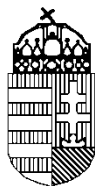


Hungarian Atomic Energy Authority



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**Regulatory procedures of operation
beyond design lifetime**

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PREAMBLE

The uppermost level legal regulations for safety of the peaceful use of atomic energy are established in Act CXVI of 1996 on atomic energy.

The stipulations on the nuclear safety requirements for nuclear facilities and the associated regulatory activities are established in Govt. decree 118/2011. (VII. 11.) Korm. and its annexes the so called Nuclear Safety Codes.

All those shall comply with the nuclear safety requirements and stipulations, who are under continuous regulatory supervision according to Subsection (2) of Section 9 of the Atomic Act, conduct an activity bound to regulatory license by this decree, contribute to such an activity or submit an application for licensing such an activity. In addition to the nuclear safety requirements and stipulations, individual regulatory prescriptions, provisions and obligations, which can be established in its resolution by the nuclear safety authority for the safety of the nuclear facility, are also obligatory.

The authority can develop recommendations on the compliance with the regulations of the Nuclear Safety Codes, which are issued in the form of guidelines. The guidelines are published in the website of the Hungarian Atomic Energy Authority.

Pursuant to Subsection (3) of Section 3 of Govt. decree 118/2011. (VII. 11.) Korm., if a regulation is complied with in accordance with a guideline, then the nuclear safety authority considers the selected method as applicable to demonstrate the compliance with the nuclear safety requirements, and it does not assess the adequacy of the applied method.

If methods differing from those described in the guidelines are applied, then the authority assesses the adequacy, applicability and comprehensiveness of the applied method in details, which may require longer administrative procedure, involvement of external experts and additional costs.

The guidelines are orderly reviewed with a frequency established by the nuclear safety authority or out of order based on the proposal of the licensees.

The listed regulations are supplemented by the internal regulating documents of the licensees and other organizations participating in the use of nuclear energy (designers, manufacturers, etc.), which are prepared and maintained in accordance with their own management systems.

Before applying a given guideline, always make sure whether the newest, effective version is considered. The effective guidelines can be downloaded from the HAEA's website: <http://www.haea.gov.hu>.

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1. INTRODUCTION

1.1. Scope and objective

This Guideline describes the regulatory procedures related to operation beyond the design lifetime of a nuclear power plant unit, and formulates recommendations on preparation of the programme and the license application required by Section 20 of Govt. Decree 118/2011 (VII.11.) Korm.

The objectives of the Guideline are to make the regulatory expectations unambiguous by the recommendations included, and to facilitate the supervision of compliance with the nuclear safety criteria during legally required procedures.

1.2. Corresponding laws and regulations

The legal background of the nuclear safety requirements are provided by the Act CXVI of 1996 on Atomic Energy and the Govt. Decree 118/2011 (VII.11.) Korm.

2. DEFINITIONS AND ABBREVIATIONS

2.1. Definitions

The current chapter does not include the definitions established in Annex 10 of Govt. decree 118/2011. (VII. 11.) Korm.

Degradation process:

Degradation caused by the impacts appearing during the operation, maintenance and tests of systems, structures and components and of environmental conditions, as a result of which the inherent safety margin of systems, structures and components may decrease, their performance parameters and operational reliability may degrade, the probability of the failure may increase.

2.2. Abbreviations

PSRR	Periodic Safety Review Report
TLAA	Time Limited Ageing Analysis
NSC	Nuclear Safety Code
SSCs	Systems, Structures and Components
OLC	Operational Limits and Conditions
SLE	Service Life Extension
FSAR	Final Safety Analysis Report

3. PROGRAMME SCHEDULED FOR REALIZATION OF CONDITIONS OF OPERABILITY BEYOND DESIGN SERVICE LIFETIME

(1) At least four years prior to the end of the design service lifetime, the licensee shall notify the nuclear safety authority of its intent to extend the design service lifetime of the nuclear power plant unit and shall, at the same time, submit the programme meant to create the conditions for operation beyond the design service lifetime. (Subsection 20. § (1) of Govt. Decree 118/2011. Korm.).

Prior to licensing, the licensee shall prepare and implement a programme to create the conditions for the operation of the nuclear facility beyond the designed service life and to demonstrate its operability. (2.6.0400. of Volume 1 of NSC).

The programme meant for the establishment of nuclear power plant unit operability beyond the designed service life (hereinafter: Service Life Extension Programme – SLE Programme) may be submitted simultaneously with regard to one or more units of the nuclear power plant. A minimum of 20 years operating experience shall be analyzed in the SLE Programme. In the case of an SLE Programme to be submitted for several nuclear power plant units, the operation service life of the first commissioned nuclear power plant unit shall be taken into consideration (2.6.0600 of Volume 1 of NSC).

The operating experience to be analyzed as a minimum should be interpreted for the whole unit. Concerning systems, structures and components installed during a repair or modification made during the service of the unit, the operating experience should be taken into account since their installation.

3.1. Recommendations for complying with requirements for content of the programme

The content of the SLE Programme shall be determined according to the content requirements of the new license application of the operation beyond the scheduled service life. It shall be proven in the programme that by its execution, the criteria being the basis for the effective operation license are fulfilled for the entire extended service life in accordance with the

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requirements of the Nuclear Safety Code. The requirements already fulfilled at the time of submission shall be outlined in the SLE Programme. The information establishing the fulfillment of the requirements shall be presented or referred to. Additionally, the fulfillment of further requirements and those activities – in addition to their scheduled performance – which are intended to be performed in order for the full implementation of the SLE programme shall be outlined (2.6.0800 of Volume 1 of NSC).

The SLE programme shall contain the scheduled period of extended service life (2.6.0700 of Volume 1 of NSC).

Based on the above NSC requirements, the recommendations described in Section 4.2 related to the compliance with content requirements specified for the operating license application should be observed for preparation of the programme.

If the requirements are completely met, then they should be described in the programme by taking account of the recommendations of Section 4.2.

If the requirements have not been met yet, then the actions intended to be carried out to fully comply with them, together with the schedule of their implementation should be described in such detail that provides the basis for correct assessment of the expected compliance.

The programme, in order to support the assessment of implementation, should include the planned length of operation beyond the design lifetime.

3.2. Regulatory oversight of the programme

During the inspection of the programme the authority investigates whether there are any conditions that would prevent the operation beyond the design lifetime. In addition, before the expiry of the design lifetime, the authority verifies whether the programme is capable of justifying the safe operability of the unit or units for the period planned beyond the design lifetime.

The nuclear safety authority shall approve the programme and monitor its execution. Should the nuclear safety authority declare that the programme is in non-compliance with the requirements, the licensee shall apply corrective measures. If the programme is not appropriately implemented, the authority shall request the licensee to perform specific actions. If the licensee demonstrates a delay in the fulfillment of its stated obligations and submission of the programme, and if programme discrepancies cannot be

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resolved, or if omissions occurring during execution cannot be supplemented, then the operation beyond the design service lifetime cannot be licensed (Subsection 20 (2) of Govt. Decree 118/2011.).

The licenses required for the performance of modifications arising during the execution of the SLE programme shall be obtained separately during the existence of the effective operation license, in accordance with the applicable regulations for the licensing of the relevant activity (2.6.0900 of Volume 1 of NSC).

3.3. Inspection of programme implementation

During its inspection activity the authority examines:

- a) issues provided in section 4.3 (for the assessment of the license application),
- b) progress of activities according to the implementation schedule intended to carry out to fully comply with the requirements not yet fulfilled,
- c) way of documentation from the aspect that the particular activity may be repeated and can be audited by an external expert.

4. LICENSE OF OPERATION BEYOND DESIGN LIFETIME

Operation beyond the design service lifetime is licensed in the new operation license issued at the request of the licensee. In the procedure by which the new operation license is issued, the nuclear safety authority takes into consideration the results of the regulatory supervision of the programme meant to create the conditions for operability beyond the design service lifetime and its implementation. The detailed regulations for the licensing of the operation beyond the design service lifetime are included in Annexes 1 and 4 (Subsection 20 (3) of Govt. Decree 118/2011.)

The operation beyond the designed service life shall be licensed under a new operation license issued at the request of the licensee. The license application shall be submitted per nuclear power plant units at least one year prior to the expiration of the valid operation license (2.6.1000 of Volume 1 of NSC).

The following shall be presented in the license application:

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- a) *general information related to the nuclear facility and the operator thereof,*
- b) *definition of systems, structures and components belonging to the scope of licensing the operation beyond the designed service life,*
- c) *comprehensive review on ageing management of passive and long-lived components,*
- d) *management of time limited ageing analyses,*
- e) *required modifications of the Final Safety Analysis Report,*
- f) *required modifications of the Operational Limits and Conditions document,*
- g) *modifications of further documents upon which the operation license is based,*
- h) *demonstration that the SLE Programme has been executed and based on those activities specified in it and throughout the service life*
 - ha) the nuclear power plant unit is in a safely operable condition, and that the technical and administrative conditions necessary for its long-term maintenance are provided for, and*
 - hb) the licensee possesses the resources necessary for the long-term maintenance of nuclear safety, furthermore*
- i) *the planned duration of operation beyond the designed service life as substantiated by analyses (2.6.1400 of Volume 1 of NSC).*

The actual version of the following documents shall be attached to the license application:

- a) *Operational Limits and Conditions document,*
- b) *the document describing the procedures which ensure that the condition of systems, structures and components important to nuclear safety as specified in Section 4.6 of Annex 4, are maintained,*
- c) *emergency operating procedures ,*
- d) *accident management guidelines, furthermore*
- e) *Nuclear Emergency Preparedness and Response Plan of the nuclear facility (2.6.1500 of Volume 1 of NSC).*

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The documents used and referred to in the documentation supporting the application for license containing the details should be submitted to the authority upon request.

If the documents supporting the license application are intended to be submitted to the service life extension license application of more units, then updated documents should be provided including the operating experience collected until the time of submission.

4.1. General aspects of compiling the license application

The programme and license application of operation beyond design lifetime should be compiled in a way that provides appropriate proof to the authority on the following:

- a) scope of systems, structures and components (hereinafter referred to as SSCs) constituting the subject of license application has been duly determined,
- b) ageing processes required to be managed during the extended service life have been duly determined,
- c) conditions of systems, structures and components belonging to the scope of the license for operation of the unit beyond the design lifetime have been assessed, ageing management programmes implemented during the operation have been evaluated, the requirements for their modification and for launching of new programmes have been defined,
- d) time limited ageing analyses (TLAAs) providing evidence for the compliance of SSCs in the scope of service life extension licensing have been re-evaluated in full scope,
- e) required update of the Final Safety Analysis Report has been performed (Subsection 3 (2) of Govt. Decree 118/2011, 4.15.0.1300 of Volume 4 of NSC),
- f) necessary modifications to the operating limits and conditions (OLCs) of the nuclear power plant have been identified,
- g) implementation of the improvement actions determined as results of the Periodic Safety Review is justified,
- h) on the basis of the above listed activities it has been ensured, or it will be ensured until the expiry of the design lifetime, as latest, that

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- SSCs belonging to the scope of service life extension are able to fulfill their safety function during the extended service life,
- safety analyses of the installation remains valid (NSC 1.2.6.0500/C, 4.15.0.0400., 4.15.0.1200., 3.2.2.2500., 3.2.3.0500., 3.2.3.0600., 3.2.3.0700.),
- operating limits and conditions will meet the conditions of the license for the extended service life.

The license application should be compiled in such a way that meets the formal and content requirements of Volume 1 of the NSC.

Analyses and descriptions included in former licensing procedures submitted to the authority should be referenced in the license application so as to ensure their retrievability. In such cases the licensee should declare that the document has been reviewed and found to be applicable for the purpose of the current license application.

All documents supporting the license application should accurately be referred to in the submission, and should be stored in a form that allows their accessibility and retrievability for the representatives of the authority.

The license application should contain any deficiencies, non-conformances, open issues and remaining tasks revealed during the elaboration of the licensing documentation, as well as the evaluation of their impact on safety. The license application should also contain the determination of those activities that are meant to eliminate all those above, including the method of implementation and deadlines.

The responsible representative of the licensee should make a statement that the licensee has prepared the license application in full compliance with the effective legal prescriptions and regulatory requirements; in addition, a statement should be made that the facility, if the tasks specified in the license application are duly performed, is applicable to operate safely until the expiry of the applied service life extension.

4.2. Recommendations on fulfilling the content requirements

4.2.1. General information

The licensee should provide its important details (name, address, responsible management, number of operated units, range of activities, owners etc.).

The license application should contain:

- a) important features of the site and the operational area; other activities on the site and details of important ventures acting on the site,
- b) legal conditions of operation, licenses concerning the operation and their validity and conditions.
- c) operating organization,
- d) external relations of the operator, i.e. with local governments and the public, population of surrounding settlements, media, local and national authorities, business partners, supervising organizations, professional societies, other power plants, scientific and technical organizations, foreign and international organizations etc.,
- e) evolution of the social acceptance of operation from the commissioning of the nuclear power plant,
- f) history of activities and programmes of the operator concerning service life extension,
- g) regulatory licenses and special authority endorsements regarding the licensing of operation beyond design lifetime preceding the procedure of the nuclear safety authority.

4.2.2. Specification of the scope of service life extension license

The primary determination of the scope should be carried out at the level of systems, structures or components. It is allowable to use different approaches in the different crafts (e.g. in case of mechanical engineering at system level, in case of civil engineering, electrical and I&C engineering at component level or group level).

In the case of both approaches, efforts should be made for the transparency and easy reviewability of completeness. For instance, markings on technological schemes and electric circuit plans or such databases are

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applicable that contain all the elements of one craft by marking those SSCs, which belong to the scope of the service life extension licensing process.

During determination of the scope different, existing source documentation or databases can be used, e.g.:

- a) Final Safety Analysis Report,
- b) operating procedures and data banks,
- c) technological schemes and single-line electric circuit plans,
- d) technical database of the plant, which contains the safety classifications and other classifications determined from the aspect of protection against hazard factors of natural origin (ABOS – safety classification database, FBOS – seismic classification database),
- e) symptom based operating procedures.

The identification, selection of the sources to be used fall under the competence of the licensee.

The scope should be determined with the method recommended by Guideline 4.14 should be followed.

During the determination of the scope those safety functions should be listed, due to the fulfillment of which the given system component or component group belongs to the scope of service life extension. In determination of the function of the system component, the safety function of the containing system should be taken into account as well.

In order to simplify the handling of SSCs, it is allowable (especially during constitution of groups of system components) to take all elements of the group into the service life extension scope instead of only involving the safety related system components of the group.

In the license application the boundaries of each individual system component should be determined. During determination of boundaries, scoping may be limited to the parts responsible for the entire fulfillment of the intended safety function. The methodology of this limitation should be described in the license application.

The scope should be in accordance with the current licensing basis of the installation. For instance, if the intended function of a safety system according to FSAR should be fulfilled with 3*100% redundancy, then it

also should be taken into account during the determination of the scope of service life extension.

Determination of the scope of service life extension should be documented to be repeatable and auditable by an external expert.

4.2.3. *Comprehensive review of the ageing management of passive and long lived components*

4.2.3.1. Scope

Based on results of the review carried out by the operator those passive and long lived components and structures belonging to the scope of service life extension should be determined in the license application, on which a comprehensive ageing management review and program should be implemented. The respective guidance can be found in Guideline 4.14.

System components belonging to the scope of the comprehensive review should be described within the scope determined for service life extension.

The designation of the evaluation boundaries of the screened system components can be carried out in different ways; in the simplest way by the appropriate marking of drawings of the systems, structures and components. But careful efforts should be made to avoid loss of information during black and white printing.

Determination of components in words is also allowable, for instance by identifying the neighboring components.

It can be practical to identify such groups of system components (so-called commodity groups) during the determination of the scope that require the same ageing management programme. The group of system components can be determined by the identification of such features like design construction, materials used, operating environment etc. In this case the applicability of their common handling should be justified.

Grouping is allowable such as: foundations, reinforced concrete wall structures, hydraulic engineering reinforced concrete structures, walls, steel structures, fire barriers, penetrations, leaktight claddings etc.

It should be demonstrated in the license application that during determination of the scope all such system components were identified, for which, in connection with the extension of the operating license of the installation, the review of ageing management programme is necessary.

4.2.3.2. Review of ageing management

Review of ageing management should be carried out and documented according to the recommendations of Guideline 4.14.

The documentation should include:

- a) description how the examined systems, structures and components or component groups fulfill their intended safety functions,
- b) identification of deterioration processes that need ageing management,
- c) description of those ageing management programmes that are applied by the operator in order to detect the identified ageing processes, to mitigate them or to manage their consequences,
- d) demonstration that the above-mentioned programmes are suitable for maintaining the design safety function of the system component during the extended operating time of the installation.

During ageing management the reconstruction or repeated verification of the design basis of the system components are usually not required. At the same time the verification of certain design parameters or conditions might be necessary if they are affected by such ageing processes that endanger the fulfillment of the safety function of a system component. This verification may be carried out by analysis, in other cases by sample checking or by checking of physical parameters (e.g. wall thickness, insulation resistance).

4.2.3.3. Evaluation of review results

In the license application the evaluation of ageing management programmes should address the following:

- a) The programmes really cover all system components that need ageing management and belong to service life extension.
- b) The preventing actions effectively avoid or mitigate the development of the deterioration processes caused by ageing, and the effectiveness is periodically checked.
- c) There is a direct collection of information about the impact as well as parameters of ageing processes regarding the fulfillment of safety functions. This can be carried out by parameter monitoring, by inservice inspection or testing.

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- d) Effects of ageing are explored based on one or more approved programmes before they could lead to the loss of safety function of the system component.
- e) Monitoring and trend analysis provide reliable forecast of adverse effects and ensure timely introduction of corrective or ageing impeding actions.
- f) Ageing management programmes contain such acceptance criteria, based on which the necessary corrective actions can be determined in due time.
- g) There are such tools available by which the efficiency of the performed corrective actions can be demonstrated.
- h) Corrective actions are really executed in due time. (The corrective actions also include the root cause analysis and actions to prevent recurrence of events.)
- i) Appropriate administrative control of ageing management programmes is provided.
- j) Operating experience is taken into account and it is demonstrated that the ageing processes are managed in appropriate manner and will be managed during the extended service life.

The system of aspects outlined above forms a logical order, but depending on the conditions there is no need to examine the realization of all the aspects for every deterioration process of all system components. The only requirement is to demonstrate in the application that the applied programmes provide the effective management of the ageing processes.

The applied programmes or the performed actions do not demonstrate in every case the conformity of ageing management. For such cases further improvement actions should be determined in the application. For instance, such actions can be: review of design values, supplementation of ageing management programmes, carrying out individual inspections by sampling, review of inspection frequency, ageing impeding actions, replacements etc.

During determination of such improvement actions the following circumstances should be taken into account:

- a) impact of system component on safety,
- b) possible consequences of deterioration process(es),

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- c) speed of deterioration process(es),
- d) discoverability of deterioration process(es),
- e) possibility of repair and replacement,
- f) adequacy of existing programmes for detecting the effects of the ageing process,
- g) cost, dose and deadline consequences of improvement.

During the evaluation, the adequately demonstrated and documented foreign experiences should be used (primarily from WWER plants and related to system components similar to examined one).

4.2.3.4. Consideration of condition and performance monitoring results

Condition and performance monitoring systems used for the continuous demonstration of safe operation generally cannot be used for demonstration of conformity of the ageing management of passive system components.

At the same time the deterioration in state of some passive components can be concluded from changing of certain active performance indicators of connected systems or system components (e.g. the deterioration of certain pressure retaining functions can directly affect the performance of the given system or can be detected through changing of value of certain in-situ measurements).

In the above-mentioned cases it is allowable to use certain active features for the demonstration of adequate ageing management of passive components or the lack of a certain ageing process or of its allowable degree.

In the license application the effect of deterioration of passive components on periodically checked or monitored parameters should be demonstrated. It should also be justified that measurement and evaluation of these parameters and corrective actions made necessary by them are carried out in due time (i.e. before the loss of safety function of examined passive system component).

4.2.3.5. Inspections and new programmes associated with service life extension

As a result of the above outlined evaluation process the introduction of new inspection and ageing management programmes may become necessary.

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In relation to the new ageing management programmes the following should be addressed in the license application:

- a) Scope: the scope of the new programme covers one system component type or one group of system components. Accordingly and also considering similarity of applied materials, production method, construction, way of installation, operating environment and occurring ageing processes the size of sample to be verified is determined.
- b) Parameters to be checked and monitored: parameters that directly affect the identified ageing process and that can be checked and monitored with the necessary reliability and accuracy are determined. It is demonstrated that these conditions would persist during the extended service life.
- c) Detection of ageing effects: it is demonstrated that the new programme is applicable for detection of the ageing effects before they could lead to the loss of the safety function of the system component.
- d) Acceptance criteria: the limits of criteria that need the initiation of various actions are determined.
- e) Corrective actions and justification process: the way of execution of the corrective actions belonging to different criteria and the way of justifying the efficiency of the action are determined.
- f) Administrative supervision: the elaboration, approval, introduction and application of the new programme are in accordance with the procedures applied in the nuclear power plant and, as necessary, approved by the authority.

4.2.4. *Time limited ageing analyses (TLAAs) to justify the compliance of systems, structures and components belonging to the licensing scope of extension of design service life*

4.2.4.1. Scope

The TLAAs should be identified according to the method described in Guideline 4.14.

It should be demonstrated that from the current licensing basis:

- a) assumptions valid for limited period connected with ageing processes of the system components are identified;

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- b) importance of them during establishment of some safety related conclusion, and the role of them in justification of maintaining the functionality of a safety system component are determined;
- c) TLAAAs referred to in documents of current licensing basis (e.g. OLCs, FSAR, operating licenses) are determined.

TLAAAs specified by the steps above should be included in the application for license of service life extension.

4.2.4.2. Justification of sustaining TLAA validity

The TLAA usually takes the design lifetime of the installation as basis. At the same time it can be justified case by case that assumptions establishing the calculation will still be valid during the extended service life.

Accordingly, it should be justified that the calculation and analysis results will be acceptable during the considered extended service life, i.e. the system component will be able to fulfill its designed safety function with the desired safety margin.

In the case of the above described justification process it is especially important to refer exactly to the original document that demonstrates the conformity.

4.2.4.3. Modification of a TLAA

If the validity of a TLAA cannot be extended until the end of the new design lifetime of the installation, but there is a possibility to decrease the conservatism applied in the calculation method or in the input data of the connected TLAA in a justified manner, then it should be described in the license application that the results of the analysis will still be valid without deterioration of the designed safety margins.

4.2.4.4. Determination and introduction of ageing management actions instead of maintaining the validity of a TLAA

If the time of validity of a TLAA cannot be extended beyond the design lifetime of the installation then it should be demonstrated that the supposed impacts of non-compliance can be managed via ageing management actions during the extended service life; the necessary supplementary ageing management programmes should be described in the license application.

4.2.4.5. Schedule of TLAA's

The updating of TLAA analyses and the necessary actions based on them should be scheduled such a way that ensures that they can be accomplished and their description can be included in the license application for service life extension.

If based on the evaluation of a TLAA the safe operation of a system component lasts longer than the design lifetime of the installation, but can be demonstrated only a period shorter than the extended service life, then for the updating of the TLAA or for the implementation of necessary actions a deadline should be proposed in the license application that is in accordance with the analysis results and provides the necessary safety margins.

4.2.4.6. Management of exemptions

For the service life extension license application it should be examined if in connection with the operating license of the nuclear power plant unit there were any exemptions from regulatory prescriptions licensed for limited duration or considered in time limited analyses.

If this kind of exemptions were identified, then in the license application the sustainability of them should be established for the duration of the extended operating license.

4.2.5. *Modification of the FSAR*

Based on 4.15.0.1300 of the NSC the modifications of the Final Safety Analysis Report necessary for the operation beyond the design service life should be identified and the actual, re-edited version of the Final Safety Report should be prepared. All modifications should be indicated that are necessary for the extension of the operating license beyond the design lifetime in the scope of the FSAR.

It should be considered that during the preparation for service life extension certain analyses of the FSAR should be modified, others should be supplemented or became unnecessary or appear as new ones.

Similarly, modifications might be necessary in certain operating, maintenance, inspection, testing etc. programmes.

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Demand for modification of existing systems, structures and components may emerge.

The above mentioned modifications should be followed in the FSAR, and its related chapters should be updated.

The SLE related modifications of operational programmes should be implemented before the issuance of the service life extension license.

The supplements due to modifications should be indicated in the FSAR after the authority has issued the operating license.

4.2.6. *Modification of OLC*

Based on 4.15.0.1400 of the NSC the modifications necessary to be carried out in the document specifying the Operational Limits and Conditions should be identified; the updated, re-edited version of the OLC document should be prepared.

The modifications to be executed and their exact place in the existing version of the OLC also should be indicated in the license application.

Based on the evaluation of ageing management programmes it may turn to be necessary to narrow the allowed tolerance of operating parameters, to modify the frequency of inservice tests, to issue a high level regulation in connection with the operation of systems to be accomplished for the lifetime extension (e.g. monitoring systems).

Some parameters of certain operational states (e.g. the p-T curve regarding the pressurization of the reactor) or the set values of certain protections can be modified.

The modification planned in the OLCs should be implemented as soon as the technical end licensing conditions make it possible. In parallel to this, the necessary modification of the operating and testing instructions should be approved.

4.2.7. *Modification of other documents supporting the operating license*

The following necessary modifications are identified and described in the license application:

- a) modifications in maintenance, testing and surveillance programme,
- b) modifications in symptom-based emergency operating procedures,

- c) modifications in severe accident management guidelines,
- d) modifications in emergency preparedness and response plan of the facility.

4.3. Regulatory assessment of license application

In possession of the new operation license the nuclear power plant units may be operated under the conditions and for the duration as specified in the license (1.2.6.1100. of Volume 1 of the NSC).

The nuclear safety authority shall set the duration of the license taking into consideration nuclear safety and other circumstances of operation, but it cannot exceed the scheduled duration demonstrated in the documentation substantiating the operation beyond designed service life (1.2.6.1200. of Volume 1 of the NSC).

The authority during its assessment examines the compliance with the formal and content requirements related to the license application. These are to be evaluated according to the aspects described in Section 4.2. During the judgment of the license application the authority considers the opinions of special authorities provided to the license application.

The authority in its review assesses if:

- a) the scope of those systems, structures and components are duly determined, which should be covered by the license application,
- b) those ageing processes are duly identified, which should be managed during the extended service life,
- c) the condition of SSCs belonging to the scope of service life extension is such that they will be able to perform their intended safety functions during the extended service life, and if the ageing management programmes implemented during operation are reviewed and if the requirements for their modification or the introduction of new programmes are determined,
- d) in accordance with the service life extension license application the time limited ageing analyses (TLAAs) are completely re-evaluated,
- e) necessary updating of the Final Safety Analysis Report are performed (Subsection 3 (2) of Govt. Decree 118/2011. Korm., 4.15.0.1300 of the NSC),

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- f) the necessary modifications of the document describing the Operational Limits and Conditions of the nuclear power plant are reviewed,
- g) the environmental impact of service life extension is assessed, and based on the above listed activities it is ensured, or at latest it will be ensured until the expiry of the design lifetime that:
- SSCs belonging to the scope of service life extension will be able to fulfil their intended safety function during the extended service life,
 - safety analyses of the facility will remain valid (1.2.6.0500/c, 4.15.0.0400, 4.15.0.1200, 3.2.2.2500, 3.2.3.0500, 3.2.3.0600, 3.2.3.0700 of the NSC),
 - operating limits and conditions will comply during the extended service life,
- h) method of documentation ensures that the given activity can be repeated and the documents could be audited by an external expert.

If the requirements are met the authority will issue a new operating license, based on which the given unit may be operated beyond the original design lifetime according to the above NSC sections and the stipulations of the license.