these deviations
5- Report on staff training
   Information about the training and qualification programme for staff with responsible
   roles (operations staff, directors, managers, leaders)

6- Report on the technical qualification of responsible roles (nuclear baseline)
   Appointment letter for new nuclear baseline roles
   Licensing certificates for newly hired and trained operations staff

   Documents proving that continuous training has been provided for operators to refresh
   their knowledge

7- Operational procedures
   Revised procedures, including those which do not need an approval by the regulatory
   body before putting into force

8- Action plan including arrangements to continuously improve the safety culture and safety
   performance of the organisation (note: should be included in the management system
   handbook).

9- Report on financial situation
   Profit margin, debt status, costs etc.

b) Acceptance criteria

Technical capability of the applicant

Leadership and management system for safety

1- The applicant should monitor its management system arrangements and revise the
   management system handbook if necessary (regarding management system see 4.1).

Capable organisation (Decision making, Learning, Safety Performance and Culture, Resources,
organisational changes)

1- Any change to the organisation should be subject to evaluation and reviewed (regarding
   organisational changes see 4.1).

2- It is expected that the licensee monitors its operational results by evaluating safety
   performance indicators (note: an increased number of scrams could be an indicator for a
   decline in the safety performance); regarding report on operation see 4.1.4c).

3- It is expected that the licensee monitors the efficiency of its safety culture arrangements
   such as examination of work samples, observation of activities, team work performance,
   professional behaviour (pre-job briefings & job debriefing, open communication, asking
   critical questions, decision-making, independent check, STOP in case of discrepancies)

4- It is expected that the licensee prepares an inspection report which summarizes all
   inspections done in the last year, including a report on deviations and how the deviances
   were cleared.
Company Manual (Vision, Mission, Values and Culture, Leadership Team)

1- The organisational structure of a licensee already holding the operation license and which is technically ready for operation should include the following units/functions:

Administration
Finance
Communications
Contracts
Human resources
Safety and licensing incl. Nuclear oversight and regulatory affairs
Project management
Document control/records
Procurement
Chemistry
Radiation Protection
Physics
Decommissioning/Radioactive waste
Emergency preparedness
Design authority
Fire protection
Maintenance/construction
Modifications engineering
Plant engineering
Reactor engineering
Technical engineering
Operations
Outage management
Nuclear fuels
Nuclear safety review

Safety/health

Security

Training

Warehouse/Workshop

Core capability (Intelligent Customer, Design authority capability, Nuclear baseline)

1- The licensee should demonstrate how it is maintaining the size of its core capability by succession planning, including intelligent customer, design authority, nuclear baseline (operations staff, responsible roles)

Safety and licensing functional unit

Recruitment policy

1- The applicant should develop plans for the continuing recruitment, and training of staff, and personnel development for the lifetime operation of the nuclear power plant.

Training policy

Procurement

Financial capability of the applicant

Financial liability

c) Advice to reviewers

Check from the management system handbook if is still consistent with the requirements for the management system.