**Template of a** **Quality Assurance Programme/Quality Plan**

*The following requirements to the content of the QAP can be expanded based on the scope and complexity of the activity to be performed.*

1. **GENERAL**

This Section specifies:

* + The basis for drafting a quality assurance programme (subject and number of the contract under which the programme is drafted, ID number of the terms of reference);
	+ Contractor’s company name, official contact persons, and correspondence address(es);
	+ Subcontractors (if applicable);
	+ Programme objectives;
	+ Nuclear and radiation safety ensurance priorities;
	+ commitment of the Management to the quality objectives during the Programme activities implementation.
1. **SCOPE**

This Section specifies:

* + The activities which the QAP is drafted for (design, construction, installation, maintenance, engineering of ..., etc.);
	+ The structures, systems, and components (SSCs) subject to the activities covered by the QAP, specifying their classification in terms of safety, seismics, etc. – *it can be specified that the activity scope complies with the ToR, a separate List can be attached, or the enclosed work breakdown schedules/plans can be referenced when they cover all the SSCs to be dealt with;*
	+ The level of compliance between the drafted QAP and current requirements – requirements that are inapplicable and not accounted for when drafting the Programme shall be specified (e.g. when the activities do not cover design/engineering, hereby it shall be specified that the requirements under Item 8 have not been considered when drafting the Programme);
	+ For activities involving **design, engineering, research** – the software codes and calculation methods used in the design as well as data on their verification and validation shall be additionally specified.
1. responsibilities

The person in charge of the contractual activities as a whole shall be specified. The officers in charge of the organisation and implementation of the activities and their supervision shall be listed, including the authorisations and responsibilities for:

* + planning, management and implementation of the relevant activities in compliance with the associated requirements;
	+ supervision during implementation of the activities;
	+ interactions between the persons involved in the implementation of the activities (including subcontractors) as well as for resolution of issues encountered in the course of their interactions;
	+ QAP review and update if necessary;
	+ communication of the QAP requirements to the subcontractors;
	+ review and approval of the subcontractors’ QAP and work schedules;
	+ maintaining the required staff qualification for execution and supervision of the works as well as for briefing the staff on specific work requirements before their commencement;
	+ overseeing the observance of the regulations in respect of RP, HSWA, FS;
	+ ensuring quality control of the work performed, deadline(s) observance, and record keeping;
	+ analysis of non-conformances, planning and implementation of corrective actions;
	+ conduct of audits.

For **design** activities

Additionally, authorisations and responsibilities are also identified in respect of:

* information collecting, compiling and transfer;
* correct choice, application, review, and attestation of computer codes and calculation methodologies;
* identification of design requirements and approval of the design output;
* ensuring the reliability of the designed SSCs.
1. Work implementation procedure

Describe in several subsections depending on the specific work.

4.1. Administrative structure

A description of the administrative structure and management levels in respect of activity/contract implementation shall be prepared:

* + The organograms for implementation of the activities shall include all the contract parties (administrative units of the main contractor and subcontractor, including the subunit responsible for quality assurance and control of the activities carried out);
	+ The lines of communication between the parties involved in the implementation of activities, quality assurance and control shall be clearly defined.

*The organograms may be enclosures to the programme.*

4.2. Work distribution

Work stages and conditions for completion of the relevant stages shall be identified.

The works to be performed and facilities to work on shall be distributed among the participants. A detailed distribution of the activities shall be used when a certain type of work is performed by more than one subcontractor or when different types of work are performed in the same premises. The following information shall be specified as a minimum for activity distribution:

* + The structures, systems and components along with their labelling as per the ToR;
	+ The names of the contractor and subcontractor administrative units which will work on the specified SSCs as well as the type of works to be performed by each of the participants.

A procedure and conditions for transfer of the completed works to the organisations assigned to perform further works as well as a deadline for documenting the planned quality control.

*The contractors and contracting authority shall plan a joint inspection of the transferred SSCs and/or the relevant documents .*

*The information related to the distribution of works between the subcontractors and within the contractor’s organisation may be presented in separate Lists or included in the work breakdown schedules/plans to be enclosed with the programme.*

*Note that when distributing the works and responsibilities, the* ***quality control*** *of* ***works*** *shall be conducted by persons and units that have not participated in the work performance.*

1. Personnel

The human resources required to complete the works shall be specified identifying the knowledge needed from the personnel performing safety related works, requirements to their qualification as well as the knowledge and expertise corresponding to this qualification.

If additional qualification is needed, it shall be clearly identified as well as the document to verify it and the person who is to check the existence of such document (e.g. for welding works, the specialist’s attestation as well as the welding instructions in compliance with the relevant codes, standards, and specifications shall be specified).

This Section also covers information and/or reference documents comprising information about:

* + verification of the knowledge and expertise of the staff involved in the implementation of activities with an impact on ensuring of safety;
	+ identification of the need for staff training and retraining, qualification enhancement and attestation as well as issue of the relevant certificates;
	+ analysis of the programmes for staff training and retraining, qualification enhancement and attestation;
	+ records of staff training and retraining, qualification enhancement and attestation;
	+ procedure for staff pre-job briefing as well as familiarisation with QAP and the specific procedures related to the job performance within the scope of their official duties and obligations.

The personnel involved in nondestructive inspections and tests shall be familiar with the requirements to the goods, equipment, and systems at the nuclear power plant.

1. NORMATIVE DOCUMENTS

This section comprises a list of the normative documents and standards applicable in the course of the contractual activities (regulations and rules for use of nuclear power, industry standards, etc.).

If necessary (e.g., NPP specific requirements), this Section shall identify the MS procedures to be drafted in order to ensure compliance with the specified normative documents and this Programme.

*The normative documents stipulating requirements to the conduct of activities may be attached to the Programme.*

1. DOCUMENTATION MANAGEMENT

This section includes information on the management of documents stipulating requirements to the performance of the contractual activities and covers the:

* + list ot documents of the external organisation’s management system to be used in the course of the contract implementation;
	+ list of documents (including design documents when such will be prepared) to be prepared in the course of the contract implementation;
	+ review, agreement, and approval of documents;
	+ system for identification, registration, communication, and storage;
	+ procedure for making changes to documents (including documents containing design input data) and keeping tehm up-to-date;
	+ control over the implementation of the requirements of the normative documents;
	+ documentation access procedure;
	+ procedure for management of documents that are common for the contractor and subcontractor, including the project documents.
1. Design/engineering control

**8.1. Design/engineering process**

This section covers:

* + Procedure for receipt, review, agreement, and approval of input data;
	+ Review and approval of the relevant requirements for a specific case, the way the results of this review will be recorded as well as the way any conflicts and ambiguities will be resolved;
	+ Collection of additional input data and their identification;
	+ Criteria according to which the design and engineering input and output will be accepted;
	+ Procedure for drafting, agreement and approval of design documents as well as issue of new versions of design documents;
	+ Design output presentation format and control operations applied;
	+ Requirements to the design documentation review (control);
	+ Procedure for labelling, registration and storage of design documentation;
	+ Software used in the preparation of design documentation (the software codes and calculation methodologies, as well as data on their review and attestation shall be specified);
	+ Procedure for performing calculations, development, review and attestation of computer codes.

The document stipulating the procedure for control of the following documents is identified or referred to:

* + Terms of Reference assigned to a subcontractor;
	+ List of the normative documents that shall apply to the design development;
	+ List of the systems subject to the QP/QAP, including systems important to safety ;
	+ Calculations;
	+ Project phases and stages;
	+ Drawings;
	+ Specifications, records of equipment and material needs.

Requirements shall be specified:

* + that during design/redesign of equipment from the safety systems and systems important to safety, the engineering organisation shall provide the designers with reliability indicators when issuing the initial technical requirements to the equipment;
	+ applicable to equipment diagnostics, monitoring capabilities, maintainability, in-service inspection, as well as requirements to the manufacturer for servicing until expiry of the equipment design life;
	+ for design analysis and review, use of alternative calculations, attestation tests, design justifications (validations).

**8.2. Modification management in the course of design and engineering**

This Section identifies:

* + The method for design modification request management;
	+ Who shall be authorised to submit modification requests;
	+ The method that will be used to review modifications within the specified periods;
	+ The persons authorised to approve or reject modifications;
	+ The method that will be used to review the implementation of modifications.

***Note*:** When presenting the information in this section, the contracting authority’s role in the communication, approval and agreement of the modifications shall be considered.

1. Purchase and serviceS management

This Section depicts the requirements that apply to purchased products/services and product/services providers. The activities shall be described and current procedures identified concerning the following:

* + Procedure for purchase of equipment, accessories and materials, as well as for provision of services,
	+ Assessment, selection and control of product and service providers;
	+ Management of the documentation for purchase of equipment, accessories and materials and for provision of services;
	+ Review of subcontractors’ quality assurance programmes and assessment of their potential for delivery of activities/services.

Regarding subcontractors of activities under the Contract, additional information about the following shall be included:

* + Drafting, review, and update of their quality assurance programmes;
	+ Approval of documents stipulating requirements to the works they are assigned to perform;
	+ Control over the subcontractors’ purchase process;
	+ Supporting a system for identification and physical marking of materials, equipment and accessories as well as identification methods for missing or compromised marking;
	+ Handling of materials, equipment and accessories (considering the following: weight, size, susceptibility to damage, separation of surfaces, limitations during handling, handling equipment, vulnerability to damages caused by static electricity, prevention of coating disintegration, maintaining the required environmental condition);
	+ Controlling the compliance of completed works with the relevant regulations (normative requirements) and QAP;
	+ Cleaning of the working area, tools and installed equipment (housekeeping), and taking into account the environmental protection and accessibility requirements.

*The subcontractors’ documents needed for completion of the respective works shall be approved by the contractor before commencement of the works. When stipulated in the contract, data about the subcontractors or their documents shall be submitted to the NPP.*

1. Control over purchased MATERIALS, EQUIPMENT, AND SPARE PARTS

This Section shall be included when necessary. The materials, equipment and spare parts needed for completion of the relevant work shall be described or a specification shall be referenced, if available (e.g., in case of works related to a technical solution).

The receiving inspection scope, responsibilities, and documents certifying its completion shall be identified.

The procedure for receiving inspection of delivered materials and accessories shall be described or the documents stipulating it shall be referred to.

Receipt shall be based on the relevant technical conditions and documents, drawings and order forms. Apart from the above, depending on the delivery, compliance with the following requirements shall be checked:

* + Packaging, transport, presence of clear markings, labels, integrity of the goods upon delivery;
	+ Availability of manufacturer’s documentation – drawings, technical datasheet, test results (reports), procedures, etc.;
	+ Integrity of packages and seals, undamaged protective and anticorrosion coatings, cleanliness, etc.

*When manufacturing equipment, it shall be subject to full or partial (sampling) inspection addressing specific indicators based on the equipment relation to safety.*

*When performing construction and installation works, certification in compliance with the normative documents is* ***obligatory*** *for the delivered materials.*

1. Work execution

The works shall be described and current procedures shall be identified for the conduct of the operations to control the quality of the technological processes and end product, as well as for:

* Execution of the processes directly influencing the product and services quality as well as the measures for their execution in accordance with the quality requirements;
* Identification and use of physical marking of the systems (elements) important to safety as well as application of additional identification methods when marking is destroyed or damaged;
* Identification of the requirements to the quality of the systems (elements) important to safety as well as to the activities impacting safety;
* Identification of the procedure and methods for execution, as well as the control over the execution of the activities impacting safety;
* Execution of equipment maintenance and repair;
* Application of statistical methods, if necessary.

Based on the activity (e.g., when manufacturing equipment), additional requirements to the handling of the equipment, its storage and transport shall be identified, including:

* + Requirements to the storage and transport of goods;
	+ Requirements to the monitoring of anticorrosion protection, cleanliness, temperature and humidity;
	+ Time interval between storage condition inspections and equipment condition check, including laboratory tests;
	+ Development of conservation and packaging methods that ensure prevention of losses, damage, or functional deterioration of the goods caused by the environment;
	+ Designing and fabrication of packagings in accordance with the Annex for procurement of industrial goods in order to ensure identification and guarantee the storage of equipment during its transportation and subsequent storage at the plant site;
	+ Equipment tests prior to its shipment to the NPP (preservation of protective and anticorrosion coatings, package integrity, presence of markings and labels, etc.);
	+ Goods shipment arrangements in compliance with the design documentation and rules applied for the transport.

*The documents stipulating the relevant activity shall also stipulate the requirements to the records that will be generated during execution.*

*The documents whose requirements shall apply to the implementation of the activities may be included in the form of an annex to the Programme.*

1. Control over the execution of activities

This Section covers the procedures for planning and conduct of quality control.

**12.1. Planning**

Based on an enclosed schedule/plan for execution of the activities and the requirements to the execution (including execution due dates), milestones are planned to review the executed activities, both within the contractor’s and subcontractors’ organisations. To plan the control, separate quality control plans may be drafted. The contractor shall coordinate the planned control executed by the subcontractors within the specified time periods.

The planned control may focus on:

* + characteristics that shall comply with specified requirements;
	+ the need for control conducted by independent organisations;
	+ acceptance criteria (specifications, drawings, vendors’ instructions, codes and standards);
	+ control methods and equipment to be used (required precision, calibration interval) or a reference to the relevant procedure;
	+ inspection intervals and sampling criteria;
	+ documented inspection results, including conformance certificates, test reports, reports;
	+ reporting of non-conformances and response actions to be taken;
	+ completion of all the operations focused on control and inspections and results acceptability;
	+ work completion dates.
	+ **For engineering** related to safety important technological processes, a review shall be envisaged of the design documentation for presence of instructions on the scope and control of the technological processes.

The planned control shall be conducted in accordance with approved control, inspection and test instructions and observing the specific normative requirements (if applicable).

Based on the nature of the works, the following can be performed in the course of implementing them:

* + Receiving inspection (upon delivery of materials required for the work);
	+ **Technical** oversight during work execution;
	+ Internal **independent** control;
	+ Tests control.

The QAP shall provide for the contracting authority and control bodies to **supervise** the planned control.

*The types of control shall be specified in the control documents that may be drafted in the form of* ***quality control plans****, road maps, control schedules, etc.*

**12.2. Technical oversight**

The activities shall be described and current procedures identified in respect of the control performed by the contractor in the course of the work. Subject to control shall be the intermediate results of the various works for which quality requirements and criteria apply.

This type of control may refer (without being limited) to:

* + Work results at every stage;
	+ Installation quality for equipment, pipelines, etc. – functional tests, factory acceptance tests, special tests in most realistic operating conditions (if stipulated in the equipment specifications);
	+ Welding quality – destructive and nondestructive testing;
	+ Clean execution of the works meeting the environmental protection and staff accessibility requirements.
	+ Completeness of separate equipment delivery.

**12.3. Internal independent control**

In respect of all kinds of inspections, the activities shall be described and current procedures identified for compliance between the works/technological processes and established requirements. The internal independent control shall be performed by competent persons who have not taken part in the works and in accordance with plans approved by the organisation’s manager.

The internal independent control shall focus on:

* + Compliance between drafted documents and the relevant regulations, standards, approved design documentation and approved schedules;
	+ Completion of all technological processes and specifications;
	+ Completion of the planned controls by the contractors and quality specialists;
	+ Presence and confidence of the results in the as-built documentation (for construction and installation works);
	+ Confidence of results and promptness of receiving inspection of delivered materials, goods, equipment;
	+ Meeting the deadlines for inspection and calibration of I&C equipment, tools and devices;
	+ Completion of all the necessary documentation in respect of quality control.

The documents (reports, certificates) verifying the completion of receiving inspections, technical oversight and internal independent control shall be identified or internal procedures/regulations stipulating requirements to the above shall be referenced.

**12.4. Test control**

*The requirements in this section apply to activities related to production, equipment maintenance, and construction and installation works.*

Test control shall be conducted in compliance with assessment requirements and criteria identified in regulatory, technical and design documentation.

The activities shall be described and current procedures identified in respect of test organisation concerning:

* + Types of tests, requirements and procedure for their performance;
	+ Ensuring test precision;
	+ Documents (methodologies, procedures) governing the tests;
	+ Technical requirements to the execution of tests;
	+ Test equipment, instruments, measurement systems used (including nonstandardised ones);
	+ Metrological assurance during the tests;
	+ Acceptance criteria;
	+ Documentation of test results;
	+ Procedure authorising representatives of the contractor and ther contracting authority to take part in the tests.
1. MEASUREMENT AND TEST INSTRUMENTATION

*This Section is included if the use of measurement and test instrumentation is required during execution of the works.*

The standardised and nonstandardised measurement and test instrumentation as well as special equipment (unique equipment, templates, control instrumentation, computers and computer codes) shall be identified.

The measurement and test instrumentation metrology characteristics shall be specified.

The documents verifying the selection of appropriate measurement instruments as well as their operability and required precision.

The procedure shall be described or documents stipulating the following shall be referenced:

* + Management of measurement and test instrumentation to ensure they meet the technical requirements (periodic inspection, adjustment, calibration);
	+ Maintenance and repair;
	+ Storage and handling;
	+ Control of the compliance with the requirements concerning the management of monitoring, test and measurement equipment;
	+ Procedure for correcting the misuse of measurement instruments.
1. Software support and calculation methods

Describe the activities and indicate the current procedures for quality assurance of software products and calculation methods, including the validation and verification of software products and calculation methods, as well as a list of current programmes and methodologies.

1. Equipment reliability

*This Sections stipulates engineering activities.*

Describe the activities and identify current procedures ensuring the reliability of equipment, goods and systems important to the safety of the nuclear power plant.

1. SAFETY MEASURES

Describe the specific safety measures and responsibility for their undertaking and execution control. The safety measures shall be identified based on the activity being performed and compliance with the industrial safety regulations and the Health and Safety at Work Act. Apart from the planned technical safety measures, the following measures shall be described:

* + The staff training on the safe methods and techniques for work execution before commencement of the works;
	+ Briefing and examination of the staff on health and safety at work (Regulation No. РД-07-2, of 16 December 2009, on the procedure for periodic training and briefing of the workers and employees on health and safety at work);
	+ Control over the observance of safety requirements.

When performing construction and installation works, additional safety measures shall be taken, such as:

* + Periodic inspections and attestation of handling equipment, load gripping devices and accessories, as well as attestation of the instructions and personnel performing specialised handling works;
	+ Periodic inspections and attestation of hazardous facilities as well as attestation of the instructions and personnel performing specialised works on hazardous facilities.
1. NON-CONFORMANCE MANAGEMENT

The activities shall be described and current procedures identified concerning the following:

* + Registration of non-conformances regarding the compliance with the quality requirements applicable to the work (services) and/or equipment, errors in the design, fabrication, equipment defects and failures, operating mode violations, human errors, etc.) and their analysis;
	+ Exceptions for the use of products not complying with the established requirements (e.g., discrimination, destruction, documentation, identification of such products) or acceptance of services not complying with the established requirements;
	+ The system for collection and processing of data on non-conformances, violations, defects, their causes, undertaking of corrective actions.

Determine exactly which non-conformances, how and at what level they can be assessed and decisions made to proceed with the work.

1. Corrective actions

The responsibilities and procedure shall be described and current procedures (if any) identified concerning the following:

* + Specification of corrective actions to prevent recurrence of the non-conformances, control over their implementation, and assessment of their efficiency;
	+ Reporting possible deviations and non-conformances and the control to ensure their efficiency.
1. MANAGEMENT OF RECORDS

The records to be created in the course of the works and to account for the implementation of the QAP shall be specified. Records verifying completion of the activities, records of measurements, control and testing, of inspections, audits, minutes and agendas of meetings, data on the qualification of the staff, etc. shall be included. The following shall be specified:

* + Contractual requirements and regulations in respect of the records to be created as well as the method for meeting those requirements;
	+ Requirements to the preparation of records and verification of the prepared records’ credibility;
	+ Procedure and periods for record storage;
	+ Record storage media (hard copy, digital);
	+ Methods for ensuring availability of records, when necessary, their legibility, access and professional secrecy protection;
	+ Method for submitting the records to the Contracting authority;
	+ Destruction of records.
1. Audits/Inspections

This Section covers:

* + Audits to be carried out in the course of the work (including of subcontractors’) and their scope;
	+ Qualification of the specialists conducting audits;
	+ Procedure on the conduct of audits – if auditing subcontractors, this procedure shall be coordinated with them;
	+ Auditors’ responsibilities and authorities as well as guaranteeing their impartiality in respect of the activities they audit;
	+ Documenting and reporting the audit results;
	+ Post-audit activities.

When using a subcontractor, requirements shall be specified for conduct (as well as documentation) of a self-assessment of its management in terms of compliance with the procedures of the subcontractor’s current QMS.

1. TERMS AND DEFINITIONS

The terms and definitions may be covered in an Appendix to the QAP depending on their number.

1. REFERENCES

The documents used to draft the programme shall be referenced.