

ABSTRACT

Qualification of Auditor and Lead Auditor to perform an assessment according NSQ-100

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0. GENERAL

0.1. Purpose

This document describes the methodology and requirements applicable to the qualification of auditors and lead auditors for the performance of audits according to NSQ-100.

0.2. Scope of application

This document defines, in line with the requirements of Nuclear Safety and of the Quality Association (NQSA), the process for third party evaluation of Nuclear Supplier's organizations, against NSQ-100 requirements.

0.3. References

- NSQ-100: Nuclear Safety and Quality Management system – Requirements - Model for quality assurance in design, development, manufacturing, erection, commissioning and services.

External references:

- Draft ISO/IEC 17021-2,
- NQA-1:2008 + addenda 1A:2009 : Non mandatory appendix 2A-3 "Guidance on the education and Experience of Lead Auditors",
- Document NISEP (Nuclear Industry Supplier Evaluation Program) : "Lead Auditor Requirements",

0.4. Terminology

Lead auditor: a qualified individual responsible for organizing, directing and performing audits.

Auditor: a qualified individual responsible for performing audits under the responsibility of a Lead Auditor.

Technical Assessor: technical specialist designated to support the Lead Auditor in special aspects during audits. The Technical Assessor doesn't perform any evaluation of conformity of the quality management system.

1. SECTIONS

1.1. Section 1- Generalities

The Certification Body (CB) will manage a list of qualified auditors. This list must be sent to NQSA with the annual report.

The evidence of the qualification of the auditors will be kept by the CB and checked by NQSA during their overview.

1.2. Section 2 – Prerequisites

Prerequisites are as follows:

1. Personal behaviors :

- Any assessor (Auditor, Lead Auditor, Technical Assessor):
 - (a) shall have the capability to communicate effectively, both in writing and oral, in its native tongue,
 - (b) shall have the capability to communicate effectively, both in writing and oral, in the language of the audit,
 - (c) shall have the capability to issue the assessment report, at least, in English language,
 - (d) shall be professional (i.e. exhibiting at the workplace a courteous, conscientious, and generally business-like demeanor).

- For Auditors : they shall be:
 - (d) diplomatic (i.e. tactful in dealing with people),
 - (e) open-minded (i.e. willing to consider alternative ideas or points of view),
 - (f) observant (i.e. actively aware of physical surroundings and activities),
 - (g) perceptive (i.e. instinctively aware of and able to understand situations).

- For Lead Auditors (in addition to above auditor behaviors): they shall be:
 - (h) self-reliant (acting and functioning autonomously),
 - (i) organized (i.e. exhibiting effective time management, prioritization, planning and efficiency),
 - (j) decisive (i.e. achieving timely decisions based on logical reasoning and analysis),
 - (k) morally-courageous (i.e. willing to act responsibly and ethically even though these actions may not always be popular and may sometimes result in disagreement or confrontation).

The behaviors shall be evaluated through direct interview by hierarchical Management.

Traceability of the evaluation shall be ensured (Refer to Appendix A2).

The corresponding records shall be kept in auditor's qualification file.

1.3. Section 3 – Training

Prospective Auditors shall receive training to the extent necessary for assuring auditing competence including:

- (1) A training in fundamentals for audits, including objectives, organization, documentation, and questioning techniques, and auditing techniques for examining, questioning, evaluating, and reporting; together with methods for identifying and following up corrective actions; and closing out audit findings,
- (2) A training on general structure of quality management systems based on ISO 9001,
- (3) A NSQ-100 training, according to a program recognized by NQSA (each auditor shall also successfully fill the questionnaire prepared by NQSA).

Traceability of the training and of the Auditor evaluation shall be ensured (Refer to Appendix A2).

The corresponding records shall be kept in auditor's qualification file.

Notes:

- *The above points (1) and (2) may be not included in the training if the prospective auditor is already qualified as Auditor or Lead Auditor for ISO 9001 in nuclear field activities or EN 9100 or TS 16949 in application of the Certification Body Quality Management Auditor qualification procedures,*
- *The skills corresponding to above point (3) shall be acquired by participation to dedicated training course.*
- *The above training is not applicable to Technical Assessors.*

1.4. Section 4 – Initial qualification process

1.4.1. Qualification criteria for Auditor:

The following 4 criteria shall be fulfilled:

Criterion #1: training shall have been performed according above §1.3.

Criterion #2: the prospective Auditor education and experience shall be evaluated in order to check if the minimum of 10 credits necessary for getting the qualification can be justified. The scoring system is detailed in appendix A1.

Criterion #3: the auditor shall have a minimum of 5 years work experience in the industry. An experience in nuclear activity (engineering, design, manufacturing, quality or process control) is not mandatory but strongly recommended.

Criterion #4: the auditor shall have participated in a minimum of 3 quality management system audits within a period of time not exceeding 3 years, prior to the date of qualification, one audit of which shall be in the nuclear field.

Traceability of the evaluation shall be ensured (Refer to Appendix A2).

The corresponding records shall be kept in auditor's qualification file.

1.4.2. Qualification criteria for Lead Auditor

The prospective Lead Auditor shall have participated:

- as an Auditor, in a minimum of 5 quality management system audits, within a period of time not exceeding 3 years prior to the date of qualification, 2 audits⁽¹⁾ of which shall be nuclear quality management system audits,
- as a Lead auditor in at least one NSQ-100 audit performed under the supervision of a qualified Lead auditor⁽²⁾.

Traceability of the evaluation shall be ensured (Refer to Appendix A2).

The corresponding records shall be kept in auditor's qualification file.

Notes applicable to the two first years (transitional period) of NSQ-100 audits:

⁽¹⁾ For each technical field, the 2 nuclear audits may not be required if it's demonstrated by the Certification Body that the prospective Lead Auditor have a sufficient technical experience and knowledge for auditing in the technical field or in a similar field (e.g. aeronautics or automotive).

The signification of:

- "sufficient" may be understood as 10 years of professional experience in the considered technical sector and 5 years of experience in auditing as Lead Auditor,
- "knowledge" may be understood as justified at least by a license/bachelor level in the considered technical field.

⁽²⁾ the request of the audit performed under supervision may be cancelled if the prospective Lead Auditor is already qualified as Lead Auditor within the Certification Body.

1.4.3. Qualification criteria for Technical Assessor:

The technical assessor will have to demonstrate a sufficient technical experience and knowledge for the technical sector. The signification of:

- "sufficient" may be understood as 10 years of professional experience in the considered technical sector,
- "knowledge" may be understood as justified at least by an equivalent of license/bachelor level in the considered technical field.

1.4.4. Technical field(s) associated to the qualification:

Qualification will be delivered for specific technical field(s) as per Appendix A2. Most of topics indicated for each technical field shall be well acquired and remaining topics have to be understood and known.

Evaluation of technical skills shall be performed by a Certification Body's technical competent person against records (CV, experience, internal technical qualifications ...).

Traceability of the evaluation shall be ensured (Refer to Appendix A2).

The corresponding records shall be kept in auditor's qualification file.

1.5. Section 5 – Delivery of the qualification

1.5.1. Submission of applications

The application is accompanied by a file containing:

- applicant's Curriculum Vitae ;
- documents as evidence of pre-requisites ;
- documents as evidence of in-house and/or external training ;
- if necessary, additional documents as evidence of the applicant's work experience.

Documents are filed by the Certification Body and archived for 10 years.

1.5.2. Issuance of qualification

The qualification will be issued according procedures of the Certification Body.

1.6. Section 6 – Maintenance of proficiency

In order to maintain his proficiency, the auditor shall have at least:

- participated in ten (10) NSQ-100 certification audits in the last 3 years with a minimum of 20 days. As we are in the starting process, we kept 10 NSQ-100 certification audit as a target but this number of audit can be revised after lessons learned. The failure of this requirement will result in the impossibility to perform alone the next certification audit,
- reviewed and studied codes, standards, procedures, instructions, and other documents related to quality management systems,
- participated in training program(s) based on personal annual assessment (management may limit the qualification, require re-training, or require re-qualification).

1.7. Section 7 – Renewal of Qualification

Qualifications are valid during 3 years except if the Auditor failed to maintain his proficiency.

The request for renewal of qualification shall contain at least:

- report of services (date, duration, technical field, position during the audit, approximate size of organization audited) performed by the auditor within the framework of the qualification,
- documents as evidence of supervision of the Auditor,
- report of observation from NQSA if applicable,
- report on treatment of any non-conformity related to his auditing activities,
- documents as evidence of attendance at any training and information courses.

In case where the Auditor failed to maintain his proficiency, re-qualification process shall include:

- if the loss of the qualification takes place between 1 and 3 years: a new NSQ-100 training must be followed and the auditor shall participate to 2 audits as an auditor, under supervision of another qualified Auditor,
- If the loss of the qualification takes place after the 3 years period: the complete qualification process must be followed.

1.8. Section 8 – Withdrawal of Qualification

The qualification may be withdrawn or suspended at any time:

- in case of no assessment activity during more than one year,
- after a non-satisfactory supervision and/or examination of an audit report (internal to the CB or NQSA supervision),
- following a client's or NQSA's significant claim,
- following any other relevant information or event,
- upon request of the Auditor's management.

In addition any Auditor who no longer performs assessments for the Certification Body (because of transfer, departure from the company, or other reason) forfeits his qualification.

1.9. Section 10 - Monitoring of auditors

During the period of validity of the qualification, monitoring of Auditor is carried out by his local management.

Monitoring includes at least:

- evaluation of minimum activity,
- report supervision,
- examination of any relevant document (e.g. external claim or internal audit report).

Any lack of monitoring will automatically lead to the loss of the qualification at the end of the qualification period.

2. APPENDIXES

- 2.1. Appendix A1 – Scoring system
- 2.2. Appendix A2 – Model of qualification record and list of technical fields

Appendix A1 – SCORING SYSTEM

EDUCATION:

| NUMBER OF CREDITS (non cumulative / maximum of 6 credits) | EDUCATION LEVEL |
|---|--|
| 4 credits | Degree in engineering (electrical or electronic or mechanical or science), mathematics, civil works, quality assurance from an accredited (State Agency or National Professional or Technical Society) institution in the country of origin |
| 5 credits | License / Bachelor degree (or equivalent) in engineering (electrical or electronic or mechanical or science), mathematics, civil works, quality assurance from an accredited (State Agency or National Professional or Technical Society) institution in the country of origin |
| 6 credits | Master degree (or equivalent) in engineering (electrical or electronic or mechanical or science), mathematics, civil works, quality assurance from an accredited (State Agency or National Professional or Technical Society) institution in the country of origin |

WORK EXPERIENCE:

| EXPERIENCE | NUMBER OF CREDITS (cumulative / maximum of 9 credits) |
|---|---|
| Technical experience in engineering, manufacturing, construction, operation, or maintenance, | 1 credit for each full year with a maximum of 5 credits for this aspect of experience |
| If 2 or more years of this experience have been in the nuclear field | 1 credit |
| if 2 or more years of this experience have been in quality assurance/systems | 2 credits |
| if 2 or more years of this experience have been in auditing quality assurance/systems | 3 credits |
| if 2 or more years of this experience have been in nuclear quality assurance/system | 3 credits |
| If 2 or more years of this experience have been in the nuclear quality assurance/systems auditing | 3 credits |

Appendix A2 – MODEL OF QUALIFICATION RECORD

| | | | |
|--------------------------------|----------------------------------|---------------------------------------|---|
| RECORD OF QUALIFICATION | <input type="checkbox"/> Auditor | <input type="checkbox"/> Lead auditor | <input type="checkbox"/> Technical assessor |
| Name | | | |
| Certification Body | | | |

| QUALIFICATION REQUIREMENTS | | | |
|--|---|--------------------------|---------------------------------------|
| Evaluation of personal behaviour | Evaluated by | Position | Date |
| | | | |
| Training courses | Contents | Date(s) | Duration (days) |
| | Fundamentals in auditing | | |
| | ISO9001 | | |
| | NSQ-100 | | |
| Education | Justification | | Number of credits |
| | | | |
| Work experience | Justification | | Number of credits (maximum 9 credits) |
| | Technical experience (general) (1 credit per year - maximum 5) | | |
| | ≥ 2 years in nuclear field | | |
| | ≥ 2 years in QMS | | |
| | ≥ 2 years auditing QMS | | |
| | ≥ 2 years in nuclear QMS | | |
| ≥ 2 years auditing nuclear QMS | | | |
| Total number of credits (10 credits are necessary) | | | |
| Auditing experience | Company audited | Type of audit / duration | Date(s) |
| | | | |
| | | | |
| | | | |
| | | | |
| Additional information | | | |

| RESULTS OF EXAMINATION | | | |
|----------------------------|------------------------------|-----------------------------|-----------|
| Examination passed | <input type="checkbox"/> Yes | <input type="checkbox"/> No | Reasons : |
| Qualification certified by | Name | Position | Date |
| | | | Visa |

Appendix to Qualification record – Technical field(s)

| EVALUATION OF SKILLS – TECHNICAL FIELD | | | | |
|--|------|----------|------|------|
| Name | | | | |
| Evaluation certified by | Name | Position | Date | Visa |
| | | | | |

Manufacturing of basic metal products and/or fabricated parts (mechanical structures)

| | | | | |
|--|--|--|--|--|
| Necessary skills for the technical field | <ul style="list-style-type: none"> - Metallurgy (Steel and Alloys) - Mechanical testing - Casting, forging, rolling, extrusion, forming, cutting processes - Machining operations - Welding operations - Heat and surface treatment - Surface preparation, finishes and coatings - Interpretation of drawings - Assembling / erection - Dimensional metrology - Non-destructive testing - Practice of structural codes | <i>Justification of auditors / assessor skills</i> | | |
| | | | | |

Manufacturing of Pressure parts (vessels and piping)

| | | | | |
|--|--|--|--|--|
| Necessary skills for the technical field | <ul style="list-style-type: none"> - Metallurgy (Steel and Alloys) - Mechanical testing - Casting, forging, rolling, extrusion, forming, cutting processes - Machining operations - Welding operations - Heat and surface treatment - Surface preparation, finishes and coatings - Interpretation of drawings - Mounting / erection - Dimensional metrology - Non-destructive testing. - tightness and pressure testing. - practice of pressure vessel & piping design codes. | <i>Justification of auditors / assessor skills</i> | | |
| | | | | |

Manufacturing of Industrial Machinery (electro-mechanical equipment and rotating machines)

| | | | | |
|--|---|--|--|--|
| Necessary skills for the technical field | <ul style="list-style-type: none"> - Machining and welding operations - Assembly, adjustment systems, mounting, grounding, anchors, alignments - Heat and surface treatment - Surface preparation, finishes and coatings. - Hydraulic systems - Electrical / electronic systems of control - Power transmission, axles, mechanisms, gears - Efforts on machines, fatigue - Interpretation of drawings - Functional tests and reliability - Electrical testing - Vibrations / sounds | <i>Justification of auditors / assessor skills</i> | | |
| | | | | |

Manufacturing of electrical equipment (power)

| | | | | |
|--|--|--|--|--|
| Necessary skills for the technical field | <ul style="list-style-type: none"> - Electrical equipment : transformers, synchronous, asynchronous, switching devices, inverters, rectifiers, power semiconductors, regulators, ... - Electric component assembly (welding, wiring, ...) - Lighting signaling and security equipment, - Machining and welding operations - Surface preparation. Finishes and coatings. - Mounting subassembly and final assembly - Tests: in process and final (verification of components, functional continuity, resistance) - Tests on prototypes: reliability, environmental, electromagnetic compatibility, electrical safety, packaging (drop test) - Packaging and labeling (CE marking, other safety marks) - On-site installation of equipment / Installing ground protections (over-voltages, lightning rod). | <i>Justification of auditors / assessor skills</i> | | |
| | | | | |

Manufacturing of instrumentation devices and systems

| | | |
|--|---|--|
| Necessary skills for the technical field | <ul style="list-style-type: none"> - Physics - Basics of mechanics - Electronic systems and devices - Metrology / Measuring systems | <i>Justification of auditors / assessor skills</i> |
| | | |

Design / Manufacturing of control & command systems

| | | |
|--|--|--|
| Necessary skills for the technical field | <ul style="list-style-type: none"> - Knowledge of instrumentation systems - Electronics : PLCs, I/O devices and systems, interface modules, ... - Same skills than « Supply of software » technical field | <i>Justification of auditors / assessor skills</i> |
| | | |

Supply of software

| | | |
|--|---|--|
| Necessary skills for the technical field | <ul style="list-style-type: none"> • Software development : <ul style="list-style-type: none"> - Feasibility study - Requirement analysis - Design phase - Production - Testing - Installation - Maintenance • Hardware systems knowledge | <i>Justification of auditors / assessor skills</i> |
| | | |

Manufacturing of nuclear fuel assemblies

| | | |
|--|---|--|
| Necessary skills for the technical field | <ul style="list-style-type: none"> - Manufacturing plants : pellets, rods, assemblies - Packing, loading, transportation, unloading of assemblies | <i>Justification of auditors / assessor skills</i> |
| | | |

Construction / Civil works

| | | |
|--|--|--|
| Necessary skills for the technical field | <ul style="list-style-type: none"> - Site preparation and investigation (soil properties) - Foundations, Piling - Material characteristics and properties - Drawings interpretation - Project Planning - Employment of subcontractors - Site construction - Handover | <i>Justification of auditors / assessor skills</i> |
| | | |

Engineering (design) services

| | | |
|--|---|--|
| Necessary skills for the technical field | <ul style="list-style-type: none"> - Engineering consultancy - Feasibility study - Preliminary Design - Detailed design | <i>Justification of auditors / assessor skills</i> |
| | | |

Inspection (NDT) services

| | | |
|--|--|--|
| Necessary skills for the technical field | <ul style="list-style-type: none"> - Welding operations - Knowledge of NDT methods, - Structural, pressure vessel end piping design codes | <i>Justification of auditors / assessor skills</i> |
| | | |