PBM2

QUALIFICATION SCHEME

FOR

QUALIFICATION OF NDE SYSTEMS IN SWEDEN

Edition 7E, 01.12.2021

This document is jointly produced by the Swedish nuclear power companies.
All revisions must be approved by joint consultation.

Approved:

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Plant administrators of PAKT documents

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Revision list

Ed.	Reason for change/affected parts	Exec (sign/org)	Issued (dd-mm-yyyy)
2	Thorough revision due to the regulation SKIFS 1996:1 issued by the Swedish Nuclear Power Inspectorate regarding revision of "the regulation SKIFS 1994:1 Mechanical Equipment in Nuclear Plants". Revisions due to aspects from review of issue 1 performed by licensees and SAQ Kontroll AB Kärnteknik.		01/05/1997
3	Revised due to experience and comments from nuclear plant owners and SQC, as well as new data from ENIQ.		01/11/1999
4	Revision due to new regulations issued by the Swedish Nuclear Power Inspectorate for mechanical components in nuclear power plants, SKIFS 2000:2, that replaces SKIFS 1994:1.		01/04/2001
5	Total review.		23/01/2014
6	Total review. In this revision, what was previously a, to PBM2, parallel description of the qualification process named “Manual of the Qualification Process” is removed and selected parts are instead introduced in this edition of PBM2. A consequence of the above is that section 3 in appendix 1 has been replaced with a reference to the new SQC document named “Qualify NDE System”. A document which gives a more detailed description than previously of the requirements on a qualification given by the qualification body. Section 3.3.1 which gives a description of the requirements on inspection laboratories for accreditation and third-party status has been updated. A new section (4.14) has been introduced, describing “Assessment that the conditions of qualified inspection systems are maintained over time”.		01/09/2016
7	Total review. Updated due to experiences from qualifications and inspections as well as updated ENIQ documents.		01/12/2021

1 Introduction

1.1 Scope

The qualification scheme (PBM 2) represents the licensees' overall requirements for performing qualification of inspection systems in accordance with the requirements stated in SSMFS 2008:13 [1], hereinafter called the ***regulations***. In addition to the regulations, PBM2 is based on ENIQ's European Methodology document [2].

PBM 2 contains definitions of key terminology, directions for the distribution of work and responsibilities between the parties involved, a description of how to perform a qualification and guidelines for the assessment of qualifications. It also includes quality assurance requirements for the qualification body and basic requirements for inspection personnel, procedures and equipment that are to be qualified.

To summarise, it is the intention of the licensees that PBM 2 is to be the guideline interpretation of the regulations for qualification.

In terms of requirements, the content of PBM 2 concentrates on ***what*** is to be done. ***How*** qualification is performed is covered by a *qualification process;* see Appendix 1.

In the qualification process as per appendix 1, the main group ”Qualify NDE system” is not described. For description of these activities, the SQC document ”Qualify NDE System” [3] is referred to. SQC is responsible for ensuring that the document [3] reflects the current requirements for qualification. Alterations must be communicated via THAG ÅK and the current edition must be accessible on SQC’s website.

1.2 Requirements

1.2.1 Requirements for In-Service Inspection

Chapter 3, section 11 of SSMFS 2008:13 [1] contains the following information about qualification for in-service inspection:

"Non-destructive examination (NDE) of reactor pressure vessels and mechanical components in Inspection Groups A and B shall be performed with inspection systems which have been ***qualified*** to reliably detect, characterise and size defects which can occur in the types of components in question.

However, sizing needs not to be included in the qualification if repair or replacement work is performed when defects are detected. The repair or replacement can be done without prior analysis of safety margins according to chapter 2 section 6.

The licensee is responsible for ensuring that such ***qualification*** is monitored and assessed by a body that has an independent and impartial position, appropriate organisation with the technical competence necessary for the task and a quality system that is suitable for the purpose. This body must be approved by the Swedish Radiation Safety Authority."

1.2.2 Requirements for repairs, manufacturing and installation

Regarding inspection of repairs, manufacturing and installation, chapter 4, section 10 states:

"Non-destructive testing in connection with inspections under section 8 must be performed either with

– well-proven inspection systems that from experience have shown to be able to reliably detect and characterise the defects and imperfections that repair, manufacturing and installation processes can give rise to, or
– inspection systems that can be adequately assessed and qualified according to chapter 3 section 11."

2 Definitions

For a list of definitions used in PBM2, refer to PAKT Definitions [4].

2.1 Damage Tolerance and Defect Sizes – Definitions and Effect on Qualifications

Section 2.1 gives some clarifications regarding the definitions that are used in describing defect sizes in qualification.

Requirements for inspection programs (inspection groups and inspection intervals) are handled in PBM 1.

2.1.1 Damage tolerance analysis

An analysis that takes into account the relevant KFM, load data and damage mechanism and which determines a component's damage tolerance, i.e. time until an actual or postulated defect reaches acceptable defect size.

The damage tolerance analysis is performed in order to determine the defect sizes that the qualified inspection system should be able to detect, characterise and size. The damage tolerance analysis is reviewed and approved by an accredited inspection body (AB).

2.1.2 Acceptable defect size

The largest defect geometry for which satisfactory safety margins for operation are deemed to exist in accordance with applicable regulations and standards.

Acceptable defect size is determined by a damage tolerance analysis.

2.1.3 Qualification defect

A selected defect size used as input data for a specific qualification, generally acceptable defect size reduced with the growth calculated to occur under prevailing operating conditions between two consecutive inspections.

Qualification defects normally come from the damage tolerance analysis and may vary depending on inspection interval.

2.1.4 Detection target

The smallest defect (defined by the parameters depth, length, width, crack opening, depending on inspection method) that the chosen inspection system with certainty shall be able to detect, characterise and, where appropriate, size.

The detection target is generally determined with the damage tolerance analysis as a basis and determined so that it is equal to or less than the qualification defect, often reduced by the tolerance for sizing.

The value of this tolerance is of greatest significance when determining a new inspection interval after a defect has been detected. The tolerance should be kept as low as possible in order to increase the possibility of keeping to the planned interval even after inspection with a detected defect.

2.1.5 Example of determining inspection interval when a defect has been detected

Figure 1 shows an example of a crack propagation diagram showing the connection between permitted defect growth and inspection interval with a detected defect ≤ detection target as a starting point. When performing an inspection in the plant and confirming that there are no defects, including measurement tolerance, greater than the ***qualification defect,*** that defect size can then be used as a starting point for determining the new inspection interval.

If, after an inspection in the plant, there is a reported defect greater than the detection target, the basis for determining the new inspection interval (max. 10 years) is the reported defect size plus the measurement tolerance, or alternatively another action is taken (e.g. repair).

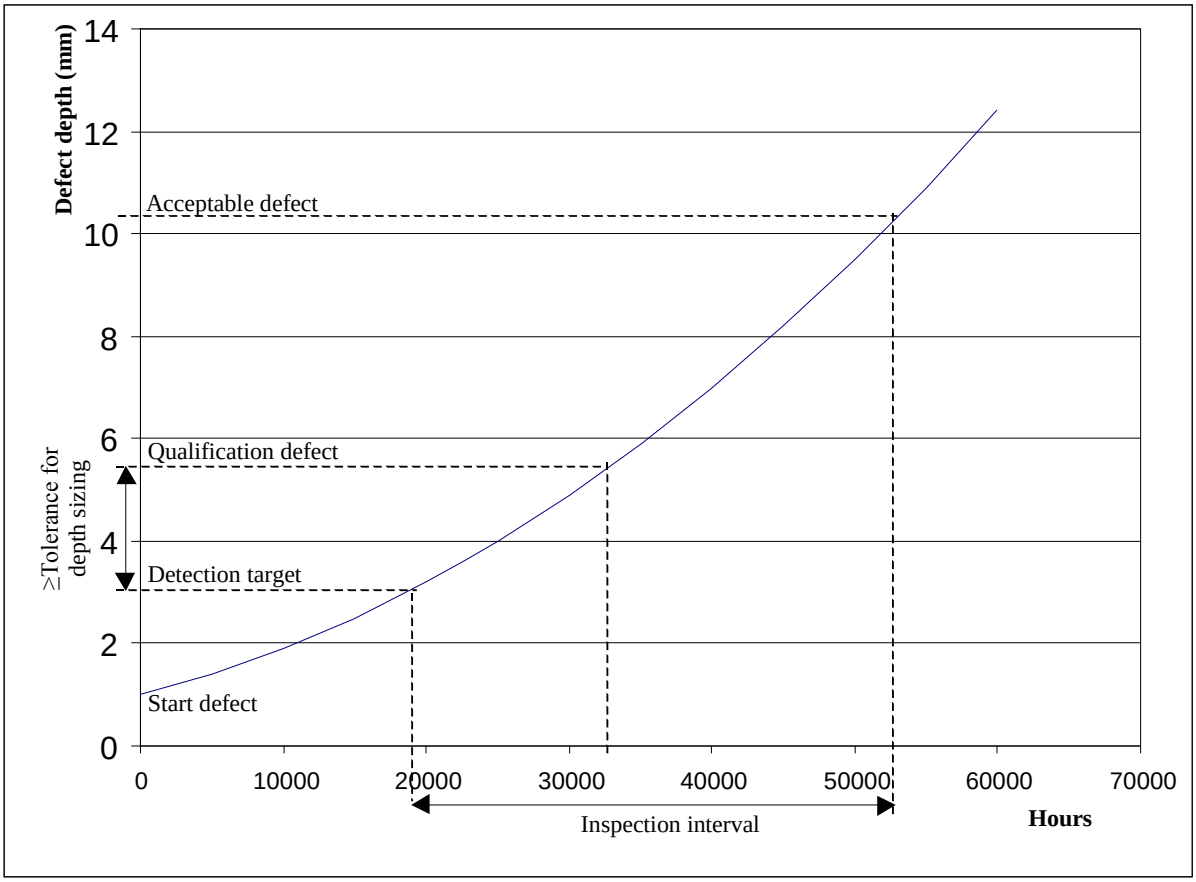

Figure 1. Example of a growth diagram, with associated definitions, for a component with detected defects ≤ detection targets. The permitted inspection interval is then calculated between the detection target and the acceptable defect size.

3 The Parties' Areas of Responsibility and Tasks

3.1 The Licensee

The licensee is responsible for ensuring that In-Service Inspection is performed in accordance with the requirements given in the regulations. This includes ensuring that inspection of components in inspection groups A and B as well as stated objects in the reactor vessel is performed with qualified inspection systems. To fulfil the requirements in this respect, the licensee must:

– Contract inspection companies accredited for their task, so-called accredited laboratories (AL) in third-party status.

– Have detailed knowledge of the inspection conditions for all relevant components and areas. This involves knowledge of materials, dimensions, manufacturing methods, accessibility for inspection and essential MTO (man, technology, and organisation) factors. It also includes knowledge of repairs and other deviations from the intended design or manufacture.

– Produce a relevant defect and structural integrity analysis including a damage tolerance analysis and a defect description, for each inspection object/area included in the qualification. The licensee may also choose ***not*** to use a defect and structural integrity analysis as a basis for the qualification. Instead, the qualification can be designed as a performance test, where the qualification parameters (detection targets, tolerances etc.) are determined based on the expected performance of the inspection system. In this case the corresponding DoS must be produced before inspection in the plant is performed.

– Specify detection targets for each inspection object/area included in the qualification.

– Carry out required investigations in connection with inspection for repairs, manufacturing or installation, to determine if the inspection systems in question can be regarded as well-proven, and when required, analyse and assess the scope and direction of the qualification required.

– Order qualification by a qualification body (QB). Technical descriptions and purpose of the inspection, qualification documentation and time schedules must be included with the order to the applicable extent.

- Support the accredited laboratory (AL) in its work of producing procedures, technical justifications (TJ) and other documents in its preparations for the qualification. The licensee must actively participate in all contact between AL and QB.
- When inspection is performed in the plant, ensure that AL reports any technical deviations, i.e. if the inspection is not in agreement with the qualified inspection procedure/technique. The licensee must report such deviations to QB for assessment.
- At inspection in the plant, ensure that AL reports any inspection scope related deviations, such as inspection limitations. The licensee must report such deviations to the accredited inspection body (AB) for assessment.
- Non-disclosure agreements shall be established with all external parties.
- Requirements for export control shall be considered.

The licensee is responsible for ensuring that in-service inspection fulfils the requirements of the regulations. It is the responsibility of the licensee to divide objects into inspection groups, assign the inspection objects' inspection intervals and also report damage tolerance for relevant components. These tasks are, however, not directly related to qualification activities and are governed in detail by PBM1. Review is performed by AB.

In connection with in-service inspection/qualification, the licensee must provide the following data to AB:

- Inspection program with the scope of inspection.
- That the inspection is performed with a qualified inspection system (qualification certificate).
- Inspection results, scope and any deviations at the in-service inspection.

3.2 The Qualification Body (QB)

The qualification body (QB) supervises and assesses qualification of NDE systems in accordance with the requirements given in SSMFS 2008:13.

QB has the following areas of responsibility and tasks, these must be guided by technical instructions:

- Preparation of qualification procedure and qualification dossier.
- Review of submitted qualification documents, including technical justifications.
- Test specimens, specification of defects, requirements for procurement, handling, secrecy, test specimen data base and fingerprint of test specimen.
- Suppliers of test specimens; approval of defect simulation technology including handling of deviations.
- The performance of qualification of procedures, equipment, personnel and systems.
- Preparation, revision and withdrawal of qualification certificates, including distribution to the licensee and AL.
- Storage of qualification certificates in a certificate database.
- Handling of deviations.

There must be instructions for maintaining confidentiality regarding customers' (AL, the licensee) commercial information, blind and open test specimens, qualification documentation, and qualification results. At the qualification body, there must be individual non-disclosure agreements in place for all personnel, both permanent and temporary employees. The instructions must clarify what information is deemed to be confidential and who should have access to it, including what confidential information temporary staff may have access to. Non-disclosure agreements shall be established with all external parties.

Requirements for export control shall be considered.

There must be routines in place to ensure that unauthorised personnel and personnel taking part in the qualification cannot take information in any form away from the qualification body's premises. There must also be routines regarding the handling of information stored on computer media (hard disc or similar).

3.3 The Accredited Laboratory (AL)

The accredited laboratory (AL) carries out in-service inspection in the licensee’s plant with qualified inspection systems, and must:

- Provide the equipment, procedures and personnel intended to be used for qualified inspection in the plant.
- Produce technical justification (TJ) and other requisite qualification documentation related to the qualification. The technical justification must generally comply with the guidelines given in ENIQ Recommended Practice 2 [6].
- Perform work in accordance with a quality assurance system that fulfils the requirements given in EN ISO 9001 or corresponding standard and thereby ensure that requirements for control, performance and documentation of all activities are fulfilled.
- Notify the company's accreditation and certification to the licensee, QB and AB.
- During qualification, follow the qualification body's procedures and other instructions, including confidentiality requirements.
- Inform QB and the licensee of changes in equipment, inspection procedures or the tasks of personnel. QB shall assess if there is a need for a supplementary qualification.
- Before and during inspection in the plant, report any noted technical deviations (procedure, personnel and equipment) as well as scope deviations for the licensee’s assessment and further handling.
- Non-disclosure agreements shall be established with all external parties.
- Requirements for export control shall be considered.

An AL is permitted to perform qualification without having a commission from a licensee. In such a case, the accredited laboratory assumes the appropriate parts of the licensee's assignments.

3.3.1 Requirements on inspection laboratories for accreditation and third-party status

Requirements on the inspection laboratory's accreditation and third-party status are imposed in accordance with chapter 2 section 7 in SSMFS 2008:13 [1] and SSM2015-5453 [5]:

Swedish laboratories and laboratories outside the EU

Inspection laboratories performing in-service inspections for which there are requirements imposed on qualified inspection systems in accordance with SSMFS 2008:13 shall be accredited by Swedac in accordance with the Accreditation and Conformity Assessment Act (2011:791) as an Accredited Laboratory (AL). The inspection laboratory must also be deemed by Swedac as holding a third-party status.

Foreign laboratories within the EU

Inspection laboratories performing in-service inspection for which there are requirements imposed on qualified inspection systems in accordance with SSMFS 2008:13 shall hold a national accreditation in accordance with EN ISO/IEC17025:2005 as an Accredited Laboratory (AL). The inspection laboratory must also be deemed by the national accreditation body or corresponding body as holding a third-party status.

3.4 The Accredited Inspection Body (AB)

The accredited inspection body (AB) has no active role in the qualification, but has tasks connected with in-service inspection carried out at the plant. The following tasks connected with qualification activities are performed by AB:

– Review of the damage tolerance analyses and associated defect and structural integrity analyses (DoS) produced by the licensee.

– Assess performed inspections and certify compliance with the requirements of the regulations. This means that AB shall certify that inspections in the plant are performed with a qualified inspection system by an accredited laboratory holding a third-party status and that result and scope fulfil the inspection programme.

– Review and assess reported inspection deviations with regard to scope of inspection, e.g. inspection limitations.

– For repairs, manufacture or installation, AB shall assess whether or not the inspection system uses a well-proven technique.

4 Qualification - In-Service Inspection

4.1 General

In this section, overall instructions are given for qualification for in-service inspection in accordance with SSMFS 2008:13, chapter 3, section 11. Qualification that relates to procedures for inspection of repairs, manufacturing or installation in accordance with SSMFS 2008:13, chapter 4, section 10 is performed to an appropriate extent in accordance with these instructions; see section 5 of this document.

In terms of requirements, the content of PBM 2 concentrates on ***what*** is to be done. ***How*** qualification is performed is covered by a *qualification process;* see Appendix 1. The main section ”Qualify NDE System” is not described in appendix 1. A description of these activities is given in the SQC document “Qualify NDE system” [3].

Detailed technical instructions for performing qualifications are produced by QB and reviewed and approved by the Swedish Radiation Safety Authority through its regulation of QB.

Unless there are specific reasons otherwise, the same editions of QB’s technical instructions valid at the time of procurement continue to apply throughout the qualification.

4.2 Prerequisites for Qualification

At the start of a qualification project, the licensee’s project manager must ensure that quality-assured prerequisites for qualification have been produced, including object-specific information.

The object-specific information should, as a minimum, include:

– Damage tolerance analysis
– Defect and structural integrity analysis
– Procurement documentation
– Qualification documentation

AL (or the licensee) issues a qualification strategy during the procurement.

See more detailed directions in Appendix 1.

4.3 Test Specimens

Test specimens are designed to simulate inspection situations for which a particular inspection system is to be qualified. The geometric shape can be identical with a particular component in a plant, but should normally be more general and represent several components. Defects to be implanted must be based on defect descriptions produced by the licensee and agreed by the licensee, AL and QB. There are two different types of test specimens:

– Blind test specimens, for which information about implanted defects is kept strictly secret.

– Open test specimens, for which information about the implanted defects may be disclosed to individuals undergoing qualification.

Due to the secrecy requirements regarding implanted defects in blind test specimens, the qualification body handles certain parts of the preparation process.

As a guideline for the choice of test specimen manufacturers and the defect simulations which the respective manufacturers have documented ability to produce, the so called Defect Matrix is written; see report in accordance with [9].

The defect content of a test specimen is described in a defect specification based on the prerequisites for qualification.

QB prepares defect specifications for the blind test specimens for the practical trials regarding personnel qualifications. These defect specifications are classified as secret. The defect specifications for the open test specimens for procedure qualification are prepared by the licensee, however, since they are part of the prerequisites for qualification, they have to be reviewed and approved by QB.

If the licensee so requests, QB must also be able to prepare the defect specifications and any necessary technical justifications for the open test specimens.

It is important that the defects in the blind test specimens correspond closely to those specified for the open test specimens. QB must therefore design the blind test specimens to the same prerequisites as the open test specimens. This is also valid when choosing existing test specimens.

4.3.1 Quality assurance

Organisations dealing with test specimens (the manufacturer, the licensee, AL and QB) must have a quality-assurance system that ensures that classified information is handled correctly and that non-disclosure agreements required for staff in these organisations are adequately issued.

The test specimen manufacturer must work in accordance with a quality assurance system that fulfils the requirements given in EN ISO 9001 or the equivalent. The test specimen manufacturer must also be approved by the licensee and QB for manufacturing of the defect type in question.

Manufacturing must follow a detailed manufacture and inspection plan. The manufacture and inspection plan must be reviewed and approved by the licensee and QB.

The inspection plan should, where applicable, refer to sections in KBM [10].

The licensee must audit manufacturers of test specimens to an appropriate extent, taking the scope of the order into account. QB must always be informed of such audits and invited to participate.

4.3.2 Fingerprint

A fingerprint must generally be performed for every manufactured test specimen, in order to ensure the quality of the test specimen. The fingerprint is intended as an assessment of whether the test specimen's defect simulations fulfil the defect specification, and function as a quality assurance prior to procedure and personnel qualification.

Fingerprint of test specimen is normally performed by QB.

4.4 Inspection Procedure

The inspection procedure, produced by AL, is the vital input document for the qualification of an inspection system.

The inspection procedure should normally comply with the guidelines in ENIQ Recommended Practice 12 [6].

4.5 Technical Justification

The technical justification (TJ) is normally prepared by AL and is the key document in which all the theoretical evidence and reports of different trials, supporting the chosen inspection technique and its application in the inspection procedure, are accounted for. The TJ must also include a measurement uncertainty analysis.

The TJ should normally comply with the guidelines given in ENIQ Recommended Practice 2 [7]. An example of a technical justification is found in the report Enhagen 1 [8].

4.6 Qualification Procedure

For each individual qualification, QB issues a qualification procedure. The purpose of the qualification procedure is to give detailed instructions for the specific qualification. The licensee and AL must be given the opportunity to comment on the qualification procedure before the actual qualification starts. The qualification procedure must state how QB assesses the results of the practical demonstrations included in the qualification.

4.7 Practical Demonstrations for Procedure and Equipment Qualification

The requirements for practical demonstration are assessed and decided during review of TJ. Practical demonstrations are then performed under QB's leadership in accordance with stipulated instructions and an agreed qualifying procedure.

Qualification of equipment is generally performed together with a Factory Acceptance Test (FAT).

A programme for equipment qualification/FAT is generally prepared by AL and reviewed and approved by the licensee and QB.

Open test specimens are generally used for procedure and equipment qualification.

Inspection equipment must be prepared, checked and test run before qualification begins. If assembly of the equipment is necessary, sufficient time must be allowed for checks and test runs.

4.8 Personnel Qualification

Qualification of personnel requires the existence of a qualified procedure and equipment. The qualification can be done separately for detection, characterisation, sizing or all parts together. It can be divided into four elements:

– Data collection
– Detection
– Characterisation
– Sizing.

The qualification may include individual elements or combinations of these.

Personnel who are to be qualified for data collection and analysis must be certified to at least level 2 in accordance with ISO 9712 or another national standard with corresponding requirements. For other assignments during mechanised inspection, an assessment must be made regarding necessary basic personnel competence.

A qualification certificate for personnel is valid for 5 years, as from the date of the qualification was carried out with approved results.

4.9 System Qualification

Equipment, procedure and personnel qualifications for one and the same inspection system may be qualified together. This is regarded as a system qualification. If any part of the system is changed, including personnel, a new assessment of the whole inspection system must be carried out.

4.10 Requalification

Requalification can become necessary when personnel, procedures or equipment have failed the qualification.

In the event of requalification due to failed qualification, the customer (the licensee and/or AL) must first show that appropriate measures have been taken to rectify the cause of the failure.

Personnel who do not fulfil the stated requirements for one or more elements may only take one requalification during the course of one year.

4.11 Reporting of Results

Qualification results are reported by QB to the licensee who has ordered the qualification, if not otherwise specifically stated in the order. Reports may also be provided to others by specific agreement.

Reporting to parties other than the licensee is an issue between the parties concerned and not the responsibility of the qualification body.

The scope and validity of the qualification must be documented by QB.

Qualification of equipment and procedures has no time limit, provided there are no significant changes. Observe that the conditions in accordance with section 4.15 (assessment that the conditions of qualified inspection systems are being maintained over time) must be met.

Personnel qualifications have a time limit. The period of validity must be stated in the documentation.

4.12 Experience Feedback

At the completion of each qualification project, a final meeting must be held, where all the parties involved have an opportunity to exchange experiences.

In order to improve the process, lessons learned and experiences gained must be continuously documented and distributed to those concerned by the qualification activities.

4.13 Deviations

Deviations during the qualification process (including inspection) are divided into three categories:

– Deviations before or after the inspection.
– Deviations in technique during inspection.
– Deviations because of inspection restrictions.

Handling of deviations is described in more detail in appendix 1.

A possible result of QB’s assessment of deviations in technique during inspection is withdrawal of the validity of the qualification. AL and licensee shall be given an opportunity to comment before a decision on withdrawal is taken.

4.14 Appeals

Request for appeal of QB's decision may be made to the Swedish Radiation Safety Authority.

4.15 Assessment that the Conditions of Qualified Inspection Systems are Maintained over Time

In accordance with SSM2015-5453 [5], an assessment shall be made of that the conditions of qualified inspection systems are maintained over time if the testing laboratory holds a national accreditation in accordance with EN ISO/IEC 17025:2005.

However, this requirement is not imposed if the testing laboratory has been accredited by Swedac in accordance with chapter 2 section 7 in SSMFS 2008:13 [1], the validity of the inspection system is then stated on the qualification certificate.

Regarding foreign accredited laboratories, AL, which hold a national accreditation in accordance with SS-EN ISO/IEC 17025:2005, the following apply:

– As a substitution for the requirement on a Swedac accreditation, a qualification body (QB) shall perform an assessment that conditions of the qualification system are maintained over time.

– The assessments must at the time of the inspection not be older than 5 years, as from the qualification date for the procedure or the date when major revisions of the inspection system were performed. What is considered a major revision is determined by QB.

– After the assessment, QB issues an assessment report.

– In the event the assessment has been replaced by a ”major revision”, this shall be stated in QB’s qualification report.

5 Qualification - Repair, Manufacture and Installation

5.1 General

SSMFS 2008:13, chapter 4, section 10 states: "Non-destructive examination in connection with inspections in accordance with section 8 (of repairs, manufacture or installation) must be performed either with:

– well-proven inspection systems which by experience have been shown to be able to reliably detect and characterise the defects and imperfections that repair, manufacturing and installation processes can give rise to, or
– inspection systems that have been adequately assessed and qualified in accordance with chapter 3 section 11."

The general advice for the same section states: "In this case, *well-proven non-destructive examination systems* refer to those

– that are based on standardised methods, found in accepted product standards or similar regulations for inspection of equivalent products with similar quality requirements, and
– which have been used over a period of time, and experience of the ability to detect and discriminate has been documented for these methods, and
– whose practical application is governed by instructions or procedures that include the necessary calibration- and handling instructions and also the appropriate technical and methodology acceptance standards."

In practice the above means:

1 The licensee must be in agreement with AB that the inspection systems used for inspection are in fact *well-proven*.
2 If this is not the case, the part of the inspection system that is judged not to be well-proven must undergo relevant qualification.
3 The qualification must be supervised and assessed by QB.

If defects are removed without subsequent repair (e.g. boat sample), the machined area must be inspected with a qualified inspection system in accordance with chapter 3, section 11.

5.2 Assessment of "Well-Proven"

If there is any doubt that an inspection system can be regarded as *well-proven*, the licensee must make an assessment in accordance with the criteria in section 5.1 and present it to AB for compliance review, well in advance of the scheduled inspection.

5.3 Scope of Qualification

The licensee (with the aid of AL) must analyse the needs and produce the necessary prerequisites for the qualification that is deemed relevant for the specific case.

The qualification documents must be reviewed by QB. Review with respect to compliance with the requirements given in SSMFS 2008:13 is performed by AB.

6 Documentation

All documentation shall be handled in accordance with valid requirements for information security and export control.

6.1 Qualification Dossier

A qualification dossier must be created for every qualification. In this all the documents, assessments, reviews and other information from the qualification in question are collected. When a qualification is completed, the qualification dossier contains the complete documentation of the qualification. The dossier is archived by QB and is confidential. The quality assurance system of the QB must include regulations to ensure that information from the qualification dossier is only made available to those parties who are authorised to see it.

6.2 Register of Valid Qualifications

QB must keep an up to date register of all completed qualifications. There must be searchable links between personnel and procedure qualifications.

6.3 Test Specimen Register

QB must keep an up to date register of all blind test specimens that QB has specified, as well as all open test specimens reported by the licensee or AL. The information to be found in the register, routines for updating and authority to use the register must be controlled by an applicable instruction.

7 References

[1] The Swedish Radiation Safety Authority's Regulations on Mechanical Components in Nuclear Power Plants - SSMFS 2008:13, ISSN: 2000-0987 (in Swedish).

[2] European Methodology for Qualification of Non-Destructive Testing, Fourth issue. 2019, ENIQ Report no. 31, Technical Area 8 European Network for Inspection & Qualification.

[3] SQC Document - ”Qualify NDE System” - SQC-5000003564.

[4] PAKT Definitions, issue 1.0, 01.09.2011.

[5] Decision on Licensee Conditions for Forsmark/OKG/Ringhals with Requirements on Measures at the use of Accredited Inspection Laboratories for In-Service Inspection, SSM2015-5453 (in Swedish).

[6] ENIQ Recommended Practice 12 – Strategy and Recommended Contents for Inspection Procedures, issue 1, ENIQ Report no 62.

[7] ENIQ Recommended Practice 2 – Strategy and Recommended Contents for Technical Justifications, issue 2, ENIQ Report no 54.

[8] Example of a Technical Justification - Enhagen 1, Report 016/06, issue C.

[9] SQC Report – UP033 – Final Report Project SOFT – Establishment of Defect Matrix – 073/10 issue C (in Swedish).

[10] PAKT-document - KBM - Quality regulations for mechanical equipment, edition 7–22.06.2015.