ROSATOM

STATE ATOMIC ENERGY CORPORATION "ROSATOM"

Qualification requirements to suppliers and Rosatom's standard practice

"Atomex-Asia 2014" Forum

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To begin with

Questionnaire for suppliers

Initial information to be assessed is enlisted in the Questionnaire for suppliers. This Questionnaire has been made in such a form that enables a local supplier to work under equal requirements both in his country and in Russia. The Questionnaire has three main areas of questions:

1. Financial background and capabilities of a supplier,

2. Technical capabilities including information on the technological processes outsourced. These capabilities must match to the safety significance of a supplier's product,

3. Aspects of quality management, environmental management, HSE management as per ISO 9001, 14001 and OHSAS 18001 (or integrated management system as per ISO 9001, 14001 and OHSAS 18001 and IAEA GS-R-3).

Documents to be applied to the Questionnaire

1. List of references. If a supplier has already delivered its products for the Russian nuclear power, this has to be reflected in the list.

2. Authorization according to the relevant legislation

3. Authorization/licenses of employees for welding, scaffolding, work at heights, crane operators, slingers, non-destructive testing, etc.

4. **Validation records for special processes** (welding, coating, concreting, non-destructive testing, thermal processing, etc.)

5. **Information on welding technology verification**

6. Confirmation that a supplier **has available qualified and competent personnel experienced in nuclear projects**

Documents to be applied to the Questionnaire (continuation)

7. **Confirmation** that managers are **aware of the necessary technological procedures, quality assurance programs and Inspections&Tests plans**

8. **Certificates of compliance** of QHSE systems (integrated management system) with requirements of ISO 9001, 14001 and OHSAS 18001

Documents to be applied to the Questionnaire (continuation)

If a supplier is experienced in development of quality documentation as per IAEA requirements and/or project management documentation as per ISO 10006 and 10007, description of the experience should be applied to the Questionnaire.

Documents to be applied to the Questionnaire (continuation)

Information, submitted with the Questionnaire, is an input for the Unified Industrial Catalogue of Equipment and Materials for Nuclear power (EONKOM).

The scope of a Questionnaire including list of supplementary documents is also used while preparing procurement documentation for competitive procedures.

Competitive procedures

Suppliers are chosen on the basis of transparent and competitive procedures. These procedures are regulated with the national legislation.

Evaluation audit

Decision on evaluation audit performing is taken upon the Questionnaire review. During this audit information submitted by a supplier in the Questionnaire is verified, results of verification are documented.

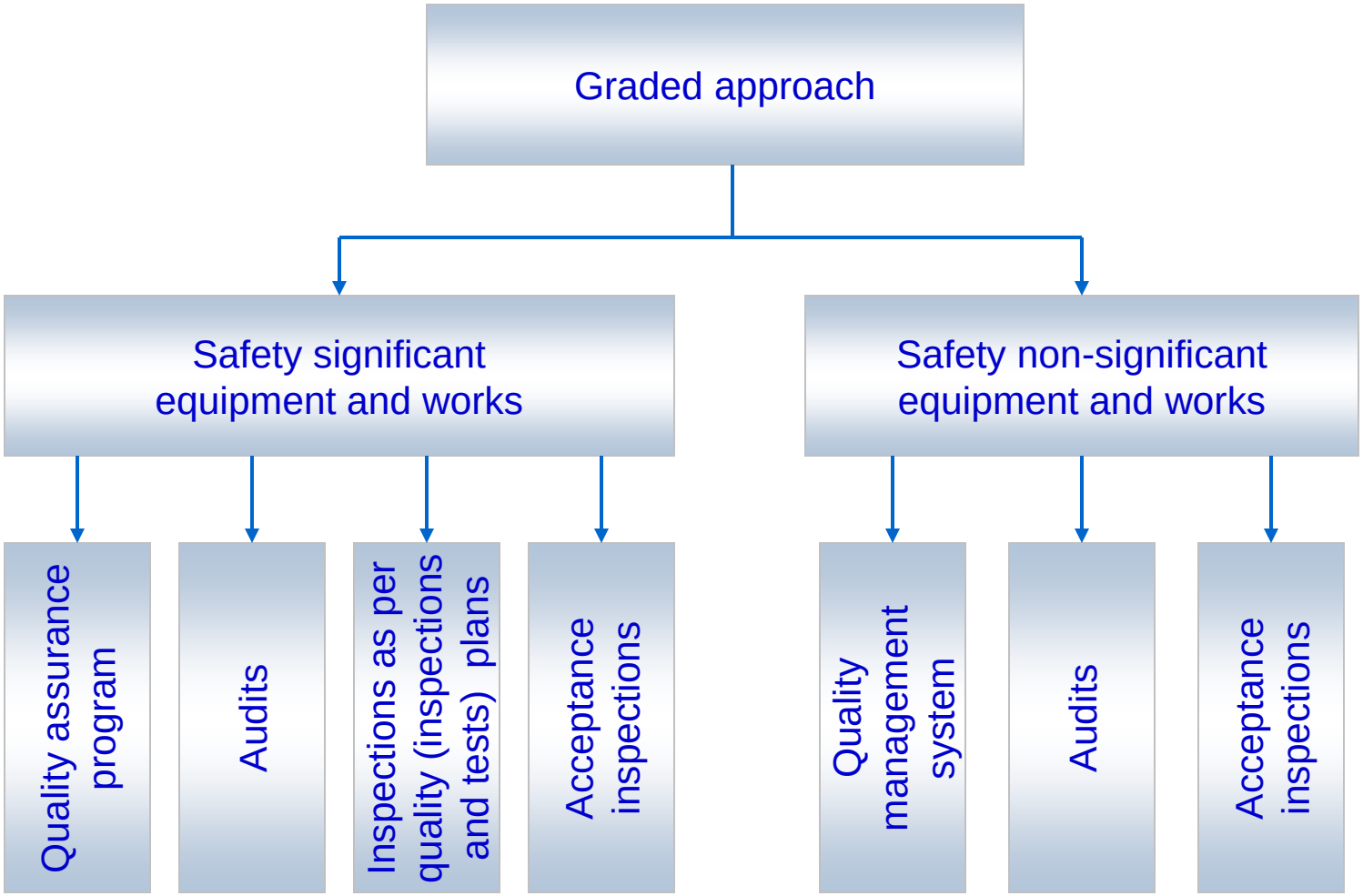
In the course of evaluation audit the verification of technological preparedness is carried out. This includes, among others, availability of working documentation, availability of design changes system, availability of certificates, etc. on material incoming control, availability of inspections and tests plans and programs, availability of metrological system (measuring, control and testing equipment), availability of structural unit, responsible for quality control.

Evaluation audit

If supplier's product range is widened, re-evaluation audit is assigned for assessment of capability of such supplier and its product to meet the identified requirements. Re-evaluation audit is also required if supplier's performance under signed contract is justified negative.

Audit types, methods and instruments are regulated by ISO 19011.

Graded approach



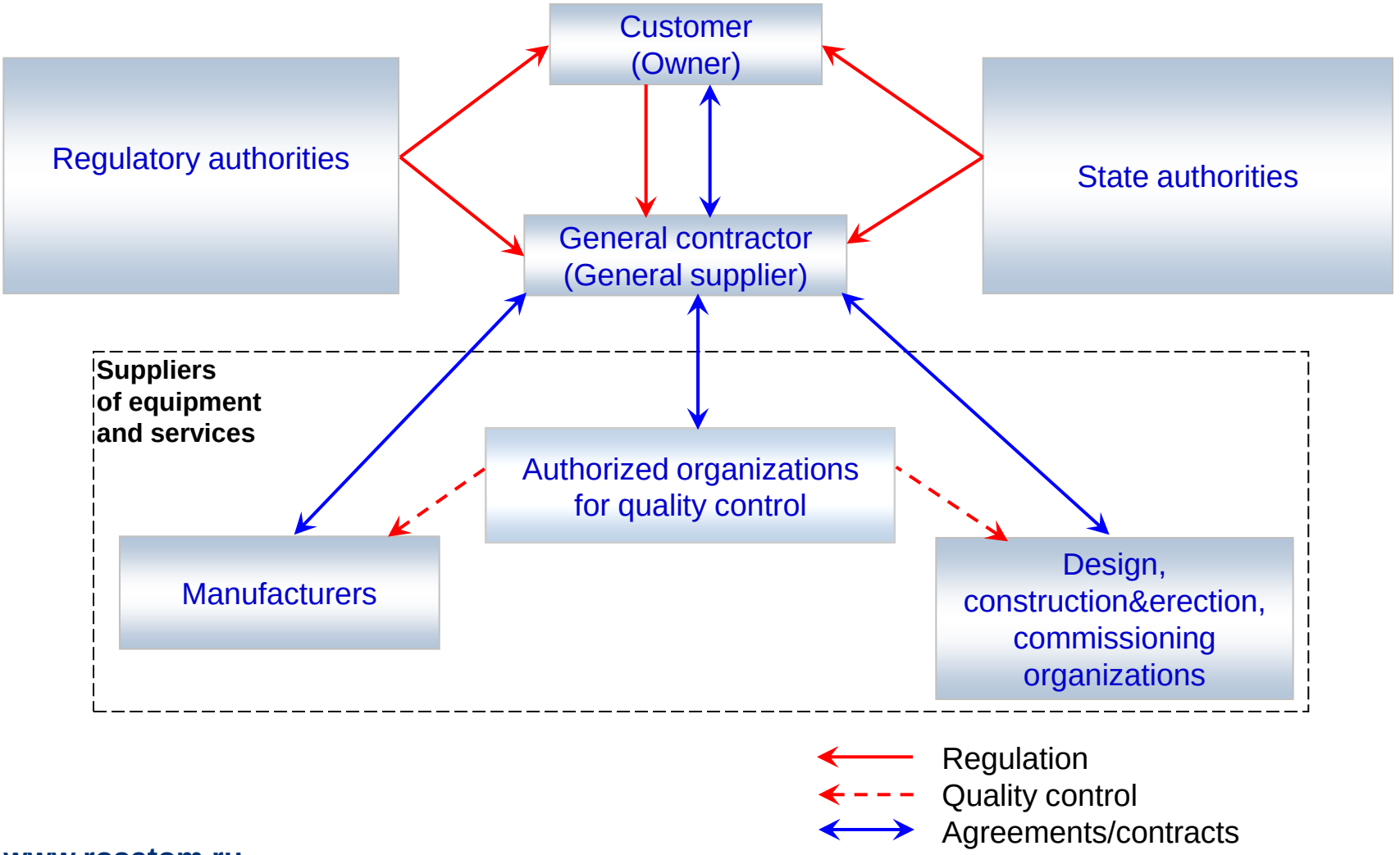
Graded approach

Rosatom applies graded approach based on relative significance of every item, service or process for nuclear safety and operability of NPP under construction (safety classification).

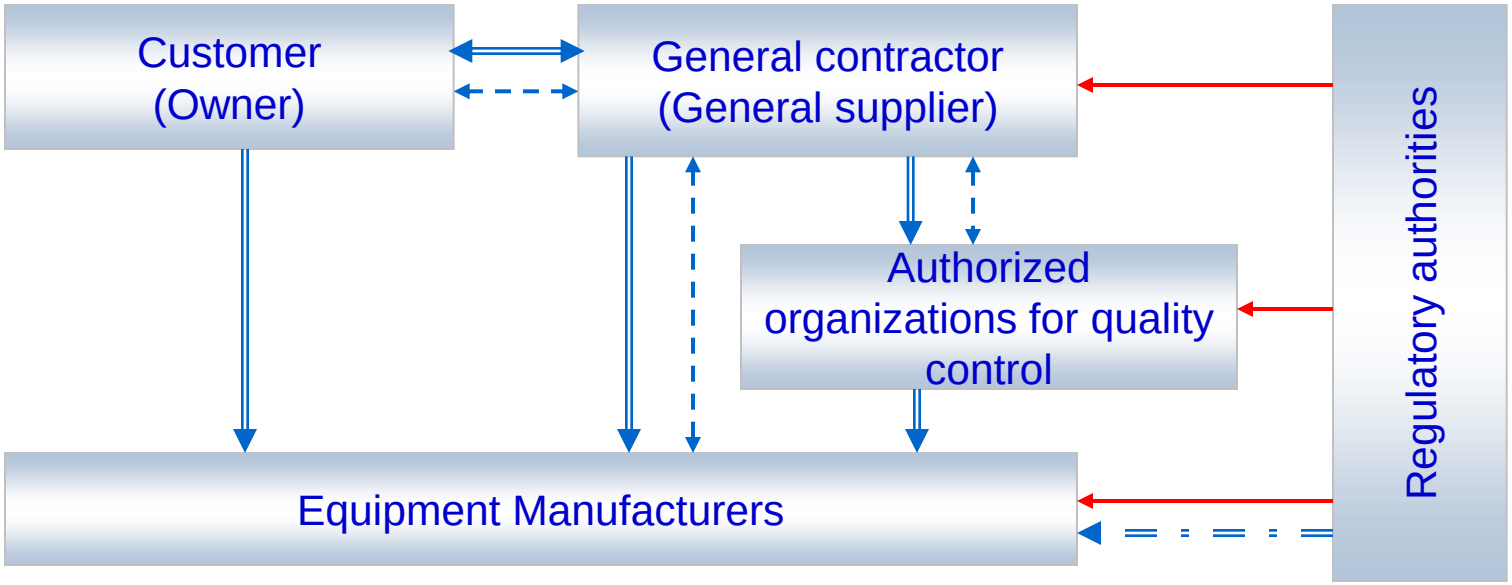
This grading can be presented in the form of quality category. Quality category can be used as a bridge between different safety classifications.

Graded approach defines requirements, in particular, to the scope of development and approval of documentation, including quality documents, to the scope and frequency of audits and inspections, to the level of personnel qualification.

Major interfaces during implementation of contractual obligations



Interfaces at quality control and acceptance inspections during equipment manufacturing



Organization and performance of control on quality, quantity and completeness of equipment and documentation

Informational interface

Regulation

Regulator's control

Main documented requirements to be included into offer

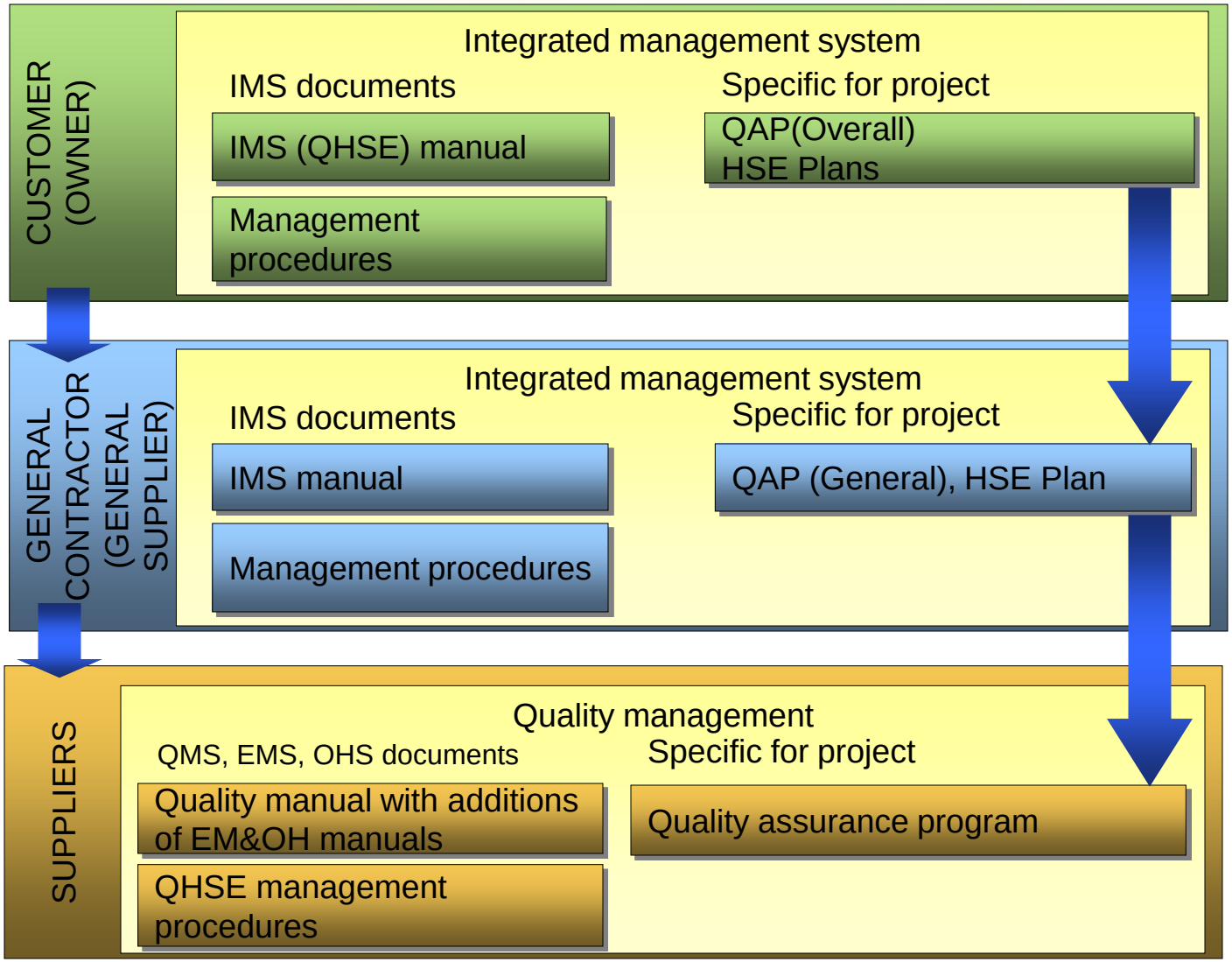
Legislative requirements

Contractual requirements

Requirements to Suppliers

- **Technical requirements**
- **Project management (works implementation schedules and milestones)**
- **Scope of developed technical accompanying documentation**
- **Packing, marking, transportation**
- **Quality requirements**
- **Reports**

Hierarchy of management requirements to be included into offer



Technical requirements

Technical requirements as minimum describe the following:

- Classification on safety and seismicity, on the base of graded approach;
- Normative documents, defining qualitative and quantitative characteristics of equipment and works;
- Main parameters and characteristics:
  - Technical data,
  - Conditions of operation,
  - Requirements to construction or assembling,
  - Requirements to reliability,
  - Requirements to technological processes, including special processes (welding, etc.),
- Requirements to materials and elements procured (including methods and scope of controls),
- Requirements to marking and packing (preservation), transportation,
- Quality requirements, methods of controls and rules of acceptance,
- Requirements to serviceability,
- Requirements to safety and environmental protection,
- Requirements to technical documentation elaborated.

Nuclear safety culture

Organisation is required to establish safety culture program in accordance with IAEA INSAG-4 and INSAG-15, which provides for:

- Identification and implementation of top priority of nuclear safety in all the Project related activities,
- Involvement and awareness of the personnel of the organisation and its supply chain, with top management leadership,
- Responsibility of the organisation top management for establishing and promoting strong safety culture,
- Planning and performing actions for safety culture enhancement
- Auditing safety culture status and elaboration of corrective actions for safety culture improvement.

Project management

Requirements as minimum describe the following:

- Necessity of elaboration of a schedule with account of its level and scope of Supplier's involvement;
- Milestones, which enable to control progress of works;
- Requirements to different PM activities including:

▪ Contract management	▪ Supply chain management
▪ Documentation management	▪ Licensing management
▪ Design management	▪ Human resources management
▪ Project change management	▪ Schedule management
▪ Requirements management	▪ Information management
▪ Risk management	▪ Interrelations and communications
▪ Configuration management	▪ Public relations

Scope of developed technical documentation submitted to the Customer

As minimum, this scope includes:

- Technical conditions (specifications) developed on the basis of design requirements with account of regulatory documents of the Customer's country;
- Passport (including results of equipment manufacturing, assembling, tests and inspections);
- Set of drawings (general assembly and per components);
- Elements strength calculations;
- Programs and methods of tests;
- Quality documents, with account of graded approach;
- Instruction on preservation, storage, transportation and depreservation;
- List of spare parts and consumables for assembly (erection) and commissioning, as well as list of spares for guarantee period of operation;
- List of handling equipment for assembly (erection);
- Operation manual, including technical description, guidelines for assembly, operation and technical maintenance.

Packing, marking, transportation

Requirements as minimum describe the following:

- Means and methods of marking;
- Main parameters of packing depending upon transportation mode;
- Transportation modes depending upon requirements of a contract with the Customer.

Requirements for packing and transportation are defined with account of requirements to safety and environmental protection. These requirements can also include the warehousing at the construction site.

Reports

Requirements as minimum describe the following:

- Periodicity and dates of preparation of works implementation reports;
- Formats of reports (including electronic reports);
- Methods and procedures of reports review and approval.

Quality control for safety significant equipment and works

Quality control during safety significant equipment manufacturing and works implementation is carried out by means of inspections in accordance with procedure, which is developed after the Contract signing, per Quality (inspections and tests) plan.

Quality plan is developed and approved by all the interested sides before commencement of the relevant manufacturing activity.

Quality plan is developed on the basis of Supplier's technological documentation and contains, as minimum, description of main technological and control operations, which have to be controlled during manufacturing by the Customer and General contractor.

Example of Quality plan for manufacturing of equipment of QA1, QA2, QA3 quality categories

АЭС «КУДАНКУЛАМ» / *KUDANKULAM NPP*				ОАО «АТОММАШЭКСПОРТ» *JSC "Atommashexport"*		Лист 1 из 8 *Sheet of*
ПЛАН КАЧЕСТВА / *QUALITY PLAN*	Рег.№ КК-ПК-АМЕ-19-06 Ред. 0 *Reg.No KK-QP-AME-19-06 Rev. 0*			Код по KKS KKS Code	FKK10BB004	
Номер позиции по спецификации к Контракту / *Position number according to the Contract specification*	№ чертежа изделия *Item Drawing No.*	№ изделия *Item No*	Категория обеспечения качества *QA category*	Класс безопасности *Safety Class*	Контракт между АСЭ и ИКАЭЛ № *Contract No.*	77-252/22600 от 23.08.2002г. *dd.*
65 (По дополнению 1 к контракту/ *according to the contract, addendum1*)	AME 322.00.00.000	1	QA3	3H *3N*		
Номер позиции по спецификации к договору / *Position number according to the agreement specification* 44.1.1	ВАННА УНИФИЦИРОВАННАЯ/ *UNIFIED BATH*				Договор между АСЭ и ОАО АМЭ№ *Contract No.*	Дополнение/*addendum* 1 к договору/ *to contract* 7725/03123 от 25.08.2003г. *dd.*

WP - точка освидетельствования; *witness point;* WP(R) -точка освидетельствования по документам; *witness point as per documents;* HP - точка остановки; *hold point.*

№ п/п Seq No.	Наименование технологической или контрольной операции Inspection-or-Production Operation Title	Наименование деталей (узлов) Name of Parts and components	Требования Requirements	Документы регистрации результатов Documents for recording results	Планируемая неделя проведения технологической или контрольной операции Planned Date (weeks) of Inspection-or-Production Operation	Статус инспекций, испытаний и свидетельство соответствия Inspection & Tests Status & Certificate of Conformity								Примечание Note
						ЗИ *MFR*				УО АСЭ *ASE AO*		ИКАЭЛ NPCIL		
						Тип точки *Point Type*	Подпись *Signature*	Тип точки *Point Type*	Подпись *Signature*	Тип точки *Point Type*	Подпись *Signature*	Тип точки *Point Type*	Подпись *Signature*	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Example of Quality plan for manufacturing of equipment of QA1, QA2, QA3 quality categories

Наименование ЗИ ОАО «Атоммашэкспорт» *Name of Manufacturer JSC "Atommashexport"*	ПЛАН КАЧЕСТВА / *QUALITY PLAN*	Рег.№ КК-ПК-АМЕ-19-06 Ред. 0 *Reg.No KK-QP-AME-19-06 Rev. 0*	Код KKS *KKS Code*	FKK10BB004	Лист *Sheet*	2	Из *of*	8

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 1E	Входной контроль материала/ *Material Incoming Inspection*	Согласно сводной ведомости материалов/ *According to Common List of materials*	Инструкция «Входной контроль материалов, полуфабрикатов и комплектующих» / *Procedure «Incoming inspection of purchased components and materials»* АЭ 00 00 001.40 Таблица контроля качества/ *Quality control table* АМЕ 322.00.00.000 ТБ1	Журнал входного контроля *Log-book of incoming inspection*	26	HP				WP		WP(R)		
2 2E	Контроль сварочных материалов/ *Welding consumables inspection*	Ванна унифицированная/ *Unified bath* АМЕ 322.00.00.000	Инструкция «Входной контроль качества сварочных материалов» / *Procedure «Welding consumables incoming inspection»* 33301.25090.00010 Таблица контроля качества/ *Quality control table* АМЕ 322.00.00.000 ТБ2	ПС* *DS**	27	HP				WP		WP(R)		
3 3E	Контроль сборки под сварку / *Check of assembly for welding*	Обечайка/ *Shell* АМЕ 322.01.01.000 Змеевик / *Coil* АМЕ 322.01.00.003 Днище/ *Bottom* АМЕ 322.01.00.018	Чертежи/ *drawings* АМЕ 322.00.00.000 СБ АМЕ 322.01.00.003 АМЕ 322.01.00.018	ПС* *DS**	27	HP				HP**		WP		
5 5E	Проверка результатов контролей сварных соединений / *Check of results of welded joints inspection*		Таблица контроля качества/ *Quality control table* АМЕ 322.00.00.000 ТБ2 Программа контроля качества/ *Quality control program* АМЕ 284.00.00.000 ПМ10	ПС* *DS**	28	HP				WP (R)		WP(R)		
6 6E	Контроль в готовом виде/ *Inspection as ready*		Чертежи/ *drawings* АМЕ 322.00.00.000 СБ АМЕ 322.01.00.003 АМЕ 322.01.00.018	ПС *DS*	28	HP				WP (R)		WP		

Example of Quality plan for manufacturing of equipment of QA1, QA2, QA3 quality categories

Наименование ЗИ ОАО «Атоммашэкспорт» *Name of Manufacturer JSC "Atommashexport"*	ПЛАН КАЧЕСТВА / *QUALITY PLAN*	Рег.№ КК-ПК-АМЕ-19-06 Ред. 0 *Reg.No KK-QP-AME-19-06 Rev. 0*	Код KKS *KKS Code*	**FKK10BB004**	Лист *Sheet*	3	Из *of*	8

Лист разработки, согласования и утверждения планируемой деятельности по контролю и надзору за качеством в Плане качества

Sheet for development, agreement and approval of planned quality inspection and surveillance activities in Quality Plan

	Разработал [1] (ОАО АМЭ) *Developed by*[1] *(JSC AME)*	Перевел [2] (ОАО АМЭ) *Translated by* [2] *(JSC AME)*	Согласовал [3] (УО АСЭ) *Agreed by*[3] *(ASE AO)*	Утвердил [4] (ОАО АМЭ) *Approved by*[4] *(JSC AME)*	Утвердил [5] (АСЭ) *Approved by* [5] *(ASE)*	Согласовал [6] (ИКАЭЛ) *Agreed by* [6] *(NPCIL)*
Должность Position	Ведущий инженер Leading engineer	Начальник бюро переводов Translation bureau manager	Уполномоченный представитель Authorized representative	Директор по качеству Quality Director	Зам. начальника ООК по АЭС КК Deputy Head of QAD of NPP KK	Engineer
Фамилия Surname	Султанова И.В. I. Soultanova	Власова Е.И. E. Vlasova	Самойлов В.Н.	Жарков С.А. S. Zharkov	Алексеев М.Н. Alexeev M.N.	GARBYAL R.S.
Подпись Signature	[signature]	[signature]	[signature]	[signature]	[signature] [stamp: INSPECTOR № 24 ИНСПЕКТОР]	[signature] [stamp: NPCIL QA Moscow]
Дата Date	07.06.2006	30.06.06	03.07.2006	23.06.06	06.08.2006	16.08.2006

Примечание:

Note:

1. Разработчик Плана качества на заводе-поставщике (ОАО АМЭ)/ *Quality Plan developer at supplier (JSC AME);*
2. Переводчик на заводе- поставщике (ОАО АМЭ) / *Translator at supplier (JSC AME);*
3. Уполномоченная организация (УО) ЗАО "АСЭ"/ *Authorized Organization (AO) of ZAO ASE;*
4. Должностное лицо завода-поставщика (ОАО АМЭ) /*Official person of Supplier (JSC AME);*
5. Должностное лицо ЗАО АСЭ/*Official person of ZAO ASE;*
6. Уполномоченный представитель ИКАЭЛ /*Authorized representative of NPCIL..*

Quality control
for safety non-significant equipment and works

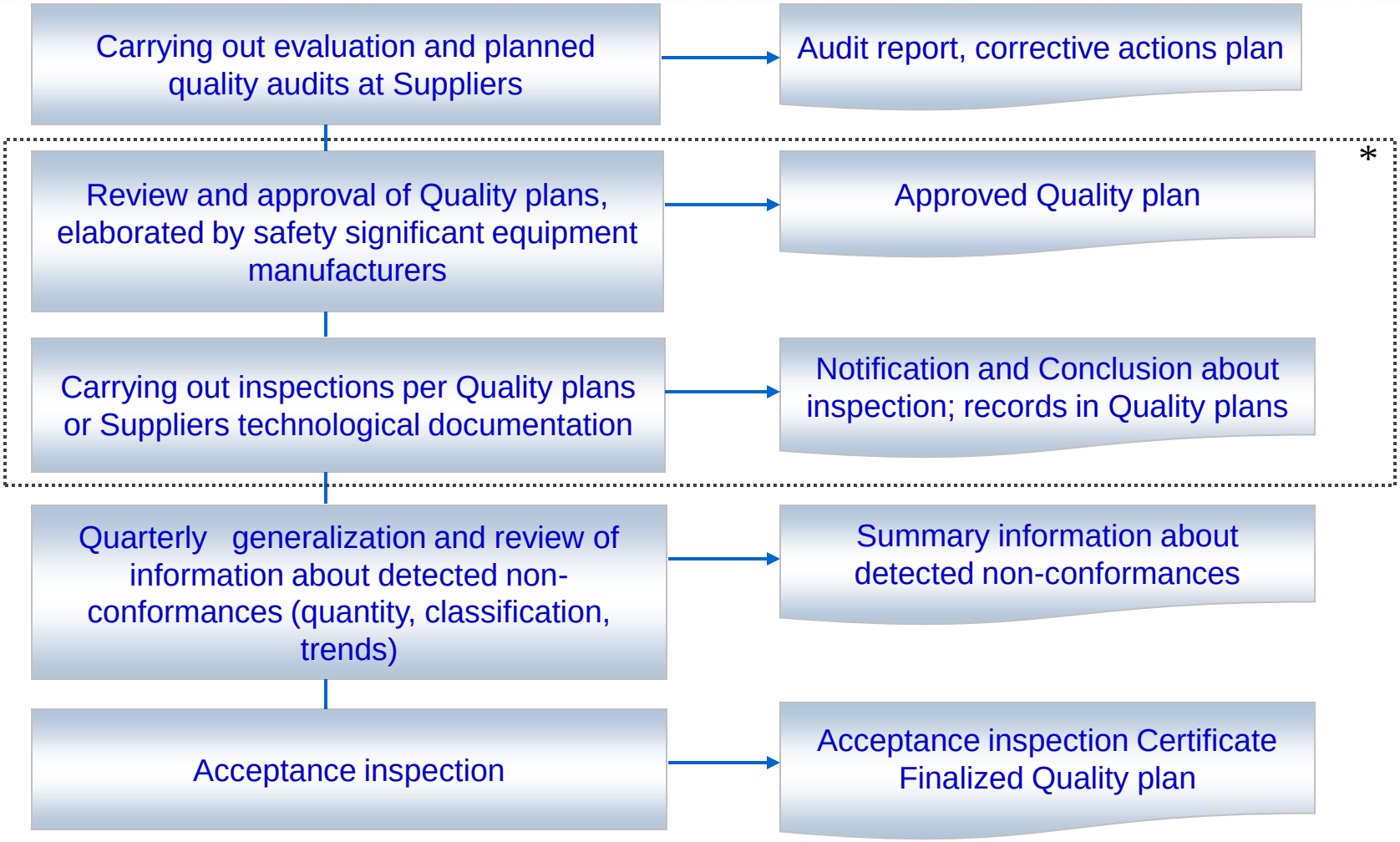
For safety non-significant equipment and works only acceptance inspection is carried out upon their completion.

However, at availability, in particular, of:

- complicated technological cycle and/or
- long manufacturing period,

could be carried out Quality control as per a Supplier technological documentation (without Quality plan development), which facilitates to control quality of main technological operations.

Major control measures of General contractor on its Suppliers



* Only for safety significant equipment or safety non-significant equipment with complicated and/or long manufacturing cycle

Acceptance inspection

Acceptance inspection covers (as a minimum) the following stages:

- Check of technological control reporting documentation;
- Visual and (if necessary) measurement control of products;
- Check of product completeness for compliance with the requirements to completeness under the purchase contract;
- Check of painting, preservation, marking of products (for equipment - also packing) for compliance with the requirements of the purchase contract;
- Check of completeness and execution of accompanying and technical documentation for compliance with the requirements of the purchase contract;
- Issuing of Acceptance inspection Certificate.

Acceptance inspection results

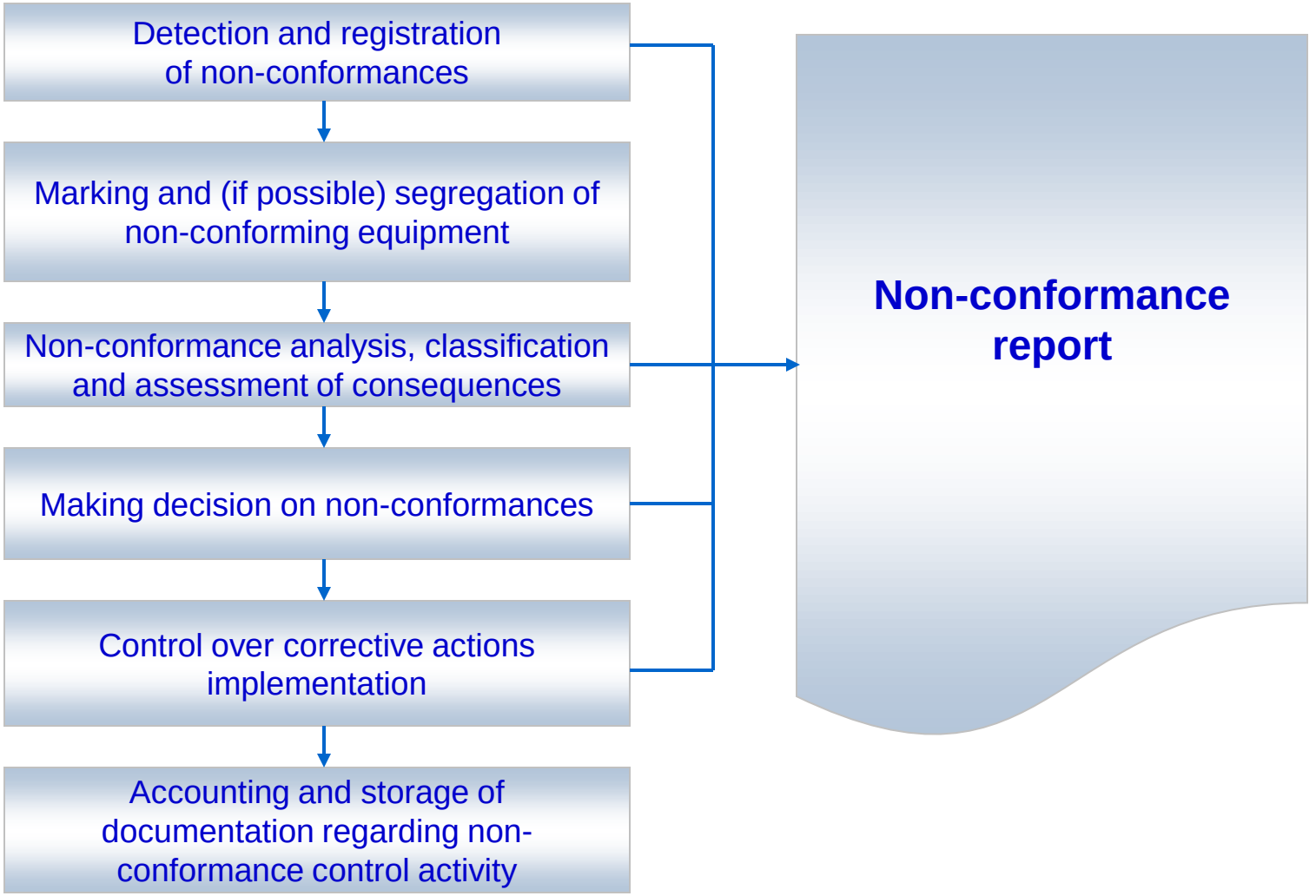
If acceptance inspection ***result is positive*** – Quality plan is signed (for safety significant equipment) and Acceptance inspection Certificate is issued.

If acceptance inspection ***result is negative*** – Supplier has to eliminate comments, stated in Acceptance inspection Conclusion) and repeated inspection has to be carried out.

After acceptance inspection for equipment is completed, if necessary inspection of compliance between equipment fastening on a vehicle and contractual requirements is carried out.

Non-conformance control

Activity on non-conformance control includes the following stages:



Preliminary NCR format

ОТЧЕТ О НЕСООТВЕТСТВИИ №
NON-CONFORMANCE REPORT No ..... (идентификационный номер отчета) (Report Identification No.)

Наименование Поставщика/ Name of Supplier:	**Наименование завода-изготовителя/ Name of Manufacturer:**		
Контракт № / Contract No (номер Контракта с ИКАЭЛ) (number of Contract with NPCIL)	**Контракт № / Contract No** (номер Контракта с Заказчиком) (number of Contract with the Customer)	**Цех № Shop No.**	**АЭС (наименование) NPP (name)**
Наименование изделия: Name of Item:	**Наименование части изделия/ Name of item part of component:**		
Заводской номер изделия: Item Manufacturer's No.:	**Идентификационный номер части изделия: Identification No. of the item part or component:**	**Дата/Date:** /ставится дата регистрации (открытия) отчета/ /report registration (opening) date shall be put/	**стр./Page** **из/of**
Чертеж/Drawing			
Описание несоответствия/ Non-Conformity Description: /приводится описание несоответствия и/или эскиз/ Возможна ссылка на Приложение к Отчету /non-conformity description and/or sketch is presented/ It is possible to refer to Appendix to the Report	**Решение по несоответствию/ Decision on Non-Conformity:** ПРИНЯТЬ БЕЗ ИЗМЕНЕНИЙ ☐ ACCEPT AS IS ПРИНЯТЬ С КОММЕНТАРИЯМИ ☐ ACCEPT WITH COMMENTS ПЕРЕДЕЛАТЬ ☐ REWORK ЗАБРАКОВАТЬ ☐ REJECT	**Номер Плана качества: Quality Plan No:**	**Номер и наименование операции по Плану качества (при необходимости): Number and name of operation as per Quality Plan (if necessary)**
		Инструкция/ Instruction: /приводятся инструкции по выполнению переделки или техническое обоснование/ Возможна ссылка на Приложение к Отчету. /instructions on repair, rework or engineering justification shall be presented/ It is possible to refer to Appendix to the Report.	
Подпись/ Signature: /подпись (с расшифровкой Ф.И.О.) должностного лица завода-изготовителя, подтверждающего описание несоответствие/ /signature (and full name) of the Manufacturer's official, who confirms the non-conformity description/	**Подпись/ Signature:** /подпись (с расшифровкой Ф.И.О.) должностного лица завода-изготовителя, принимающего решение по несоответствию/signature (and full name) of the Manufacturer's official, who takes a decision on non-conformity		
Тип несоответствия/ Non-Conformity Type: /приводится тип несоответствия 1,2,3,4/ /non-conformity type 1, 2, 3, 4 is indicated/	**Тип подтверждаю/ The type confirmed by:**	/подпись (с расшифровкой Ф.И.О.) должностного лица завода-изготовителя / signature (and full name) of the Manufacturer's authorized official /подпись (с расшифровкой Ф.И.О.) уполномоченного лица Поставщика//signature (and full name) of the Supplier's authorized official /подпись (с расшифровкой Ф.И.О.) представителя Заказчика/signature (and full name) of the Customer's representative	
Комментарии проектировщика (конструктора) оборудования относительно решения: Equipment Designer's Comments Pertaining to the Decision: /Заполняется для несоответствий любого типа. Возможна ссылка на документ организации-проектировщика, прилагаемый к Отчету. Для несоответствий 3 и 4 типов обязателен комментарий генерального проектировщика/ /To be filled for non-conformances of any type. It is possible to refer to the designer's document attached to the Report. The comments of the General Designer shall be provided for non-conformances of types 3 and 4/			

Non-conformance control

Activity on non-conformance control is aligned with graded approach, which is based on relative significance of non-conformance influence onto NPP safety and reliability.

Non-conformances classification is defined on the basis of requirements set in contracts and standards of the Customer.

As a result of information about non-conformance of equipment or process with the requirements imposed the following decision can be taken:

- **Reject.**
- **Accept with comments or Rework (repair).**
- **Accept as is.**

Corrective and preventive actions

For implementing decisions made a Corrective action plan is to be developed. This Plan can also include actions taken by a supplier for prevention of same nature NC occurrences. Corrective actions should be adequate to the equipment safety significance.

Information on NC management is entered into Suppliers Database and is an input for supplier's re-evaluation in case of serious, safety significant or repetitive NCs.

Thank You for Attention!

Elena Miryuschenko
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