

Unclassified

NEA/CNRA/R(2003)4



Organisation de Coopération et de Développement Economiques
Organisation for Economic Co-operation and Development

06-Oct-2003

English text only

**NUCLEAR ENERGY AGENCY
COMMITTEE ON NUCLEAR REGULATORY ACTIVITIES**

NEA/CNRA/R(2003)4
Unclassified

Working Group on Inspection Practices

NUCLEAR REGULATORY INSPECTION OF CONTRACTED WORK SURVEY RESULTS

JT00150867

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NUCLEAR ENERGY AGENCY

The OECD Nuclear Energy Agency (NEA) was established on 1st February 1958 under the name of the OEEC European Nuclear Energy Agency. It received its present designation on 20th April 1972, when Japan became its first non-European full Member. NEA membership today consists of 28 OECD Member countries: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, Norway, Portugal, Republic of Korea, Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The Commission of the European Communities also takes part in the work of the Agency.

The mission of the NEA is:

- to assist its Member countries in maintaining and further developing, through international co-operation, the scientific, technological and legal bases required for a safe, environmentally friendly and economical use of nuclear energy for peaceful purposes, as well as
- to provide authoritative assessments and to forge common understandings on key issues, as input to government decisions on nuclear energy policy and to broader OECD policy analyses in areas such as energy and sustainable development.

Specific areas of competence of the NEA include safety and regulation of nuclear activities, radioactive waste management, radiological protection, nuclear science, economic and technical analyses of the nuclear fuel cycle, nuclear law and liability, and public information. The NEA Data Bank provides nuclear data and computer program services for participating countries.

In these and related tasks, the NEA works in close collaboration with the International Atomic Energy Agency in Vienna, with which it has a Co-operation Agreement, as well as with other international organisations in the nuclear field.

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COMMITTEE ON NUCLEAR REGULATORY ACTIVITIES

The Committee on Nuclear Regulatory Activities (CNRA) of the OECD Nuclear Energy Agency (NEA) is an international committee made up primarily of senior nuclear regulators. It was set up in 1989 as a forum for the exchange of information and experience among regulatory organisations and for the review of developments which could affect regulatory requirements.

The Committee is responsible for the programme of the NEA, concerning the regulation, licensing and inspection of nuclear installations. The Committee reviews developments which could affect regulatory requirements with the objective of providing members with an understanding of the motivation for new regulatory requirements under consideration and an opportunity to offer suggestions that might improve them or avoid disparities among Member Countries. In particular, the Committee reviews current practices and operating experience.

The Committee focuses primarily on power reactors and other nuclear installations currently being built and operated. It also may consider the regulatory implications of new designs of power reactors and other types of nuclear installations.

In implementing its programme, CNRA establishes co-operative mechanisms with NEA's Committee on the Safety of Nuclear Installations (CSNI), responsible for co-ordinating the activities of the Agency concerning the technical aspects of design, construction and operation of nuclear installations insofar as they affect the safety of such installations. It also co-operates with NEA's Committee on Radiation Protection and Public Health (CRPPH) and NEA's Radioactive Waste Management Committee (RWMC) on matters of common interest.

ABSTRACT

This report presents the WGIP survey on contracted work. The task was undertaken by the WGIP to identify trends and impacts from the use contractors by NPP organisations in member countries. The survey consisted of twenty questions that focused on Licensing, Process Control, Safety issues and other Inspection areas.

TABLE OF CONTENTS

INSPECTION OF CONTRACTED WORK.....	1
ABSTRACT	4
1. EXECUTIVE SUMMARY.....	6
2. COMPILATION OF SURVEY FINDINGS.....	8
2.1 Licensing.....	8
2.2 Process Control.....	9
2.3 Safety Consideration.....	9
2.4 Other Issues.....	9
3. LIMITATION OF THE SURVEY AND POTENTIAL PATHS FORWARD:	11
APPENDIX 1: SURVEY QUESTIONS	12
Contracted Work - Survey Questionnaire.....	12
APPENDIX 2 TABULATION OF SURVEY RESPONSES	14
Contracted Work - Initial Short Survey; Summary of answers	27
APPENDIX 3 - COMPLETE RESPONSES.....	29
BELGIUM	29
CANADA	34
CZECH REPUBLIC	39
FINLAND.....	42
FRANCE	47
GERMANY	50
HUNGARY.....	57
JAPAN.....	61
MEXICO.....	64
NETHERLANDS	67
SPAIN.....	71
SWITZERLAND.....	75
UNITED KINGDOM.....	78
UNITED STATES	88

1. EXECUTIVE SUMMARY

This report presents the WGIP survey on contracted work. The task was undertaken by the WGIP to identify trends and impacts from the use contractors by NPP organisations in member countries. The survey consisted of twenty questions that focused in four areas:

1. Licensing
2. Process Control
3. Safety issues
4. Other issues

Fourteen member countries completed the surveys compiled. The Appendixes to this document include the Survey Questionnaire, a tabulation of the received answers, and the text of received answers. The survey indicates that the NPP licences in all surveyed countries use contractors. The spectrum of contracted activities includes Maintenance, Inspections, Engineering and Analytical services. Management and Operator tasks are not contracted out.

The following summarises the survey findings in each focus area:

- **Licensing:** In general no specific laws and regulations apply to the use or qualification of contractors. Single exception to this rule is the area of pressure boundary where in some countries the contractor is required to be register. In all surveyed countries the licensee maintain the responsibility for safety in relation to work performed. The contractor liability is commercial in nature and limited by the contract. The survey results indicate that all respondent Regulatory Bodies rely on licensee to have policies for dealing with contractors.
- **Process Control:** The responses on observed licensee policies indicate that process control activities span the areas of contractor qualification, supervision of quality and the inspection of work. In several countries licensees form user groups that qualify and verify contractor capabilities. The majority of respondents indicated that the licensees maintain updated lists of qualified contractors. In some of these countries the regulator audits to verify that the licensee maintains QA programmes governing contractor work. These Quality Assurance (QA) programmes often refer to national or international standards. Half of respondents reported examples of the contractors' inability to deliver on their contractual obligations. Contractor proprietary documents related to the object of the contract are in general reported to be part of the turnover received by the licensees per contract terms. Regulatory inspections of contractor work are in general similar to inspections carried on work conducted by the licensees.

- **Safety Considerations:** Approximately half of respondents identified problems on net loss of knowledge for the nuclear industry as a result of increased reliance of contractors. There were multiple responses identifying examples of contractor incompetence that affected the plants' safety case. The regulators rely on the licensee screening the contractors' performance by inspecting the completed work. A majority of regulatory bodies plan no changes in covering the use of contractors. Exceptions are the UK, Finland, and Japan.
- **Other Issues:** This section was intended to allow respondents to identify contractorisation issues that were not covered by the questions in the other three focus areas above. The survey participants as outlined in this report identified a significant number of other issues. There was no underlying theme or trend to characterise these issues.

Trending the extent of contractor use and associated impacts is not conclusive. The scatter of survey data is caused by the wide spectrum of activities that contractors are engaged. Each area has distinctly unique safety issues and challenges. No commendable practices can be extracted from the survey data.

WGIP considered the need for additional work on the issues associated with the use of contractors and agreed that such work will be beneficial. Proposals for such future work included:

1. Survey the impacts from use of contractors in specific areas of licensee activities (e.g., maintenance, construction, analysis, design) and define by the survey the issue associated with the use of contractor in each of these activities and how the impacts from using contractors in each specific area are managed.
2. Survey for specific impacts from contractorisation. Ex. Management and preservation of knowledge, Change Control.
3. Focus on regulatory inspections capable of assessing licensee competence to provide adequate oversight of the nuclear safety aspects of the contractor work.

In a subsequent discussion WGIP members agreed that the licensee's ability to maintain control on the nuclear safety aspects of the contractor represents a safety concern that cuts across the spectrum of contracting activities. This was identified as a topic where additional WGIP work may bring useful insights to the inspection challenges associated with contractor work. It was further concluded that the original task associated with the survey be considered complete and that a working group undertakes a new task in this area of work. This task should identify the elements and processes that are necessary for the licensee to maintain Control of Nuclear Safety aspects of the contracted work and also to identify inspections that would allow the regulator to seek assurances of the adequacy of such controls. The project will draw on information provided from this later survey and also from previous CNRA work. The WGIP recommendation for future work focuses on defining inspection that could assess the competence of the licensee to:

- Ensure that requirements concerning nuclear safety issues are clearly expressed in a contract
- Determine that a contractor is dealing with these issues during provision of the contract.
- Assess whether the deliverables meet the original specified of nuclear safety requirements

2. COMPILATION OF SURVEY FINDINGS

2.1 Licensing

In countries surveyed, there were no specific laws applying directly to contractors, but some have specific laws pertaining to licensees or utilities companies that indirectly apply to contractors. For example, pressure-retaining components/vessels are subjected to regulations in some countries.

Services of contractors are used in all countries surveyed. Maintenance, special tools, engineering services for modifications are the more common activities contracted out. Most countries assure that management and operators tasks are not contracted out. The survey tried to identify if the extent of use of contractors had changed over the years. Responses indicated that there is no net trend regarding the extent of contractors usage. Some countries have seen an increase, others a decrease, and in some cases there is no been no noticeable change in the last 5 years.

The majority of respondents impose Quality Assurance (QA) requirements on contractors. In some cases, licensee QA programmes have to be respected by contractors. Of course, the programmes involve using standards and procedures. In some of these cases international standards are applied.

In all submissions received, licensees are responsible for safety; this appears to affect the extent of licensees monitoring the contractors in the delivery of services or components.

All Respondents indicated that there are internal policies at the utilities they regulate for dealing with contractors. In more than one country, licensees form users groups that qualify nationally or at least verify centrally the abilities of potential contractors.

Generally, licensees control the work at the planning stage, during the work and during a final inspection.

Regulatory bodies reported that licensees control work by assigning supervisors to the contractor job sites. Some licensee have their staff identify stop, witness or hold points and allow inspection by utility personnel where licensee staff are not monitoring contractors on a full-time basis.

It was assumed in the design of the survey that licensees ran the risk of losing competence if they relied on contractors extensively, in times of economic reorganisations and restructuring. The question asking how the licensees maintained their competence and capability as a whole when using contractors, was not well understood, or was a bad question. One respondent made the statement that licensees had the competence, but were simply too lean in resources to complete contracted work.

The liability of contractors is very clear in the majority of countries, and is generally defined in the contract and limited to it.

2.2 Process Control

The vast majority of respondents stated that their licensees maintain an updated list of qualified suppliers. Either, the licensees, operators, owners or users groups verify QA programmes of suppliers/contractors; regulatory bodies don't review them, but many regulatory bodies verify that licensees audit their suppliers/contractors and maintain the above lists.

Respondents stated that in their opinion, licensees received their requested proprietary documents from their contractors and suppliers, as cited in the contracts; yet in some cases, regulatory bodies cited that there were difficulties. The survey reported that there is no difficulty in obtaining operating procedures or maintenance procedures for systems or components. As per requirements of the QA programme, there is no difficulty in obtaining the necessary materials certificates.

Regulatory bodies have stated that they did not generally inspect the work of contractors differently from how they do for the work done by licensees; although in some cases, the frequency or scope differed. In other cases regulatory bodies also added the verification that licensees processes were followed.

About half of the respondents had at least one example of contractors' inability to complete their contract due to problems that developed in the course of the work. Three respondents had examples of contractors incompetence in understanding safety issues associated with their work.

2.3 Safety Consideration

Non-conformances are generally established during the final inspection; licensees either force the contractor to resolve them itself or if necessary through the combined effort of the licensee and the contractor.

Most respondents simply stated that their inspection programme and set of guides and rules assured that licensees had the knowledge to select the best contractor, ensure QA requirements are met, has the capability to operate and maintain contracted equipment or services and can monitor the quality of the completed work.

About half of the respondents stated that they had seen a net loss of knowledge in the nuclear industry. At least two regulatory bodies are taking actions to cover this situation. One respondent noted this was a possibility in the future.

2.4 Other Issues

While the majority of regulatory bodies do not plan any changes covering the area of inspection of contractors, three regulatory bodies indicated changes were ongoing.

Issues not covered by the survey questions, but mentioned by respondents at least once, are:

- main contractors are going out of operation due to restructuring;
- relative permanence of some contractors on sites;
- understanding the language of contractor instructions;
- some one-time contracts treated as commissioning;

- availability of spare parts; suppliers not maintaining their nuclear registration;
- knowledge management is a concern after many retirements and early retirements;
- leasing the operation of a nuclear plant to another company could result in different issues;
- the use of contractors for large functions at sites such as Health Physics, writing safety cases;
- licensees forming alliances or partnerships;
- contractors for management functions;
- unclear status of workers from parent or subsidiary companies, working at licensees;
- concerns expressed about the use of architect engineers;
- language problem;
- large fraction of station dose given to contractors;
- the possible loss of safety culture when using contractors in areas of operation and management;
- net loss of knowledge such as seen for turnkey projects.

WGIP may want to explore these issues if they become more common and require further discussion.

3. LIMITATION OF THE SURVEY AND POTENTIAL PATHS FORWARD:

The analysis of the survey results indicates a significant scatter of responses. This scatter prevents trending or exact conclusions to be drawn. Part of this originates from the diversity of activities that contractor work covers (e.g., design, safety analysis, construction fabrication, outage maintenance, support services). The corresponding safety concerns differ as widely as the nature of the object of the contracted work. For example, the safety impact from poor contractor workmanship in Construction presents unique challenges that cannot be reviewed, or correlated with the types of safety problems emerging from contracting out safety analysis (i.e.; loss of knowledge of the safety case).

Potential directions for future work are to limit the focus to areas that can provide significant uniformity of issues. Two suggested directions for further investigating this topic could be:

1. Survey the impacts from use of contractors in specific areas of licensee activities: maintenance, construction, analysis, design and define by the survey the issue associated with the use of contractor in each of these activities and how the impacts from using contractors in each specific area are managed.
2. Focus the survey on specific impacts from contractorisation. Ex. Management and preservation of knowledge, Change Control.

APPENDIX 1: SURVEY QUESTIONS

Contracted Work - Survey Questionnaire

Draft Definition for contractor: An independent company performing a design, maintenance, operation, test, installation or modification at the nuclear plant, on behalf of the licensee, by contract, or service for the licensees.

Licensing

1. Briefly state your national **policies** or practices, laws and licensing requirements for the use of contractors by licensees?
2. Are the services of contractors used in your country, and has the **extent** of their use changed a lot over the last 5 years?
3. Are contractors subjected to any **requirements**, standards or procedures?
4. Who is responsible for the **overall safety** of the “contractor installed system/component” or “contracted service” at the nuclear power plants in your country? Who is accountable for the work done by contractors?
5. Do licensees have **internal policies** and procedures for dealing with contractors? Briefly describe.
6. a) How does the licensee **control the work** by the contractor? Briefly state at what **stage(s)**.
b) How do the licensees maintain their competency and capability as a whole when using contractors?
7. Are the contractors **liable** for their work?

Process Control

8. Are contractors following **QA** standards or procedures?
9. Does the licensee or regulatory body maintain a list of **qualified suppliers**; does the regulatory body or licensee inspect the QA programmes of contractors?

10. Is there a requirement for the contractor to **submit drawings** or proprietary documents? Are there any difficulties in the availability of design or technical information, documents or drawings from contractors, compared to licensee performed work?
11. Does the regulatory body **inspect** the contractors work any **differently** than licensee work?
12. Do you have any examples where a contractor was **unable to follow-up** after problems following a contract? What was done subsequently?
13. Do you have any examples where the licensee did not seem to **understand the safety issues** associated with contractor work?
14. How do licensees assure that contractors have sufficient **knowledge**, training, equipment and safety awareness?

Safety Considerations

15. Does the licensee or contractor perform final inspections, and how are **non-conformances** being dealt with?
16. Does the contractor **supply** operating and maintenance manuals for new constructions? Is there a requirement for materials inspection, analyses, certification?
17. How does the regulatory body ensure that the licensee has enough **knowledge to select** the right contractor, to select the right QA requirements, to operate or maintain contracted equipment or services and monitor the quality of completed work?
18. Has the use of contractors resulted in a possible net **loss of knowledge** for the industry, and how has the regulatory body in your country reacted to this possible outcome?

Other issues

19. Are there any regulatory requirement **changes** likely to occur in the near future in your country on that issue?
20. State in a few words any **other** important issue(s) not covered by the questionnaire.

APPENDIX 2 TABULATION OF SURVEY RESPONSES

1. Briefly state your national policies or practices, laws and licensing requirements for the use of contractors by licensees?

COUNTRY	RESPONSES
Belgium	none relating to contractors specifically, except for in-service inspection of PRCs of SRSs, on the pressure vessel decree
Canada	yes, specific standard that applies through the licenses on the use of contractors
Czech Republic	According to Atomic Act: Whoever performs practices related to nuclear energy utilisation or radiation practices shall proceed in such manner that nuclear safety and radiation protection are ensured as a matter of priority and must have an implemented quality assurance system.
Finland	Part of Nuclear Energy Decree, reg. guides (YVL)
France	yes...
Germany	by social law not limited to nuclear sector (deals with payment, training, security, QA)
Hungary	none specifically
Japan	Electric Utility Industry Law applies to contractors; licensees establish a regulated system which involves the contractors
Mexico	none relating to contractors specifically
Netherlands	IAEA Safety Series 50
Spain	new Royal Decree states that contracts trigger inspection by RB of the contractor
Switzerland	none relating to contractors specifically
United Kingdom	no specific law or regulations for contractors Reg. Body has an internal guidance on contractorisation, designed for inspectors; License condition 26 relates to and places responsibility for control and supervision of operations, includes contracts
United States	none specifically

2. Are the services of contractors used in your country, and has the extent of their use changed a lot over the last 5 years?

COUNTRY	RESPONSES
Belgium	used extensively; outages, special tools & knowledge, FH, NDE, modifications no change in extent in last 5 years
Canada	increase over the last 5 years services in engineering, specialised maintenance services
Czech Republic	The service of contractors is used in Czech republic in all stages of NPP life. As the Czech Atomic Act was changed in 1997 together with implemented decrees, the extent of use contractors has been also changed. The changes are not significant.

Finland	some non-destructive testing
France	engineering, maintenance no change in extent in last 5 years
Japan	used... No change in last 5 years
Germany	all categories except operation, extensive use; even a decrease in operating personnel seen increase in extent in last 5 years
Hungary	less operator personnel, reliance in maintenance and modifications increased use in last 5 years
Mexico	maintenance, modifications, welding, excludes operation decreasing extent over time
Netherlands	engineering, security, maintenance increasing slightly in core programmes
Spain	engineering, support, manufacturer, installation, inspection, testing, QA, maintenance, training; not management or operation no change in extent in last 5 years
Switzerland	Engineering, modifications, analysis, PSAs licensees maintain core competence decreased for smaller contractors, maintained for larger contractors
United Kingdom	Increase in time many different areas...

3. Are contractors subjected to any requirements, standards or procedures?

COUNTRY	RESPONSES
Belgium	licensees issue contractor an information package...
Canada	requirements on contracts, and QA requirements for nuclear services on N286, and lower tier standards Z299 series
Czech Republic	The contractors are subjected to Atomic Act requirements that are applied by licensee by audits. The technical safety requirements of nuclear safety related equipment are subjected to technical safety authority, which performs its own inspection and licensing work.
Finland	requirements in QA from STUK in regulatory guides, license nationally, qualification testing,
France	requirements on contracts, QA ministerial order 1984, ISO 9002, audits by EdF central services workers qualifications required

Germany	qualified for profession; trained per Federal Personnel Qualification Guidelines cleared for security by RB as a Federal Ordinance trained by licensee in specific aspects, plant training on safety, RP, FP
Hungary	requirements in regulatory safety code series 14 reg. safety guides dealing with QA requirements licensee must elaborate internal rules (based on regulatory guides) for selection of contractors
Japan	to QA guidelines within scope of self-safety regulations, and JEAG series guidelines for QA (programme, planning, procurement)
Mexico	meet licensee QA requirements, international standards and procedures
Netherlands	licensee imposes requirements, standards and procedures
Spain	see Q1, the Decree and CSN SG 10.8, which states that contractor must meet Standard UNE 73:401-95; need a QA manual, procedures, to be approved by the licensee.
Switzerland	meet licensee QA requirements, standards and procedures
United Kingdom	meet licensee QA requirements
United States	meet NRC requirements for QA

4. Who is responsible for the overall safety of the “contractor installed system/component” or “contracted service” at the nuclear power plants in your country? Who is accountable for the work done by contractors?

COUNTRY	RESPONSES
Belgium	Licensees are.
Canada	Licensees are.
Czech Republic	The licensee is generally responsible for the safety of all NPP systems and components.
Finland	Licensees are.
France	Licensees are.
Germany	Licensees are.
Hungary	Licensees are. Licensee accountable for the work of their contractors
Japan	Licensees are.
Mexico	Licensees are.
Netherlands	Licensees are.
United Kingdom	Licensees are
Spain	Licensees are.
Switzerland	Licensees are.
United States	Licensees are.

5. Do licensees have internal policies and procedures for dealing with contractors? Briefly describe.

COUNTRY	RESPONSES
Belgium	Yes through procedures; see Q14
Canada	Yes, requirement by Canadian standard N286.1, for all activities
Czech Republic	The licensee has established audit procedures in its QA system. Audits on contractors are performed regularly. The licensee issues the list of organisations and producers that are proved by audits.
Finland	Yes, licensee audits QA of the contractor; contractor uses QA of the licensee
France	Yes, through EdF central services, trend is to qualify nationally a contractor
Japan	Yes, under utility QA programme; utility requests documents and audits contractors
Germany	Yes; safety & Quality policies, QA regulatory, procedures
Hungary	Yes; Safety Policies and Quality Policies, QA rules and procedures
Mexico	Yes; QA Programme Chapter VII for procurement, services
Netherlands	Yes, as per Code and Safety Guide of IAEA, procedures for procurement
Spain	criteria in 10-CFR50, IAEA safety guides and reg. body guides licensees created a utilities QA owners group to assess contractors and suppliers
Switzerland	Yes
United States	yes, in 10 CFR50

6a. How does the licensee control the work by the contractor? Briefly state at what stage(s).

COUNTRY	RESPONSES
Belgium	licensees inspect at hold & witness points, or permanent QC auditor supplied by licensees
Canada	licensees prepares work statement, implements a quality programme, for procurement, visits contractors in the planning process, audit, inspects at hold/stop points at times, works in teams with licensees
Czech Republic	licensee can supervise the work of contractor in all stages. The stages of design and production are supervised through assessing of documents and temporarily by inspection.
Finland	licensee verifies capability, qualifications, controls and adherence to QA plan
France	through a central services(EdF) work supervisor on site
Germany	supervision of the work, review of work results; QA is integral part of work package, defined in the contract
Hungary	inspection to control quality of work, conformance to plans and contract
Japan	licensee supervise contractors, implement confirmation and audit
Mexico	licensees provides co-ordinator, follows daily, reviews document package licensees QC contractors
Netherlands	licensees audit, inspects at hold/stop points, evaluates at end of job
Spain	before signing contract, before, during and after work, follow final inspection

Switzerland	licensees audit, inspects at hold/stop points at times, works in teams with licensees
United States	planned and periodic audits and inspections of suppliers and contractors

6b. How do the licensees maintain their competency and capability as a whole when using contractors?

COUNTRY	RESPONSES
Belgium	see Q18
Canada	through the control of a Design Authority
Czech Republic	he licensee has maintenance programme and prepares annual modification programme. The contracts for those activities, which are to be realised by contractors are prepared and assured by determined department and staff.
Finland	through the control of the contractors and training
France	monitoring contractors on 3 year period training/retraining workers nation-wide, to maintain safety qualification
Germany	qualification and training remain responsibility of plant staff, regardless use of contracts
Hungary	included in the contracts, contractors assure insight.
Japan	JEAG specifies that utilities train personnel involved in activities influencing quality.
Mexico	by qualifying the contractors (their QA) or inspection of the QC for commercial grades.
Spain	knowledge not lost since licensees are capable, but too lean in resources.
Netherlands	refers to IAEA 50-SG-01, licensee must be able to evaluate contractor

7. Are the contractors liable for their work?

COUNTRY	RESPONSES
Belgium	see Q4; licensees are.
Canada	yes, liable to the extent of contract law
Czech Republic	The contractors must be liable for their work. That is checked by audits and inspections of realised works
Finland	yes to products according to contract, inspection bodies for NDT-testing, have a liability assurance
Germany	yes according to the definition of the work
Hungary	yes to contracts
Japan	yes, within scope of contract
Mexico	yes for their work
Switzerland	yes to contracts
Netherlands	not to nuclear act and safety, but yes to financial losses and personal injury
Spain	yes to contracts

United Kingdom	licensees are accountable for the work of the contractors
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8. Are contractors following QA standards or procedures?

COUNTRY	RESPONSES
Belgium	see Q1
Canada	Yes, see Q3
Czech Republic	The QA system requirements related to nuclear safety and radiation protection are defined in Decree. Some of contractors have QA system proved according to ISO 9000 type standards.
Finland	Yes, at all levels
France	Yes
Germany	Yes, integral part of the contract
Hungary	Yes, a prerequisite
Japan	yes, see Q3
Mexico	Yes that of the licensees
Netherlands	Yes that of the licensees
Spain	Yes, follow licensees QA or previously qualified own QA procedures
Switzerland	Yes ISO2000 as a minimum
United Kingdom	yes, see Q3; that of licensees or their own
United States	Yes

9. Does the licensee or regulatory body maintain a list of qualified suppliers; does the regulatory body or licensee inspect the QA programmes of contractors?

COUNTRY	RESPONSES
Belgium	no; follow ASME rules, if licensees qualified as manufacturers, installer, are authorised by a Boiler Pressure vessel inspectorate
Canada	Yes, according to standards, licensees must maintain list; QA programmes inspected by licensees, but also audited by regulator
Czech Republic	The licensee has the list of proven contractors (see par. 5). SUJB inspections include licensees QA system. The objects of inspection are QA programmes approval (QA programme shall be approved prior the modification realisation starts) and observation. The contractors QA system and its realisation may be also inspected.
Finland	Yes, licensees maintain charts RB reviews contractors QA , especially for manufacturing of safety related components
France	Yes - EdF inspects QA programmes of contractors through audits
Germany	Yes licensees keep list qualified contractors through operators group; and audit, along with main supplier Siemens-KWU RB does not inspect QA of contractors

Hungary	Yes, licensees keep a database containing names and most important data of qualified suppliers Yes, licensees audit suppliers periodically, regulatory body supervises this activity, a direct audit by the RB of the suppliers is possible
Japan	yes, inspected QA programmes through audits
Mexico	Yes; licensee inspect contractors QA; regulator audits
Netherlands	Yes; licensee required to inspect contractors QA; regulator audits
Spain	Yes licensees keep a list of qualified contractors through QA owners group; RB reviews some safety-related activities, and procedures by licensees to qualify contractors, and some contractors training in RP, FP.
Switzerland	Yes; licensee inspect some contractors QA; regulator audits
United Kingdom	yes, licensees do (reg. body doesn't), part of their procurement arrangement
United States	Regulators could inspect contractors in cases of allegations

10. Is there a requirement for the contractor to submit drawings or proprietary documents? Are there any difficulties in the availability of design or technical information, documents or drawings from contractors, compared to licensee performed work?

COUNTRY	RESPONSES
Belgium	specified on contract; some difficulty expressed by licensees
Canada	Requirement specified on contracts; there are difficulties in assembly of the design or technical information; regulator established a proprietary library (private library) to ensure availability
Czech Republic	The attachments to the licence applications are mandatory. The documentation (reports, technical documentation including drawings, analyses etc.) to be attached is defined in Atomic Act (art. 13 par. 3) and its appendices. The licensee requires all necessary documents from its contractors for the licence application. The regulator handles proprietary documents in compliance with special law.
Finland	Documents and drawings available (legislated)
France	no answer...
Japan	requirement specified on QA requirements.
Mexico	Established on contract drawings and documents available
Netherlands	Documents and drawings available
Germany	same requirement as for licensee
Hungary	requirements for all documentation available, even if copyrighted this is not a problem
Spain	requirements for drawings and documents to licensees no problems
Switzerland	Requirements for drawings and documents documents required by regulator

United Kingdom	Yes
United States	---

11. Does the regulatory body inspect the contractors work any differently than licensee work?

COUNTRY	RESPONSES
Belgium	inspection of processes at licensees
Canada	mostly the same; differences when auditing the contractor; licensee is advised of problems uncovered with contractor, for the licensee can take action
Czech Republic	The contractor could be inspected by SUJB in those areas, which are defined in Atomic Act and decrees implemented. The only requirement for contractors is implementation of QA system. That is the reason inspection of contractor is different from inspection of NPP licensee, who is obliged to fulfil other specified requirements.
Finland	Yes
France	Yes regulator inspects EdF supervision system over contractors, on top of site direct supervision of contractors
Germany	Yes
Hungary	Yes, the same except for the frequency, and scope...
Japan	Yes
Mexico	Yes
Netherlands	Yes regulator verifies if licensee checked contractor's own procedures
Spain	Yes, but contractors inspections are carried out with the presence of licensees
Switzerland	Yes
United Kingdom	yes, no difference
United States	Yes

12. Do you have any examples where a contractor was unable to follow-up after problems following a contract? What was done subsequently?

COUNTRY	RESPONSES
Canada	Example linked with contractors going out of business
Finland	examples given
France	Yes, contractor was forbidden to continue work at other sites
Germany	No
Hungary	yes, an example of contract terminated and new contractor hired
Mexico	None
Netherlands	None
Spain	No, not occurred yet
Switzerland	some example of unwillingness

	regulator required licensee to take lead
United Kingdom	yes, a contractor giving health physics and safety case services

13. Do you have any examples where the licensee did not seem to understand the safety issues associated with contractor work?

COUNTRY	RESPONSES
Belgium	No; but some shortcomings detected by licensees
Canada	yes one example given
Finland	Yes, example given
France	No
Hungary	No
Japan	no answer
Mexico	None
Netherlands	None and unlikely
Germany	No
Spain	None
Switzerland	None
United Kingdom	yes, many examples

14. How do licensees assure that contractors have sufficient knowledge, training, equipment and safety awareness?

COUNTRY	RESPONSES
Belgium	post job evaluation, 40 questions asked through procedure
Canada	through inspection of potential contractor; selection to meet with procurement standard
Czech Republic	The licensee CEZ, a.s. has QA department to establish, control and supervise internal QA system. One part of QA system is dedicated to assurance of contractors. It includes special questionnaires for audit performance to register the contractor on the list. Contractor's personnel training and testing is required regarding the type of work to be done.
Finland	licensee audits before giving contract, workers go through tests
France	see no 6
Germany	licensees monitor that prerequisite
Hungary	qualification/education are a prerequisite for contractor selection... licensee supervises during contract selection
Japan	see Q9
Mexico	requirements on licensee procedures used the NUPIC system to verify contractor background

Netherlands	see above no 6, 9, 13
Spain	see no 5 & 6
Switzerland	licensees have procedures for selecting new suppliers by controlling work done and performing audits
United Kingdom	see guidance document
United States	see previous answers

15. Does the licensee or contractor perform final inspections, and how are non-conformances being dealt with?

COUNTRY	RESPONSES
Belgium	see Q4; each non-conformance assessed...
Canada	done by licensees and their contractors; non conformance's treated by standard
Czech Republic	The licensee performs final inspection together with contractor. The licensee staff also performs interoperation inspections. The found non-conformances are registered. The corrections are made according to non-conformance's type.
Finland	licensee and/or RB does the final inspection; treatment of non-conformance's as per contract agreement
France	followed up as non-conformance reports
Germany	yes, licensees perform final inspection; non conformance's to be corrected by the contractor
Hungary	yes licensee performs final inspection Dealing with non-conformance's according to procedural prescriptions. Prevention is done before contract.
Japan	in JEAG: utility and contractor together solve non-conformance
Mexico	licensee or contractor does final inspection non conformance's integrated into the licensee corrective action programme
Netherlands	licensee does final inspection regulator forces licensee to correct problems
Spain	final inspection required by contract acceptance by QA programme; non-conformance's integrated to the CAP of the licensee.
Switzerland	licensee does final inspection regulator forces licensee to correct problems
United Kingdom	see guidance document

16. Does the contractor supply operating and maintenance manuals for new constructions? Is there a requirement for materials inspection, analyses, certification?

COUNTRY	RESPONSES
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Belgium	yes, stated in orders or codes (ASME)
Canada	Yes, as per contract and requirements, especially for pressure retaining components
Czech Republic	If specified in contract the contractor also supplies operating and maintenance manuals for new constructions. The requirements for material inspections, analyses and certifications are established in Decree.
Finland	Yes
France	Yes and no; depends on qualification level of the contractor
Germany	Yes
Hungary	Yes (by legal obligation and contract)
Japan	see Q10; if specified on contract
Mexico	Yes through licensee QA programme also ASME Code applies
Netherlands	Yes (requirement of EC)plus through licensee requirements if needed
Spain	Yes, as per QA programme, and when required a quality report, test results, inspections, to control material and services
Switzerland	Yes, plus through licensee requirements
United Kingdom	yes if needed, as a regulatory requirement

17. How does the regulatory body ensure that the licensee has enough knowledge to select the right contractor, to select the right QA requirements, to operate or maintain contracted equipment or services and monitor the quality of completed work?

COUNTRY	RESPONSES
Belgium	through audit of the licensee procurement process
Canada	through inspection of licensee, wrt standard N286.1
Czech Republic	The regulatory body is ensured that the licensee has enough knowledge to select the right contractor and monitor the quality of completed work by statements in QA system and approved QA programmes. The QA requirements are defined in Decree.
Finland	through inspection programme and periodic safety review
France	through inspections (EdF services or/and in the NPPs)
Hungary	yes, see no 3; (safety code and safety guides)
Japan	no; don't inspect
Mexico	through verification of qualification process
Netherlands	through inspection of all licensee activities (see no 6)
Spain	yes through inspections
Switzerland	through approval of org. change, and through plant modification approval
United Kingdom	strategy under preparation, called the Intelligent Customer

18. Has the use of contractors resulted in a possible net loss of knowledge for the industry, and how has the regulatory body in your country reacted to this possible outcome?

COUNTRY	RESPONSES
Belgium	uncertain, as no measures; but early retirements cause concerns on knowledge management set up required
Canada	does not know the answer, regulator has not reacted to possible outcome
Czech Republic	Regulator keeps eyes on the problem. There are no indications of loss of knowledge for industry.
Finland	net loss seen, since reorganisation of a large contractor (Fortum) has some limitations of contracts; more anticipated losses (ABB)
France	No
Germany	not seen yet; regulatory body plans to look at this in the future.
Hungary	No
Japan	no
Mexico	net loss seen NA for regulator
Netherlands	net loss seen contractors not seen as the cause (loss through retirements, uncertainty)
Spain	No; regulatory body continues to review licensee training
United Kingdom	yes, downsizing, retirements, regulatory body, in a management of change consideration, ensures that licensees address the issue and corporate knowledge when they downsize. Problem for the Government in general.

19. Are there any regulatory requirement changes likely to occur in the near future in your country on that issue?

COUNTRY	RESPONSES
Belgium	none
Canada	none
Finland	Yes; revision of YVL guides on pressure retaining components and YVL guides on I&C
France	None for now
Germany	No
Hungary	No fundamental changes
Japan	subject under review...
Mexico	No; no changes expected
Netherlands	No, but adoption of IAEA Safety series 50.
Spain	None
Switzerland	No; no changes foreseen

United Kingdom	yes, principles led to LC36 and Intelligent Customer principles; now working on enforcing these principles
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20. State in a few words any other important issue(s) not covered by the questionnaire.

COUNTRY	RESPONSES
Canada	availability of spare parts; suppliers not maintaining their nuclear registration; knowledge management is a concern after many retirements and early retirements; too early to tell but leasing the operation of a nuclear plant to another company could bring different issues to the surface
Finland	anticipation of net loss of knowledge as turnkey (or black boxes) projects occur.
France	no answer
Japan	in response to JCO, utilities considering to add the audit function of the contractor in the area of employee education
Germany	- closer attention to language problem - large fraction of station dose given to contractor
Netherlands	- relative permanence of some contractors - understanding the language of contractor instructions - some one-time contracts treated as commissioning
Spain	-the overall knowledge loss from the nuclear industry; finding nuclear class material difficult, going to commercial class. -the possible loss of safety culture when using contractors in areas of operation and management
Switzerland	Main contractors are going out of operation due to restructuring. Regulators intend to monitor changes
UK	the use of contractors for large functions at sites such as Health Physics, writing safety cases, licensees forming alliances or partnerships, or management functions; also, the limited scope of the definition of contractor in this survey does exclude workers from parent companies, which could be in hazardous situations if left unattended in the plant also concerned about the use of architect engineers

Contracted Work - Initial Short Survey; Summary of answers

COUNTRY	RESPONSE
Belgium	- site inspected by regulator, regardless of contractor work or licensee work; - contractors subjected to same QA by licensee, requirements on all aspects of work; - qualification of tools used by contractors, inspected by regulator; - regulator inspects methodology used to qualify contractors, assessment by the licensee of the performance of contractors; ISSUE: distinct impression that overall competence is declining.
Canada	- site inspected by regulator, regardless of contractor work or licensee work; - contractors subjected to QA by licensees;

	<ul style="list-style-type: none"> - specific QA for components manufacturers <p>ISSUE: difficulty for licensee to obtain or use contractor models, calculations, drawings for turnkey projects.</p>
Germany	<ul style="list-style-type: none"> - contractors extensive use - contractors subjected to same QA by licensee, requirements on all aspects of work; - licensee group audits and qualifies potential contractors; - contractors trained and qualified similar to licensees; trust worthiness checks; - training reviewed by regulator
Hungary	<ul style="list-style-type: none"> - contractors subjected to same QA by Act (government decree, Atomic Act, Safety Codes), requirements on all aspects of work; - site inspected by regulator, regardless of contractor work or licensee work; - Regulator can initiate changes to licensee QA programme; - Regulator forces licensees to request QA from contractors
Japan	<ul style="list-style-type: none"> - site inspected by regulator, regardless of contractor work or licensee work; - contractors subjected to same QA by licensee, requirements on all aspects of work;
United Kingdom	<ul style="list-style-type: none"> - site inspected by regulator, regardless of contractor work or licensee work; - contractors subjected to QA by licensees; - regulator does not approve QA system; - regulator drafting guidance for inspectors (April 1999); <p>ISSUE: increasing use of contractors, and loss of abilities by licensees in critical areas, such as ability to assess contractor work.</p>
United States	<ul style="list-style-type: none"> - site inspected by regulator, regardless of contractor work or licensee work; - authority for inspection of contractor premises by regulator (not routine) - contractors subjected to same QA by licensee, requirements on all aspects of work;

APPENDIX 3 - COMPLETE RESPONSES

BELGIUM

1. Briefly state your national policies or practices, laws and licensing requirements for the use of contractors by licensees.

Belgian legislation

There are no national legal requirements, except for in service inspection, manufacturing, repair and replacement of pressure retaining components of safety related systems.

For these systems, as the Belgian boiler and pressure vessel decree did not make any difference between nuclear and non nuclear boilers, a special ministerial decree was issued to allow for the use of nuclear codes (ASME Boiler and Pressure Vessel Code, sections III, VIII and XI, and American Standard ANSI B 31.1 in particular) instead of the technical requirements for classical boilers.

A document, the so-called “Transposition of the regulatory aspects of the ASME III and XI codes to Belgian level” defines the administrative rules applicable to in service inspection, manufacturing and repair and replacement activities related to safety systems and components and describes in detail the tasks and interfaces between AVN and the boiler and pressure vessel inspectorate (BPVI).

Licensing requirements

The Safety Analysis Report (SAR) specifies that each licensee has to define and implement a Quality Assurance Programme (QAP) to maintain quality and safety during the course of operation. The requirements of this QAP are also applicable to contractors. Fulfilment of these requirements needs to be verified on the basis of an examination / audit of the QAP of the contractors. Services provided by contractors with no approved QAP are submitted to the QAP and work procedures of the licensee.

2. Are the services of contractors used in your country, and has the extent of their use changed a lot over the last 5 years?

The utility relies in a relative large extent on the services supplied by contractors, especially during outages, in which up to 80% of the total workload is carried out by contractors. This situation already exists for more than 5 years.

Contractors are called in either if plant staff is not able to handle the workload or if special skills, knowledge or tools are required. Typical activities that are executed by contractors are:

- maintenance activities which require specific knowledge or special tools (e.g. preventive and corrective maintenance on large equipment like main turbo alternator, diesel generators, primary coolant and feedwater pumps; high pressure jet cleaning of heat exchangers; ...);
- handling of fuel assemblies (refuelling; loading of spent fuel casks; reception and storage of new FA);
- inspection activities requiring qualified inspectors (e.g. NDE of pressure vessels, steam generator tubes, welds, ...) or special tools (e.g. NDE of condenser and heat exchanger tubes, ...);
- radioprotection assistance;
- testing activities (e.g. functional tests on fire detection and suppression systems and components; functional tests on snubbers; functional tests on safety valves, calibration of instrumentation; ...);
- realisation of modifications (instrumentation & control, piping, structures, ...);
- house keeping and site security.

3. Are contractors subjected to any requirements, standards or procedures?

Beside the technical aspect (see answer to question 1), contractors need to be aware of the most important organisational aspects and procedures. Therefore, every contractor receives an information pack containing:

- a video tape;
- an accompanying brochure;
- some forms with sample test questions.

The videotape shows essential information about:

- Quality Assurance (this section stresses the importance of thorough work preparation, working with proper and safe tools, hold points and checkpoints, reporting any defaults, suggesting improvements, procedures / instructions or job sheets).
- safety regulations associated with working in an industrial environment;
- safety rules associated with working in the controlled zone.

In order to be sure that all personnel has assimilated this information, every year 20 multiple-choice questions need to be answered.

4. Who is responsible for the overall safety of the “contracted installed system / component” or “contracted service” at the nuclear power plants in your country? Who is accountable for the work done by the contractors?

As in most European countries, the Belgian regulations assign to the licensee the full responsibility for the safe operation of its plant, which must be operated in conformity with the requirements of its license. The director of the NPP is responsible for assuring himself that the design, construction and operation of the NPP meet the relevant safety standards.

Contractors are only responsible for the quality of execution of the tasks mentioned on the work orders. The utility remains responsible for taking the equipment out of service, for tagging it, for work protection and for final work control and equipment re-qualification.

5. Do licensees have internal policies and procedures for dealing with contractors? Briefly describe.

The process for dealing with contractors contains the following steps:

- writing of an order in accordance with the requirements of a written procedure;
- pre-job briefing or kick-off meeting – eventually, training sessions are organised by the utility;
- follow up of the work (witness and hold points);
- final work control;
- general evaluation (see answer to question 14 for more details).

6a. How does the licensee control the work by the contractors? Briefly state at what stage(s).

Each work is carried out in accordance with a written instruction or procedure. These instructions or procedures state at what stages verifications need to be done by the licensee (witness and hold points). Depending on the type of work, the witness and hold points are pre-established (e.g. preventive maintenance) or defined case by case. In particular cases (e.g. opening and closing of the reactor vessel, refuelling, preventive maintenance on diesel generators), permanent surveillance by an independent QC auditor is provided.

After completion of the work, a final work control is executed.

6b. How do the licensees maintain their competency and capability as a whole when using contractors?

See answer to question 18.

7. Are the contractors liable for their work?

See answer to question 4.

8. Are contractors following QA standards or procedures?

See answer to question 1 “Licensing requirements”.

9. Does the licensee or regulatory body maintain a list of qualified suppliers; does the regulatory body or licensee inspect the QA programmes of contractors?

Until now, only contractors acting as “manufacturer, “installer” or “repair organisation” in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code, sections III and XI, are subjected to formal qualification or authorisation. This authorisation is granted on the basis of their QAP, which scope and implementation need to be reviewed and accepted by the BPVI.

10. Is there a requirement for the contractor to submit drawings or proprietary documents? Are there difficulties in the availability of design or technical information, documents or drawings from contractors, compared to licensee performed work?

Requirements with respect to technical documentation (e.g. quality plan, procedures, drawings, schemes, ...) are stated expressly in the orders.

About difficulties in the availability of design or technical information, documents or drawings, the licensee has reported some shortcomings in the availability of detailed design specifications of originally installed equipment.

11. Does the regulatory body inspect the contractors work any differently than licensee work?

In general, it is the role of the regulatory body to make sure that an adequate level of safety is maintained.

This is achieved by, among others, “permanent” surveillance through periodic inspections. The goal of these inspections is to verify compliance with the license (and SAR), as well as the licensee’s safety organisation and culture.

One of the topics covered by the periodic inspections is the procurement of purchased items and services.

These inspections are focused on:

- the methodology and procedures used to qualify or certify contractors;
- the assessment by the licensee of the performance of contractors;
- the identification of weaknesses in the QAP;
- the definition, implementation and follow-up of corrective actions.

Specific inspections are conducted in case of particular events. These events may concern as well as licensee as contractor work.

12. Do you have any examples where a contractor was unable to follow-up after problems following a contract? What was done subsequently?

Please clarify this question.

13. Do you have any examples where the licensee did not seem to understand the safety issues associated with contracted work?

It is the opinion of the regulatory body that the licensee is aware of the safety issues associated with contractor work.

However, this does not mean that no problems have arisen when dealing with contractors. In fact, shortcomings have been detected for instance with respect to work preparation, training, follow-up by in-house personnel and final work control

14. How does the licensee assure that contractors have sufficient knowledge, training, equipment and safety awareness?

The assessment by the licensee of the ability of a contractor to execute tasks in conformity with the quality requirements is essentially based on a post-job evaluation. This evaluation is carried out in accordance with a written procedure, in which approximately forty questions are specified. The answers to these questions are given by the contractors and are discussed, eventually amended and evaluated (assigning points from 0 to 5) by the licensee. Low scores (< 2) require the definition of corrective actions. The implementation of these corrective actions is followed up by the licensee.

15. Does the licensee or contractor perform final inspections, and how are non-conformances being dealt with?

As stated already in the answer to question 4, the licensee remains responsible for final work control and equipment re-qualification.

The procedure for dealing with non-conformance's does not depend on who has executed the work. Each non-conformity has to be justified on a safety point of view (if applicable). Non-conformance's related to pressure retaining components of safety related equipments require approval by AVN and / or the BPVI.

16. Does the contractor supply operating and maintenance manuals for new constructions? Is there a requirement for materials inspection, analyses, certification?

Requirements with respect to technical documentation (e.g. operating and maintenance manuals, procedures, drawings, diagrams,) are stated expressly in the orders.

For pressure retaining components of safety related systems, materials inspection, analyses and certification are in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code, section III.

For class 1E electrical equipment and instrumentation, material and equipment certificates are supplied in order to demonstrate compliance with the quality and environmental qualification requirements.

17. How does the regulatory body ensure that the licensee has enough knowledge to select the right contractor, to select the right QA requirements, to operate or maintain contracted equipment or services and monitor the quality of completed work?

It is not the role of the regulatory body to ensure that the licensee has enough knowledge to select the right contractor, to select the right QA requirements, to operate or maintain contracted equipment or services and monitor the quality of completed work.

However, shortcomings with respect to these aspects will be detected through previously mentioned inspection programme and corrective actions will be asked to be taken by the licensee.

18. Has the use of contractors resulted in a possible net loss of knowledge for the industry, and how has the regulatory body in your country reacted to this possible outcome?

We suppose that “industry” needs to be replaced by “utility” or “licensee”.

For the moment being, it is difficult to state on the impact of the use of contractors on the knowledge level of the licensee, due to the lack of appropriate indicators.

However, the possibility of loss of knowledge has recently gained the attention of the licensee and the regulatory body. This is essentially due to the fact that early involved and experienced licensee personnel will retire in the near future. To cope with this problem, a Knowledge Management project has been set up. The aim of this project is first to identify the minimum level of knowledge and competence required and subsequently to make arrangements to assure the preservation of this level.

19. Are there any regulatory requirement changes likely to occur in the near future in your country on that issue?

No.

20. State in a few words any other important issue(s) not covered by the questionnaire.

Nil.

CANADA

1. Briefly state your national policies or practices, laws and licensing requirements for the use of contractors by licensees?

Canada has a national standard (CSA N286.0) which governs the use of contractors by licensees as well as a specific standard, which governs procurement control. The standard is so structured that the owner (N 286.0) can select an architect/engineer to design the plant to N 286.2, select another contractor to do

procurement (N 286.1), another contractor to build (N 286.3). The owner retains responsibility for ensuring the programmes interface and information is fed forward and backward.

In operating plants, the Nuclear Power Plant Licence issued by the CNSC specifies that the licensee must establish and maintain a Quality Assurance programme that meets the requirements of the CSA N286 series of standards. The design standard (CSA N286.2) addresses the selection of the quality programme requirements for design contractors. The procurement standard (CSA N286.1 “Procurement Quality Assurance for Nuclear Power Plants”) addresses the evaluation, bid review, contract award, and subsequent control of contractors. The contractor is responsible for the control of any subsequent sub-contracts through the procurement requirements of CSA Z299.

2. Are the services of contractors used in your country, and has the extent of their use changed a lot over the last 5 years?

Yes, the services of contractors are used in Canada. The type and extent of services of contractors have increased over the last 5 years for the multi-unit stations in Canada. Due to the planned privatisation of the Ontario electricity market the type and extent of services of contractors will increase for the multiple-unit stations in Canada. Also, there are indications that the type and extent of services of contractors will increase for the single-unit stations in Canada.

The single unit stations are currently considering major refurbishment programmes, which will be carried out by a contractor.

The leasing of the Bruce facility to Bruce Power may result in several OPG divisions that provide services to OPG and Bruce Power (periodic inspection, technical services, nuclear waste management...) becoming independent contractors supplying services to both organisations

3. Are contractors subjected to any requirements, standards or procedures?

Yes, contractors are subject to the requirements of the contract and any referenced standards or procedures. The Canadian Standards Association N286 series of standards is the regulatory requirement for the quality assurance programmes for licensees. The second-tier CSA Standard N286.1, which covers procurement quality assurance, specifies the application of one of the CSA Z299 standards or other appropriate quality assurance standards to contractors.

4. Who is responsible for the overall safety of the “contractor installed system/component” or “contracted service” at the nuclear power plants in your country? Who is accountable for the work done by contractors?

The licensee is responsible for the overall safety of the “contractor installed system/component” or “contracted service” at the nuclear power plants in Canada.

The licensee is accountable for the work done by contractors.

5. Do licensees have internal policies and procedures for dealing with contractors? Briefly describe.

Yes, licensees have internal policies and procedures for dealing with contractors. The CNSC evaluates the licensee’s quality programme to confirm that the policies and procedures satisfy the requirements of CSA

N286.1. The second-tier CSA Standard N286.1 specifies requirements for the organisation and execution of the procurement function. These requirements apply to the procurement of items and services such as designing, purchasing, manufacturing, constructing and installing, commissioning, operation, and decommissioning of safety-related equipment and systems in a nuclear power plant.

6. a) How does the licensee control the work by the contractor? Briefly state at what stage(s).

The licensee controls the work by the contractor by implementing a quality assurance programme in accordance with the requirements of CSA Standard N286.1, Procurement Quality Assurance for Nuclear Power Plants.

The licensee is required to

1. Clearly specify requirements
2. Evaluate potential contractors
3. Confirm that they meet technical and quality requirements
4. Monitor activities during contract performance

6.b) How do the licensees maintain their competency and capability as a whole when using contractors?

One of the methods used by licensees to maintain their competency and capability as a whole is through the control of a Design Authority.

The licensee is required to have a “design authority” function that establishes or confirms design requirements, identifies design verification activities and conducts design completion assurance activities.

7. Are the contractors liable for their work?

Contractors are liable for their work to the extent of contract law.

8. Are contractors following QA standards or procedures?

Yes. Refer to the answer to question number 3.

9. Does the licensee or regulatory body maintain a list of qualified suppliers; does the regulatory body or licensee inspect the QA programmes of contractors?

The licensee maintains a list of qualified suppliers.

Generally, the licensee audits the QA programmes of contractors. However, the QA programmes of contractors are subject to audit by the nuclear regulator.

10. Is there a requirement for the contractor to submit drawings or proprietary documents? Are there any difficulties in the availability of design or technical information, documents or drawings from contractors, compared to licensee performed work?

Yes, there are requirements for the contractor to submit drawings or proprietary documents? Sometimes there are difficulties in the availability of design or technical information, documents or drawings from contractors, however, these are usually resolved through the implementation of a CNSC proprietary documents system.

11. Does the regulatory body inspect the contractors work any differently than licensee work?

Yes and no. The CNSC conducts audits at contractors when required to evaluate a licensee project. The CNSC has audited contractors producing “Fuel String Supporting Shield Plugs”(F3SP) and “Used Fuel Dry Storage Containers”(UFDSC) for utilities. The audits are conducted in the same manner but are different with regard to the need to respect the contractual relationship between the licensee and the contractor. Deficiencies are reported to the licensee instead of the contractor. The licensee must then request correction from the contractor as well as correcting the deficiencies in his own programme which allowed the contractor deficiency to occur.

12. Do you have any examples where a contractor was unable to follow-up after problems following a contract? What was done subsequently?

When the contractual arrangements are in accordance with the standard the licensee will have obtained design requirements, design calculations, design verifications, technical specifications and other technical data required to support subsequent procurement, construction, or commissioning activities. The technical information on the design bases is obtained and stored to support future change analysis or modifications to contractor designs.

There are examples of manufacturers going out of business. In most cases it is possible to identify alternate suppliers using the technical specifications used for the original procurement.

13. Do you have any examples where the licensee did not seem to understand the safety issues associated with contractor work?

Yes. The general contractor for the construction of an isotope production reactor failed to conduct adequate inspections and poor workmanship practices jeopardised the operation of the reactor safety systems. The licensee control of the contractors activities was less than adequate.

14. How do licensees assure that contractors have sufficient knowledge, training, equipment and safety awareness?

The licensees evaluate and select potential suppliers in accordance with the requirements of CSA Standard N286.1, Procurement Quality Assurance for Nuclear Power Plants. The supplier’s capabilities are determined by an assessment of the contractor’s facilities, which may include a pre-contract award survey. The licensee should plan and conduct surveillance or monitoring activities throughout the life of the contract.

15. Does the licensee or contractor perform final inspections, and how are non-conformances being dealt with?

Both the licensee and contractor perform final inspections.

Non-conformance's are dealt with in accordance with the corrective functions requirements of CSA Standard N286.1, Procurement Quality Assurance for Nuclear Power Plants and/or one of the CSA Z299 standards or other specified quality assurance standards.

16. Does the contractor supply operating and maintenance manuals for new constructions? Is there a requirement for materials inspection, analyses, and certification?

Yes, contractors supply operating and maintenance manuals for new constructions

Yes, there are requirements for materials inspection, analyses and certification, particularly for pressure retaining components.

17. How does the regulatory body ensure that the licensee has enough knowledge to select the right contractor, to select the right QA requirements, to operate or maintain contracted equipment or services and monitor the quality of completed work?

The CSA N286.0 standard has specific requirements on training and qualification for all licensee staff. Each licensee has a procedure on the selection of QA programme requirements as part of their QA programme. The CNSC conducts audits of the licensees procurement processes against the requirements of CSA Standard N286.1, Procurement Quality Assurance for Nuclear Power Plants to verify that appropriate documentation is obtained and the quality of completed work is monitored.

18. Has the use of contractors resulted in a possible net loss of knowledge for the industry, and how has the regulatory body in your country reacted to this possible outcome?

CNSC audits have not detected any loss of knowledge for the industry. Licensee's contract out design, maintenance, and construction work but have not lost the capability to do it themselves or accurately specify requirements. In most cases the detailed work is contracted out but verification and peer reviews are done by the licensee.

CNSC staff do not know the answer to this question.

The CNSC has not reacted to this possible outcome.

19. Are there any regulatory requirement changes likely to occur in the near future in your country on that issue?

No. Regulatory requirement changes are not likely to occur in the near future on that issue.

20. State in a few words any other important issue (s) not covered by the questionnaire.

CZECH REPUBLIC

1. Briefly state your national policies or practices, laws and licensing requirements for the use of contractors by electric utilities?

According to Atomic Act §4 par. 3 and 7: Whoever performs practices related to nuclear energy utilisation or radiation practices shall proceed in such manner that nuclear safety and radiation protection are ensured as a matter of priority and must have an implemented quality assurance system. The licensee can contract any other supporting organisations. The contracts are made basically according to Commercial Code with regarding Atomic Act requirements. And vice versa whoever wants to product nuclear safety related items should follow Atomic Act requirements

2. Are the services of contractors used in your country, and has the extent of their use changed a lot over the last 5 years?

The service of contractors is used in Czech republic in all stages of NPP life. As the Czech Atomic Act was changed in 1997 together with implemented decrees, the extent of use contractors has been also changed. The changes are not significant.

3. Are contractors subjected to any requirements, standards or procedures?

The contractors are subjected to Atomic Act requirements that are applied by licensee by audits. The technical safety requirements of nuclear safety related equipment are subjected to technical safety authority, which performs its own inspection and licensing work.

4. Who is responsible for the overall safety of the "contractor installed system/component" or "contracted service" at the nuclear power plants in your country? Who is accountable for the work done by contractors?

The licensee is generally responsible for the safety of all NPP systems and components. The responsibility of contractor is established by written contract.

5. Do licensees have internal policies and procedures for dealing with contractors? Briefly describe.

There is one NPP utility and licensee CEZ, a.s. The utility has established audit procedures in its QA system. The audits for all nuclear safety related item producers are performed regularly in compliance with SUJB Decree No. 214/1997 (QA). The licensee issues the list of organisations and producers that are proved by audits.

6.a) How does the licensee control the work by the contractor? Briefly state at what stage(s).

Licensee can supervise the work of contractor in all stages. The stages of design and production are supervised through assessing of documents and temporarily by inspection. Licensee personnel check the maintenance and testing that is performed in NPP area.

6.b) How do the licensees maintain their competency and capability as a whole when using contractors?

The licensee has maintenance programme and prepares annual modification programme. The contracts for those activities, which are to be realised by contractors are prepared and assured by determined department and staff.

7. Are contractors liable for their work?

The contractors must be liable for their work. That is checked by audits and inspections of realised works.

8. Are contractors following QA standards or procedures?

The QA system requirements related to nuclear safety and radiation protection are defined in Decree No. 214/1997. Some of contractors have QA system proved according to ISO 9000 type standards.

9. Does the licensee or regulatory body maintain a list of qualified suppliers; does the regulatory body or licensee inspect the QA programmes of contractors?

The licensee has the list of proven contractors (see par. 5). SUJB inspections include QA system fulfilment mainly as the responsibility of licensee. The objects of inspection are QA programmes approval (QA programme shall be approved prior the modification realisation starts) and observation. If there are special reasons contractors QA system and its realisation is inspected by SUJB inspectors (art. 39 of Atomic Act).

10. Is there a requirement for the contractor to submit drawings or proprietary documents? Are there any difficulties in the availability of design or technical information, documents or drawings from contractors, compared to licensee performed work?

The attachments to the licence applications are mandatory. The documentation (reports, technical documentation including drawings, analyses etc.) to be attached is defined in Atomic Act (art. 13 par. 3) and its appendices. It is essential for licensee to require all necessary documents from its contractors regardless it is proprietary or not and attach them to the licence application. The proprietary documents are denominated and SUJB staff handles them in compliance with special law.

11. Does the regulatory body inspect the contractors work any differently than licensee work?

The contractor could be inspected by SUJB in those areas, which are defined in Atomic Act and decrees implemented. The only requirement for contractors is implementation of QA system. That is the reason inspection of contractor is different from inspection of NPP licensee, who is obliged to fulfil other specified requirements.

12. Do you have any examples where a contractor was unable to follow –up after problems following a contract? What was done subsequently?

13. Do you have any examples where the licensee did not seem to understand the safety issues associated with contractor work?

14. How do licensees assure that contractors have sufficient knowledge, training, equipment and safety awareness?

The licensee CEZ, a.s. has a QA department to establish, control and supervise internal QA system. One part of QA system is dedicated to assurance of contractors. It includes special questionnaires for audit performance to register the contractor on the list. Contractor's personnel training and testing is required regarding the type of work that is to be done.

15. Does the licensee or contractor perform final inspections and how are non-conformances being dealt with?

The licensee performs final inspection together with contractor. The licensee staff also performs interoperation inspections. The found non-conformances are registered and specified in protocols. The corrections are made according to non-conformance's type and new protocol is issued.

16. Does the contractors supply operating and maintenance manuals for new constructions? Is there a requirement for materials inspection, analyses, and certification?

If specified in contract the contractor also supplies operating and maintenance manuals for new constructions. The requirements for material inspections, analyses and certifications are established in Decree No. 214/1997.

17. How does the regulatory body ensure that the licensee has enough knowledge to select the right contractor, to select the right QA requirements, to operate or maintain contracted equipment or services and monitor the quality of completed work?

The regulatory body is ensured that the licensee has enough knowledge to select the right contractor and monitor the quality of completed work by statements in QA system and approved QA programmes (approved by SUJB). The QA requirements are defined in SUJB Decree No. 214/1997, which is the base for SUJB approval of QA programme

18. Has the use of contractors resulted in a possible net loss of knowledge for the industry, and how has the regulatory body in your country reacted to this possible outcome?

SUJB keeps eyes on the problem. There are no indices of loss of knowledge for industry.

19. Are there any regulatory requirement changes likely to occur in the near future in your country on that issue?

20. State in a few words any other important issue (s) not covered by the questionnaire.

FINLAND

1. Briefly state your national policies on practice, laws and licensing requirements for the use of contractors by licensees?

The national policies for the use of contractors are defined in the Finnish legislation, the Nuclear Energy Decree, and in the regulatory guides called YVL guides.

STUK does not give a general approval or license to produce NPP components to any manufacturer abroad, but the approval is granted for a specific component or a series of components at a time.

For manufacturing, repairing and installation of pressure equipment (pressure vessels and piping) a company in Finland may be generally authorised (licensed) at the request made through the licensee, and only those manufacturers (= contractors) whose ability STUK has assessed (including competence, fabrication equipment and the suitable fabrication space) can be used. STUK gives the written permission. The qualification is assessed in the intervals of three years. The manufacturing must happen under supervision of the competence person.

Approval of manufacturers for all other equipment (pumps, valves, hoisting equipment etc.) is managed as a part of component-specific pre-inspection just like the approval of fabrication abroad. This approval is not given in isolation but in connection with a specific purchase of components. This choice was made in order to avoid work burden at STUK from assessments and approvals, which would not lead to equipment fabrication to NPPs.

Pre-inspection means a review and approval of documentation that provides information on manufacturer and manufacturing methods, and presents the design basis, design features, material specifications, strength analysis, and detailed quality control plans of the component. An approval of the pre-inspection documents is also the authorisation of the manufacturer to produce the component in question.

A pre-inspection is done separately for each safety classified mechanical component, including piping systems, and for selected electrical and I&C systems.

2. Are the services of contractors used in your country, and has the extent of their use changed a lot over the last 5 years?

There are some regular contractors, which carry out particular activities. This kind of contractor is e.g. Fortum Engineering (FE). Due to the organisational changes in Fortum the activity is chanced (reduced).

For NDT (non-destructive testing) there are many companies which are used regularly: ABB, Technical Research Centre of Finland (VTT), Siemens-KWU, and TRC. YIT-POWER is used as the manufacturer of pipelines.

3. Are contractors subjected to any requirements, standards or procedures?

General requirements of QA manuals and requirements of YVL guides are also applied to contractors.

STUK requires the following information on the manufacturer and it is applied also for contractors:

- Description of the manufacturer's QA system.
- Fabrication license issued according to the national practice, or an equivalent demonstration of the manufacturer's qualifications
- Plans and results of qualification tests relating to fabrication procedures (welding, heat treatment etc.) and to testing procedures (ultrasonic, radiographic, magnetic particle, penetrant and eddy current testing)
- References to earlier supplies to NPPs

If this information has been submitted earlier in connection with another component or work from the same manufacturer, it is enough to provide only the changes since the previous submittal.

4. Who is responsible for the overall safety of the "contractor installed system/component" or "contracted service" at the nuclear power plants in your country? Who is accountable for the work done by contractors?

The licensee is responsible for the safety of the nuclear power plant. The employees of the contractor are responsible of the quality of their work and the utility shall control the contractor.

5. Do the licensees have internal policies and procedures for dealing with contractors? Briefly describe.

The licensee audits the quality assurance system of the contractor either regularly or in connection with an order submitted. Contractors shall fulfil requirements in the QA manual of the licensee. Use of contractors, who are previously well known and used before, are preferred.

Auditing the quality assurance system of the contractor

The purpose of auditing is to:

- verify that the measures are in place in compliance with the presented QA system,
- assess the adequacy of the QA with respect to the quality expected from the component,
- assess whether the fabrication and project organisations in question have a capability to supply a product according to specifications.

A possibility for adequate auditing by STUK has to be reserved in the contracts, and it has to provide also a possibility to audit subcontractors if STUK considers such audits necessary.

Each audit is made jointly with licensee experts, thus emphasising the responsibility of the licensee organisation to make its own assessment and to verify the correctness of information it submits to STUK.

6. a) How does the licensee control the work by the contractor? Briefly state at what stage(s).

In case of component manufacturing the licensee controls that the contractor has worked according to the accepted manufacturing plan and all necessary documents exist. In practise there are difficulties in the side of electrical and instrumentation systems and components.

Licensee is responsible to:

- verify that the contractor's (manufacturer) organisation has technical and administrative capabilities for the high quality work
- make sure that qualifications as required by the Finnish regulatory guides are in place
- establish adequate controls as needed to make sure that the approved QA programmes are followed.

6b) How does the licensee maintain their competency and capability as a whole when using contractors?

The licensees maintain their competency and capability through their supervisory role in controlling the work of the contractors. The pre-inspection documentation for all repairs as well as for new equipment and systems must be inspected and approved by the licensee .All important information and experience remains within the licensees.

The licensees have technical departments for different engineering areas. The personnel is continuously trained update their personal know-how.

7) Are the contractors liable for their work?

The inspection body must have a liability insurance. Contractors have usually a product warranty and responsibility for the performance of a product (mechanical components). They are responsible to work according to design plans.

It is not clear, weather there were corresponding warranties in electrical and instrumentation systems and components. In the future the liability insurance will be required from inspection bodies of I&C and electrical components.

8) Are contractors following QA standards or procedures?

QA standards and procedures are required for all the participating bodies and at all levels.

9) Does the licensee or regulatory body maintain a list of qualified suppliers: does the regulatory body or licensee inspect the QA programmes of contractors?

The licensees have charts about competent contractors and the licensee inspects the QA manuals. STUK makes spot checks to the QA manuals. STUK makes a careful review of the QA manuals of contractors, which manufacture equipment important to safety.

In I&C and electrical system only the other utility (Fortum) has a list, but TVO or STUK does not have any lists.

10) Is there a requirement for the contractor to submit drawings or proprietary documents? Are there any difficulties in the availability of design or technical information, documents or drawings from contractors, compared to licensee performed work?

STUK's access to all important design and manufacturing documentation is guaranteed by legislation. In practice no problems exist.

11) Does the regulatory body inspect the contractor work any differently than the licensee work?

There is no difference in the inspection practices of contractors and the licensee.

12) Do you have any examples where a contractor was unable to follow-up after problems following a contract? What was done subsequently?

In connection with the plant modernisation process the steam generators of TVO's reactors were designed and manufactured by a company different than the original designer. Clear deficiencies in the supply of the necessary design information to the new designer caused thermally induced cracking in the core water supply piping. Additional corrective measures were carried out and additional inspections are needed annually.

There has also been problems with contractors in the qualification of programmable I&C systems.

13) Do you have any examples where the licensee did not seem to understand the safety issues associated with contractor work?

The low-pressure safety injection pumps of Loviisa plants are being replaced. The contractor does not seem to understand the problems caused by impurities during accident conditions.

14) How do licensees assure that contractors have sufficient knowledge, training, equipment and safety awareness?

Before making a contract the licensee will audit the potential contractor and thus verify that the contractor has the necessary knowledge, training, equipment and safety awareness needed for the job in question. When a contractor sends for instance welders for the first time to the plant they have to pass a working test according to the licensee's instructions although the welders have been qualified according to EN standards.

The assessment of the contractors is required for work done in safety classified I&C and electrical systems.

15) Does the licensee or contractor perform final inspections, and how are non-conformance's being dealt with?

In case of mechanical components the licensee and STUK make the final inspections, deviations are handled according to the QA-manuals of the contractors and the licensee.

In case of I&C components treatment of the non-conformance is usually described in the agreement. It is also presented in the quality plan. STUK requires that the licensee make certain inspections. STUK controls that the inspections have been made properly and the results are acceptable.

16) Does the contractor supply operating and maintenance manuals for new constructions? Is there a requirement for materials inspection, analyses, and certification?

Operation and maintenance manuals are supplied by manufacturers/contractors. The required QC documents are supplied according to manufacturing plan and the safety class of the equipment.

17) How does the regulatory body ensure that the licensee has enough knowledge to select the right contractor, to select the right QA requirements, to operate or maintain contracted equipment or services and monitor the quality of completed work?

The adequacy of the knowledge of the licensee is assessed as a part of the total periodic inspection programme of the licensee and in a broader scope during periodic safety reviews.

18) Has the use of contractors resulted in a possible net loss of knowledge for the industry, and how has the regulatory body in your country reacted to this possible outcome?

Before the formation of the present Fortum organisation all nuclear power plant know how was located in the same organisation. Currently the Loviisa plant is a different unit of the Fortum parent organisation than Fortum Engineering, where a lot of the expertise is. However, these two units have a co-operation contract, but still it creates some limitations. In case of TVO the designer, former ABB Atom, is also in a heavy reorganisation process and clearly some weakening of its know-how background can be anticipated. STUK is closely following these two development processes.

19) Are there any regulatory requirement changes likely to occur in the near future in your country on that issue?

The pressure equipment act and correspondingly the nuclear energy act have changed due to the recently issued EU pressure directives. YVL-guides must be revised accordingly.

In the electrical and I&C systems area some new requirements related to contracted work are considered to be issued in the near future. There is need for the harmonisation between different technical sectors. Some new common YVL guides are needed.

20) State in the few words any other important issue(s) not covered by the questionnaire?

The in-house knowledge of the licensee is in danger to decrease, when equipment with agreed functions are purchased from the contractors as "black boxes".

FRANCE***General***

In France, there are 58 PWRs of FRAMATOME design (originally WESTINGHOUSE), owned and run by EdF.

20 years ago, EdF has started to contract work, for maintenance during outages mostly, first with manufacturing companies like FRAMATOME, JEUMONT SCHNEIDER, etc..... then with others.

It can be said that most of the maintenance work (also modification) is actually done by contractors, basically because of the generic aspects of PWR design, also because these workers can easily travel from one NPP to the other.

1. Briefly state your national policies or practices, laws and licensing requirements for the use of contractors by electric utilities?

National policies or practises ; laws and licensing requirements for the use of contractors (to be answered later).

2. Are the services of contractors used in your country, and has the extent of their use changed a lot over the last 5 years?

The services of contractors are used a lot for maintenance and modifications in the PWRs, and the extent of their use has not changed during the last 5 years.

3. Are contractors subjected to any requirements, standards or procedures?

Contractors companies are subjected to : specific qualifications (with or without notices) valid for 3 years, mostly given through audits run by EdF central services, and for specific activities.

Besides, most of them comply with ISO 9002 Q/A system.

The workers themselves must comply with specific personal qualifications on safety, and for radiation protection.

All contracted works are subjected to contracts signed by NPPs, which are to comply with the quality/assurance ministerial order for nuclear installations of 1984.

4. Who is responsible for the overall safety of the "contractor installed system/component" or "contracted service" at the nuclear power plants in your country? Who is accountable for the work done by contractors?

The overall safety always relies upon the director of NPPs. The only differences that do occur for contractors rely upon quality control systems (i.e. quality plans : some of them use their own, others use the EdF (NPP) ones).

5. Do licensees have internal policies and procedures for dealing with contractors? Briefly describe.

The internal EdF policies are defined by EDF/UTO (central services), one major trend is the following : specific NPPs are to formally quality "nation-wide" contractors for specific activities (like valve work, pipe work, etc).

6.a) How does the licensee control the work by the contractor? Briefly state at what stage(s).

Controlling (or supervising) the work done by contractors is a major issue for EdF, and also for the Safety Authority.

It is based on the actual supervising work done by the EdF work supervisor, who is to fill up "evaluation forms", which are compiled at the end of the outage, and then for all NPPs.

6.b) How do the licensees maintain their competency and capability as a whole when using contractors?

Capability and competence are maintained in the following way :

- monitoring the contractors companies capability through the 3-year qualification period (see § 3).
- training and retraining of the workers through specific nation-wide sessions, enabling the workers to keep or upgrade his safety qualification.
- The system for qualification and supervision of the contractors has been improved in the past years and is now satisfactory for the Safety Authority. However, there is one area where improvements are still to be expected, i.e. radiation protection and dosimetry issues.

8. Are contractors following QA standards or procedures?

Yes.

9. Does the licensee or regulatory body maintain a list of qualified suppliers ; does the regulatory body or licensee inspect the QA programmes of contractors?

Yes – EdF does inspect the QA systems of contractors through audits.

10. Is there a requirement for the contractor to submit drawings or proprietary documents? Are there any difficulties in the availability of design or technical information, documents or drawings from contractors, compared to licensee performed work?

No answer.

11. Does the regulatory body inspect the contractors work any differently than licensee work?

Yes – The regulator does inspect the EdF system for supervising the contractors work, but also the contractors work itself on the work-site.

12. Do you have any examples where a contractor was unable to follow –up after problems following a contract? What was done subsequently?

Yes – There are examples. The contractor’s company can be forbidden to continue work on an other site.

13. Do you have any examples where the licensee did not seem to understand the safety issues associated with contractor work?

No.

14. How do licensees assure that contractors have sufficient knowledge, training, equipment and safety awareness?

Several answers :

- the nation-wide qualification system that enables the NPP to prepare the contract,
- the verification of individual workers qualification, during the prior to work meeting.

15. Does the licensee or contractor perform final inspections and how are non-conformances being dealt with?

Non conformance’s are written, either in the Q/A system of the contractor (then transformed in non-conformance NPP reports), or directly as non-conformance NPP reports.

16. Does the contractors supply operating and maintenance manuals for new constructions? Is there a requirement for materials inspection, analyses, and certification?

It depends on the qualification level of the contractor’s company.

17. How does the regulatory body ensure that the licensee has enough knowledge to select the right contractor, to select the right QA requirements, to operate or maintain contracted equipment or services and monitor the quality of completed work?

This is done through inspections, either of EdF national services, or/and in the NPPs.

18. Has the use of contractors resulted in a possible net loss of knowledge for the industry, and how has the regulatory body in your country reacted to this possible outcome?

No.

19. Are there any regulatory requirement changes likely to occur in the near future in your country on that issue?

Not for the time being.

20. State in a few words any other important issue (s) not covered by the questionnaire.

GERMANY

1. Briefly state your national policies or practices, laws and licensing requirements for the use of contractors by licensees?

Since the beginning of operation of nuclear power plants the German nuclear power plant operators have intensively made use of contracted work. All NPP were designed, constructed and commissioned on a turn-key-basis by a contractor. The supplier of the plant plays an important role as contractor throughout the entire lifetime of the plant. The supplier and other contractors are called in for maintenance, service, engineering tasks, safety evaluations, modifications, and other tasks. Contracted work is carried out mainly during outages, some during operation. It is important to note that regular operation of the reactor and the plant itself is carried out only by own personnel of the operating organisation.

According to the German social laws, work of contracted personnel may be ordered by two options:

- Contract of a work package on a lump sum basis. The orderer purchases a defined work with defined results. He has only limited influence (to be defined in the contract) on the contractor's personnel involved. Qualification of the personnel involved as well as quality assurance measures are defined by the contract.
- Contract of working personnel. Hired persons are directly treated as own personnel. For this model stringent requirements for the social security of hired personnel exist.

In most cases, model 1. applies. For both models, the operator of the plant (orderer) as licensee carries the full responsibility for the safety of the plant.

2. Are the services of contractors used in your country, and has the extent of their use changed a lot over the last 5 years?

The German utilities usually tend to keep their own staff for operation of the NPP small. Also, the staff for technical support, engineering and similar tasks are only small teams either at the operating organisation itself or at the headquarters. These teams mostly comprise of specialists for project management for planning and supervising of contracted work. The amount of contracted work may be judged on the fact that usually more than 1000 persons are working at the NPP site during an average outage compared to some 350 persons of own staff for operation of one NPP unit.

The timing of outages of all German NPPs is co-ordinated as to the electricity production needs as well as to the availability of contractors service capabilities.

Since the beginning of operation of nuclear power plants the German nuclear power plant operators have intensively made use of contracted work. The extent of their use did not change during the last five years, but may extent substantially as the cost pressure introduced by the liberalisation of the electricity markets increases.

Examples of typical work packages often contracted are listed in Table 1. Also, the typical timing for such work is listed. In most cases, the suppliers or manufacturers of components and equipment are also contracted for maintenance, repair and service on their supplied products.

3. Are contractors subjected to any requirements, standards or procedures?

The contractors personnel, in particular their managers and supervisors, must be professionally qualified and trained similar as NPP own staff for respective jobs according to the relevant Federal Personnel Qualification Guidelines. The qualification requirements are stated in the contract. All contractors personnel have to attend plant specific basic training and instruction lectures for general plant safety rules, radiation protection, fire protection and industrial work safety applicable at the respective plant before they start work.

In addition to professional qualification, there shall be no doubts as to the trustworthiness of the personnel. This is mandatory for all personnel working at a nuclear power plant including contractors personnel. The trustworthiness is evaluated by the licensing and inspection authority according to a Federal ordinance on the basis of information available to the state (Länder) and federal security authorities.

4. Who is responsible for the overall safety of the “contractor installed system/component” or “contracted service” at the nuclear power plants in your country? Who is accountable for the work done by contractors?

For the regulatory body the operating organisation as licensee is the only relevant counterpart in supervision of the NPP. He remains responsible for the safety of the plant at all times.

Nevertheless, it is a main concern of the regulatory inspection authorities, that only qualified companies are contracted.

5. Do licensees have internal policies and procedures for dealing with contractors? Briefly describe.

For all contracted work packages personnel of the operating organisation perform supervising of the conduct of contracted work, review the work results and finally state the correct results as ordered. The contractors personnel, in particular their managers and supervisors, must be professionally qualified and trained similar as NPP own staff for respective jobs according to the relevant Federal Personnel Qualification Guidelines. The qualification requirements are stated in the contract. All contractors personnel have to attend plant specific basic training and instruction lectures for general plant safety rules, radiation protection, fire protection and industrial work safety applicable at the respective plant before they start work.

6. a) How does the licensee control the work by the contractor? Briefly state at what stage(s).

For all contracted work packages personnel of the operating organisation perform supervising of the conduct of contracted work, review the work results and finally state the correct results as ordered. Quality assurance is an integral part of the contracted work package as defined in the contract.

6. b) How do the licensees maintain their competency and capability as a whole when using contractors?

The qualification and training requirements for the responsible plant personnel remain in force regardless whether contractors are used.

7. Are the contractors liable for their work?

Yes, according to the definition of the contracted work.

8. Are contractors following QA standards or procedures?

Quality assurance is an integral part of the contracted work package as defined in the contract. The German Power Plant Operators Organisation, in which all NPP operator are members, carries out Quality Assurance Audits to qualify possible contractor companies. Also, the main supplier of the German NPPs (Siemens-KWU) takes part in this auditing process and carries a list of qualified contractors, qualified products and operation media like lubrication oils, chemicals, etc.

9. Does the licensee or regulatory body maintain a list of qualified suppliers; does the regulatory body or licensee inspect the QA programmes of contractors?

The German Power Plant Operators Organisation, in which all NPP operator are members, carries out Quality Assurance Audits to qualify possible contractor companies. Also, the main supplier of the German NPPs (Siemens-KWU) takes part in this auditing process and carries a list of qualified contractors, qualified products and operation media like lubrication oils, chemicals, etc.

The licensee prescribes the QA-programme by the contract. The Regulatory Body does not inspect the QA programmes of contractors.

10. Is there a requirement for the contractor to submit drawings or proprietary documents? Are there any difficulties in the availability of design or technical information, documents or drawings from contractors, compared to licensee performed work?

For the regulatory body the operating organisation as licensee is the only relevant counterpart in supervision of the NPP. He remains responsible for the safety of the plant at all times. Nevertheless, it is a main concern of the regulatory inspection authorities, that only qualified companies are contracted. Engineering data, safety evaluations and descriptions of planned modifications, worked out by contractors and presented by the licensee, are treated as NPP licensee's own work. At finishing of maintenance, repair or modification jobs, functional tests are mandatory, for which the operator carries the responsibility. These test are witnessed or their results reviewed by the regulatory inspection authority or their experts to give regulatory approval for further operation (in particular start-up approval after outage).

In addition, the safety instructions and plant specific training programme for contractors personnel is reviewed by the regulatory body. Increasingly, attention is given to language problems as the use of foreign contractors becomes more frequent.

11. Does the regulatory body inspect the contractors work any differently than licensee work?

No.

Engineering data, safety evaluations and descriptions of planned modifications, worked out by contractors and presented by the licensee, are treated as NPP licensee's own work. At finishing of maintenance, repair or modification jobs, functional tests are mandatory, for which the operator carries the responsibility. These test are witnessed or their results reviewed by the regulatory inspection authority or their experts to give regulatory approval for further operation (in particular start-up approval after outage).

12. Do you have any examples where a contractor was unable to follow-up after problems following a contract? What was done subsequently?

No

13. Do you have any examples where the licensee did not seem to understand the safety issues associated with contractor work?

No

14. How do licensees assure that contractors have sufficient knowledge, training, equipment and safety awareness?

The contractors personnel, in particular their managers and supervisors, must be professionally qualified and trained similar as NPP own staff for respective jobs according to the relevant Federal Personnel Qualification Guidelines. The qualification requirements are stated in the contract. All contractors personnel have to attend plant specific basic training and instruction lectures for general plant safety rules, radiation protection, fire protection and industrial work safety applicable at the respective plant before they start work.

In addition to professional qualification, there shall be no doubts as to the trustworthiness of the personnel. This is mandatory for all personnel working at a nuclear power plant including contractors personnel. The trustworthiness is evaluated by the licensing and inspection authority according to a Federal ordinance on the basis of information available to the state (Länder) and federal security authorities.

Nevertheless, it is a main concern of the regulatory inspection authorities, that only qualified companies are contracted. In addition, the safety instructions and plant specific training programme for contractors personnel is reviewed by the regulatory body.

15. Does the licensee or contractor perform final inspections, and how are non-conformance's being dealt with?

For all contracted work packages personnel of the operating organisation perform supervising of the conduct of contracted work, review the work results and finally state the correct results as ordered. Non-conformance's are to be corrected by the contractor.

16. Does the contractor supply operating and maintenance manuals for new constructions? Is there a requirement for materials inspection, analyses, and certification?

Yes. Yes.

17. How does the regulatory body ensure that the licensee has enough knowledge to select the right contractor, to select the right QA requirements, to operate or maintain contracted equipment or services and monitor the quality of completed work?

This had not been a problem. For the regulatory body the operating organisation as licensee is the only relevant counterpart in supervision of the NPP. He remains responsible for the safety of the plant at all times.

18. Has the use of contractors resulted in a possible net loss of knowledge for the industry, and how has the regulatory body in your country reacted to this possible outcome?

Not yet so far. This issue will be closely looked at in the future.

19. Are there any regulatory requirement changes likely to occur in the near future in your country on that issue?

No.

20. State in a few words any other important issue(s) not covered by the questionnaire.

The safety instructions and plant specific training programme for contractors personnel is reviewed by the regulatory body.

Increasingly, attention is given to language problems as the use of foreign contractors becomes more frequent.

For the radiation protection of his personnel the contractor holds a license to let his employees work in radiation areas of other facilities than his own. He is responsible to train his staff and to supply dosimetry passports and film badges. Additional dosimetry by electronic dosimeters is done by the NPP health physics department and the results documented in the individual passports. Incorporation measurements are done before and after work at each NPP on a regular basis. Contractors personnel are subject to radiation protection safety directions of the NPP health physics manager.

The intense use of contracted work in all German NPPs leads to the fact, that the main part of the collective dose, especially during outages, is given to contractors personnel.

Table 1: Examples of Contracted Work in Germany

CONTRACTED WORK	SYSTEM, COMPONENT	EXAMPLE OF POSSIBLE CONTRACTOR	TIME
Engineering	all plant	supplier of plant specialised companies	Anytime
Service	Guard personnel for physical protection	specialised companies	anytime
Service	waste conditioning	specialised companies	anytime
Service	Cleaning and decontamination of buildings and rooms, waste collection, etc	specialised companies	anytime
Service	painting	specialised companies	anytime
Service	Core calculation	supplier of fuel	anytime
Service	inspection and repair of fuel elements	supplier of fuel	During and after outage
Maintenance	test and inspection of main coolant pumps	Supplier of main coolant pumps	outage
Maintenance	Test and inspection of pumps	supplier of pumps	outage
Maintenance	Inspection of diesel generators	supplier of diesel generators	outage
Maintenance	Welding	supplier of component, specialised companies	outage
Maintenance	Decontamination of systems	supplier of plant, specialised companies	outage
Maintenance	Steam generator inspection, cleaning, tube repair	supplier of plant	outage
Maintenance	non destructive testing	Specialised companies	outage
Maintenance	test and inspection of safety valves	supplier of valves	outage
Modifications	all plant	supplier of plant	outage
Service	Scaffolding	specialised companies	outage
Service	Insulation	specialised companies	outage
Service	health physics, radiation protection	specialised companies	support during outage

HUNGARY***1. Briefly state your national policies or practices, laws and licensing requirements for the use of contractors by licensees?***

Licensees select their contractors themselves. They control the adequacy of contractors according to their internal procedures. The regulatory body supervises the procedures of the licensee and carries out inspections during the selection process of contractors by the licensee, furthermore using its statutory right it can process regulatory inspections to each firm involved in the nuclear field.

The most relevant legal provisions:

- Act CXVI. of the year 1996. on Atomic Energy
- 87/1997. (V.28.) Korm. Governmental Decree
- 108/1997 (VI.25.) Korm. Governmental Decree and its Annexes, furthermore the supporting regulatory guidelines.

2. Are the services of contractors used in your country, and has the extent of their use changed a lot over the last 5 years?

The extent of work done by contractors for the licensees has increased in the past five years through restructuring of the industry. Formerly the NPP staff completed every work (maintenance, modification, etc.). At present significant part of the work is being done by contractors and the number of operating personnel has been decreased.

3. Are contractors subjected to any requirements, standards or procedures?

Yes. We have a particular volume in the regulatory safety codes series (five volumes all together) and fourteen regulatory safety guides dealing with QA requirements and the licensees shall elaborate its internal regulations on the basis of regulatory prescriptions that contain requirements for selection and employment of contractors.

4. Who is responsible for the overall safety of the “contractor installed system/component” or “contracted service” at the nuclear power plants in your country? Who is accountable for the work done by contractors?

The operator has universal and legally declared responsibility for overall safety. The issuer of the contract (any of the licensees) is accountable for the work done by the contractors.

5. Do licensees have internal policies and procedures for dealing with contractors? Briefly describe.

The licensees have Safety as well as Quality Policies, QA regulations and procedures.

6. a) How does the licensee control the work by the contractor? Briefly state at what stage(s).

6. b) How do the licensees maintain their competency and capability as a whole when using contractors?

The technical organisation of the operator that orders a contract as well as the inspection branch of the independent internal safety organisation of the licensee perform control of the quality of the work, the conformance to the plans and the contract. It is included in the contract that contractor is liable to ensuring insight also inside its own site.

7. Are the contractors liable for their work?

Yes, the contractors are liable for those included in contract.

8. Are contractors following QA standards or procedures?

Yes, this is a prerequisite for services being made for nuclear facilities.

9. Does the licensee or regulatory body maintain a list of qualified suppliers; does the regulatory body or licensee inspect the QA programmes of contractors?

Yes, we maintain a database that contains the names and most important data of qualified suppliers. Yes, the licensees select and periodically audit suppliers according to their procedure. The regulatory body shall supervise the activity of the licensee and if it is considered necessary he can carry out an inspection himself at the suppliers.

10. Is there a requirement for the contractor to submit drawings or proprietary documents? Are there any difficulties in the availability of design or technical information, documents or drawings from contractors, compared to licensee performed work?

All documentation of any activity connected to a nuclear facility shall be made available to the regulatory body even if it is copyrighted. The regulatory body has not encountered any serious problem with that in course of its work yet.

11. Does the regulatory body inspect the contractors work any differently than licensee work?

The regulatory body does not make a basic distinction between licensees and suppliers in course of inspections. However, there is difference in the frequency of inspections and the specific technical scope of inspections, respectively.

12. Do you have any examples where a contractor was unable to follow-up after problems following a contract? What was done subsequently?

There was an example that a contractor could not fulfil its task properly, therefore the consignor annulled the contract and another supplier was contracted for the given task.

13. Do you have any examples where the licensee did not seem to understand the safety issues associated with contractor work?

There was no evidence for that.

14. How do licensees assure that contractors have sufficient knowledge, training, equipment and safety awareness?

It is prerequisite for the selection of suppliers that it has qualified workforce and the level of education shall meet the requirements. The licensee in course of the selection process supervises this condition.

15. Does the licensee or contractor perform final inspections, and how are non-conformance's being dealt with?

Yes, the licensee performs final inspection. Non-conformance's are dealt with according to the procedural prescriptions. Technical or administrative counter-measures are determined to avoid non-conformance's.

16. Does the contractor supply operating and maintenance manuals for new constructions? Is there a requirement for materials inspection, analyses, and certification?

Yes, in each case. The contractor is liable by legal provision and the concerning contract, respectively.

17. How does the regulatory body ensure that the licensee has enough knowledge to select the right contractor, to select the right QA requirements, to operate or maintain contracted equipment or services and monitor the quality of completed work?

We mentioned in the answer No.3. that a separate regulatory safety code and fourteen corresponding regulatory safety guides regulate this field.

18. Has the use of contractors resulted in a possible net loss of knowledge for the industry, and how has the regulatory body in your country reacted to this possible outcome?

This phenomenon shall be taken into account through the changing industrial structure. Therefore the regulatory body is gathering all relevant information to avert possible net loss of knowledge. In the frame of TSO contracts there is an alternative to preserve knowledge with including TSOs.

19. Are there any regulatory requirement changes likely to occur in the near future in your country on that issue?

Yes. We assess the activity of the licensees and the regulatory body, respectively, and modifications can be made according to the assessments. However, fundamental changes are not envisaged.

20. State in a few words any other important issue(s) not covered by the questionnaire.

No further idea.

Appendix Submitted: Qualification of suppliers of nuclear facilities

Applicable legal prescriptions:

Act I of 1997 on ratification of the Nuclear Safety Convention

- The Hungarian Parliament enacted in its Act I of 1997 the Nuclear Safety Convention brought forth under the aegis of International Atomic Energy Agency on 20th September 1994. in Vienna.

Article 13.

- Each Contracting Party shall take the appropriate steps to ensure that quality assurance programmes are established and implemented with a view to providing confidence that specified requirements for all activities important to nuclear safety are satisfied throughout the life of a nuclear installation.

Act CXVI of 1996 on Atomic Energy, Section 11.

- (2) Only those institutions, organisations, and other companies qualifying as economic organisations under Section 685, Paragraph c) of the Civil Code which possess appropriate quality assurance systems can take part in activities related to nuclear facilities, nuclear systems and equipment.

Government Decree 108/1997. (VI. 25.) Korm., Section 14.

- (1) Nuclear facilities and equipment may only be commissioned, operated and modified, repaired, maintained or decommissioned by qualified and certified organisations and staff.
- (4) If modification, repair or maintenance is not performed by licensee's own organisation, the licensee shall draw up and operate a qualification system, in co-operation with HAEA NSD, for verifying aptitude.

Nuclear Safety Codes

- The Nuclear Safety Codes – Volume 2 (Quality Assurance for NPP) specifies the basic requirements that is necessary for establishment and maintaining QA systems fostering the safety in NPP.
- In order to fully comply with those prescribed in the above cited legal provisions HAEA NSD obliged the operators of nuclear installations (Licensees) to elaborate their for qualification of suppliers.
- The Regulatory inspects the internal regulations of the licensees and their corresponding activities. In course of the inspection compliance of the internal procedure of licensees with the legal background and compliance of the qualification process with the regulations. In addition the Regulator supervises the auditors whether they assess the QA system of suppliers in necessary details and in an unbiased way. Last but not least Regulatory compares the QA system of suppliers against the general requirements specified in the corresponding QA standards and the special requirements in the procedures of the operators.

- Possesses all documentation in connection with qualifications and maintains regulatory register by the information, furthermore assesses the corresponding activity of the licensees.
- Regulatory is entitled to initiate modification in the QA system, process of the licensees on the basis of its previously performed assessment with respect to its right for specified in Sub. (4) of Section 14. of Government Decree 108/1997. (VI. 25.) Korm.
- According to the Sub. (5) of Section 18. of Act CXVI of 1996 on Atomic Energy HAEA is entitled to conduct inspections at any user of atomic energy, in its scope of authority.

JAPAN

1. Briefly state your national policies or practices, laws and licensing requirements for the use of contractors by electric utilities?

The Electric Utility Industry Law prescribes the responsibilities of the licensee in the construction, maintenance and operation of electric facilities of nuclear power plants. The licensees have to establish a self-safety regulation in which contractors are involved in the integrated safety system.

2. Are the services of contractors used in your country, and has the extent of their use changed a lot over the last 5 years?

The services of contractors are used.

There was no substantial change.

3. Are contractors subjected to any requirements, standards or procedures?

The contractors are subjected to the requirements from a electric utility within the scope of the self-safety regulation as well as such guidelines as the "JEAG 4101 Guideline for Quality Assurance of Nuclear Power Plant", "JEAG 4102 Guideline for the Planning of Quality Assurance in the Nuclear Power Plant " and "JEAG 4105 Guidelines for Procurement Management in the Nuclear Power Plant".

4. Who is responsible for the overall safety of the "contractor installed system/component" or "contracted service" at the nuclear power plants in your country? Who is accountable for the work done by contractors?

The licensees(electric utilities) are accountable for the work done by contractors directly.

5. Do licensees have internal policies and procedures for dealing with contractors? Briefly describe.

The internal policies and procedures are requested for contractors and checked by a electric utility during preparation of a contract agreement under the quality assurance programme of the electric utility. The electric utilities shall undertake audit for contractors and request submission of documents as appropriate.

6.a) How does the licensee control the work by the contractor? Briefly state at what stage(s).

The JEAG 4105 Guidance for Procurement Management of Nuclear Power Plant specifies that the buyers (electric utilities) shall manage compliance of the products and services with the procurement requirements, undertake documentation, give supervision and advise to contractors, and give a follow up of the inspection, test and treatment after receiving procured products and services undertaken by an electric utility. Specifically an electric utility implements document confirmation, audit and inspection.

6.b) How do the licensees maintain their competency and capability as a whole when using contractors?

The JEAG 4105 Guidance for Procurement Management of Nuclear Power Plant specifies that the buyers (electric utilities) shall carry out necessary education and training of personnel who may influence to the quality according to the knowledge, experience and skill they have. Therefore electric utilities implement company education and encourage employees to attend seminars.

7. Are the contractors liable for their work?

Contractors are liable within the scope of the contract.

8. Are contractors following QA standards or procedures?

Refer to the Q3.

9. Does the licensee or regulatory body maintain a list of qualified suppliers ; does the regulatory body or licensee inspect the QA programmes of contractors?

The JEAG 4105 Guidance for Procurement Management of Nuclear Power Plant specifies that the buyers (electric utilities) shall, in selecting contractors, evaluate contractors with the capability to provide products or services with compliance with the requirement on the quality of procurement documents.

The electric utilities, in general, check QA programme of contractors during preparation of a contract agreement and undertake audits periodically.

10. Is there a requirement for the contractor to submit drawings or proprietary documents? Are there any difficulties in the availability of design or technical information, documents or drawings from contractors, compared to licensee performed work?

There is a requirement for contractors to submit drawing or proprietary documents, which is specified in the contract Agreement. Accordingly there is no difficulty in the availability.

11. Does the regulatory body inspect the contractors work any differently than licensee work?

The regulatory body undertakes inspection for the electric utility. The work done by contractors are also inspected as the work done by electric utilities.

12. Do you have any examples where a contractor was unable to follow –up after problems following a contract? What was done subsequently?

Regulatory Body does not track incidents related to contractor performance.

13. Do you have any examples where the licensee did not seem to understand the safety issues associated with contractor work?

Regulatory Body does not track incidents related to contractor performance.

14. How do licensees assure that contractors have sufficient knowledge, training, equipment and safety awareness?

Refer to the Q9.

15. Does the licensee or contractor perform final inspections and how are non-conformances being dealt with?

The JEAG 4105 Guidance for Procurement Management of Nuclear Power Plant specifies that electric utilities shall plan and implement inspection and test for the products and services to see their compliance with procurement requirement.

The nonconformity with procurement requirement involves nonconformity by an electric utility and that by contractors. The electric utilities and contractors shall define the way to manage and to prevent recurrence of those nonconformity of the products and services.

16. Does the contractors supply operating and maintenance manuals for new constructions? Is there a requirement for materials inspection, analyses, and certification?

Refer to the Q10.

17. How does the regulatory body ensure that the licensee has enough knowledge to select the right contractor, to select the right QA requirements, to operate or maintain contracted equipment or services and monitor the quality of completed work?

An electric utility selects contractors and requests quality assurance by its own responsibility.

18. Has the use of contractors resulted in a possible net loss of knowledge for the industry, and how has the regulatory body in your country reacted to this possible outcome?

We consider that the use of contractors has not resulted in a possible net loss of knowledge for the industry,

19. Are there any regulatory requirement changes likely to occur in the near future in your country on that issue?

The QA system involving contractors are now under consideration in course of review of a self-safety regulation.

20. State in a few words any other important issue (s) not covered by the questionnaire.

In response to the accident in JCO, electric utilities are considering the audit to be included in the self-safety regulation to see how contractors educate their employees .

MEXICO

1. Briefly state your national policies or practices, laws and licensing requirements for the use of contractors by licensees?

There is not an explicit national policy for using contractors by the licensee. When a contractor is needed for participating in some specific area, this area make an application to the Quality Assurance Department.

2. Are the services of contractors used in your country, and has the extent of their use changed a lot over the last 5 years?

We have used contractors during outages as well during normal operation for issues not directly pertaining to plant operation. Examples are maintenance work during outages, plant modifications, welding of piping, etc.

The use of contractors has slowly decreased in the last 5 years.

3. Are contractors subjected to any requirements, standards or procedures?

Contractors must meet the QA Licensee requirements, applicable international standards and procedures. They are also subjected to follow the Quality Assurance Programme of the licensee, its procedures and the requirements established in the procurement documents (contract, requisitions) .In some cases, contractors have their own Quality Assurance Programmes which are reviewed by the QA Department.

4. Who is responsible for the overall safety of the "contractor installed system/component or "contracted service" at the nuclear power plants in your country who is accountable for the work done by contractors?

In Mexico, the licensee is responsible for the overall safety of the contracted service and the work done by contractors at Laguna Verde Nuclear Power Plant.

5. Do Licensees have internal policies and procedures for dealing with contractors? Briefly describe.

QA Programme Chapter VII establishes the overall policies about purchased material, equipment and services.

Some procedures are related with the celebration of the contest and the elaboration of the contract.

6. How does the licensee control the work by the contractor? Briefly state at what stage(s).

The area that requires the contractor services designs a co-ordinator who follows the contractor's activities daily and receives the final work and a documental package.

Contractors working for the licensee are inspected by the QC area of the licensee during their activities.

7. Are the contractors liable for their work?

They are liable for their work and this is follow through Area co-ordination, QC inspection and audits carried out by the QA Department.

8. Are contractors following QA standards or procedures?

They follow QA Programme of the licensee and its procedures.

Some contractors use its own QA programme and its procedures.

9. Does the licensee or regulatory body maintain a list of qualified suppliers; does the regulatory body or licensee inspect the QA programmes of contractors?

The licensee maintains an up dated list of qualified suppliers and send one copy to the regulatory body. In order to qualify their contractors, the licensee inspects their QA Programmes and the regulatory body audits some of them during its inspections.

10. Is there a requirement for the contractor to submit drawings or proprietary documents? Are there any difficulties in the availability of design or technical information, documents or drawings from contractors, compared to licensee performed work?

The requirements are established in the contract.

The licensee has no problem in obtaining drawings or proprietary documents.

11. Does the regulatory body inspect the contractors work any differently than licensee work?

The regulatory body inspects the contractors work in the same way as work carried out by the licensee.

12. Do you have any examples where a contractor was unable to follow-up after problems following a contract? What was done subsequently?

No. This kind of problem has not occurred yet.

13. Do you have any examples where the licensee did not seem to understand the safety issues associated with contractor work?

No. In Mexico, this problem has not happened yet

14. How do licensees assure that contractors have sufficient knowledge, training, equipment and safety awareness?

All these requirements are established on licensee procedures which contractors are subjected to.

The licensee verifies its compliance by carrying out inspections and audits. It sometimes uses the NUPIC system to verify contractors' background.

15. Does the licensee or contractor perform final inspections, and how are non-conformance's being dealt with?

The licensee or contractor carry out final inspections. If non-conformance- s are identified, these are integrated to the Corrective Actions System of the licensee to be promptly corrected.

16. Does the contractor supply operating and maintenance manuals for new constructions? Is there a requirement for materials inspection, analyses, and certification?

The QA Programme of the licensee in Chapters 7 and 10 establishes requirements to control of purchased material, equipment and services and to inspection work.

In addition, ASME codes are compromised to be followed.

17. How does the Regulatory Body ensure that the licensee has enough knowledge to select the right contractor, to select the right QA requirements, to operate or maintain contracted equipment or services and monitor the quality of completed work?

The licensee's knowledge to carry out these activities is verified during the regulatory body inspections to the qualification process followed.

18. Has the use of contractors resulted in a possible net loss of knowledge for the industry, and how has the regulatory body in your country reacted to this possible outcome?

Some trained people has been contracted by foreign companies causing a loss of knowledge, but the regulatory body is not authorised to resolve this kind of problem.

19. Are there any regulatory requirement changes likely to occur in the near future in your country on that issue?

No, there are not expected changes on this matter.

20. State in a few words any other important issue (s) not covered by the questionnaire.

NETHERLANDS

1. National policies/practices/laws and licensing requirements for the use of contractors

Our national policy is to follow the IAEA safety series No 50. Hence in the licenses of the NPP the use of the Codes and guides are prescribed and for the use of contractors the specific items of procurement control of the 50-C-QA (in the new version 50-C/SG-Q) and 50-SG-QA3 (in the new version 50-SG- Q6) has to be followed.

2. Use of contractors and trending over the last 5 years.

The use of contractors at the NPP is very common; contracting in the areas as security, maintenance (especially during outage) and engineering is done. Over the last 5 years a slight increase is noticed in the use of contractors in the "primary process". In the "non-primary process" (canteen, security cleaning etc.) almost all work is now done by contractors.

3. Are contractors subjected to any requirements, standards or procedures?

The Regulatory Bodies (RB) do not impose any (additional) requirements, standards or procedures directly to a contractor. This is done by the licensee because the RB impose requirements for the use contractors (and sub-contractors) to the licensee (see question I).

4. Responsibility for overall safety / accountable for the work done by contractors The licensee / the licensee.

5. Policies/procedures of the licensees for dealing with contractors.

To fulfil the requirements of the Code and safety guides of the Quality assurance concerning Procurement the licensee has to have procedures for dealing with contractors.

In the selection procedure of a contractor the licensee finds it very important to use companies in the neighbourhood in order to ensure a better commitment to work being performed.

6. How does the licensee control the work by the contractor?

- a. Selecting : using the list of approved suppliers (items and/or personnel)

b. Procurement :

See items of 602 of Safety series 50-C-QA

6.b. How do the licensees maintain their competency and capability as a whole when using contractors?

The IAEA Safety Guide 50-SG-O1 "staffing of NPP and the recruitment, > training and authorisation of operating personnel" (part of our legal > system) is a very important tool to the KFD to pin-point the licensee's > staffing and training efforts in order to cope with its responsibility to > manage the operation of the plant in a safe way. This means that the > licensee must be staffed and trained in such way that the competency and > capability is in place to assess the work done by a contractors (see > control-items c and d of question 6.a). The inspections of the KFD as > mentioned in question 6.a. must give an answer on this problem.

- a. Work (at NPP) : Guidance by licensee, hold points, tests / reporting according QA-procedures and documentation
- b. Evaluation: Evaluation job done / contractor audit and up-dating list approved suppliers.

Contracting is an activity which is subjected to the QA-programme of the licensee. Staffing and training of the licensee must be adequate to cope with this programme (and so with mentioned control-items a, b, c and d). This is one of the focus points during the inspections of the nuclear safety department KFD where contracting is involved.

7. Are contractors liable for their work?

Not by the Nuclear Energy Act (on which the inspections of the KFD based) but they can be held liable when financial loses and/or personal injuries are happened. The liability for nuclear safety is always of the licensee.

8. Are contractors following QA standards or procedures?

They have to follow the QA standards and procedure of the licensee (see also 6.c).

9. List of qualified suppliers.

The licensee is responsible for an up-dated list of approved suppliers. Most of them have an ISO-certificate and consequently a QA-programme. The KFD don't have that list (we have a list for our own suppliers as we are ISO-9001 certified!). The licensee has to evaluate this list and inspection/auditing at a supplier/contractor is one of the means to do so.

The regulatory body has amended the 50-C-QA section 1.2.1. Added is: "The licensee is responsible for providing right of access to supplier facilities, records and further information for the purpose of source inspection and audit for regulatory authorities, the licensee, the main contractor and their delegates". Based on this article we can (and have done during the modification of the NPP in 1997) inspect and audit contractors and suppliers.

10. Requirement for contractor to submit drawings.

See answer at question 9. In practice we didn't find any difficulties in getting copies of drawings, documents etc. According to our status of "civil servant" the issue of secrecy is automatically taken care off.

11. Inspecting work of contractors versus work of licensee.

In principle there is no difference in the way of inspecting work of contractors or licensees. The licensee is responsible for both type of works. When we inspect a job, carried out by a contractor, we check if the guidance of the licensee is effective and that the contractor knows what he has to do when problems will happen (a contractor can do his job without constant supervision by the licensee). When a contractor uses there own procedures we check if the licensee has reviewed and approved those procedures.

12. Examples where a contractor was unable to follow-up after problems following a contract.

I don't know any examples of this problem; in fact this a problem between the licensee and contractor. In contacts with the regulatory body this eventual problem is no excuse to have a job performed well and safely (the licensee is always responsible!).

13. Examples of not understanding safety issues by the licensee associated with contractor work.

I don't have any examples; in practice it is unlike that it will/can happen as the licensee initiates the job (safety implications/justification/ ALARA), provides introduction and, if necessarily , training for a contractor, checks the occupational health conditions of the working area (scaffolding, fife prevention) and provides the necessarily documentation (work-permit, procedures).

14. Assurance that contractors have sufficient knowledge, training, equipment and safety awareness.

See answers at questions 6, 9 and 13.

15. Final inspections and how to deal with non-conformance's.

In the end all contractor work is subjected to a final inspection (the operation of the NPP). It depends on the importance of the equipment when a "final" inspection of a specific item take place. All contractors work is inspected visually by the licensee.

When new equipment is installed a functional (cold)- an actual (warm) test is required.

Dealing with non-conformance's is part of the procurement process. In contacts with the regulatory body: see answer of question 12).

16. Supply operating and maintenance manuals.

Contractors have to supply operating and maintenance manuals for new constructions (It is also a requirement of the European Committee). When the equipment is part of system important to safety inspection of materials, analyses en certifications are required according to the grading of that system.

17. How does the RB ensure that the licensee enough knowledge to select the right contractor.

The regulatory body checks by inspecting and auditing all activities of the licensee as mentioned in the answer of question 6.

18. Possible net loss of knowledge for the industry by using contractors.

There is a net loss of knowledge, but the use of contractors is not the cause. Other factors as: uncertain (no?) future of NPP and retirement of personnel experienced in the nuclear field are more important. On the moment this problem is in discussion with the licensee.

19. Change of any regulatory requirement in near future about contracting

No.

The only change foreseen is the adoption of the new 5O-C/SG-Q (on the moment the 5O-C-QA and the series 5O-SG-QA1 up to SO-SG-QA11 are in force), but we think that the different wording in the volume "Procurement" will not change the basic requirements.

20. Anything else to stress out?

Based on the "frequency" of contracting we check additional focus points (beside those of question 6). The forms are:

"Permanent" contracting of experts.

They are at the NPP for such a long time and are treated as "own personnel". We check that they are indeed treated in that way. (following the same company training's and drills as own personnel, yearly functional/appraisal meeting with the direct chef, etc.)

Regular services.

For certain jobs (i.e. temporary repair of a small leakage) and maintenance during the outage period always the same companies (and persons) are hired. To inspect this group we checking the points mentioned in question 13. One of the problems that can arise is "understanding the language". Most of the documentation is in Dutch, but also original handbooks is available in German (The NPP is a Siemens/KWU design) and English (ASME, etc.). During the outage a lot of German speaking contractors (specialists) are in and craftsman can have their roots in Portugal, Spain, Morocco or Turkey.

"One of a life-time"

When a big job is carried out by a contractor (i.e. the modification of the NPP in 1997) special attention is paid to the arrangements between the contractor and the licensee. Also the

contractor is audited by the RB and checks at his suppliers of equipment are done. The job is regarded as a commissioning process and will be inspected in that way.

SPAIN

1. Briefly state your national policies or practices, laws and licensing requirements for the use of contractors by licensees?

The old Decree (from 1972) of Nuclear and Radioactive Installations Rule stated that the manufacturers of equipment's for NPPs needed a license granted by the Ministry of Industry and Energy. The new Royal Decree (from December 1999) has eliminated this specific authorisation. Nevertheless, the Rule states that the licensees have to sign a contract with contractors, in order to permit the inspection of companies, documentation and activities by the inspectors of the CSN (as Regulatory Body). Then, the CSN can inspect, by Law, not only licensees but also contractors. In the other hand, the Royal Decree (RINR) states that the NPPs must have a Quality Assurance Manual. The Safety Guides of the CSN state that these Manuals should be in accordance with the standard UNE 73:401-95. According with this standard, the suppliers of equipment's and services to a NPP must be qualified by licensees.

2. Are the services of contractors used in your country, and has the extent of their use changed a lot over the last 5 years?

The services of contractors are very used in the Spanish plants, mainly during outages and also as permanent supplementary staff of licensees.

The most usual kind of services performed by independent companies, on behalf of the licensees, are as follows:

- Manufacturers
- Engineering companies as support of licensee's staff
- Services as inspection, testing, quality assurance, training and maintenance
- Installation services and civil work

The services of contractors are used in the overall areas of the plant performance except on management and operation. The extension of their use has not changed in a significant manner over the last 5 years.

3. Are contractors subjected to any requirements, standards or procedures?

(See answer 1)

The CSN Safety Guide 10.8 "Quality Assurance of suppliers to NPPs" states that the contractors must cope with the standard UNE 73:401-95. The contractors performing activities related with structures, systems and components related with safety should have a Quality Assurance Manual and procedures. The Manuals of contractors shall be approved by licensees of NPPs.

4. Who is responsible for the overall safety of the "contractor installed system/component" or "contracted service" at the nuclear power plants in your country?. Who is accountable for the work done by contractors?

The only responsible for the overall safety at a nuclear power plant, according with laws and regulations is the licensee of the plant.

5. Do licensees have internal policies and procedures for dealing with contractors? Briefly describe.

The licensees have criteria to assess the contractors. These criteria are in the Quality Assurance Manual and procedures, according to 10CFR50 Appendix B (USA), Safety Guides from IAEA and Safety Guides from CSN.

The Spanish utilities created the Quality Assurance Owners Group 10 years ago. The suppliers and contractors are assessed by the Owners Group, in an overall manner, independent of particular services done for any plant.

6. a) How does the licensee control the work by the contractor? Briefly state at what stage.

The licensees control the work by the contractor as follows:

- An assessment of the qualification and capability of contractors before to sign a contract with a company (usually there is a list of contractors qualified by the Q.A. Owners Group).
- Supervision, inspection or audits during the performance of the works, depending on the kind of service.
- Reviewing records of contractors related to the execution of works.
- Final inspection to warrant the conformity when the works are done.
- Inspections of reception the equipment's, materials and others.

6. b) How do the licensees maintain their competency and capability as a whole when using contractors?

When licensees contract a company to perform specific works at the plant they design a co-ordinator who follows the contractor's activities daily.

Most of the contracted works are due to economical reasons. The licensee has the knowledge to perform the activities but do not have enough people on staff to carry them out. In some cases, mainly in engineering services, really the licensee contracts people with a very high qualification in a particular issue. It is a usual policy of licensees to have a small staff in some particular areas contracting several companies as supplementary staff.

7. Are the contractors liable for their work?

Yes. The contractors are liable for their work according with the contracts signed with licensees. The QA Departments of licensees check the contractor activities by inspections and audits to ensure that they perform the works in accordance with the requirements established previously.

8) Are contractors following QA standards and procedures?

Yes. The contractors follow QA standards and procedures from licensees. Many companies acting as contractors use their own QA programme and procedures that have been qualified previously by licensees.

9) Does the licensee or regulatory body maintain a list of qualified suppliers; does the regulatory body or licensee inspect the QA programmes of contractors?

The CSN, as regulatory body, does not maintain a list of qualified suppliers. The licensees have a list of contractors qualified throughout the QA Owners Group (see answer 5).

Usually, the CSN does not inspect directly to suppliers. Only some important safety related activities, as manufacturers of big components for NPPs (reactor vessel, steam generators etc.) and fuel elements suppliers, are inspected directly by CSN.

The CSN inspects methods and procedures used by licensees to qualify suppliers and contractors. Also, the CSN inspects how workers of contractors have been trained in aspects as radiological protection and fire protection procedures that are specifics of each plant.

10) Is there a requirement for the contractor to submit drawings or proprietary documents? Are there any difficulties in the availability of design or technical information, documents or drawings from contractors, compared to licensee performed work?

According with the Law, the contractors do not have to submit any document to the regulatory body. Only licensees are required and are liable forehead the CSN. Nevertheless, the contracts signed between licensees and contractors have to state that the regulatory body can inspect their factories, procedures, drawings and documents if their activities are safety related.

Until now, no problems have been detected in this issue.

11) Does the regulatory body inspect the contractors work any differently than licensee work?

The regulatory body inspects the contractors work in the same way as works carried out by the licensee. The only difference is that the inspections to contractors are carried out always in the presence of licensees.

12) Do you have any examples where a contractor was unable to follow-up after problems following a contract?

No. This kind of problem has not occurred yet.

13) Do you have any examples where the licensee did not seem to understand the safety issues associated with contractor work?

The CSN has not knowledge of any examples.

14) How do licensees assure that contractors have sufficient knowledge, training, equipment and safety awareness?

The control of contractors by licensees has been explained in answers 5 and 6.

This control includes not only methods and procedures of contractors but also knowledge and training of workers.

15) Does the licensee or contractor perform final inspection, and how are non-conformance's being dealt with?

Final inspections are carried out if are required by QA Programmes, depending on the kind of services.

The non-conformance's identified are managed according QA procedures of licensee and they are integrated to the corrective actions programme of the licensee.

When a formal acceptance of contracted work is required by licensee at the end of the work a final inspection will be carried out. The scope of inspections may be an overall review of documentation related to the activities, a visual inspection of equipment and components supplied or installed and others.

16) Does the contractor supply operating and maintenance manual for new constructions? Is there a requirement for materials inspection, analysis, and certification?

Yes. The QA Programme of the licensee states requirement to control of purchased material, equipment and services.

The manufacturers give to the licensee instruction manuals that contain operational characteristics and instructions for preventive and corrective maintenance. These manuals are considered Q.A. records.

If the supply are structures, equipment's and components safety related is required that the supplier join to the equipment's a quality report including certifications of materials, tests and inspections carried out at the factories of contractors.

17) How does the regulatory body ensure that the licensee has enough knowledge to select the right contractor, to select the right QA requirements, to operate or maintain contracted equipment or services and monitor the quality of completed work?

The licensee's knowledge to follow-up these activities is verified by the inspections of the regulatory body. The scope of inspections carried out by the CSN to the licensee's QA Department is not only the following of its QA Programme but also its relationships with suppliers and contractors.

18) Has the use of contractors resulted in a possible loss of knowledge for the industry, and how has the regulatory in your country reacted to this possible outcome?

The use of contractors is mainly for routine tasks carried out by workers without a high qualification or for very specific works where a high qualified technical people or tools are needed.

In both cases the use of contractors has not resulted in a loss of knowledge.

In the other hand, the regulatory body is following and reviewing the annual programmes carried out by licensees in order to maintain the qualification and training of their personnel. Also, the CSN performs periodic inspections to the Training Departments of licensees.

19) Are there any regulatory requirement changes likely to occur in the near future in your country on that issue?

There is no prevision of changes on this issue.

20) State in a few words any other important issue(s) not covered by the questionnaire.

- The issues associated with a loss of competence of the overall nuclear industry. Due to the nuclear programmes situation in most of the countries, the nuclear industry that support to NPPs staff is being dismantled and they are changing to others business. In many cases it is impossible to find “nuclear grade items and components” to replace or renew systems in a NPP. Then, sometimes it is necessary to use "commercial grade items" in safety related systems during substitutions or renewals.
- Should be important to assure that the use of contractors in other fields as management or operation will not result in a possible loss of safety culture or will not reduce the safe operation margins of the NPPs.

SWITZERLAND

1. Briefly state your national policies or practices, laws and licensing requirements for the use of contractors by electric utilities?

Switzerland has no laws and licensing requirements dealing with the licensee policy related to the contractors. HSK is demanding good practices. Each licensee has established a Quality Assurance System which had been reviewed and acknowledged by HSK. Part of this is the licensee policy related with the contractors. HSK performs inspections of the Quality Assurance Systems. Each change of the system has to be acknowledged by HSK.

2. Are the services of contractors used in your country, and has the extent of their use changed a lot over the last 5 years?

The services of contractors are used for engineering work such as preparation of plant modifications, performing accident calculations, nuclear and thermal-hydraulic transient analyses, core design, safety analyses and for establishing probabilistic safety analyses (PSA).

The licensees have the responsibility for the nuclear safety. Therefore they have established organisational structures and personnel resources related also with the ability to deal with contractors. The licensees have laid open, that the core-competence related with the safety systems is held by their staff.

Over the last 5 years due to cost cutting measurements some contracts with small companies (mostly one head- companies) were cancelled. The contracts with big companies like ABB, Siemens or GE have been maintained.

3. Are contractors subjected to any requirements, standards or procedures?

The contractors are subjected to requirements, standards and procedures of the licensee. HSK is only involved in overseeing the QA-Systems of the licensee.

4. Who is responsible for the overall safety of the "contractor installed system/component" or "contracted service" at the nuclear power plants in your country? Who is accountable for the work done by contractors?

The licensees are accountable for the work done by contractors.

5. Do licensees have internal policies and procedures for dealing with contractors? Briefly describe.

The licensees have internal policies and procedures for dealing with contractors. HSK is only involved in overseeing the QA-Systems of the licensees.

6.a) How does the licensee control the work by the contractor? Briefly state at what stage(s).

The licensees control the work of the contractors by performing audits, inspections at set points (e.g. final tests) and partly working together with the contractor (e.g. revision of a Diesel engine).

6.b) How do the licensees maintain their competency and capability as a whole when using contractors?

The licensees maintain the core competence and capability as a whole in each safety-related topic. In this field the licensees and the contractors usually are working in teams. In the case of PSA the analysis is done by contractors and reviewed by PSA-teams of the licensees.

7. Are contractors liable for their work?

The contractors are liable for their work according to their contracts with the licensee. HSK can get insights into the contracts.

8. Are contractors following QA standards or procedures?

Normally the contractors are following DIN ISO 2000 ff standards. This is seen as a minimum. Sometimes the licensee performs audits.

9. Does the licensee or regulatory body maintain a list of qualified suppliers ; does the regulatory body or licensee inspect the QA programmes of contractors?

The licensees maintain a list of qualified suppliers. The licensees have qualified procedures in selection of new suppliers. HSK can get insight into these documents.

In some cases the licensees inspect the QA programmes of contractors. The HSK inspected the QA programmes of some contractors working in the fields of transportation and fuel production.

10. Is there a requirement for the contractor to submit drawings or proprietary documents? Are there any difficulties in the availability of design or technical information, documents or drawings from contractors, compared to licensee performed work?

The contractor has to give submit drawings and proprietary documents to the licensee. HSK partly examines these documents e.g.- for acknowledging plant modifications. HSK can get insight in all needed documents.

11. Does the regulatory body inspect the contractors work any differently than licensee work?

HSK makes no differences in the inspection procedure of the licensee and contractors. Usually HSK is inspecting contractors together with the licensee.

12. Do you have any examples where a contractor was unable to follow –up after problems following a contract? What was done subsequently?

There were only some examples, that a contractor was unable (or unwilling) to follow up after problems. In this cases HSK insisted, that the licensee has to show ways how to solve the problems.

13. Do you have any examples where the licensee did not seem to understand the safety issues associated with contractor work?

HSK has no examples where the licensee did not seem to understand the safety issues associated with contractor work.

14. How do licensees assure that contractors have sufficient knowledge, training, equipment and safety awareness?

The licensees assure that contractors have sufficient knowledge etc. by controlling the work done at the plant and performing audits. The licensees have qualified procedures in selection of new suppliers.

15. Does the licensee or contractor perform final inspections and how are non-conformances being dealt with?

The licensees are performing final inspections. If there are safety-related non-conformance's HSK gets involved. In this case HSK insists that the licensee has to show ways how to solve the problems.

16. Does the contractors supply operating and maintenance manuals for new constructions? Is there a requirement for materials inspection, analyses, and certification?

The contractor supplies all operating and maintenance manuals for new constructions. The licensee has requirements for material inspections, analyses and certification if needed.

17. How does the regulatory body ensure that the licensee has enough knowledge to select the right contractor, to select the right QA requirements, to operate or maintain contracted equipment or services and monitor the quality of completed work?

The licensees have laid open that their staff have the core-competence of all safety related systems. The licensee has to report each change of the organisation. This is the "from the top" approach to ensure that the licensee has enough knowledge.

Other ways to ensure that the licensee has enough knowledge are the inspections and the acknowledging procedure of HSK for plant modifications. With this "from the bottom" approach sometimes in early stages it can be shown that wrong contractors were selected.

Once wrong contractors were selected by the licensee the HSK has no legal demand for the selection of another one.

18. Has the use of contractors resulted in a possible net loss of knowledge for the industry, and how has the regulatory body in your country reacted to this possible outcome?

The use of contractors has not resulted in a possible loss of knowledge for the licensee. (what is meant with industry?)

19. Are there any regulatory requirement changes likely to occur in the near future in your country on that issue?

No changes foreseen.

20. State in a few words any other important issue (s) not covered by the questionnaire.

Main contractors are going out of operation due to restructuring. The results are not felt yet. But HSK has to monitor this in future.

UNITED KINGDOM

General Response

1. NII inspects contracted work in the same way as work carried out by licensees.
2. NII recognises that a quality assurance system is particularly important for contracted work. Accordingly, NII expects the licensee's QA system to either deal directly with all aspects of I

the contracted work or to link seamlessly with the contractor's QA system to ensure adequate quality standards are achieved. NII does not approve quality assurance systems.

3. NII is currently concerned about the increasing use by licensee's of architect engineers and considers that licensees, as a minimum, must have the ability:
 - to let the right contract e.g. to correctly specify the work, to select the right contractor and to specify quality requirements;
 - to monitor the quality of completed work;
 - to understand all safety issues associated with contracted work; and
 - to live with the outcome of contracted work, recognising that individual contractors may be unable to support the licensee after the contracted work has been handed over.
4. Overall, it is the licensee that is responsible for safety. Accordingly, licensees must be accountable for work carried out by contractors and accept responsibility for their work.
5. Internal guidance for NII inspectors is being drafted.

NOTE: Review draft guidance document; this will answer questions 1,3,4,5,6, 7, 8, attached.

2. Are the services of contractors used in your country, and has the extent of their use changed a lot over the last 5 years?

Yes, as companies change their ways of working and slim their workforce.

9) Does the licensee or regulatory body maintain a list of qualified suppliers; does the regulatory body or licensee inspect the QA programmes of contractors?

Licensees tend to do this as part of their procurement arrangements.

10) Is there a requirement for the contractor to submit drawings or proprietary documents? Are there any difficulties in the availability of design or technical information, documents or drawings from contractors, compared to licensee performed work?

I don't quite understand this, if you mean can the NII require contractors to give them drawings, documents etc. the answer is yes.

11) Does the regulatory body inspect the contractors work any differently than licensee work?

was answered previously - no difference

12) Do you have any examples where a contractor was unable to follow-up after problems following a contract?

We have an example which I will bring up in my national report of a contractor giving health physics and safety case services who is to withdraw from the nuclear business.

13) Do you have any examples where the licensee did not seem to understand the safety issues associated with contractor work?

many - a particular concern is in safety cases written by contractors for licensees - and we are taking steps to rectify this using the Intelligent Customer concepts and principles - see the guidance Faxed to you.

14) How do licensees assure that contractors have sufficient knowledge, training, equipment and safety awareness?

Our contractorisation guidance Faxed to you addresses this.

15) Does the licensee or contractor perform final inspection, and how are non-conformance's being dealt with?

ditto

16) Does the contractor supply operating and maintenance manual for new constructions? Is there a requirement for materials inspection, analysis, and certification?

These things depend on the contract there is no general rule - other than NIIs requirement that the licensee needs to have the intelligence to scrutinise them and to establish that they are appropriate for the licensee's use.

17) How does the regulatory body ensure that the licensee has enough knowledge to select the right contractor, to select the right QA requirements, to operate or maintain contracted equipment or services and monitor the quality of completed work?

We are now working strongly on this issue and the Intelligent Customer concept and principles are key to our response to the issue.

18) Has the use of contractors resulted in a possible loss of knowledge for the industry, and how has the regulatory in your country reacted to this possible outcome?

Yes - downsizing is resulting in older, more experienced staff retiring early - LC36 addresses the management of changes such as downsizing and we put emphasis on ensuring that licensees address corporate knowledge loss when they propose downsizing. There is also a nuclear education issue - which is that the UK is slowly losing expertise and not replacing it with new staff. We are trying to address this issue in collaboration with Government.

19) Are there any regulatory requirement changes likely to occur in the near future in your country on that issue?

LC36 and the Intelligent Customer principles are now established, but we are doing further work on establishing strategies for enforcement.

20) State in a few words any other important issue(s) not covered by the questionnaire.

The questionnaire seems to be mainly targeted on the use of contractors for packages of work at sites. There are other uses of contractors which concern us in UK : for example using contractors to manage (as well as carry out) a large function on a site - like health physics. Using contractors to write safety cases (reporting to a licensee's engineering organisation which might be at its HQ). Licensees forming alliances or partnerships with others. How much of the management of a plant can be taken over by a contractor before the contractor has to be the licensee. The relationships between licensees and parent companies or owners.

One further point on the definition. We use the following "anyone not in the employ of the licensee" is treated as a contractor. Your definition, by using the word "independent" blurs the case for examining the relationship between the licensee and its parent company or a subsidiary company. We have had several instances where the licensee has used staff from another company to do unsupervised work because the other company is its parent or subsidiary and we are unhappy with this because it adds uncertainty to the responsibility for safety. In the UK the company responsible for safety is the licensee and not related companies - I think Ontario Hydro experience is an example of why we should be sensitive to this.

APPENDIX Draft Guidance document submitted by the UK:

April 1999, NII INTERNAL GUIDANCE ON CONTRACTORISATION

Purpose and Scope

1. This guidance is for the use of NII Inspectors in regulating nuclear safety activities relating to licensed nuclear sites, where those activities are not wholly carried out by the licensee or the licensee's staff.

Legal Basis

2. The law requires that nuclear site licensees, as users of the site, are in charge and control of the site and all nuclear safety related activities so as to discharge their responsibilities as licensees for the health and safety of their workers and the public.

3. The main legal duties on a licensee in relation to contractorisation are:

- a) s3 HSW Act in relation to the safety of persons not in the licensee's employment;
- b) s7 NI Act in relation to the absolute duty to prevent injury or damage in relation to nuclear matter; and
- c) LC26 in relation to the control and supervision of operations and other licence conditions which place specific duties on licensees.

4. Given existing Licence Conditions, although contractors will have legal duties for example under health and safety legislation, they do not in general, apart from particular examples such as duties under The Ionising Radiations Regulations 1985 have any legal responsibility for nuclear safety under licence conditions unless they are also a licensee. Licence conditions do not generally apply to contractors on a nuclear site unless they are also a joint holder of a licence for the site in question and Nil avoids licensing sites when two parties share control.

5. s1 of the NI Act may be paraphrased as "No site may be used for the purpose of installing or operating a nuclear installation unless a licence has been granted by the Health and Safety Executive and is for the time being in force". s3 of the NI Act specifies that a licence can be granted only to a corporate body and is not transferable. It follows that the licensee is a company which is also the user of a site.

6. In the absence of a definition of user in the Act or in case law, Legal Counsel's opinion is that the user is the corporate body which is in day-to-day control of the site, process and activities and whose staff manage the operation of the plant. This concept is embodied in the Nil published guidance ["Notes for Applicants"] for potential licensees which also states that it is NIA's expectation that a licence applicant has, and a licensee must maintain, the capability within its own organisation, in terms of organisation, staffing and expertise, to understand, and take responsibility for, the nuclear safety implications of its activities and hence the safety case for the plant and the limits under which it must be operated. The implication is that the licensee is responsible for nuclear safety even though some tasks may have been delegated to contractors.

7. Thus, Nil has a legitimate interest in regulating the affects of contractorisation, where they may affect safety, at licensees' support and corporate organisations, at a contractor's premises as well as at licensees' sites, and this arises from NIIs duties under the NI Act. .

Definitions

8. In this guidance the word *Contractor* means on organisation or individual person(s) who provide a service to but are not in the employment of the licensee. Typical services are insurance assessment services including independent design verification that are carried out by consultants either at a Consultant's premises, at the licensee's own headquarters on the licensed site or elsewhere.

9. Similarly *Contractorisation* means the licensees' process of restructuring or other initiatives carried out by licensees to enable contractors to be used to replace or augment licensees' staff in performing functions. The possibilities for using contractors range up to the situation where the incorporation of contractors make significant inroads into a licensee's management structures.

10. *Intelligent Customer* is defined in Annex 3.

Guidance

Safety Management System

11. It is NII policy that a licensee maintains and operates a safety management system which encompasses contractors, sub-contractors, and their employees as well as the licensee's employees.

12. It is important that a licensee as user of the site is in charge and in control of all activities related to safety so as to discharge its responsibilities as a licensee.

13. A licensee should have and implement a clear policy for assuring safety which includes proper consideration of its use of contractors and any sub-contractors. Further guidance is given in Annex 1.

14. A licensee should implement its policy for assuring safety through a safety management system which is robust, auditable and follows a recognised Quality Assurance standard. Further guidance is given in Annex 2.

15. The safety management system should provide the arrangements whereby contractors are managed so as to adequately protect the safety of contractors, licensee's employees and others, including members of the public.

16. The safety management system should ensure that selected contractors and sub-contractors are adequately equipped for the contracted task in terms of resources, equipment, knowledge and expertise etc. and that each party operates a safety management system and quality assurance system to ensure nuclear safety.

17. The safety management system should ensure that the arrangements for selecting, controlling, specifying and accepting standards of work of contractors together with arrangements for interfacing with contractors and sub-contractors are specified in the licensee's management arrangements.

18. The safety management system should ensure that each contractor and sub-contractor has an appropriate safety management system specifying, in relation to safety, the management structure, competencies and resources necessary to assure safety, together with the interface arrangements with the licensee and other relevant contractors and sub-contractors.

19. The safety management system should have arrangements which ensure continuity at contract termination when the work is either taken over by the licensee or passed to another contractor. The safety management system should ensure that the licensee has credible contingency plans to deal with a contractor terminating a contract early (e.g. through a contractor being unsuitable, bankrupt etc.).

20. The safety management system should ensure that the licensee's, contractor's and sub-contractor's staff are aware of the extent to which their work and actions can affect the safety of the nuclear installation.

Justification for the Use of Contractors

21. It is NII policy that a licensee has Management of Change arrangements to deal with the effects on safety of proposed changes to management structures, staff levels, methods of working (including contractorisation and use of contractors and sub-contractors) and responsibilities etc.

22. Further general internal NII guidance on licensees' Management of Change arrangements is provided separately.

Licensee as Intelligent Customer

23. It is Nil policy that a licensee has and retains adequate capability within its organisation to understand the nuclear safety requirements of all its activities related to safety, including those carried out by its contractors and sub-contractors, and to take responsibility for managing safe operation including the situation when contracted work is being undertaken or has been completed.

24. A licensee needs to be able to recognise when technical questions need answering, to judge the adequacy of the responses in the context of its duties and responsibilities and to understand on a continuing basis the nature, substance and details of the safety case for the plant, even where it has not produced the safety case itself.

25. The licensee, as a corporate body, needs to maintain sufficient expertise in all disciplines, pertinent to the safe operation of its plants, at a high level so as to discharge its obligations as a licensee. To this end, It is important that sufficient expertise exists at Executive level in the licensee's organisation.

26. The policy statement (paragraph 23) and following amplification (paragraphs 24 and 25) are similar to the requirements to be met for a candidate licensee (see separate internal guidance on licensing). Therefore should the requirements of paragraphs 23-25 not be met by a licensee consideration needs to be given to the fitness of the licensee and hence to who, in practice, is discharging the duties of a Licensee.

27. There is a minimum level of expertise which a Licensee must maintain; there is therefore a limit to the extent that a licensee can diminish the expertise of its organisation by using contractors for core functions. This limit is not pre-ordained, and varies with circumstances.

Licensee Involvement with Contractors

28. It is NII policy that a licensee in order to discharge its responsibility for safety, should adequately oversee contractors and sub-contractors within licence condition arrangements and hence have adequate resources and knowledge to do so.

29. It is likely that some or all of contractor's and sub-contractor's staff will need to be made Suitably Qualified and Experienced Persons (SQEPs) according to and within the licensee's arrangements under LC 12 etc. The practices for SQEPs for contractor's and sub-contractor's staff should be similar to those for the licensee's own employees.

30. Licensees should ensure that contractor's and sub-contractor's staff are adequately, suitably and appropriately trained for the work they are to perform and are aware of the importance of their work in assuring nuclear safety. Licensees should pay particular attention to training in relation to radiological safety, conventional safety, site emergency arrangements and permit for work systems.

The practices for training for contractor's and sub-contractor's staff should be at least as good as those for the licensee's employees.

31. It is likely that licensees will have to assist with or even wholly provide the training in the above areas of contractor's and sub-contractor's staff who may be affected by their activities. In any event, Nil will satisfy itself on a sample basis that contractors' staff are adequately trained for specialist activities they perform.

32. Licensees have a responsibility to ensure that contracted work is carried out to an adequate standard. It is particularly important that licensees meticulously oversee, for nuclear safety work, contractors and sub-contractors carrying out safety case preparation and review, design, construction, commissioning, modification or maintenance etc. to ensure that the end product meets suitable standards of nuclear safety. In such situations the licensees should:

- a) set standards for the contracted work;
- b) evaluate and accept completed work; and

c) make arrangements to cover the interfaces licensee/contractor, contractor/contractor, contractor/sub-contractor etc.

ANNEX I

USE OF CONTRACTORS

1. The need for the licensee to be the user of the site does not rule out the use of contractors for certain functions. But licensees need to control and take responsibility for their actions so that there is no compromise of the licensee's chain of command and control. The degree of use of contractors can vary over a wide range as can the potential hazards which could arise from such activity. For less-complex use of contractors, for example the use of specialist contractors on well defined tasks, the hazard may lie mainly in an immediate danger to the contractor's workers or workers around them -or the hazard may be left behind as latent or inherent defects which reveal themselves later.

2. Contractorisation is many-faceted. There are several ways in which Licensees could propose the use of contractors in the nuclear industry (at sites and within corporate organisations), for example:

- a) supplementing staff numbers -using contractors in the same way as an occupier's own employees;
- b) specialist contract work -using contractors for lifts, asbestos removal, site radiography, and boilers because of the extremely specialised nature of the work;
- c) Contracting individual tasks -e.g. specific maintenance jobs like stripping a pump;
- d) Contracting operational activities -e.g. the carrying out of part or all of the licensee's core function, while still being managed by the licensee's management staff (e.g. maintenance or Health Physics);
- e) Contracting managerial activities -e.g. managing part of occupier's core function -"functional contractorisation" (e.g. carrying out the management of maintenance or Health Physics functions); or
- f) Partnering -e.g. for major activities such as refuelling at Sizewell, or refurbishing turbines. Where the occupier enters into a long-term relationship with the contractor in which there is more certainty of the continuation contract. But there is also more risk of losing key expertise.

3. The term *functional contractorisation* is used to describe the situation where the core functions of all or part of management of a site is proposed to be contractorised. The extent of such contractorisation which should be permitted by Nil is difficult to decide. On the one hand a licensee may be clearly in control and meet all the Nil policies in contractorisation. On the other hand, a licensee may have given up effective control of the site so as no longer to be the user of the site or act as a fit licensee. In such a case the licence ought to be passed to others. Both of these cases are relatively easy to recognise. The difficult area is where there is a mix between the level of control of the licensee and its contractor(s) in various functional areas such that it is hard to decide who is the true user of the site i.e., who should be the licensee. In such situations the advice of Unit 1 F should be sought.

4. There are a number of sources of risk arising from the use of contractors. These include:

- a) the indirect risk from contractor's activities on a site caused by undetected, latent, faults left behind when a contractor completes his work or even leaves site;
- b) the direct risk to contractor's staff or others (including licensee's and other contractors' staff) from a contractor's activities;
- c) the direct Task to contractor's staff on a site from the licensee's or other contractors' activities;

- d) the indirect risk arising from contractor's activities off-site (e.g. design contractors, safety case contractors);
- e) the indirect risk arising from the licensee not understanding the contractor's output;
- f) nuclear and radiological hazards -separated out because of the different legal regime; and
- g) conventional hazards created by the contracted work.

Partnering and Alliancing

Further consideration is being made in Nil and this will be added here in due course.

Agency Staff

Further consideration is being made in Nil and this will be added here in due course.

ANNEX 2

LICENSEE'S MANAGEMENT ARRANGEMENTS FOR CONTRACTORS

1. The licensees' management arrangements for contractors and sub-contractors should:

- a) state clearly that, regardless of the nature of the contractor's work, the licensee retains sole responsibility for nuclear safety;
- b) cover the circumstances in which contractors can and cannot be used, particularly in relation to retaining its capability to be a nuclear site licensee;
- c) be clear and (if already in place) be demonstrably successfully , its implementation;
- d) cover all modes of contractor usage and all sources of hazard from using them;
- e) cover interactions between licensees' own staff and their contractors and between one contractor (or sub-contractor) and another;
- f) cover the appropriate inculcation of the licensees' safety culture into contractors' activities;
- g) cover the control of contractors through the application of rules, procedures, training etc. and the dynamic aspects of new contractors taking over from previous ones;
- h) comply with all legal requirements;
- i) concern itself with the assurance that licensees and contractors management structures and resources will be adequate to implement the policy;
- j) state that licensee's management of change arrangements should be applied in all respects, to changes in employing contractors;
- k) state that licensee's management of change arrangements should result in timely notification to Nil of significant changes; and
- l) state that sub-contractors (at all levels of embeddedness) should be treated the same as primary contractors (the licensee may, as with primary contractors, treat the work appropriately to its safety significance).

ANNEX 3

INTELLIGENT CUSTOMER

The term Intelligent customer has been in use in Nil for several years without clear definition. In essence, it refers to the attributes the holder of a Nuclear Site Licence must display in meeting its duties under the NI Act. It is NIIs view that a Licensee must have, and take steps to retain, adequate capability within its own organisation to understand the nuclear safety requirements of all of its activities relevant to safety, and those of contractors, and to take responsibility for managing safe operation.

The reason that a Nuclear Site Licensee has to behave as an Intelligent Customer is that it has responsibility for nuclear safety on its sites: It must understand its duties under the law; particularly duties as a nuclear site licensee; It must have sufficient breadth and depth of knowledge to understand the safety features of its plant and the hazards it presents. Consequently it needs to understand advice and service given to it and the context, for safety, in which that advice sits: even when the advice is esoteric. It cannot rely on a contractor to put the contractor's work into its overall context, it must have arrangements to do it itself although contractors can help -and even then the licensee must have a certain amount of capability to understand it

A Licensee must retain a knowledge of the plant, its design and safety features. It needs to retain history e.g. of incidents, operational history, changes etc. either in the knowledge base of employees or otherwise captured. It must not put itself in the contractual position that contractors can claim such knowledge is proprietary information and not available to the licensee.

As for all other employers, a Nuclear Site Licensee must, if it is to use contractors to do work, have arrangements for managing contractors which to prompt it to subject contractors' work to regular scrutiny so as to assure its quality. It must know its contractors' capabilities and assess and monitor before, during and after the work - assess before work to assure an appropriate contractor; monitor during work to ensure an appropriate job; and assess after work to decide on performance and whether to use the contractor again.

A Licensee's management system and arrangements should prompt it to be sceptical about contractors work and formalise regular scrutiny - the worse situation is to have a partnership which is so successful that the licensee loses this critical faculty and at a later date the contractor starts to seriously under-perform - the licensee may then have lost the capability to be aware of the deficiencies.

DEFINITION OF INTELLIGENT CUSTOMER

The holder of a Nuclear Site Licence must have, and take steps to retain, adequate capability within its own organisation to understand the nuclear safety requirements of all of its activities relevant to safety , and those of contractors, to take responsibility for managing safe operation and to set, interpret and ensure the achievement of safety standards. It must:

- understand its duties under the law, particularly duties as a nuclear site licensee;
- have sufficient breadth and depth of knowledge to understand the safety features of its plant and the hazards it presents

Consequently it needs to understand advice and service given to it and the context, for safety, in which that advice sits.

UNITED STATES

The U. S. Nuclear Regulatory Commission (NRC) holds its licensees responsible for the proper construction and safe operation of their commercial nuclear power plants. The NRC and the U. S. Nuclear industry have established a system for the inspection of commercial nuclear facilities to provide for multiple levels of inspection and verification of NRC regulatory requirements. Each licensee, contractor, and vendor participates in a quality verification process in compliance with the requirements prescribed by the U. S. Code of Federal Regulations (CFR). The NRC performs inspections of those components, systems, and structures at nuclear power plants regardless of whether they were constructed/modified by the licensee or by a vendor or contractor in order to provide assurance that plants are operated safely and in accordance with the regulations.

The NRC has the authority under the Energy Reorganisation Act of 1974 to perform inspections of records, components, systems, and of the premises of organisations (i. e. vendors and contractors) providing components or activities important to safety to oversee the commercial nuclear industry to determine whether its requirements are being met by licensees and their contractors. However, the NRC does not perform routine periodic audits or inspections of vendors or contractors. Rather, the majority of the effort to ensure compliance with the regulations is performed by the licensees. The licensee is responsible for developing and maintaining a detailed quality assurance (QA) plan in accordance with 10 CFR Part 50, Appendix B requirements. Through a system of planned and periodic audits and inspections, licensees are responsible for ensuring that suppliers, contractors and vendors have suitable and appropriate QA programmes that meet NRC requirements, guides, codes, and standards. Although the NRC does not inspect suppliers, contractors or vendors, the NRC does perform inspections if there is an allegation implicating these entities and the allegation has some merit for further investigation.