

# AREVA NP FUEL SECTOR MANAGEMENT MANUAL

FMM, Revision 1

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## Summary of Changes

Item	Page	Description and Justification
FMM		Introduction of the ISO 9001 : 2008 revision. Integration of remarks coming from auditors following GSE renewal audits occurred in 2009
Appendix C	V	<b>ISO 9001 : 2008</b> instead of ISO 9001 : 2000
0.1 Scope	1 of 52	<b>ISO 9001 : 2008</b> instead of ISO 9001 : 2000
0.2 Purpose	2 of 52	Add : <b>their work</b> , in order to clarify the purpose
0.3 Applicability	2 of 52	Add : bullet point regarding the Radiation protection system ; based on auditors recommendation
0.5 Terms and definitions	3 of 52	Terms : Customer Complaint, "Written" has been deleted.
1. Fuel Sector Presentation	5 of 52	A sentence has been added in order to indicate that the changes in the process of being finalized are not implemented.
1.1 AREVA	5 of 52	Update the number of employees, <b>75000</b> instead of 71000
1.1 AREVA	6 of 52	Replace colleagues by <b>employees</b>
1.2.1 Organization	6 of 52	Modify Fig. 1.2 <b>Fuel Sector matrix</b> and added "Customer Center Asia-Pacific"
2.2.1 Customer Requirements	10 of 52	Add bullet : <b>Customer Satisfaction Index measurement</b>
3.1.2 Process Approach	15 of 52	Update the Process map for the Fuel Sector : <b>V2</b>
4.4.2 Responsibility and authority of Fuel Sector	23 of 52	Modify Fig. 4.3 <b>Organizational Structure of Fuel Sector</b>
4.5 management Review	28 of 52	Add : <b>systematic periodically evaluation of compliance with legal requirements</b>
6.1.3 Training	32 of 52	Add : <b>Obtain and maintain the required skills to achieve the conformity to product specifications and process requirements</b> Clarifying the effectiveness evaluation : <b>On the spot and cold assessment</b>
6.2 Other resources	32 of 52	Add : <b>System</b>
8.2.1 Assessment of stakeholders Satisfaction	47 of 52	Add a sentence : <b>And globally, a composite metric, the Customer Satisfaction Index (CSI ) is implemented at Fuel Sector level.</b>
Appendix A	A3 of A14	Add : <b>FMM</b>
Appendix A	A5 of A14	Add : <b>1)NQA-1, Subpart 2.7 and Part I, Supplements 3S-1 and 11S-2 do not apply to the Manufacturing Equipment Software (MES) systems at the Horn Rapids Road facility. These systems are governed by the site license with the NRC (SNM-1227)</b>
Appendix A	A13 of A14	Replaced Fuel America by <b>US Region Fuel</b>
Appendix B	B2 of B2	# Sections have been changed
Appendix C	C1 of C3	<b>ISO 9001 : 2008</b> instead of ISO 9001 : 2000

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**External Distribution**

- FS Customers (w/o Appendix A except for customers regulated under 10 CFR 50, Appendix B who will be provided a copy with Appendix A
- National Regulatory Authorities as required by national codes and regulations
- Stakeholders on request

**Internal Distribution**

- Fuel Sector Quality Safety Environment Management Committee
- Available via on line electronic documentation system

## 0. Introduction

### 0.1. Scope

This Management Manual describes the Quality, Occupational Health and Safety (OH&S), and Environmental Management System implemented within the Nuclear Fuel Sector (FS). It applies to the AREVA NP Fuel Sector at the locations of Paris, Lyon, Romans-sur-Isère, Pierrelatte, Dessel, Paimboeuf, Rugles, Montreuil-Juigné, Ugine, Jarrie, Willmington, Lynchburg, Richland, Erlangen, Lingen, Duisburg and Karlstein (exclusion are described in the section 0.3).

It is based on the Management Manual of AREVA NP, which is implemented within AREVA NP for all Sectors (including their subsidiaries): Plants - Services - Fuel - Equipment. It also applies to Corporate Departments as applicable, such as the Technical Center, when they supply products to the Sectors or to their own external customers.

This manual fulfills the requirements of the following codes, standards and regulations:

Titles	References
<b>International codes and standards</b>	
Quality Management Systems – Requirements - (ISO - International Organization for Standardization)	ISO 9001:2008
Environmental Management Systems – Requirements	ISO 14001:2004
Health and Safety Management Systems – Requirements	OHSAS 18001:2007
The Management System for Facilities and Activities (IAEA - International Atomic Energy Agency)	IAEA GS-R-3
<b>National standards and regulations</b>	
Arrêté du 10 août 1984 relatif à la qualité de la conception et de l'exploitation des installations nucléaires de base (French Regulation)	Arrêté du 10 août 1984
Allgemeine Forderungen an die Qualitätssicherung (KTA - German Nuclear Safety Standards Commission)	KTA 1401 (06/96)
Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants (US Regulation)	10 CFR 50 Appendix B
Quality Assurance Requirements for Packaging and Transportation of Radioactive Material (US Regulation)	10 CFR 71 Subpart H
Quality Assurance Program Requirements for Nuclear Facilities	ANSI/ASME NQA-1 1994

**Tab. 0.1: Requirements of codes, standards and regulations**

Applicable requirements are completed in chapter 2. Where additional standards are to be used or exceptions to these standards are taken, these conditions will be noted in lower tier documents.

For projects regulated under the provisions of 10 CFR 50, Appendix B or 10 CFR 71 Subpart H, applicability of ANSI Standards and NRC Regulatory Guides are shown in Appendix A.

For projects regulated under the provisions of KTA 1401, Appendix B is applicable.

## 0.2. Purpose

The Integrated Management System constitutes the foundation of the FS Management system to ensure consistency of Quality, OH&S, and Environmental Management and its continuous improvement through the entire Sector and to emphasize that managers, those performing the work and those assessing the work, all contribute in ensuring that their work meets the stringent Product Quality, OH&S, Nuclear Safety, and Environmental requirements.

Based on this FS Management Manual, each Entity develops documents with appropriate detailed measures.

The extent to which the Management measures are applied is consistent with the decision of the Management and with the importance of the particular product or process to nuclear safety. A graded approach is used, which satisfies the applicable requirements and ensures QSE requirements are met.

## 0.3. Applicability

The Integrated Management System of the FS, as described in this Manual, is applicable for the FS locations of sales and marketing, development and design, procurement, manufacturing, inspection, testing of materials, parts, components or assemblies for use in a reactor. It also applies to related engineering services and technical support including irradiated fuel inspection, repair or reconstruction of irradiated fuel, in-core monitoring hardware and software and nuclear plant analyses. It also applies to safety and environmental systems at the FS locations.

This manual is applicable to Fuel Sector activities discussed above with the following exceptions:

- Quality at CERCA, which is covered under a separate manual
- Radiation protection systems which are at site level ( to better take into account national regulations ), and so are not part of IMS manual.
- Office activities of Paris (Rue Lafayette), Lyon, Erlangen and Lynchburg (Old Forest Road), which are covered by an OHSAS 18001 and ISO 14001 certification at site level
- Erwin Tennessee facility, which is in the scope of NFS

In the U.S., the IMS also applies to radioactive material shipping containers (See Appendix A for compliance with 10 CFR 71 Subpart H.).

## 0.4. Responsibility

The FS SDCI Director is responsible for defining the content and changes to the Integrated Management System and Management Manual in conjunction with the Fuel Sector Quality Safety Environment Management Committee. BU and Entity specific requirements, including description of BU and Entity organization structure, are provided in manual attachments or sub-tier documents.

The Manual is released by the FS SDCI Director.

## 0.5. Terms and Definitions

Terms are used as defined in standards. Additional and deviating definitions used in this document are:

TERMS	DEFINITIONS
<b>Business Unit</b>	Part of Fuel Sector comprised of several Entities, related by their line of work: Design and Sales Business Unit, Fuel Manufacturing Business Unit, and Zirconium Business Unit
<b>Corporate Department</b>	Department that supports in the field of its missions, the whole of AREVA NP
<b>Cross-audit</b>	An audit performed annually by an independent AREVA NP audit team on an AREVA NP Management organization to assess compliance with AREVA NP Management Manual, Corporate Procedures and concerned Sector's IMS
<b>Customer</b>	Client of AREVA NP and its subsidiaries
<b>Customer Complaint</b>	A correspondence sent by the customer to the project manager or to the Unit or Sector managers, which formally complains that AREVA NP has not fulfilled a contractual obligation or customer expectation
<b>Entity</b>	Subgroup of Fuel Sector with the same Level 3 IMS
<b>Event</b>	An event classification which includes both product non-conformances and other undesirable potential situations. An event may occur due to quality, occupational health and safety or environmental reason
<b>Fuel related product</b>	Materials, parts, components and assemblies for use in a reactor
<b>Fuel Sector QSE Management Committee (QSEMC)</b>	A committee consisting of Entity QSE Managers led by the FS SDCI Manager. Entity Managers may participate as required by the FS SDCI Manager
<b>Incident</b>	Event in which a pollution or injury or illness or fatality occurred, or could have occurred
<b>Internal supplier</b>	Unit of AREVA NP providing a product to another unit of AREVA NP
<b>Non conformance</b>	A deficiency in a characteristic, documentation or procedure that renders the quality of a product or process, the safety and the environmental impact unacceptable or indeterminate
<b>Objectives</b>	Goal to be reached, resulting from strategy, which can be measured and clearly set, for example achieving a new performance level or completing an activity such as a project
<b>Procedure</b>	A document that specifies or describes how an activity is to be performed (document = any written or pictorial information describing, defining, specifying, reporting, or certifying activities, requirements, procedures, or results)
<b>Process</b>	Set of interrelated or interacting activities which transforms inputs into outputs
<b>Process Owner</b>	Person appointed by the Management to pilot a process, identify and implement KPI for a process. The list of the appointed

	Process Owners is available on the Intranet
<b>Product</b>	Result of a process which may be a hardware product, a software product or service activities
<b>QA Program</b>	Quality program dedicated to a project
<b>Safety Related</b>	The managerial controls, administrative documents, operating procedures, systems, structures, and components that have been designed to mitigate the consequences of postulated accidents that could cause undue risk to public health and safety
<b>Resources</b>	Includes human resources and specialized skills, infrastructure, work environment, information and knowledge, suppliers, as well as material, technology and financial resources
<b>Sector</b>	Part of AREVA NP which is responsible for the world wide business of particular scope of product
<b>Software Product</b>	Set of computer programs, procedures, and possibly associated documents and data; a software product may be designated for delivery, an integral part of another product, or used in the design, development, or manufacturing process
<b>Stakeholders</b>	People (individuals, groups of people, representatives of organizations) who may be affected by the entity's operations or who may have an impact on the entity. Customers are part of stakeholders
<b>Supplier</b>	Any individual or organization that furnishes a product in accordance with a procurement document. An all inclusive term used in place of terms such as Subcontractor, or Vendor
<b>Target</b>	Quantitative definition of an objective (performance requirement)

**Tab. 0.2: Terms and Definitions**

## 0.6. Abbreviations

<b>TERMS</b>	<b>DEFINITIONS</b>
<b>AREVA NP</b>	AREVA NP and its subsidiaries
<b>BU</b>	Business Unit
<b>EHS</b>	Environment Occupational Health and Safety
<b>FMM</b>	Fuel Sector Management Manual
<b>FQP</b>	Fuel Quality Procedure
<b>FS</b>	Fuel Sector
<b>FSOP</b>	Fuel Sector Operating Procedure
<b>IM</b>	Integrated Management
<b>IMS</b>	Integrated Management System
<b>KPI</b>	Key Performance Indicator
<b>NDT</b>	Non Destructive Testing
<b>OH&amp;S</b>	Occupational Health and Safety
<b>QSE</b>	Quality, OH&S, Environment and Nuclear Safety
<b>SDCI</b>	Sustainable Development and Continuous Improvement

**Tab. 0.3: Abbreviations**

## 1. Fuel Sector Presentation

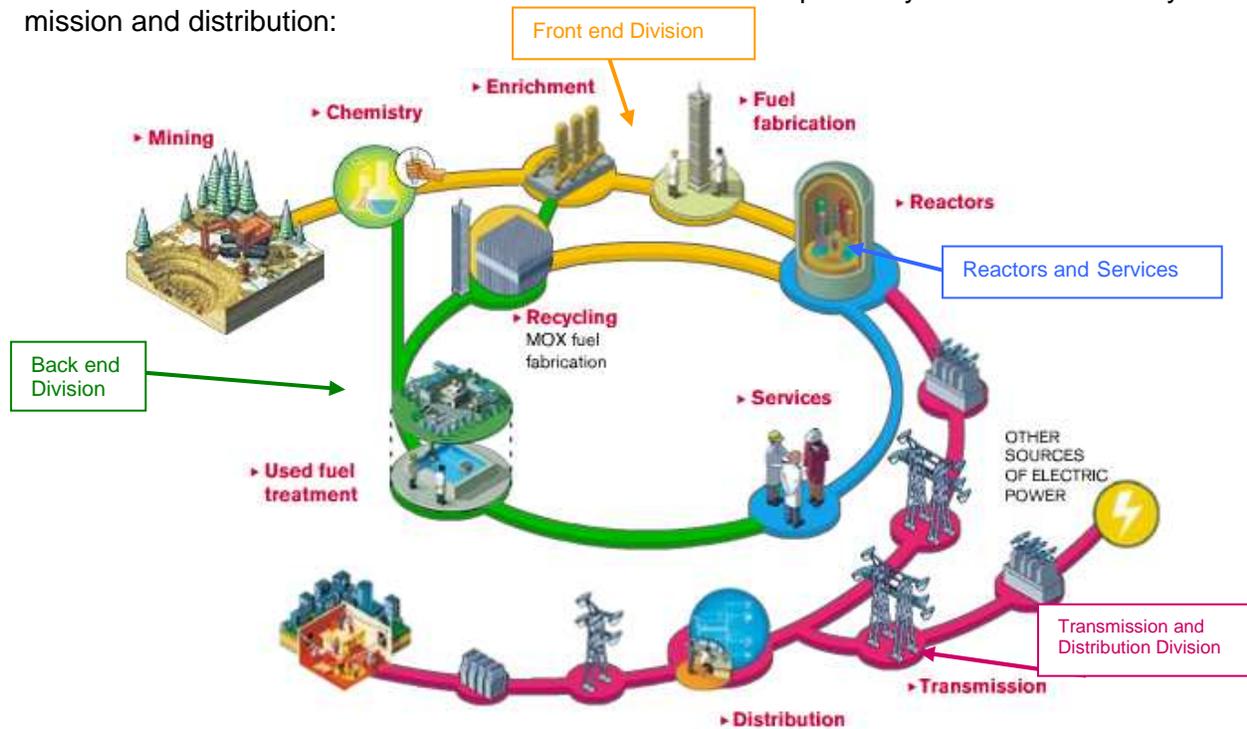
Some changes are scheduled at the beginning of 2010 and will be included within 2010 and will be taken in account later.

### 1.1. AREVA and AREVA NP

With manufacturing facilities in 43 countries and a sales network in more than 100, AREVA offers customers reliable technological solutions for CO<sub>2</sub>-free power generation and electricity transmission and distribution. AREVA is the world leader in nuclear power and the only company to cover all industrial activities in this field.

75,000 employees are committed to continuous improvement on a daily basis, making sustainable development the focal point of the group's industrial strategy. AREVA's businesses help meet the 21st century's greatest challenges: making energy available to all, protecting the planet, and acting responsibly towards future generations.

AREVA is divided into 4 divisions which cover the nuclear power cycle and in electricity transmission and distribution:



**Fig. 1.1: AREVA's core business**

Each division comprises several business units (BU). The AREVA group has 20 business units, each of which corresponds to a field of expertise of one of our 4 first-tier subsidiaries:

- **AREVA NP**
- AREVA NC
- AREVA T&D
- AREVA TA

Each subsidiary comprises several legal companies. These companies constitute the foundation of our legal and tax structure.

**AREVA NP** is the world leader in the design and construction of nuclear power plants, and the supply of fuel, maintenance and modernization services. AREVA NP is headquartered in Paris (France) with main subsidiaries in the United States (AREVA NP Inc.) and Germany (AREVA NP GmbH). The Company gathers over 18,000 employees

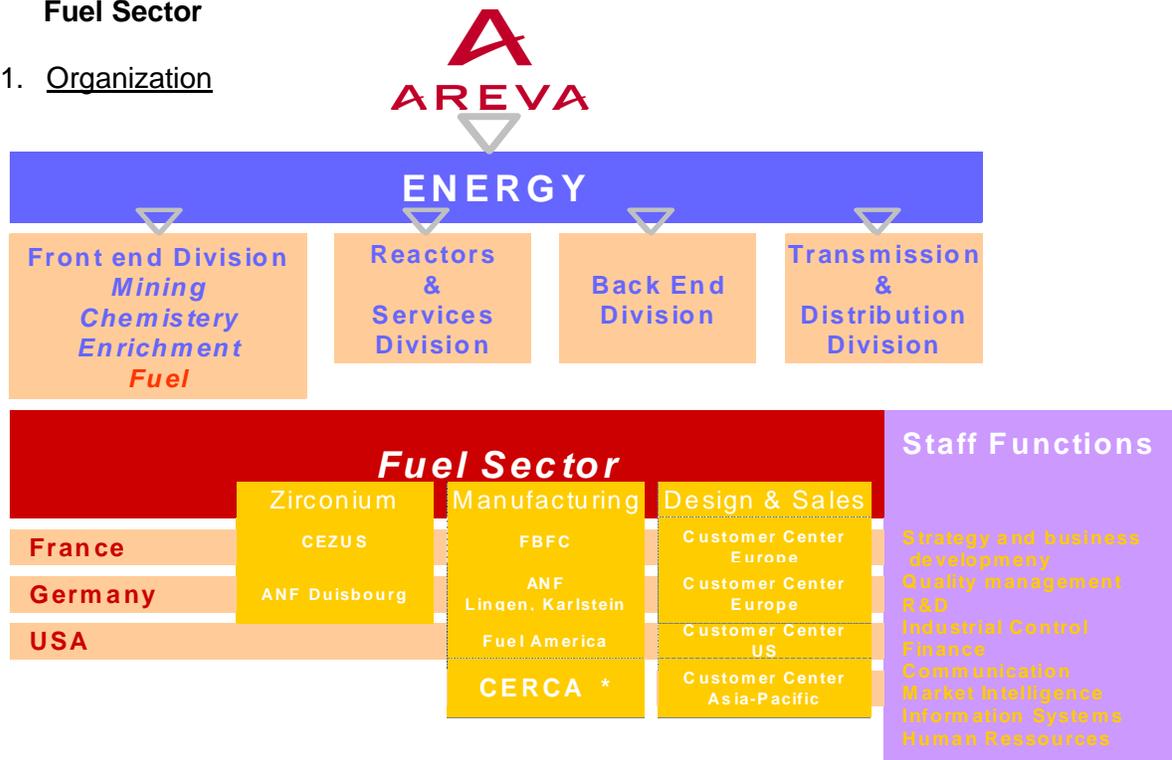
AREVA NP activities are grouped together in 4 sectors:

- **Fuel Sector**
- Plants Sector
- Services Sector
- Equipment Sector

This manual only applies to the Fuel Sector, as described above.

## 1.2. Fuel Sector

### 1.2.1. Organization



\* CERCA, located in Romans and Pierrelatte ( France ), is the world leading producer of research reactor fuel and Radiative reference sources

**Fig. 1.2: Fuel Sector matrix**

The Fuel Sector is part of the Front end Division. With over 5,000 employees, it is present in France, Belgium, Germany and the United States through its 3 business units :

- Design and Sales BU, based in Germany, France and the United States
- Zirconium BU, with 5 plants in France and 1 in Germany
- Fuel Manufacturing BU, organized into 8 plant sites (3 in the United States and 5 in Europe)

The Fuel Sector includes another entity CERCA, which has plants in France, fabricates and sells fuel elements for research reactors.

## 1.2.2. Activities

Fuel Sector designs, fabricates and markets nuclear fuel assemblies for Pressurized Water Reactors (PWR), Boiling Water Reactors (BWR) and research reactors. A fuel assembly is made up of fuel rods (metal tubes) containing uranium oxide pellets (the fissile material), held in a metal frame (the skeleton) which is usually made of zirconium alloy. The Fuel Sector also supplies MOX (a mixture of uranium and plutonium oxides) and ERU (Enriched Reprocessed Uranium) fuels, using fissile materials obtained during the recycling of spent fuel.

With almost 40% market share, we are the world leader in the manufacture of fuel for PWR and BWR reactors.

## 1.3. Fuel Sector Business Units



**Fig. 1.3: Fuel location**

As shown on the map, Fuel Sector Business Units include several entities in France, Belgium, Germany and United States.

### 1.3.1. Zirconium Business Unit (ZrBU)

The ZrBU supplies 40% of all Zirconium world market, from Zr sponge to finished flats, bars and tube products. Zirconium manufacturing activities comprise Cezus in France with 5 facilities (Jarrie, UGINE, Rugles, Montreuil-Juigné and Paimboeuf) and ANF Duisburg in Germany, representing globally the largest capacity in the world.

To ensure optimum reactivity with customers, Zirconium activities have been organized into Product Lines:

- Flat product line in Rugles
- Barstock line in Ugine
- And a Tubing line in Montreuil-Juigné, Paimboeuf and Duisburg

### 1.3.2. Design and Sales Business Unit (DSBU)

The DSBU organization is a customer-centered organization composed of:

- Three Customers Centers (USA, Europe and Asia)
- One US Front-End sales Center
- One Engineering Center managing globally these activities
- One Products and Technology Center

This Design and Sales Business Unit organization offers customers solutions taking benefit from all Design and Sales Business Unit competencies and skills while keeping proximity and preference to local contacts. This could be summed up in “Think Globally! Act locally!”

The comprehensive fuel supply services span PWR and BWR fuel assemblies, including mixed oxide (MOX) fuel and fuel fabricated from enriched reprocessed uranium (ERU). In addition to designing nuclear fuel and components to meet tomorrow’s demands, we also perform fabrication, licensing, engineering services, and fuel inspection and repair.

### 1.3.3. Fuel Manufacturing Business Unit (FMBU)

The FMBU comprises the fuel manufacturing activities of AREVA NP: Inc in the USA, FBFC (Franco-Belge de Fabrication de Combustible) in France, FBFC international in Belgium and ANF (Advanced Nuclear Fuels GmbH) in Germany. This worldwide production capacity, globally managed, is able to meet all needed flexibility and availability required by any customer, whatever the ordered product.

FMBU’s facilities produce:

- UO<sub>2</sub> powder and pellets
- Fuel rod and fuel assembly manufacturing for BWR and PWR
- Components for fuel assemblies: spacer grids, upper and lower tie plates for PWR and BWR fuel assemblies as well as water channels for BWRs

### 1.3.4. CERCA

CERCA, a wholly-owned subsidiary of AREVA NP, is the world’s leading producer of fuel elements for research, test and high flux reactors:

- 25 types of fuel designs delivered to 40 countries
- TRIGA fuel types (joint-venture with General Atomic)

CERCA is also producing radioactive sources for industrial and medical purposes.

## 2. External and Internal requirements

In addition to standards and regulations identified in the section 0.1 of this manual, entities have to take into account several requirements to implement and improve their Quality, OH&S, and Environmental Management System.

### 2.1. Internal requirements

All Internal requirements are set up in AREVA charters, policies and other lower level documents (directives, guides, etc). The IMS takes into account internal requirements like:

Policies and charters	References
AREVA Values Charter	PO ARV DIR GEN 1
AREVA Nuclear Safety Charter	PO ARV SHS GEN 4
AREVA Sustainable Development Declaration for suppliers	FO ARV PUR GEN 8
AREVA Occupational Safety Policy	PO ARV SHS GEN 1
AREVA Health Policy	PO ARV SHS GEN 3
AREVA Environment Policy	PO ARV SDI ENV 9

**Tab. 2.1: Charters and Policies**

A group-wide model called AREVA WAY has been developed from internal and external benchmarks and from the Group’s commitments with regard to Sustainable Development.

It sets goals for us to achieve via ten commitments and lays down the path for achieving them through a continuous improvement system (see section 3.1.1). Each of these commitments is spearheaded by a corporate department, which defines the related programs and manages their deployment.

AREVA Way is expressed in a **Values Charter applicable to all executives and employees**. Management is responsible for implementing the Charter at all levels of the organization. The principles of the **Global Compact** are integral to our Values Charter and serve as inspiration for our sustainable development policy.

It is broken down into ten **AREVA Way commitments** that explain and describe our contribution to each of the **three sustainable development pillars: economic, social and environmental**.

## 2.2. Stakeholders requirements

### 2.2.1. Customers requirements

Measures are established to ensure that customer requirements are identified and fulfilled with the aim of enhancing customer satisfaction (see sections 7.2 and 8.2.1). Communications with customers are defined at the most efficient level in order to collect, analyze and use information for improving customer satisfaction.

In order to achieve customer satisfaction, various activities are performed on a regular basis such as:

- Customer needs and expectations are determined, analyzed and taken into account during proposals
- Meetings with customer
- Management of customer complaints and requests
- Customer opinion surveys
- Customer Satisfaction Index measurement

### 2.2.2. Other stakeholders

According the AREVA WAY definition, other stakeholders are employees or employee representatives, suppliers, elected representatives, residents, associations, administrations, the media and communities.

In effectively managing stakeholder relations, entities have to:

- Identify them and to enter into dialogue with them
- Enter into joint operations such as partnerships with some of them related to their concerns: impact measurements, environmental preservation, etc
- Improve the commitment to employees
- Improve the forecasting requirements, both qualitative and quantitative
- Improve concerns employees involvement in the entity's performance improvement

## 2.3. Legal requirements

In each country, entities have to identify, have access and update to the applicable legal requirements to which the organization subscribes related to its quality, environmental aspects and OH&S.

Entities ensure that these applicable legal requirements are taken into account (in less that 3 months) in establishing, implementing and maintaining its integrated management system. Relevant information on legal requirements is communicated to persons working under the control of the organization and other relevant interested parties.

## 2.4. EHS requirements

Each entity ensures to take into account, according to applicable legal obligations, when establishing, implementing and maintaining its Integrated Management System of the:

- Hazard identification, risk assessment and determining controls
- Identification and assessment of environmental aspects

#### 2.4.1. Hazard identification, risk assessment and determining controls

Entities implement methodology for hazard identification and risk assessment defined with respect to its scope, nature and timing to ensure it is proactive rather than reactive.

Employees have to participate and be consulted in the methodology implementation.

Hazards, impacts and results of the risk assessments are documented in a risk analysis documents prepared in accordance with national regulation (e.g. “document unique” in France).

##### 2.4.1.1. *Hazard Identification*

To eliminate or control the potential risk of a hazard, sites must identify the hazards in their workplace (e.g. checklist including hazardous substances, manual handling, machinery and equipment, physical work environment...).

The hazard identification is carried out by site area, by job or by activity:

- Refer to workplace documents (e.g. manufacturing and maintenance files, safety data forms, documents established by the medical officer, accident reports, personnel request...)
- Visit of the workplace: it concerns an inventory of fixtures which allows to pinpoint, to identify and to record hazards
- Draft a synthesis

##### 2.4.1.2. *Risk assessment*

After the hazard identification, the risk assessment allows to define a level of risk according to, at least:

- The seriousness of risk incurred
- The probability of appearance of undesired events, frequency of exposure of the employee(s)

A prioritization grid is implemented according to sites and their specificities (hazard, activity domain). The aim is to determine if the risk level is acceptable or not. Any statutory anomaly is processed as a priority.

##### 2.4.1.3. *Determining controls*

Entities take into account the risk assessment to determine or change controls. The target is to reduce the risks according to the following hierarchy:

- Elimination
- Substitution
- Engineering controls
- Signage/Warnings and/or administrative controls
- Personal protective equipment

#### 2.4.1.4. *Update*

The risk assessment is updated periodically as required and during important changes or modifications of activity, installation, organizational or management systems.

### 2.4.2. Identification and assessment of environmental aspects

#### 2.4.2.1. *Identification of environmental aspects (EA)*

Each site identifies the environmental aspects of its activities, products and services within the defined scope of the environmental management system that it can control and those that it can influence taking into account planned or new developments, or new or modified activities, products and services.

The environment function of each site draws up a list of the EA. The identification of the EA is a process which determines the beneficial or negative environmental impacts. Each environmental impact is associated to each aspect identified. This list brings out the main EA encountered on the site concerned and those which have or can have significant environmental impacts.

#### 2.4.2.2. *Assessment of environmental aspects*

The EA of each site are evaluated using an analysis matrix or grid of hierarchy according to their impact on the environment. Classification of the EA is done in consultation with the people concerned by the EA (e.g. environment department, representative agent, operators and maintenance).

Each EA identified is placed in the matrix (in accordance to the occurrence of the aspect and of its effect on the environment) which allows bringing to light the most damaging EA. The border between significant EA and non significant EA is set by the Environment function of each site.

#### 2.4.2.3. *Management of actions and follow-up*

The significant environmental aspects are identified and communicated to plant management. Site management decides on the points to be dealt with during the year considered according to the improvement axes, the focus and objectives set by site. The objectives, the actions to be taken are followed up during the management review.

#### 2.4.2.4. *Update*

The environmental analysis is updated periodically according to the site instructions or at the time of the introduction of a new product or at each modification of product or activity.

### 3. Integrated Management System

The FS has established, documented, implemented, assessed and maintains a Management System integrating Quality, OH&S, and Environment. It continually improves its effectiveness in accordance with requirements (see chapters 0 and 2).

Design, procurement, production, inspection, handling and shipping (packaging and transportation) activities are part of the IMS scope. These requirements are propagated through procedures such as engineering, manufacturing, inspection, and administrative procedures.

#### 3.1. Process Management

##### 3.1.1. Continuous Improvement

The Integrated Management System and the **AREVA WAY** approach work in synergy. We found the same fundamental principles like the Continuous Improvement.

In this context, the IMS is based on the dynamic cycle “PDCA”:

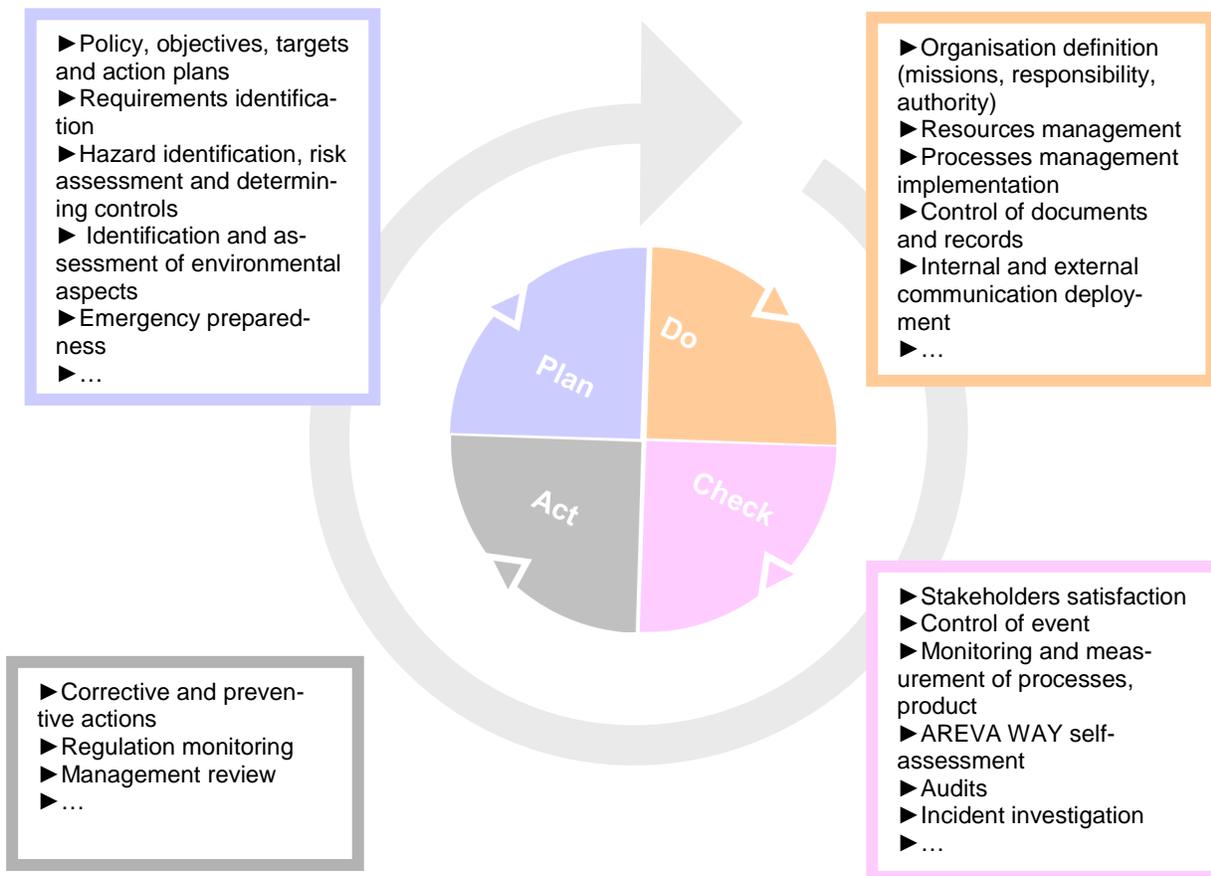


Fig. 3.1: PDCA cycle

Fuel Sector and entities continually improve the effectiveness of the IMS through by e.g. policy, objectives, management review and several measurement methods (see chapter 8).

AREVA has put its Sustainable Development and Continuous Improvement approach at the heart of its strategy and defined 10 commitments and 7 values to drive its action (AREVA WAY). To achieve its goals and respect its commitments, our group uses a continuous improvement process. Such management system allows us to structure and to decline our actions. Completed by non-financial reporting system, it allows us to analyze the main stakes in our professions, to clarify objectives of progress and to report in a factual way.

FS SDCI Director supports and helps managers and staff to implement Sustainable Development commitments and makes sure that each of us is concerned about it in our daily lives.

This self assessment method (AREVA WAY) gives additional evaluation results and complete the action plans for continuous improvement.

### 3.1.2. Process approach

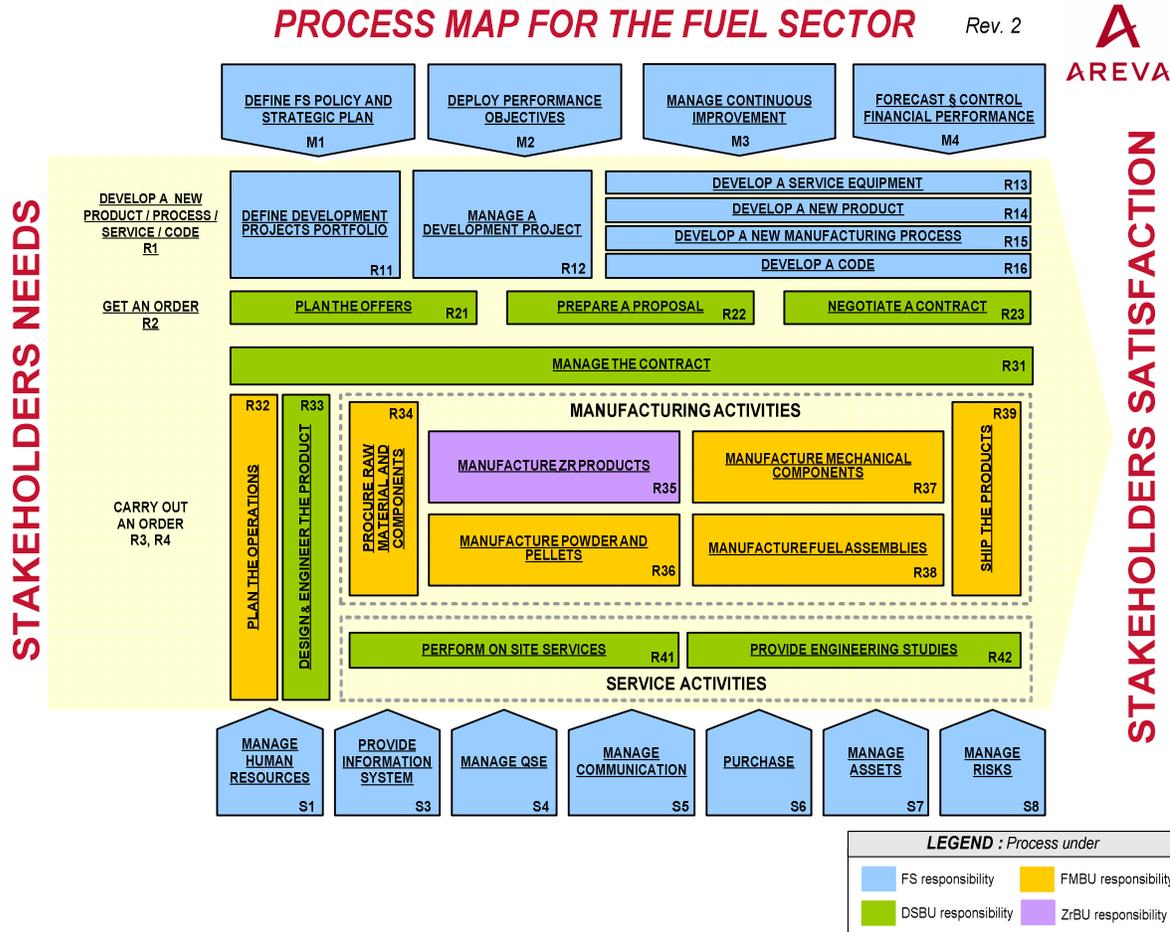
The process approach takes into account management, realization and support processes:

- **Management Processes:** Management develops the policies and strategies of the company based on its vision and mission, stakeholders' needs, legal requirements, and various feedback systems for continuous improvement of its performance. These policies and strategies are deployed through operational objectives that direct the day-to-day business of the company, and ultimately to the individual performance expectations of each employee. They provide guidance and consistency for realization processes and support processes.
- **Realization Processes:** The day-to-day business of the company is the realization of developing products and services and the infrastructure to support them, the process of getting an order, and all the activities required to carry out that order.
- **Support Processes:** They contribute to the smooth running of realization processes, by providing them with the necessary resources. Though they do not create any product directly perceivable by the stakeholders, they are necessary for the operation and sustainability of management and realization processes.

The Process Map for the Fuel Sector, approved by the Fuel Sector Executive Vice President and his Management Committee, illustrates the processes vital for operation, and contains links to detailed relationship maps (showing the sequence and interactions between these various processes) and process descriptions for the individual processes (see intranet).

The organizations ensure the availability of resources and information necessary to support the operation and monitoring of these processes.

At the FS or Entity level, as appropriate, the individual processes are documented by process descriptions and/or procedures which include the necessary information regarding the sequence of the steps, main interactions between the processes and criteria. Indicators will be used to measure the effectiveness of these processes as applicable.



**Fig. 3.2: Process Map for the Fuel Sector**

### 3.1.3. Process owner

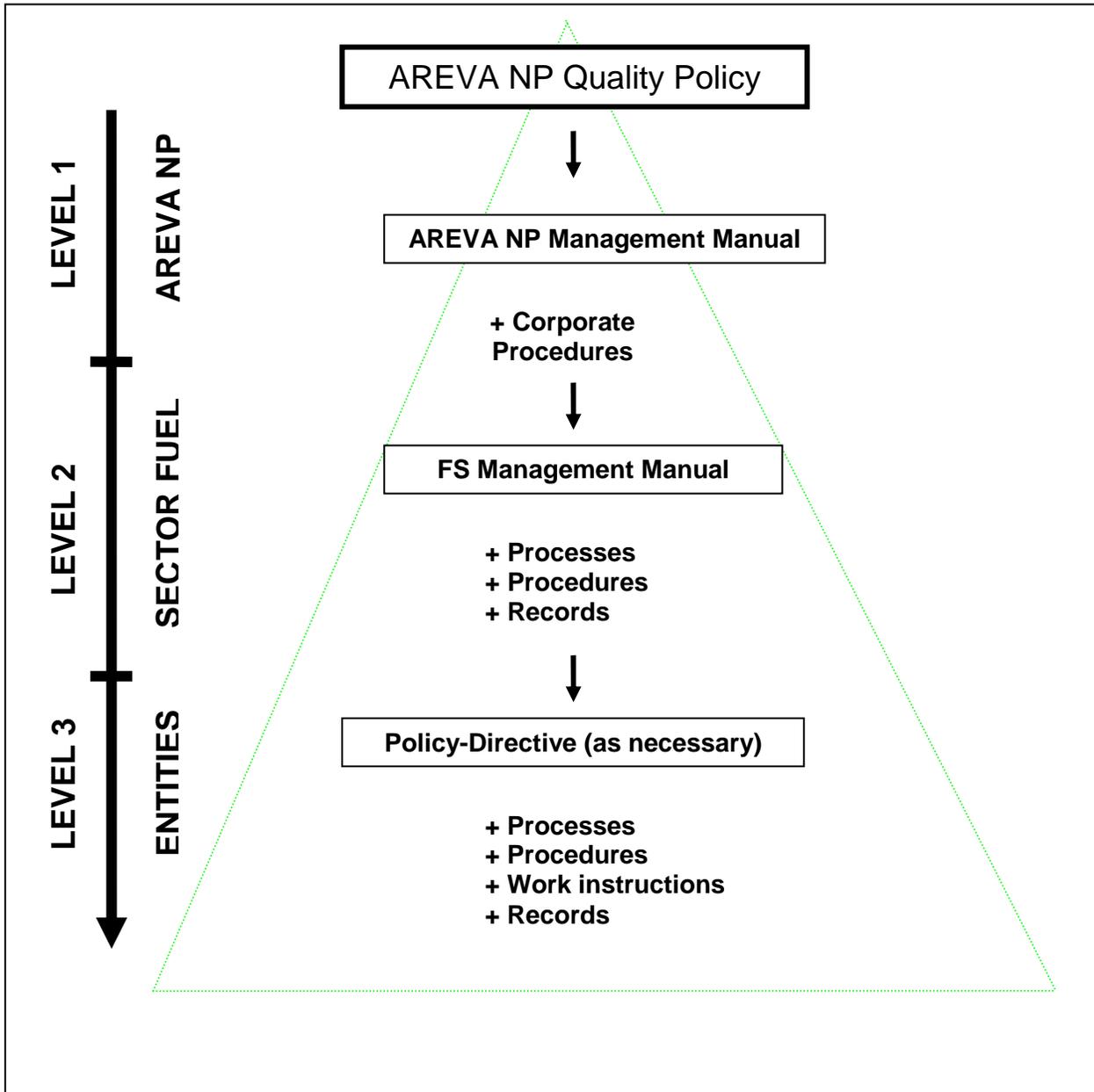
The Fuel Sector management assigns one process owner to each process defined at the sector level and the Entity management assigns a process owner to each process defined within this Unit (see document on intranet – Fuel Sector Process Owners).

The main responsibilities of the process owners are:

- Support the application of the process
- Monitor, measure and analyze process
- Implement actions necessary to achieve planned results
- Review regularly the process effectiveness and track process efficiency
- Implement continuous improvement of the process

**3.2. System documentation**

The AREVA NP IMS is structured (see Fig. 3.3) in accordance with requirements (see chapters 0 and 2), so that fundamental requirements are documented, understood and maintained throughout AREVA NP.



**Fig. 3.3: Structure of the FS IMS Documentation**

The implementation of the Integrated Management System is due to the adoption of the AREVA NP Policy at the AREVA NP and Sectors levels (see chapter 4.1).

### 3.2.1. Management Manual

The Manual describes the organization and the principles selected to put into effect the policy, objectives and targets.

**Preparation, Review, Approval:** It is prepared, reviewed each calendar year and revised if needed by the FS SDCI Director. He is responsible for collecting proposed changes from the BUs and Entities and incorporating appropriate changes. The approval will be done by the FS Executive Vice President.

**Distribution:** New or revised requirements of the Management Manual shall be transferred into lower tier procedures within 120 days following the issue of the revision, unless otherwise specified.

### 3.2.2. Process descriptions, Procedures and/or work instructions of Entities

Based on the Manual the associated provisions and measures are detailed in procedures. Those procedures can be applicable for the entire AREVA NP, the FS or specific to either a BU or Entity. Preparation, review and approval of these procedures are described in sub-tier documents.

### 3.2.3. Quality Assurance Plans (QAPs)

For specific projects, Quality Assurance Plans (QAPs) can be issued under the responsibility of the project manager. Preparation, review and approval of these QAPs are described in sub-tier documents.

### 3.2.4. Translation of documents

The English version is the reference version for the Level 1 and Level 2 documents. Level 3 documents may be issued in the regional language only. Corporate Sustainable Development and Continuous Improvement Vice President and FS SDCI Director respectively are responsible for the translation of these documents into regional languages, when needed.

## 3.3. Classification of Characteristics

In order to place the correct amount of emphasis on the more important product quality characteristics, Entities may implement a system of classifying quality characteristics in design documents for subsequent use in process qualification and/or product inspection and testing.

### 3.4. Control of Documents and Data

Measures are established and described in AREVA NP, FS and Entity processes and/or procedures to control documents (including those prepared by customers or external sources, e.g. codes and standards) and electronic data bases, which are used for activities that may directly or indirectly affect the Quality of products, the OH&S, and the Environment. The measures also assure that changes to documents and data bases are appropriately controlled.

Procedures cover the following aspects for:

- Preparation, review, approval and revision of documents
- Release and distribution in order that applicable documents are available at the location where documents are used
- Identification of changes
- Identification of the applicable revisions of documents or data
- The distribution of documents such as “Advanced Copies,” “Temporary Document Revisions” or “Use with Restrictions” in order to avoid the unnecessary shutdown of key production operations
- Ensuring that documents remain legible, readily identifiable and retrievable
- Translation and review of translation of documents by competent translator. Translation is identified as such
- Requirements for protection of proprietary information and archiving

Review and approval of changes are performed by the same organizations that reviewed and approved the original or by designated organizations having access to the necessary information for review (such as the previous revision).

### 3.5. Control of Records

Measures are established and described in FS and sub-tier procedures to control records - including those prepared by customers or external sources - consistent with applicable regulatory or stakeholders requirements. Records may be paper, hard copy, microfilm or electronic.

Records are retained to provide evidence that requirements have been fulfilled and that the IMS functions effectively. They can include operating logs, results of reviews, inspections, tests, audits, monitoring of work performance and materials analyses. Associated records from suppliers form part of these records. The records may also include closely related data such as qualifications of personnel, processes and equipment.

Procedures cover the following aspects for:

- Classification of permanent and non-permanent records
- Identification, collection and indexing
- Filing and archiving duration
- Conditions for preservation, retrieval and disposition

Inspection and test records identify the inspector or data recorder, the type of observation, the results, the acceptability and the action taken in connection with any deficiencies noted. Records are identifiable and retrievable.

Records are provided to customers in accordance with contract requirements.

## 4. Management Responsibility

### 4.1. Management Commitment and Policy

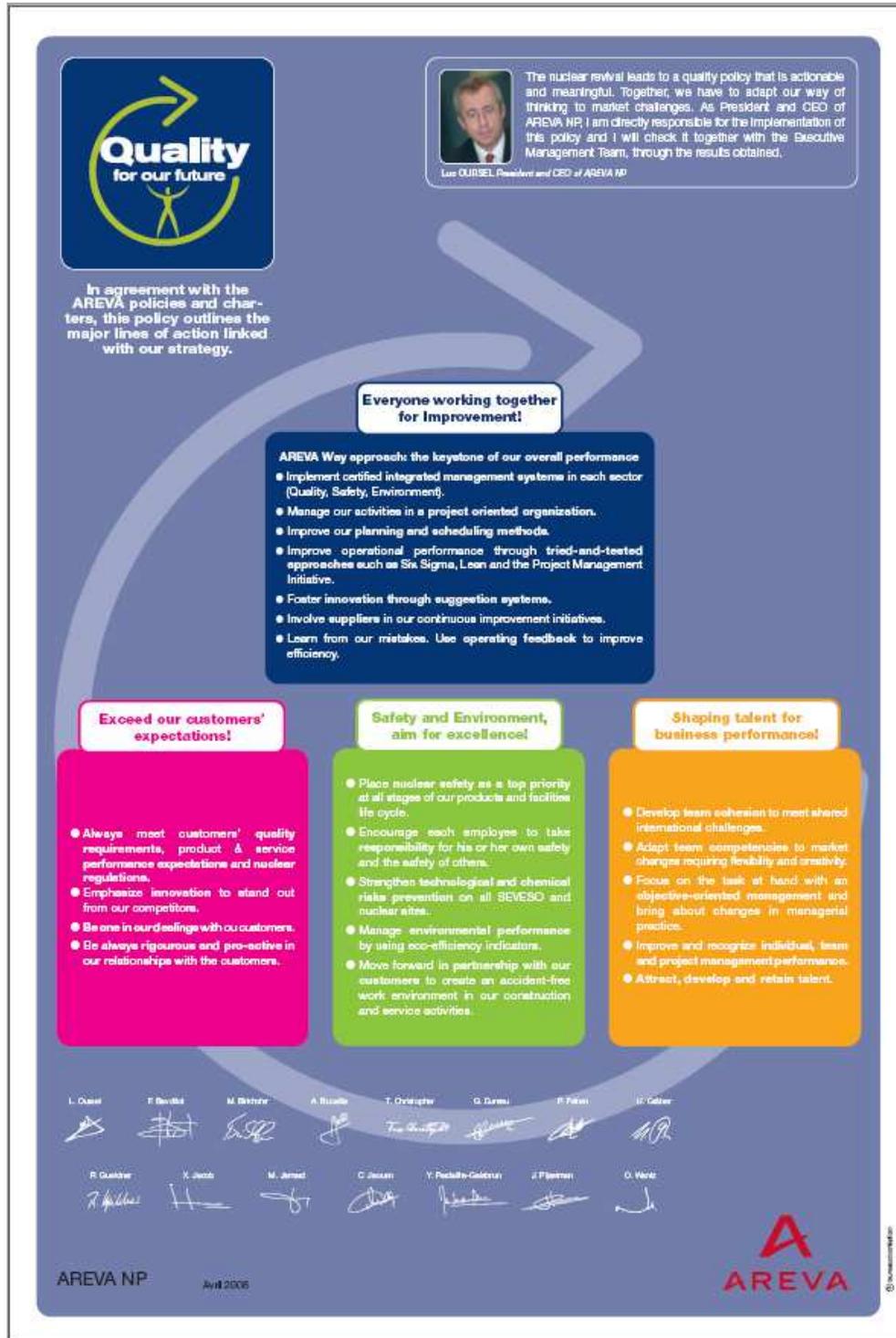


Fig. 4.1: Fuel Sector Policy

The applicable version is the one on intranet:

<http://bufuel.aveva.corp/quality/liblocal/docs/3-Quality%20System/2-PO%20F%20Fuel%20Sector%20policy/AREVA NP Quality Policy en.pdf>

In agreement with the AREVA charters and policies (see section 2.1) AREVA NP has established this policy (Fig. 4.1) which especially regards quality (customers' requirements and satisfactions), risks and environmental aspects of organization, activities and products. This policy has been adopted by the Fuel Sector with the signature of the Fuel Sector Executive Vice President.

AREVA NP and Fuel Sector Management are committed to the deployment, implementation and continually improving the effectiveness of the Integrated Management System:

AREVA NP policy is documented, implemented, maintained and reviewed periodically for continuing suitability. It is communicated and understood to all persons working for or on behalf of the entity and available to the stakeholders.

Each entity has the choice either to appropriate AREVA NP Policy or to implement its own Quality, OH&S, and Environmental policy. Whatever the implemented policy, it meets all requirements in accordance with this FMM.

All personnel perform their duties in agreement with the requirements set forth in the IMS of the FS and all related documentation.

Persons who are assigned the functions of assuring that the required Quality, Occupational Health and Safety, and Environmental protection has been achieved are identified so that they are provided with sufficient organizational freedom, resources and authority to perform their functions.

## **4.2. Customer focus**

Top management (FS and entity levels) shall ensure that customer requirements are determined and met the aim of enhancing customer satisfaction (see section 2.2.1).

## **4.3. Planning**

### **4.3.1. QSE objectives**

The Quality, OH&S, and Environmental objectives are based on the AREVA NP Policy. They are documented and established at relevant functions and levels within the organization.

Objectives are measurable and practically include:

- The commitments to the prevention of injury, illness and pollution
- The compliance with internal and external requirements
- The continuous improvement

Best-practice sharing within AREVA is also an element of the IMS. Such comparison leads to identification of strengths and areas of improvement that influence the deployment of objectives.

Information on customer's feedback, results of audits, process reviews, self assessments, Management Review conclusions and product verifications are used as sources for the definition of objectives.

Additional OH&S and Environmental objectives are defined at BU or Entity level to take into account the specific regulations, the results of risk analysis and the stakeholders' needs. They are quantified and measurable, and if applicable, indicators are set up to assess their performance.

Syntheses (objectives assessments) are established at either BU or Entity level and are the basis of reporting to the FS level.

#### 4.3.2. QSE system planning

IMS planning within the FS ensures that QSE objectives, including those needed to meet the requirements from stakeholders and standards are established and reviewed at all levels within the organization. This shall be achieved by measures such as:

- Identification of internal and external requirements (see chapter 2): e.g. these of customer resulting from contract reviews, identification and assessment of risks and environmental aspects
- Consideration of technical options, financial, operational and business requirements
- Assurance that the integrity of the IMS is maintained when customer specific changes are required (if needed, those changes are included in a quality assurance plan) or due to other internal or external changes
- Provisions of controls, processes, production and inspection equipment, resources and skills
- Assurance of compatibility between design, production and inspection and applicable documentation
- IMS assessment during audits, process reviews and Management Reviews
- Comprehensive training programs for all personnel likely to affect or to impact Quality, Occupational Health and Safety, and Environment
- Identification and development of process capability measurement to ensure product and product verification requirements are satisfied
- Measures and analysis of environmental and safety parameters
- Preparation of inspection plans
- Establishment of acceptance criteria

#### 4.3.3. Programme(s)

Each entity establishes implements and maintains a programme(s) for achieving its objectives. It includes as a minimum:

- Designation of a person in charge who has authority for achieving objectives at relevant function and level of the organization, and
- The means and time-frame by which the objectives have to be achieved

The programme(s) is reviewed at regular and planned intervals, and adjusted as necessary, to ensure that the objectives are achieved.

## 4.4. Responsibility and authority

In AREVA NP, Fuel Sector and Entities, top management ensures that the responsibilities and authorities are defined and communicated within the organization.

### 4.4.1. AREVA NP

AREVA NP organizational structure is given in Fig. 4.2. The applicable version is available on AREVA NP intranet:

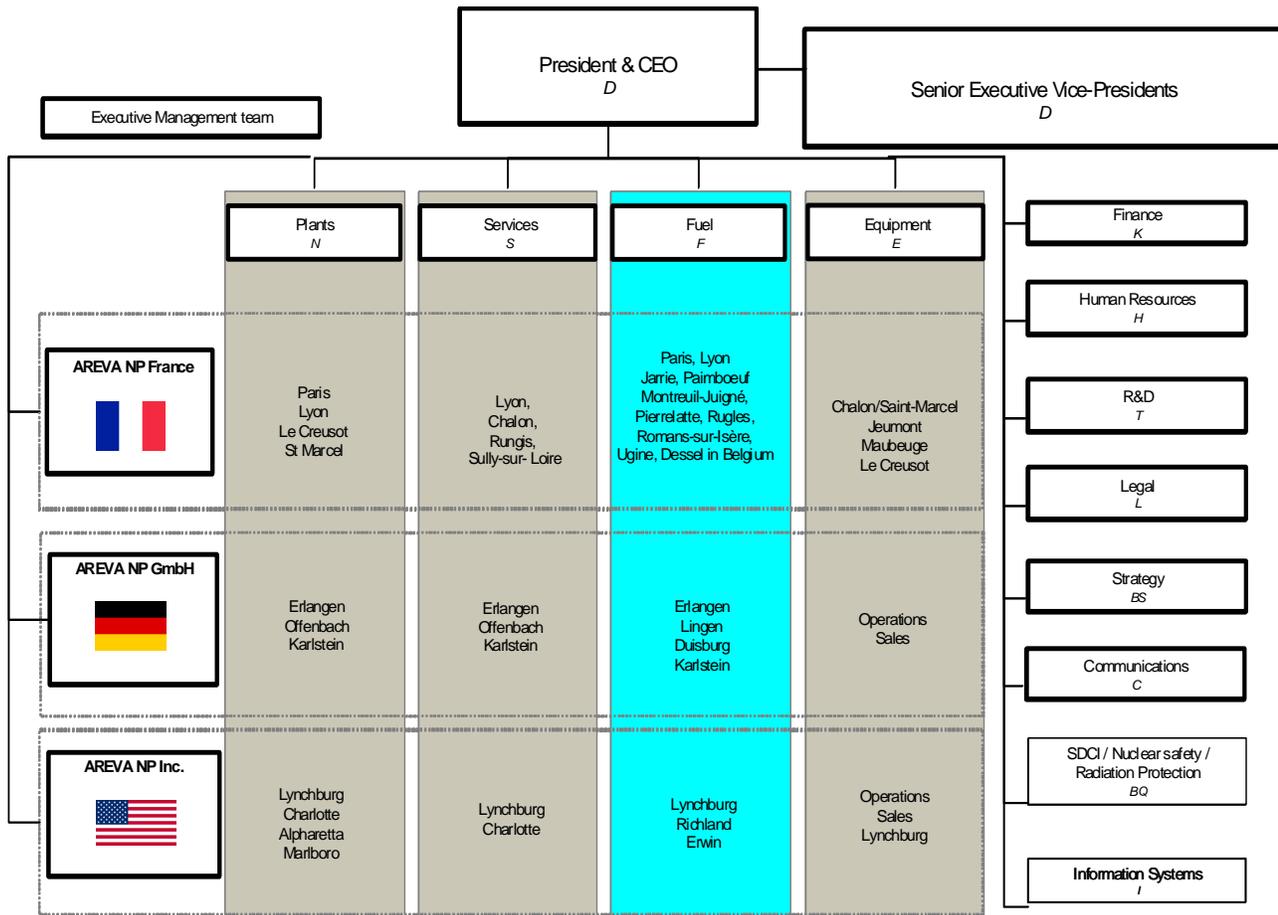


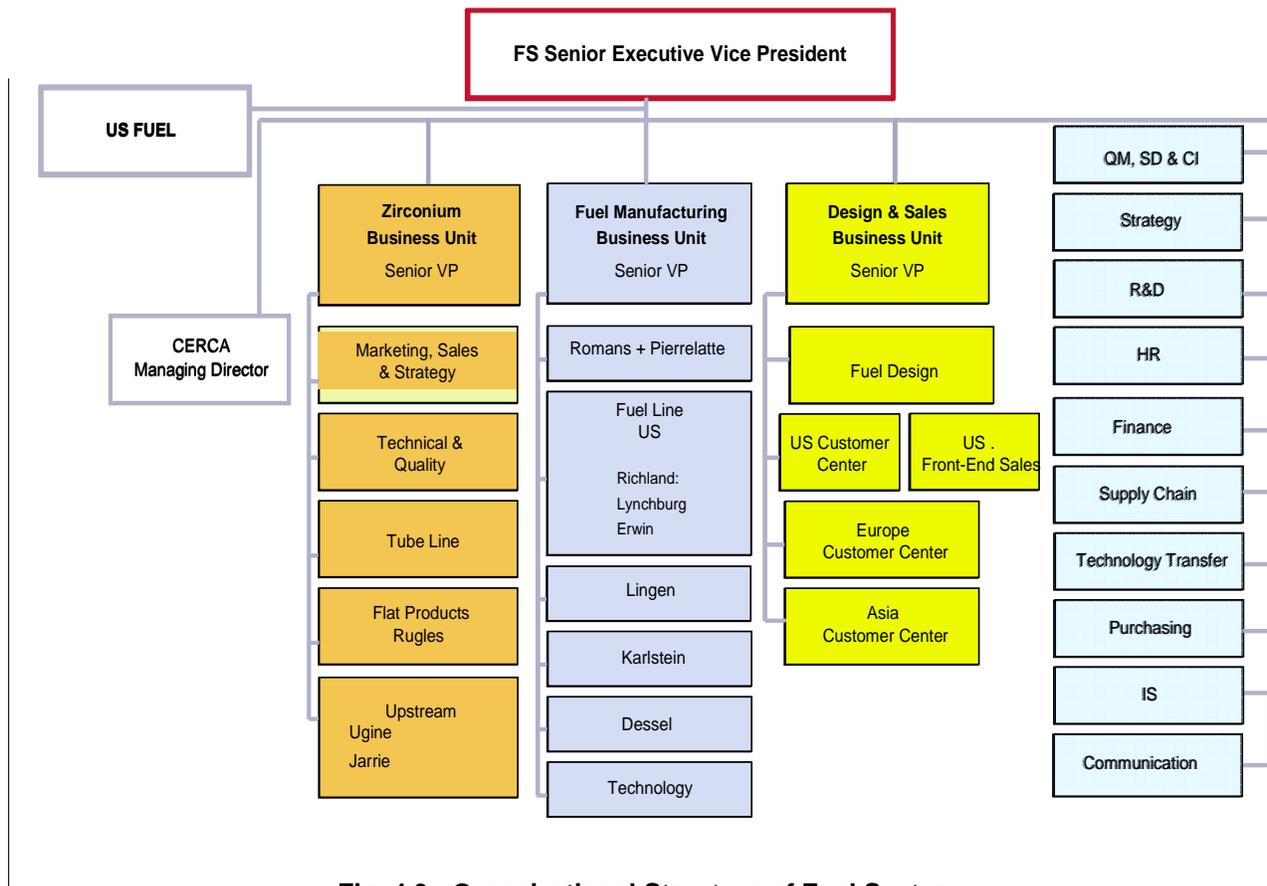
Fig. 4.2: Organizational Structure of AREVA NP

## 4.4.2. Responsibility and Authority of the Fuel Sector

In order to favor integration within the FS, enhance dialogue, develop cross approaches between Entities doing the same kind of activity, the FS is managed according to three Business Units: Design & Sales, Zirconium and Fuel Manufacturing (see Fig. 4.3). The main target of this structure is to achieve global optimization at the FS level.

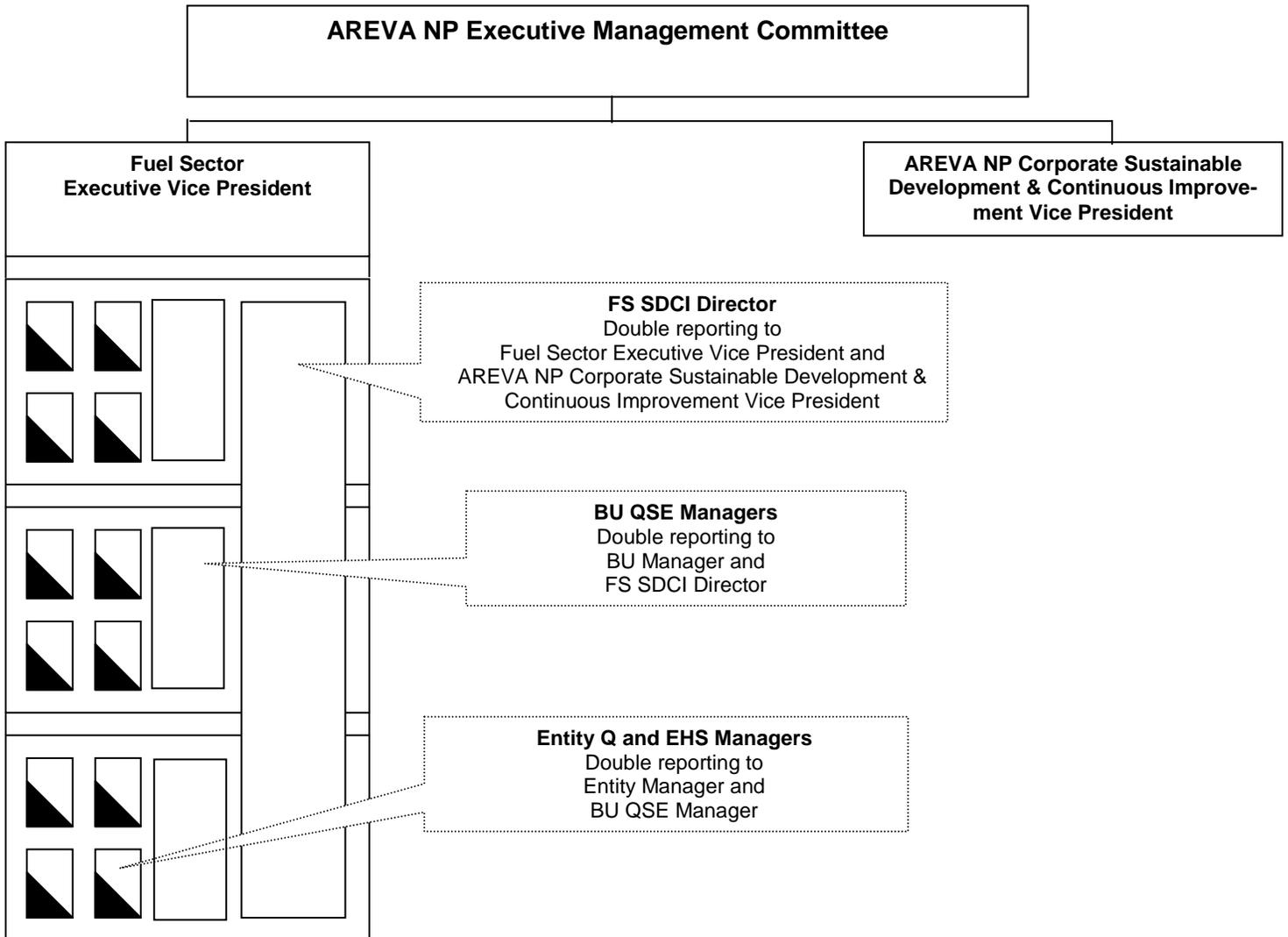
Each Entity retains its legal responsibilities. Management accountabilities and responsibilities within the FS are defined, in part, by provisions within this Management Manual, which defines integrated Quality, OH&S, and Environmental requirements applicable to the worldwide Fuel Sector activities. Entity QSE Managers have the responsibility and authority to ensure local and national regulatory requirements and contract responsibilities are met. These responsibilities, authorities, and requirements are defined in Entity procedures. EHS responsibility is formalized by written delegation of power to the Site Managers.

The Fuel Sector Entities are located in three Regions (France, Germany and the United States). Because of international boundaries, each regional legal enterprise must comply with its own national regulatory, reporting, and financial requirements. A legal enterprise may contain elements of more than one BU or Entity. Reporting relationships between and among the BU's, Entities, and legal enterprises are defined in lower-tiered documents.



**Fig. 4.3: Organizational Structure of Fuel Sector**

### 4.4.3. QSE Management Representative Authority and Responsibilities



**Fig. 4.4: Functional IMS Organization of the FS**

According to the Entity the QSE organization may change. There are either:

- QSE Managers
- Or Q Managers, Environmental and/or Safety Managers

#### 4.4.3.1. FS SDCI Director

The SDCI Director of the FS reports to the FS Senior Executive Vice President and in addition to the AREVA NP Corporate SDCI Vice President. He is the Management Representative of the FS IMS and responsible for providing the assurance that the Entities control and can guarantee the quality and reliability level required by the customer and the admissible risk level with respect to OH&S, and in order to ensure control over significant environmental aspects.

The SDCI Director is independent and as such has no direct responsibility for product design, engineering services or production. This position is responsible for supervising the implementation of the FS Quality, OH&S, and Environmental-related activities including the interpretation of requirements and to define, deploy, manage, execute and audit the IMS for the FS.

Specific responsibilities include:

- Preparation and maintenance of the FS Management Manual and procedures in cooperation with the Entity and BU QSE Managers
- Organization and administration of Management Reviews at the FS level
- Reporting of quality trends and quality-related costs
- Definition of continuous improvement measures of Integrated Management System
- Coordination of improvement programs between the Entities or BU's
- Coordination of audits to verify implementation of the Entity Integrated Management requirements
- Obtaining and maintaining certification of the IMS by an accredited certification body

The FS SDCI Director function is supported by the QSE Managers of the BU's and Entities. The FS SDCI Director may delegate specific tasks and responsibilities to be performed to the respective Integrated Management organizations. The FS SDCI Director has the overall authority to make decisions on interfacing IM matters within the FS. This position has the authority to submit quality, OH&S, and environmental-related matters directly to the FS Executive VP and the AREVA NP SDCI Vice President. The FS SDCI Director will defer to the Entity QSE Managers for resolution of local regulatory concerns. The FS SDCI Director has the organizational freedom and authority to identify and report quality, OH&S, and environmental issues recommend, initiate and provide solutions; verify implementation of solutions and initiate actions to prevent the recurrence of events.

Qualification requirements for the FS SDCI Director are:

- A bachelor's degree in a technical field
- At least ten years experience in responsible management of technical or manufacturing activities in the nuclear field, five years of which have been in fields allied to nuclear quality assurance
- Knowledge of applicable QSE-related codes, standards, and regulatory requirements
- Thorough knowledge of the AREVA NP QSE Programme(s)

The FS Executive Vice President may designate equivalent experiences where needed.

#### 4.4.3.2. BU and Entity QSE Managers

The QSE Managers within the various Entities are independent and as such they are charged with no direct product design, engineering services or production responsibilities. They are responsible for interpreting requirements and for the deployment and maintenance of the IMS within their respective organizations. This deployment integrates the inter-organizational functions required to implement the global IMS, as well as defining System elements that address local EHS requirements and authority regulations, and direct customer requirements. In matters of potential conflict, the QSE Managers shall retain the authority to interpret local regulations consistent with regulatory expectations.

Specific QSE Managers responsibilities include:

- In charge of the definition of the content and the development of the IMS in compliance with FMM, processes and procedures:
  - Take into account requirements (e.g. local regulations...)
  - Identification, reporting and put forth solution in QSE issues
  - Formulating and implementing QSE programs
  - Preparation and maintenance of specific procedures
  - Providing IMS indoctrination and training and developing and implementing enhancement initiatives
  - Performing supplier evaluation
  - Developing and implementing a comprehensive audit program to verify compliance. Participating or performing audits in other Entities upon request of the FS SDCI Director
  - Conducting Management Reviews within the Entities as needed
- Communication:
  - Interfacing with the other BUs and Entities on IMS matters
  - Reporting regularly on the performance of the IMS (particularly FS SDCI Director and Management)
- Authority to stop work for their respective facilities in order to maintain the requisite quality and EHS commitments
- QSE control related to the product of the BU or Entity as appropriate. This involves:
  - Preparation/review of product related documents
  - Performance of inspection and surveillance, including at suppliers' shops
  - Coordination of disposition of nonconformance
  - Compilation/review of records and product certification
- In Quality Assurance:
  - Interpreting and administering the Quality Assurance Programs
  - Providing the necessary organization and qualified personnel to carry out the required Quality Assurance / Quality Functions
  - Participation in contract reviews as required
  - Monitoring and conducting corrective and preventive actions

BU Managers have some specific missions as for example:

- Audit of the common organizations of the BU
- Coordination of the certification audits of the BU

Qualification requirements for QSE Managers are:

- A bachelor's degree in a technical field
- At least ten years experience in responsible management of technical or manufacturing activities in the nuclear field, five years of which have been in fields allied to nuclear quality assurance
- Knowledge of applicable quality-related codes, standards, and regulatory requirements

The BU and Entity Executive may designate equivalent experiences where needed.

#### 4.5. Management review

Management Reviews will be conducted at the BU or Entity level as directed by the FS SDCI Director, as needed to support the FS Management Review.

BUs and Entities may also conduct Management Reviews as needed to fulfill local/legal requirements and support BU or Entity objectives.

Reports including conclusions of the BU and Entity Management reviews will be distributed to the FS SDCI Director as sources for the annual FS Management Review.

In each BU or Entity where an annual Management Review is held this review will include current performance and improvement opportunities related to the following, if applicable:

- Results of audits and self-assessments, risk assessments, incident investigations, systematic periodically evaluation of compliance with legal requirements
- Stakeholders feedback, including Customer complaints
- Process performance and product conformity, performance of the organization
- Results of process reviews
- Results of participation and consultation as well as complaints of vicinity
- Status of preventive and corrective actions, including trend analyses
- Follow-up actions from earlier Management Reviews
- The extent to which objectives have been met
- Changes that could affect the IMS, e.g. legal and other requirements
- Recommendations for improvement

The FS Management Review covers the assessment of opportunities for improvement and of the need for changes to the IMS including FS Quality policy and objectives, to ensure its continued suitability, adequacy and effectiveness. It uses the BU and Entity Management Reviews, as appropriate, as an input.

The results of the FS Management Review are documented in reports containing the following topics:

- Improvement of the effectiveness of the IMS (e.g. policy, objectives, targets) and its processes performance
- Improvement of products related to customer requirements
- Improvement of occupational health and safety
- Improvement of environmental protection
- Improvement of nuclear safety
- Resource needs

The report of the FS Management Review is distributed to the AVERA NP Corporate SDCI Vice President as a source for the Corporate Management Review.

## 5. Communication, participation and consultation

### 5.1. Communication

Top management ensures that appropriate communication processes are established within the organization. In the FS IMS, the communication is implemented in the process S5 “Manage communication”.

The FS SDCI Director ensures that communication takes place regarding the effectiveness of the IMS. To accomplish this, he relies upon the process owner of “Manage communication” as far as necessary.

#### 5.1.1. Internal Communication

Suitable measures are established among all levels and all functions to ensure that information relevant to OH&S, environmental, customer needs, quality, economics goals, and also materials as well as policy, objectives and their achievement are communicated and available to persons working under the control of the organization.

Specific measures are defined and implemented to ensure personnel information of subcontractors and visitors about unit organization and potential hazards for OH&S.

Internal communication is performed through intranet, magazines, posters, meetings, etc.

#### 5.1.2. External Communication

In each level, information relevant to OH&S, environmental, quality and economics goals are communicated to stakeholders.

The customers' communication is focused:

- On product and project information
- Enquiries, contracts or order handling, including amendments, and
- Customer feedback, including customer complaints

With regards to OH&S hazards, Environmental aspects and IMS (e.g. legal requirements and others requirements), Entities receive or built document and respond to relevant communication from external involved parties.

In more than the legal requirements, industrial sites take the initiative to communicate a Sustainable Development report by site to stakeholders. By this way they communicate externally about its OH&S and significant environmental aspects.

## 5.2. Participation and Consultation

Management at all levels fosters the involvement of all individuals in the implementation and continuous improvement of the IMS.

Considering Occupational Health and Safety, Entities involve workers in their:

- Appropriate involvement in hazard identification, risk assessments and determination of controls
- Appropriate involvement in incident investigation
- Involvement in the development and review of OH&S policies and objectives
- Consultation about any changes that affect their OH&S
- Representation on OH&S matters

Employees are represented on OH&S matters, as required by Regional or Local Unit regulations. Workers are informed about their participation arrangements, including who is their representative(s) on OH&S matters.

The consultation process integrates also subcontractors for changes affecting OH&S of their personnel who participates on AREVA NP activities.

The external stakeholders (e.g. company doctors, external bodies, authorities, customers...) are consulted as necessary for all questions related to OH&S of personnel.

The arrangements related to participation, consultation and QSE organization are documented and communicated to personnel, by each Entity or Subsidiary.

## 6. Resources management

Within FS, measures are established to identify and provide the resources, which are needed for:

- Establishing, implementing, maintaining and improving the IMS and continually improving its effectiveness
- Enhancing stakeholders satisfaction by meeting stakeholders requirements
- Ongoing reduction of risks and environmental impacts

Resources include human resources and specialized skills, infrastructure, work environment, information and knowledge, suppliers, as well as material, technology and financial resources.

### 6.1. Human resources

At the Fuel Sector level human resources are managed in the process S1 “Manage Human Resources”.

#### 6.1.1. Competence

Entities ensure that any persons under its control (e.g. employees, contractors, temporary workers) performing tasks that may affect product quality, impact on OH&S or have the potential to cause a significant environmental impact are competent on the basis of appropriate education, training or experience.

In this way Entities determine the competence requirements for individuals at all levels and provide training or take other actions to achieve the required level of competence.

#### 6.1.2. Awareness

A general indoctrination session is presented to each employee who performs activities affecting Quality, OH&S, and Environment. This indoctrination is presented to new personnel before start of work. The purpose of the indoctrination session is to familiarize persons working under its control with:

- Their roles, responsibilities and importance in achieving conformity to the QSE policy, objectives and procedures and to the requirements of the IMS, including emergency preparedness and response requirements
- The OH&S consequences, actual or potential, of their work activities, their behaviour, and the OH&S benefits of improved personal performance
- The significant environmental aspects and related actual or potential impacts associated with their work, and the environmental benefits of improved personal performance
- The potential consequences for non respect of specified procedures

Re-indoctrination is performed when significant changes in the IMS are issued.

### 6.1.3. Training

Comprehensive training programs are established in procedures in each Entity for any personnel whose activity may affect QSE.

These procedures address:

- Maintenance and promotion of organizational commitment, social, professional and methods competence of the employees
- Determining training needs taking into account strategic and individual needs of the personnel as well as different levels of responsibility, ability, language skills and risk.
- Obtain and maintain the required skills to achieve the conformity to product specifications and process requirements
- Scheduling and performing of training
- Evaluate effectiveness of the training ( on the spot and cold assessment )
- Legal safety training
- Job-related training for the different tasks
- Special training and certification for special processes
- Audit performance in accordance with applicable codes and standards
- Requirements for retraining and re-certification
- Requirements for establishing and maintaining training records

### 6.2. **Other resources**

Each Entity is responsible for identifying, providing and maintaining suitable resources to carry out their activities.

Infrastructure includes, but is not limited to:

- Building, work space, and associated utilities
- Process equipment, both hardware and software
- Licensing installations
- Supporting services such as:
  - Transport and packaging service
  - Documentation and archiving service
  - Information System and communication service

At the Fuel Sector financial resources are managed in the process M4 "Forecast and Control Financial Performance".

People are provided with all tools and resources required to fulfill assigned tasks. The work conditions comply with all relevant OH&S regulations applicable for the specific work places and with the results of risk assessments.

## 7. Production realization

### 7.1. Realization processes

The process map of the FS illustrates the realization processes (see Fig. 3.2). According to the scope of supply of the particular order, the relevant parts of the Process Map shall apply to the production of product for a given contract.

These realization processes in conjunction with the management and support processes contain all necessary details or reference the implementing procedures to assure that:

- The QSE objectives and requirements linked to the product or services performances are achieved
- Necessary processes and documents are established and specific resources for the product or services, OH&S and environment are provided
- EHS risks due to the product or services realization are controlled by establishing and communicating operating criteria to employees and necessary documents and requirements to purchasing, suppliers and subcontractors
- Required verification, validation, monitoring, inspection and test activities specific for the product / services are planned and performed and the criteria for product / services acceptance are established
- Records needed are prepared to provide evidence that the realization processes and resulting products meet the requirements

Measures are established for monitoring and controlling the processes for their respective output according to criteria for acceptability. These measures ensure that resources and suitable production facilities are maintained and appropriate reviews and approvals are obtained for product, process and equipment changes.

Planning of product realization includes:

- Establishing Quality Assurance Plans, Project Master Plans, Development Plans and Inspection Plans as required
- Analyzing EHS risks due to operations / workplace / process / machinery / work organization related to product / services realization
- Design and development planning
- Design reviews, verification and validation
- Control of QSE records to provide evidence that the products meet the acceptance criteria

## 7.2. Customer related processes

### 7.2.1. Determination of requirements related to the product

Contract review ensures that customer requirements are identified including:

- Product requirements specified by the customer, including the requirements for availability, delivery, support, nuclear safety, OH&S and environment
- Product requirements not specified by the customer but necessary for intended or specified use where known
- Obligations related to the product, including regulatory and legal requirements

### 7.2.2. Review of requirements related to the product

Product requirements, whether documented by the customer or not, are defined and results of reviews are documented prior to the commitment to supply products to the customer.

Feasibility assessment of all requirements, including applicable regulations, codes, standards and guidelines is performed.

Deviations from the requirements stated in the customer's documents require resolution with other Entities as well as with the customer and – if necessary – with regulatory authorities and are communicated to relevant personnel.

Changes to contractual requirements are expediently addressed in the same manner as the original contract information and requirements.

### 7.3. Design and Development processes

#### 7.3.1. General

Procedures are established for the preparation and review of design documents, including the correct translation of applicable regulatory, stakeholders' requirements and design bases into design and procurement documents. Included are such activities as: physics, seismic, mechanical, thermal, hydraulic, radiation and accident analyses; associated development and maintenance of software programs; establishment of materials compatibility; determination of accessibility for in-service inspection, maintenance and repair, and the development and maintenance of QSE standards.

Design processes are responsible for the preparation, review, approval and verification of design documents for items and services within their respective areas of responsibility. Design documents include such documents as specifications, drawings, analyses and software program documentation. These documents specify technical, quality, OH&S and environmental requirements appropriate to the activities they cover. Wherever practical and applicable, industry standards and specifications are utilized in design specifications for suitable materials, parts, equipment and processes. They are independently reviewed for completeness and technical accuracy. Approved documents are required to procure or produce items.

The design and development of new products must not only conform to legal requirements and pertinent codes and standards but must also allow for environmentally relevant aspects of a product's life cycle (development, production, use, recycling/disposal). The aim is to conserve resources, extend the service life of products and simplify recycling and disposal.

The following principles apply to nuclear facilities:

- Product longevity should be ensured through the use of proven (i.e. conforming to assured safety methodology) materials and production methods and conservative design methods
- The scope and duration of in-service inspections should be reduced through the use of designs that are amenable to testing and optimized production technology
- Maintenance procedures should be optimized through appropriate logistics; use of remote-controlled equipment
- Geometry and design shall allow for ease of decontamination
- Determination and inspection of installation and process materials to be used]

Errors and nonconformance in approved design documents, including design methods such as computer programs that could adversely affect product performance, are documented and corrected. Deviations from specified QSE standards are identified and controlled in accordance with procedures.

### 7.3.2. Design and Development Planning

Design and development of new products and changes to existing products are carried out as described in procedures. Eco-conception steps are taken into account in order to reduce the environmental impacts during the life cycle of products. Plans are prepared for each new product design and development activity. They describe or reference these activities and define responsibility for their implementation. The design and development activities are assigned to qualified personnel equipped with adequate resources. The plans are updated as the design evolves.

For software products the design and development process is suitably defined.

### 7.3.3. Design, Organizational and Technical Interfaces

Procedures establish methods for the identification and control of design, organizational and technical interfaces and for their coordination among participating design organizations. These procedures establish methods for review, approval, distribution and revision of design documents to ensure that the appropriate design, organizational and technical interfaces are considered.

### 7.3.4. Design and Development Input

Input data which is necessary for the performance of design activities are such as:

- Customer's needs and requirements
- The applicable technical, contractual, legal and regulatory requirements
- The QSE standards and any standards required for the design
- Design analyses prepared, reviewed and approved in accordance with procedures
- Other requirements essential for design and development.

### 7.3.5. Design and Development Output

Design and development output data are presented to a degree of detail and in a form suitable for verification. As a minimum output documents:

- Satisfy the requirements stipulated in design input
- Provide appropriate information for production and service operations
- Contain or reference product acceptance criteria and applicable QSE criteria as needed
- Define the characteristics of the product that are essential to its safe and proper use

Design outputs are documented in design reports, design calculations, drawings and specifications, reload reports, and parts lists. Design reports for new products or major changes to existing products demonstrate that design input requirements were met. Parts lists are used to define specific product designs by listing the applicable part structures, part names, part numbers and other information necessary for production and procurement activities. These design output documents are prepared, reviewed and approved as stated in procedures.

### 7.3.6. Design and Development Review

Design reviews are conducted at defined milestones in the design and development processes for new products or major changes to existing products:

- To evaluate the ability to fulfill requirements
- To identify problems and propose solutions
- To determine the importance to OH&S and environmental aspects and impact

The number of design reviews to be conducted depends on the scope and complexity of the project.

Individuals or groups other than those who performed the original design but who may be from the same BU or Entity conduct the design review process. Implementation and documentation of the design review results are specified by procedures.

Experience from production and results of reactor service or problems discovered during production or service activities are reported to the design organizations. This information and experiences from the recent design process shall be considered during the fuel design review process.

### 7.3.7. Design and Development Verification

Procedures are provided to assure verification of designs. Verification methods include independent review of design documents, design analyses (calculations) and design verification testing. The design organization determines design verification methods to be used.

#### 7.3.7.1. *Independent Review of Design Documents*

All design documents are independently reviewed for completeness and technical accuracy. The reviewer shall be any technically qualified individual other than the author of the document in compliance with local regulations.

#### 7.3.7.2. *Design Analyses*

Design analyses (calculations) are used to establish design requirements or to verify the design. The analyst is required to document the calculations as to purpose, assumptions, method, input data, results and conclusions in such a manner that an independent reviewer can verify its technical accuracy independent of the analyst. Design analyses are checked by independent reviewers who are competent in the particular type of analysis being checked.

Computer codes used for design analyses are verified, except for those that can easily be verified by a user, before use as stipulated in procedures.

### 7.3.7.3. *Design Verification Testing*

Design verification by testing is used whenever engineering judgment leads to the conclusion that design analyses or previous experience cannot substantiate a design or design feature.

Design verification testing is conducted by the test organization using test procedures that incorporate the requirements of design specifications that establish the design limits of the items or features being tested. If verification of a design or design feature is solely by test, the testing is conducted under the most adverse design conditions that can be practically achieved as determined by analysis.

Test results are reviewed by the responsible design organization to determine if they verify the design or design feature tested.

### 7.3.8. Design and Development Validation

The suitability of new product designs may be demonstrated by the placement of lead test assemblies or components in reactors to validate their performance under operating conditions.

Validation takes place within the framework of the specified acceptance criteria and procedures with reference to the terms and conditions of use. Acceptance criteria are defined in the design input. Acceptance is performed, e.g., during final inspection.

For software products adequate measures are implemented, e.g., validation plans.

### 7.3.9. Design and Development Changes

Measures ensure that changes and modifications to designs are identified, documented and controlled. The changes are verified and validated, as appropriate, and approved before implementation.

Design changes to previously approved and issued design documents shall be reviewed and approved in the same manner (unless otherwise specified) as the original documents. If those required to accept or approve are unable to achieve a unanimous agreement, the items of disagreement are referred to the next higher level of management until resolved.

## 7.4. Purchasing

### 7.4.1. Purchasing process

Measures are established in procedures to assure that products are procured from suppliers that meet the requirements of the FS and those specified in customer contracts or legal requirements. Main suppliers have to subscribe to “Sustainable Development Declaration for Suppliers” of AREVA in order to regard to their own environment and in response to the social and societal expectations of their own stakeholders.

One or combinations of the following methods according to the importance of the purchased product are used for supplier evaluation:

- Supplier’s third party certificates and references
- Evaluation of supplier’s QSE System
- Review of performance data for former products and services of the supplier
- Source, incoming inspection and/or surveillance results

This evaluation leads to an assessment, which contains at least the registered name of the supplier including the location where the work is performed, scope of supply and expiration date as well as the condition under which the supplier is considered approved.

Assessment issued by an entity (from the FS or another Sector) complying with the applicable FS procedure is deemed valid for the other Entities. These assessments are registered in a common FS Approved Suppliers List (database). Information related to the status of suppliers is contained within the Approved Suppliers List.

In addition, supplier assessments performed by other sites of AREVA NP may be accepted by the Entities provided the conditions for assessment have been found acceptable by the unit in charge of the assessment.

The assessment is valid for a maximum duration of three years. The renewal is based on one or a combination of methods used for the initial evaluation.

Commercial grade and/or designated products for use in the reactor may be procured from suppliers where specific quality controls for nuclear applications cannot be imposed in a practicable manner. In these instances, an evaluation of the suitability of the item or service for nuclear applications is performed by the responsible process engineering and/or design organization. The critical characteristics of the item or service are also determined and documented as part of this evaluation. Special methods may be needed for verification of these critical characteristics. If needed, these special quality verification methods may include inspections, tests or commercial grade surveys or evaluations of the supplier.

#### 7.4.2. Purchasing data

Procurement documents for the purchase of products include or reference the following provisions, as applicable:

- Scope of supply
- Technical requirements
- IMS requirements (e.g. respect to EHS requirements including regulations)

Purchase orders are reviewed prior to release by personnel different from those who prepare the order.

Procurement document changes receive the same approval as the original for the specific requirements that are changed.

#### 7.4.3. Verification of purchased product

Measures assure that purchased products conform to the procurement documents. These measures include provisions as appropriate, for source evaluation and selection, objective evidence of quality furnished by the supplier, inspection at the source and examination of products upon delivery at intervals consistent with the importance, complexity and quantity of the product or services.

People in charge of the inspection, either at the source or upon delivery, are entitled or qualified according to Entity procedures. If they perform a source inspection for another sector, they shall be qualified according to the applicable corporate procedure.

Documentary evidence that purchased products conform to the procurement requirements is retained and must identify the specific requirements such as standards, specifications and drawings.

For design services, the relevant Design group monitors the quality of the required technical documents that are prepared by the supplier. Rules for releasing these documents are defined in procedures. If the supplier uses computer codes for critical studies, the verification actions consist of checking:

- The existence and validity of a calculation note
- The validity of the codes
- The validity of the input data with respect to the applicable ranges
- The validity of the results obtained with respect to the limits set

#### 7.4.4. Product and Service Transfer between Entities

For the product and service transfer between the entities an internal order is used. IMS requirements consist of the implementation of the FS IMS and the requirements from the final customer, if any. Product and associated records received from another Entity is inspected for completeness and possible shipment damage.

Design service documents are reviewed by responsible Design personnel for consistency with the internal order, completeness and quality of documents.

## 7.5. Production and Service Processes

### 7.5.1. Control of production and service processes

#### 7.5.1.1. *Fuel Related Products*

Drawings and specifications issued by Design groups may not be directly usable on the shop floor. On this basis, manufacturing and inspection documents are prepared to determine the chronological sequence and the description of manufacturing and inspections steps. Other documents are issued such as parameter sheets based on qualification of processes.

The documents can also include safety and environmental aspects. To ensure appropriate work instructions are disposed on all relevant places at the sites.

#### 7.5.1.2. *On-Site Service*

For any work on-site an operation file is issued which includes the planning of the work (schedule, assignment of personnel), the sequential list of operations, the list of applicable documents and the documents themselves. In addition, the necessary documents required on-site, as prerequisites such as personnel accreditations or qualifications of equipment are also included.

The documents can also include safety and environmental aspects. To ensure appropriate work instructions are disposed on all relevant places at the customer sites.

### 7.5.2. Qualification or validation of production and service processes

#### 7.5.2.1. *Production Processes*

Production processes as required are qualified on the basis of qualification programs which define production output to be evaluated, characteristics to be controlled and acceptance criteria defined or reviewed by the Design function and necessary documentation.

Production processes in which the quality achieved depends on the performance of the process and the results cannot be fully verified by subsequent inspections and tests are considered special processes are covered by more in-depth controls. These special processes are performed under controlled conditions with qualified procedures, trained and qualified personnel and suitable equipment and re-qualified if required.

Typical special processes and tests include welding, liquid penetrate testing, radiography, helium leak testing, ultrasonic testing, eddy current testing and nuclear rod assay.

For technically similar products, small quantities and non-repetitive production, qualification exemptions can be granted providing products or processes undergo more extensive inspection and surveillance.

The qualification process including required documents as well as archiving is described in procedures.

#### 7.5.2.2. *On-Site Service*

The aim of the qualification is to demonstrate that:

- The functional requirements of the equipment are met
- The desired result for the product subject to the work is obtained
- No irreversible damage occurs to the product subject to the work

The qualification process including required documents as well as archiving is described in procedures.

#### 7.5.2.3. *Qualification of Non Destructive Testing (NDT) Inspectors*

Procedures for qualification of NDT inspectors are established and define the following items:

- The qualification levels suited to the tasks, as well as the contents and the duration of the training and corresponding experience
- The terms of the certification tests and examinations, including the medical examinations designed for checking the physical ability of the applicants. These medical examinations, including visual acuity testing, are extended to all personnel performing visual inspection of the products
- The responsibilities for granting certificates
- The validity duration of the certifications and the conditions of their renewal
- The updating and archiving of the certification files

Certification of the personnel is not required for operating automatic inspection equipment and for carrying out, according to procedures, simple and repetitive operations, including frequent calibrations that can be considered as adjustments, providing surveillance is ensured.

#### 7.5.2.4. *Maintenance and EHS inspections*

A maintenance program or maintenance plan is prepared to ensure implementation of preventive maintenance of equipment affecting the quality of the products, the OH&S and the environment. The objective of this preventive maintenance is to ensure a continuous, safe and stable process.

For maintenance operations (preventive or corrective) the conditions for restarting shall be defined as appropriate.

For all OH&S and environmental relevant machinery and equipment maintenance and EHS inspections are carried out in accordance to the local legal requirements, guidelines and approval documents. All necessary measures will be determined during maintenance planning equipment and machinery.

#### 7.5.2.5. *Software Control*

Before application, new and modified software used for the functional and mechanical design of fuel assemblies and other core components, as well as for manufacture and inspection, is subject to appropriate verification and validation to demonstrate suitability for the intended purpose.

### 7.5.3. Identification, traceability and status control

Measures are established and documented in procedures for the identification and control of products. These identification and control measures are designed to prevent the use of incorrect or defective products. These measures also assure that sub-components are traceable to finished products throughout production and use. Such traceability also supports warranty evaluations for product failures encountered in use or storage. Moreover these measures are established to indicate, by the use of markings such as stamps, tags, labels, routing cards or other suitable means, the status of inspections and tests performed upon individual hardware items.

Suitable configuration control measures are implemented for identification, traceability and status control of software products.

#### 7.5.3.1. *Identification*

Traceability is maintained through receipt of material to final shipment. Procedures require that identification be maintained either on the item or on the package or on the records traceable to the item. Methods of identification and traceability are such that they provide, at all times, a link between the product and the related documentation and prevent the use of nonconforming products or product that has not yet been accepted.

Any fuel related product which loses its identification is considered as potentially nonconforming until such time as the identity can be established or the item is dispositioned by the nonconforming control System (see Section 8.3).

#### 7.5.3.2. *Inspection and Test Status*

Controls are established to assure that the inspection and processing status of items which will become part of the product or are important to the manufacturing process are adequately identified from receipt of the items to end use, in order to prevent inadvertent bypassing of operations or inadvertent use.

The following controls are employed to assure that the status of fuel related products are adequately identified:

- Lot cards, production order routers, station reports, route cards, inspection forms, and/or checklists are utilized to identify and control lots or items and to transfer identification when several items are joined into a single unit
- Inspector or operator identification is entered on the identity/control documentation to signify the completion of operations or inspections
- Hold points may be established at specified points in the process whereby material processing may not proceed until formally inspected and released by authorized personnel and/or the customer. Release points are designated in associated procedures. Releases become part of the quality records
- Conditional release of fuel related products beyond hold points may be initiated by completion of a "Conditional Release" or equivalent. Conditional Releases are not to be used to waive specification requirements. Conditional Releases shall be converted to Full Releases, at the latest, prior to product shipment
- Rejected items are suitably identified (e.g. hold tags) and / or separated from acceptable items to prevent their inadvertent use

#### 7.5.4. Customer property

Uranium hexafluoride (UF<sub>6</sub>) is an example of customer property of fuel related products. Acceptance of such product is based on quantity and inspection followed by a formal release. Inspection includes visible damage on the packaging or product, review of the documents required to evidence quality and as appropriate, physical and/or chemical analysis.

Engineering analyses, plant data and software are examples of non-hardware types of purchaser property. Acceptance of data and analyses is done through the validation of data or results.

Precautions are taken to preclude damage to customer property. A report is issued for any loss, damage or other limitation according to Entity procedures. This report is transmitted to the customer and kept according to Entity procedures dealing with the control of quality records.

#### 7.5.5. Preservation of product

Procedural controls are established to assure that fuel related products are handled, stored, shipped and preserved in a manner such that quality, OH&S, environment is not adversely affected. Trained individuals accomplish the special handling, storage and preservation in accordance with procedures. Where special controls are not required for handling, storage and preservation, standard material handling and transportation methods are used to protect against physical damage.

##### 7.5.5.1. *Control of Prohibited Materials*

Controls are established to assure that materials detrimental to fuel performance are sufficiently controlled or not used. The measures include control of essential material purchases and evaluation of the process via appropriate analyses, as required to assure that adequate control is maintained over the use of such materials.

##### 7.5.5.2. *Packaging and Storage*

Procedures for packaging and storage assure that fuel related products, which are subject to deterioration or damage through exposure to air, moisture and other environments, are protected during procurement, production, interim storage and final shipping.

##### 7.5.5.3. *Delivery*

Shipping of nuclear material is performed in accordance with national and international regulations.

As requested by the customer upon receipt of nuclear fuel at the customer's plant, inspection is performed, based on a procedure which is mutually agreed between involved parties.

## 7.6. Control for measuring and test equipment

Inspection, measuring and test equipment is defined as those devices used to measure characteristics for the purpose of determining acceptance of products to specified requirements where subsequent inspection is not performed.

Furthermore inspection and measuring equipment is also defined as those devices that are used for measuring of OH&S and environmental parameters.

Procedures for calibration and use of the measuring and test equipment are established and document the basis of calibration. These procedures describe requirements such as:

- Traceability of calibration standards according to national or international standards, where such standards exist. In the event there are no national or international standards, the basis of the calibration is documented
- Equipment within the scope of the calibration and maintenance program is procured, controlled and used to ensure the required degree of accuracy, reproducibility and traceability
- Frequencies of recalibration are established, based on required accuracy usage, stability of the equipment and, where feasible, the calibration status is identified by tag, label or other appropriate means
- Nonconforming equipment is clearly identified and its use prohibited or suitably restricted until repaired or calibrated
- Environmental conditions for calibration
- Handling and safeguarding of equipment
- Use of test hardware (fixtures, templates)

Inspection, measuring and test equipment being used to determine product acceptance that is found to be out of calibration will be removed from service and recalibrated before being used again. Products are then considered as potentially nonconforming.

Calibration records for measuring, inspection and test equipment are maintained. As a minimum, identification number of the equipment, calibration method and results of calibrations are recorded.

## **8. Measurement, analysis and improvement**

### **8.1. Planning of measurement, analysis and improvement**

Measures are established in procedures for planning and implementing measurement, analysis and improvement processes, which are needed:

- To demonstrate product conformity
- To monitor and measure characteristics of activities that have significant environmental impact
- To monitor incidents / events, illness and other evidence of nonconformities
- To monitor performance, applicable operational controls and conformity with objectives and targets
- To monitor the extent to which objectives, programs, legal requirements,... are met
- To monitor the effectiveness of controls (e.g. for OH&S)
- To monitor improvements
- To ensure IMS conformity
- To continually improve the effectiveness of the IMS
- To use statistical techniques as appropriate

## 8.2. Monitoring and measurement

At the Fuel Sector or Entities levels several measurements of the performance of the IMS are implemented.

### 8.2.1. Assessment of stakeholders Satisfaction

Each entity monitors information on customer feedback to ensure the customer requirements are satisfied and that communication during the processing of customer complaints is satisfactory.

Customer satisfaction surveys are realized based upon face to face interviews. The satisfaction survey results help Fuel Sector and Entities to improve their performances.

Moreover the customer focused metrics are implemented. At Fuel Sector level, the three following metrics are used:

- Customer complaints
- On time delivery
- End of project evaluation

And globally, a composite metric, the Customer Satisfaction Index (CSI) is implemented at Fuel Sector level.

These indicators are completed by those obtained from the reporting process implemented as part of the project management method PMI.

Employee satisfaction and involvement is periodically measured at AREVA level through Employee Opinion Surveys (EOS). The lines of improvement identified are converted into action plans which form parts of the Entity's AREVA WAY objectives which are monitored using AREVA WAY model.

In order to enable dialogue with the various players, AREVA has deployed a local stakeholder mapping methodology. This approach involves identifying the main economic, environmental, social and societal issues for AREVA sites and those involved in their environment. Sites could thus confront their perception with actual expectations of their stakeholders. Actions plans were then put together to better meet expectations. This method implementation is not compulsory for all sites.

### 8.2.2. Evaluation of compliance

According to our commitment to fulfill all legal and other relevant requirements measures are established to evaluate periodically the conformity with these requirements.

The evaluation of compliance with legal and other relevant requirements is part of internal audits and site inspections. The evaluation results are discussed and approved as part of the management review.

### 8.2.3. Audits

A comprehensive program of planned and periodic audits is carried out to verify compliance with all aspects of the IMS. The audit process is described in a corporate procedure. The audits include the evaluation of work areas, activities, quality, OH&S or environment-related practices and review of documents and records. The audit program includes supplier audits, as well as internal audits. Audit reports are documented and distributed to appropriate management and necessary corrective actions are taken to correct noted deficiencies.

#### 8.2.3.1. *Internal audits*

Internal audits are performed at the BU and/or Entity level in accordance with the applicable AREVA NP procedure and this manual. The internal audit schedules are issued annually and revised as necessary by each BU and/or Entity.

Internal audits are scheduled to cover the audit program elements and are chartered to identify potential improvements. All elements of the audit program will be audited by each BU and/or Entity every 3 years.

Audits are led by qualified auditors in accordance with the applicable AREVA NP procedures who do not have direct responsibility in the area being audited.

The lead auditor, or designee, monitors implementation and verifies the effectiveness of corrective actions. The BU and/or Entity QSE Managers ensure that the corrective action program is effectively implemented.

Internal audit findings with global implications are distributed to all BU and/or Entity QSE Managers within the FS and to the FS SDCI Director.

#### 8.2.3.2. *Cross-audit*

Cross-Audits, complementing the internal audits, are performed to check the consistency of the different IMS. A cross audit schedule is prepared annually at the AREVA NP and then implemented by the Sectors. They are conducted by independent teams between different levels in accordance with the applicable AREVA NP procedure.

#### 8.2.3.3. *Customer or Authority audits*

Customer or Authority audits are performed at BU's and/or Entities. Results are evaluated by the audited QSE Manager. If the audited is not in charge of the contract, the results are transmitted to the appropriate BU and/or Entity QSE Manager for resolution. Audit nonconformities with global implications are distributed to all BU and/or Entity QSE Managers within the FS and to the FS SDCI Director.

#### 8.2.3.4. *Third Party audits*

Coordination of audits and answer to the nonconformities or comments from the Certification body audits is under the responsibility of the FS SDCI Director.

#### 8.2.4. Monitoring and measurement of processes

The effectiveness of processes is reviewed at regular intervals with the aim of continuous improvement. The review is based on product and IMS requirements as well as on defined process indicators.

Statistical techniques for measurement and monitoring of processes are applied, if useful for the following purposes:

- To determine effectiveness of processes
- To control and monitor processes
- To analyze processes in order to improve process performance such as increase yield, reduce variability
- To improve product reliability and performance
- To analyze problems and develop corrective and preventive actions

#### 8.2.5. Monitoring and measurement of product

Inspection procedures are established and executed to verify conformance with specifications and drawings for accomplishing activities affecting quality.

Inspections for acceptance of the work will be performed by individuals other than those who performed the activity being inspected. However, certain inspections may be performed by individuals who performed the activities being inspected provided such inspections do not require sensory or human judgment. Examples of inspections which may not require independence are:

- Physical inspections with gages which do not require recording of data (e.g. go/no-go gages)
- Automated inspections – automated coordinate measuring machines, gamma scanner, etc
- Automated processes or “mistake-proof” tools – heat treatment furnace charts, torque wrenches with set breakaway
- Inspection of assembly attributes which are generated by multiple operations and are not readily traceable to an individual operation/operator

Inspection by the manufacturing organization may be applied during production and for final inspection of finished product, provided such inspections are subject to documented surveillance by Quality personnel to assure their acceptability.

Examinations, measurements or tests of product processed are performed for each production step where necessary to assure quality. The provisions of special processes (see Section 7.5.2.1) apply if inspection of products is impossible or disadvantageous.

Inspectors are qualified / trained in accordance with procedures.

Procedures for in-process inspections are established to monitor processing parameters and equipment. In-process inspections are documented on production routers/travelers, route cards, computer Systems, etc.

### **8.3. Control of event**

#### **8.3.1. Control of Nonconforming Product**

Measures are established in FS and Entity processes and procedures to control products which do not conform to requirements in order to prevent their inadvertent use. These procedures include, as appropriate, provisions for identification, documentation, segregation, disposition and notification to affected organizations. Nonconforming products will be reviewed and accepted, repaired or reworked or rejected in accordance with procedures.

Products, which are reworked or repaired, are inspected in accordance with applicable inspection requirements applied to the original items or as specified in applicable rework or repair procedures.

When a nonconforming product is detected after delivery or use has started, actions are taken by the responsible Entity, which are appropriate to the effects or potential effects of the nonconformance.

Measures ensure that any defect in fuel related product or any noncompliance with customer requirements which could create a substantial nuclear safety hazard is communicated to the customer without delay.

For products to be delivered to US customers or when required by customers, the requirements of 10 CFR 21 "Reporting of Defects and Noncompliance," are fulfilled in the affected Entities. A similar reporting procedure is implemented for other contracts as required by the customer.

#### **8.3.2. Emergency preparedness**

At the Entity level procedures are implemented to identify emergency situations and to plan how to react and respond to such situations with the aim to avoid consequences for staff, neighbours, machinery, equipment and the environment or reduce them at an acceptable level.

Emergency plans are regularly checked and revised, e.g. after emergency trainings or the occurrence of emergency situations.

Crisis communication is realized in compliance with the "Manage communication" process.

### **8.4. Incident investigation**

In the field of OH&S and environmental management, incidents are seen as event. To improve EHS and to avoid incidents measures are established to investigate, analyze and record all kinds of incidents. The aim is to understand deficiencies and other factors (e.g. human factors) that are causing or contributing to the occurrence of incidents. The results of such investigations are documented, maintained and communicated.

The procedure of incident investigation is realized at Entities level. It is the basis for the corrective and preventive actions and helps to improve emergency preparedness.

### **8.5. Analysis of data**

The FS and its Entities collect and analyze appropriate data to determine suitability and effectiveness of the IMS and identify improvement potential (performance indicators). This includes data generated by measuring and monitoring activities and other relevant sources.

STAR is the tool created for collecting SDCI data and establishing dashboards.

Analysis of data and performance indicators identify areas of improvement for the IMS. The results of the analysis are internally communicated to all organizational units to facilitate improvement initiatives.

These data are analyzed to provide information on:

- Stakeholders satisfaction, stakeholders complaints
- Conformity to product requirements
- Audits results
- Conformity to legal requirements
- Status of EHS
- Characteristics of processes, products and their trends
- Completion of C/p actions
- Suppliers' performance

Results of data analysis by the Entities are transmitted to the FS SDCI Director in order to determine suitability and effectiveness of the IMS.

## 8.6. Corrective and preventive actions

In case of actions to correct or prevent nonconformities, safety risks assessments have to be done prior to implementation; these risk assessments must be recorded.

### 8.6.1. Corrective actions

Actions are taken to analyze and eliminate the causes of nonconformities including events, emergency situations and stakeholders' complaints in order to prevent recurrence. Such corrective actions are appropriate to the effects of the encountered problems and are also used to drive process improvement.

Nonconforming conditions, audits, inspection or surveillance of products, stakeholders' complaints or other events which can adversely affect quality, OH&S and environment constitute the main sources of corrective actions. Such situations are analyzed for root or apparent causes and reported to appropriate levels of management for review and decision.

Depending on the effect of the nonconformance, corrective actions are defined. A follow-up system is implemented. Evidence of implementation and verification of effectiveness is monitored.

Lists of actions in progress are periodically issued or filed in databases and communicated to involved people in charge of the actions, management and the project Manager.

Corrective actions can also be imposed to the suppliers following surveillance and/or audit activities.

The corrective action process is described in FS and Entity processes and procedures.

### 8.6.2. Preventive actions

Actions are taken to analyze and eliminate the causes of potential nonconformance in order to prevent their occurrence. Such preventive actions are appropriate to the effects of the potential problems.

The procedure for planning and implementing preventive actions consists of the following:

- Evaluating and using suitable sources of information concerning quality, OH&S, environmental impacts of products, machinery and activities
- Applying analysis methods where useful (e.g. risk assessments)
- Defining actions which may result in a safer and more reliable product, in improving of OH&S and in reduction of environmental impacts
- Implementing and documenting preventive actions
- Monitoring and reviewing effectiveness of implemented actions

Analysis of Quality, OH&S and environmental data, audits and other actions such as process reviews are the main source of preventive actions. The preventive action process is described in FS and Entity processes and procedures.

## Appendix A

# Quality Assurance Plan for Projects Regulated Under 10 CFR 50, Appendix B Criteria and for Shipping Containers Regulated Under 10 CFR 71, Subpart H

### 1. Applicability

This appendix is fully applicable at all Fuel Sector facilities conducting work on projects under US NRC Regulation 10 CFR 50, Appendix B or conducting work on shipping containers subject to 10 CFR 71, Subpart H. It is not applicable to projects conducted neither under other national regulatory requirements nor on shipping containers not regulated under US NRC 10 CFR 71, Subpart H.

### 2. QA Program Elements

All sections of this Manual apply to work on projects under US NRC Regulation 10 CFR 50, Appendix B or conducting work on shipping containers subject to 10 CFR 71, Subpart H.

The following additional requirements apply to work on shipping containers subject to 10 CFR 71, Subpart H:

- For revisions that impact our QA Program elements applied to 10 CFR 71 activities, we will obtain prior US NRC approval before implementation.
- Measures are established as described in this Manual to control the design, procurement, fabrication, handling, shipping, cleaning, assembly, inspection, testing, use, maintenance, repair and modification of components of our approved containers used to ship fissile and Type A and Type B quantities of radioactive material.
- Shipping container components are classified in accordance with design control procedures that determine their safety significance based upon appropriate regulatory guidance. These classifications, in part, determine the level of quality controls applied to the procurement and use of the components.
- Design control measures as described in this Manual are applied to container attributes such as criticality controls, compatibility of materials, accessibility for in-service inspection, and decontamination capability. These attributes are specified in license drawings which accompany certificates of compliance (C of Cs) issued by the US NRC. Changes in the conditions specified in the package approval require US NRC approval.
- Discrepant shipping containers are removed from service and either refurbished/repaired to comply with license requirements or the license is amended (if justified) to accommodate the new configuration(s).

**3. Correlation of 10 CFR 50, Appendix B Criteria and 10 CFR 71, Subpart H Requirements with ISO 9001 Requirements**

See Attachment 1.

**4. Applicability of ANSI Standards and Regulatory Guides**

See Attachment 2.

**5. Matrix Chart of AREVA NP QA Program and QA Procedures Related to QA Criteria**

See Attachment 3.

**6. Fuel America Organizational Chart**

Fuel America is an Entity a used and defined within this quality manual. See Attachment 4 for Fuel America organizational reporting relationships.

**7. NRC QA Program Approval**

See Attachment 5.

- End -

**Attachment 1**

**Correlation of 10 CFR 50, Appendix B Criteria and  
10 CFR 71, Subpart H Requirements with ISO 9001 Requirements**

	10 CFR 50, Appendix B QA Criteria	Corresponding ISO 9001 Requirements	FMM Section Which Imposes Criteria/Requirement	10 CFR 71, Subpart H Requirements
I	Organization	Management Responsibility	4.4	71.103
II	QA Program	QA System and Management Responsibility, Training	3.0, 4.0, & 6.0	71.101 & 71.105
III	Design Control	Design Control	7.3	71.107
IV	Procurement Document Control	Purchasing	7.4	71.109
V	Instructions, Procedures, and Drawings	Not Applicable	7.5	71.111
VI	Document Control	Document Control	3.5	71.113
VII	Control of Purchased Material	Purchasing, Purchaser Supplied Product, Quality Audits	7.4, 7.5.2, & 8.2.3	71.115
VIII	Identification and Control of Materials and Parts	Product Identification and Traceability, Inspection and Testing	7.5.3 & 8.2.5	71.117
IX	Control of Special Processes	Process Control	7.5.2	71.119
X	Inspection	Inspection and Testing	8.2.5	71.121
XI	Test Control	Not Applicable	7.5.3	71.123
XII	Calibration of Equipment	Inspection, Measuring, and Test Equipment	7.6	71.125
XIII	Handling, Storage, and Shipping	Handling, Storage, Packaging, and Delivery	7.5.5	71.127
XIV	Inspection, Testing, and Operating Status	Inspection and Test Status	7.5.3	71.129
XV	Nonconforming Material	Control of Nonconforming Product	8.3.1	71.131
XVI	Corrective Action	Corrective Action	8.6	71.133
XVII	QA Records	Quality Records	3.5	71.135
XVIII	Audits	Quality Audits	8.2.3	71.137

**Attachment 2****Applicability of ANSI Standards and Regulatory Guides**

The AREVA NP Quality Assurance Program satisfies the requirements of Appendix B to 10 CFR 50, "Quality Assurance Criteria for Nuclear Power Plants"; USNRC Regulatory Guide 1.28, "Quality Assurance Program Requirements"; ANSI N45.2 (1977), "Quality Assurance Program for Nuclear Fuel Power Plants"; 10 CFR 71, Subpart H, "Quality Assurance Requirements for Packaging and Transportation of Radioactive Material"; and ANSI N14.1 (1995), "Uranium Hexafluoride Packaging for Transport."

Since the Quality Assurance requirements and guidelines of the Regulatory Guides and ANSI Standards were initiated to apply to nuclear power plants, interpretation is required to determine their applicability to services, and the design and manufacture of a plant component such as nuclear fuel. The AREVA NP Quality Assurance Program follows the guidelines set forth in Section 17.1 of the USNRC Standard Review Plan insofar as it applies to fuel design and fabrication activities performed by AREVA NP. The extent to which the ANSI Standards and Regulatory Guides referenced in the Standard Review Plan are deemed to be applicable to AREVA NP activities is summarized in the table which follows. The listed ANSI Standards apply only to nuclear safety-related activities. Specific exceptions to the documents are included with appropriate justification. Standards or Guides referenced by the Standard Review Plan which are deemed not applicable to fuel design and fabrication have been omitted.

APPLICABILITY OF ANSI STANDARDS AND REGULATORY GUIDES		
ITEM No.	Document Number & Date	Subject and applicability
1.	Reg. Guide 1.28 (Rev. 3, Aug. 1985)	Quality Assurance Program Requirements (Design Construction)
	ANSI N45.2, 1977	Quality Assurance Program Requirements for Nuclear Power Plants  Applicability: Fully applicable
	ANSI/ASME NQA-1	Quality Assurance Requirements for Nuclear Facilities  Applicability: Applicable with same comments as described below for corresponding Supplements 1 NQA-1, Subpart 2.7 and Part I, Supplements 3S-1 and 11S-2 do not apply to the Manufacturing Equipment Software (MES) systems at the Horn Rapides Road facility. These systems are governed by the site license with the NRC (SNM-1227)
2.	Reg. Guide 1.38 (Rev. 2, May 1977)	Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage, and Handling of Items for Water-Cooled Nuclear Power Plants
	ANSI N45.2.2 - 1972	Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Power Plants  Applicability: ANSI N45.2.2, Section 2.7.1 (3), defines nuclear fuel as a Level A item. As such, ANSI N45.2.2, Section 3.2.1, Items 1-9, apply with the following exceptions:  1) ANSI N45.2.2, Section 3.2.1, Item 1 is amended to eliminate the need for temperature and humidity controls  2) The serial number of the fuel assembly constitutes adequate item identification as required by Section 3.2.1, Item 9 of ANSI N45.2.2. Shipping container marking shall comply with the requirements of applicable state and federal regulations governing nuclear fuel shipments  Additionally, the following sections of ANSI N45.2.2 are deemed to apply: 4.6, 5.1, 5.2.1 (5), 5.2.2. (7), 5.2.2 (8), 5.2.2 second paragraph (2) and (4), 5.3, 5.4, 5.5, 5.7, 6.1 (at fuel fabrication site only, and with exception of temperature and humidity controls). Storage in shipping containers may satisfy the requirements of Section 6.1 of ANSI N45.2.2, and 7.1

<b>APPLICABILITY OF ANSI STANDARDS AND REGULATORY GUIDES</b>		
<b>ITEM No.</b>	<b>Document Number &amp; Date</b>	<b>Subject and applicability</b>
3.	Reg. Guide 1.58 (Rev. 1, Sept. 1980)	Qualification of Nuclear Power Plant Inspection, Examination, and Testing Personnel
	ANSI N45.2.6, 1978	<p>Qualification of Inspection, Examination, and Testing Personnel for the Construction Phase of Nuclear Power Plants</p> <p>Applicability: Applicable with the following clarifications:</p> <ol style="list-style-type: none"> <li>1) Levels of capability and associated certifications, as specified by Sections 2.0, 3.1 and 4 of ANSI N45.2.6, are applicable only to special processes, as defined by ASNT-TC-1A.</li> <li>2) Formal levels of qualification are not assigned for nuclear fuel ultrasonic test and helium leak check equipment operating personnel. However, formal training programs for all inspectors are conducted and documented in accordance with ASNT-TC-1A recommended practice. The degree of evaluating acceptability of test results is limited by procedure, to comparing chart or dial readings of product tests versus acceptance limits established using approved standards</li> <li>3) Practical experience and on-the-job training times may vary from the ASNT-TC-1A classifications. Other inspections and testing qualifications, while formalized, are not deemed to require designation of levels of capability or certification. In addition, physical examinations after initial training are verified biennially in lieu of annually per Section 2.5, since this is company policy</li> <li>4) A special category, "Level II Rod Film Reader Only," is defined at the Richland facility to evaluate acceptability of fuel rod weld radiographs only. This classification requires less extensive general training and experience than "Level II," and limits qualification to an in-depth ability to read and interpret film only. Special training with demonstration of ability to consistently detect defects is required and is documented in training files</li> <li>5) Liquid penetrant inspectors are trained and certified under a AREVA developed training program. This program is based upon ASNT-TC-1A.</li> </ol>

<b>APPLICABILITY OF ANSI STANDARDS AND REGULATORY GUIDES</b>		
<b>ITEM No.</b>	<b>Document Number &amp; Date</b>	<b>Subject and applicability</b>
4.	Reg. Guide 1.64 (Rev. 2, June 1976)	Quality Assurance Requirements for the Design of Nuclear Fuel Power Plants
	ANSI N45.2.11 - 1974	<p>(Same title of Reg. Guide 1.64)</p> <p>Applicability: Applicable with the following clarifications and exceptions which make the standard more consistent with Nuclear Fuel Design: (1) Paragraph 3.2 of ANSI N45.2.11 is changed to read as follows: "The design shall be such as to be capable of accommodating the following where applicable:</p> <ol style="list-style-type: none"> <li>1) Basic functions of each structure and component</li> <li>2) Performance requirements</li> <li>3) Codes, standards, and regulatory requirements including the applicable issue and/or addenda</li> <li>4) Design conditions such as pressure and temperature</li> <li>5) Loads such as seismic, thermal, and dynamic where required</li> <li>6) Environmental conditions anticipated during fabrication, storage, and operation, such as pressure, temperature, humidity, corrosiveness, and nuclear radiation</li> <li>7) Interface requirements, including definition of the functional and physical interfaces involving structures and components</li> <li>8) Material requirements, including such items as compatibility and corrosion resistance</li> <li>9) Mechanical requirements, such as vibration, etc</li> <li>10) (Not applicable)</li> <li>11) Hydraulic requirements such as allowable pressure drops and fluid velocities</li> <li>12) (Not applicable)</li> <li>13) (Not applicable)</li> <li>14) Layout and arrangement requirements</li> <li>15) Operational requirements under various conditions, such as plant startup, normal plant operation, plant shutdown, plant emergency operation, special or infrequent operation and system abnormal or emergency operation</li> <li>16) Provision for accommodating installation of necessary instrumentation.</li> </ol>

<b>APPLICABILITY OF ANSI STANDARDS AND REGULATORY GUIDES</b>		
<b>ITEM No.</b>	<b>Document Number &amp; Date</b>	<b>Subject and applicability</b>
		17) (Not applicable) 18) (Not applicable) 19) Failure effects requirements of structures, and components, including a definition of those events and accidents which they must be designed to withstand 20) Test requirements including in-plant tests and conditions under which they will be performed 21) Accessibility, maintenance, repair and in-service inspection requirements for the fuel, including the conditions under which these will be performed 22) Personnel requirements and limitations, including qualification and number of personnel available for testing and inspection and permissible personnel radiation exposures for specified areas and conditions 23) Transportability requirements such as size and shipping weight, limitations, and DOT regulations 24) (Not applicable) 25) Handling, storage, and shipping requirements 26) Other requirements to prevent undue risk to the health and safety of the public 27) Materials, processes, parts, and equipment suitable for application 28) Safety requirements for preventing personnel injury, including such items as radiation hazards, and restricting the use of dangerous material”
		(2) If, in an exceptional circumstance, the designer's immediate supervisor is the only technically qualified individual available, this review can be conducted by the supervisor, provided that: a) The provisions of the Regulatory Guide are satisfied b) The supervisor did not prescribe or limit the techniques or inputs used in the design document. The use of supervisors as reviewers is approved in each instance by the cognizant manager c) Quality Assurance audits will cover the frequency and efficiency of the use of immediate supervisors as design verifiers to guard against abuse
		(3) The requirements of Section 6.3.3 for incorporation of design test acceptance limits into test procedures are not deemed applicable if the purpose of the test is to produce data for design inputs. Additionally, not all qualification tests are conducted under the worst conceivable design

APPLICABILITY OF ANSI STANDARDS AND REGULATORY GUIDES		
ITEM No.	Document Number & Date	Subject and applicability
		conditions
5.	Reg. Guide 1.74 (Feb. 1974) ANSI N45.2.10-1973	Quality Assurance Terms and Definitions (Same title as Reg. Guide 1.74)  Applicability: Fully applicable
6.	Reg. Guide 1.88 (Rev. 2, Oct. 1976)	Collection, Storage, and Maintenance of Nuclear Power Plant Quality Assurance Records
	ANSI N45.2.9-1974	<p>Requirements for Collection, Storage, and Maintenance of Quality Assurance Records for Nuclear Power Plants</p> <p>Applicability: Applicable with the following exceptions:</p> <ol style="list-style-type: none"> <li>1) The vault at Richland has no provision for drainage, as recommended by Section 5.6 (6); however, there is no credible mechanism (e.g., sprinkler system) for entry of water into the vault. Lynchburg maintains duplicate storage of lifetime QA Records in remote locations</li> <li>2) Calibration records are maintained in the calibration laboratory as these are not subject to vault storage until reasonable time after fuel shipment</li> <li>3) Quality Control records and procurement records need not be transferred to vault storage</li> <li>4) Radiographs of fuel assembly components are not retained as QA Records. Results of the review are recorded on Inspection Report and/or routing cards and these are saved as lifetime QA Records</li> <li>5) The requirements of Section 5 do not apply to nonpermanent QA Records. Retention times are established for these records and they are maintained by designated organizations</li> </ol>

<b>APPLICABILITY OF ANSI STANDARDS AND REGULATORY GUIDES</b>		
<b>ITEM No.</b>	<b>Document Number &amp; Date</b>	<b>Subject and applicability</b>
7.	Reg. Guide 1.144 (Rev. 1, Sept. 1980)  ANSI N45.2.12-1977	<p>Auditing of Quality Assurance Programs for Nuclear Power Plants</p> <p>Applicability: Applicable with the following exceptions:</p> <p>1) With respect to the annual audit frequency requirements of Paragraph 3.5.2, the term "Applicable elements..." is interpreted within the following context. AREVA conducts comprehensive internal QA Audits of important quality functional areas. Each functional area audit may address implementation of one or more of the QA Program criteria (elements) applicable to the area. Each QA Program criterion is audited at least once every three years during the performance of functional area audits. The basis for this frequency is the considerable QA involvement in support of customer program audits which occur numerous times yearly. In determining the audit scope and frequency, an evaluation of the area being audited is performed. The evaluation may include some or all of the following: prior quality assurance program audits, results of audits from other sources, assessment by AREVA NP lead auditors during their support for utility oversight activities, nature and frequency of identified discrepancies, significant changes in the organization or quality assurance program, and the corrective actions taken to correct discrepancies</p> <p>External (Supplier) audits are regularly scheduled on the basis of supplier performance and importance to safety of the activities being performed. Audit frequency of suppliers, normally between one and three years, may be altered (increased or decreased) based on an annual evaluation of the supplier's quality assurance program, history of performance, and implementation of that program. This evaluation considers the complexity of the system or component concerned and the degree of quality and process control required by the manufacturing effort</p> <p>As an exception to the foregoing, audits of suppliers are not necessarily performed for procurement actions where acceptance of the product is in accordance with Section 10.3.2 of ANSI N45.2.13 - 1976</p> <p>In the case of both internal and external audits, audit frequency is adjusted, as necessary, from these requirements depending on the importance and status of the organization/area being audited</p> <p>2) Concerning Paragraph 4.5.2.1, a written reply to the audit report is obtained only if required by the audit report or the audit report transmittal. Written responses to individual adverse findings (Corrective Action Requests) are obtained in accordance with Paragraph 4.5.1.</p>
8.	Reg. Guide 1.123 (Rev. 1, July 1977)  ANSI N45.2.13 - 1976	<p>Quality Assurance Requirements for Control of Procurement Items and Services for Nuclear Power Plants</p> <p>(Same title as Reg. Guide 1.123.)</p> <p>Applicability: Fully applicable</p>

APPLICABILITY OF ANSI STANDARDS AND REGULATORY GUIDES		
ITEM No.	Document Number & Date	Subject and applicability
9.	Reg. Guide 1.146 Aug. 1980  ANSI N45.2.23 - 1978	Qualification of Quality Assurance Program Audit Personnel for Nuclear Power Plants  (Same title as Reg. Guide 1.146.)  Applicability: Applicable with the following exception:  Calibration and lab services supplier audits may be performed by QC auditors, rather than QA auditors, due to the specialized and limited scope of these audits. QC auditors are appropriately trained and qualified in accordance with approved procedures, but are not required to be formally designated Lead Auditors, as defined by ANSI N45.2.23
10.	ANSI N14.1 (1995)	Uranium Hexafluoride Packaging for Transport  Applicability: Fully applicable.
11.	ASME Section VIII	Applicability: Repairs or rework that requires welding and inspection of 30B cylinders shall be performed in accordance with National Board Inspection Bureau (NBIB) "R" stamp requirements. Weld operators shall be certified in accordance with AWS D1.1 requirements and be employed by a NBIB "R" certificate holder. The AREVA designated welding engineer shall review weld procedures, procedure qualification records, welding operator qualifications, and rework travelers prior to weld operations. Weld inspectors shall be National Board Commissioned.

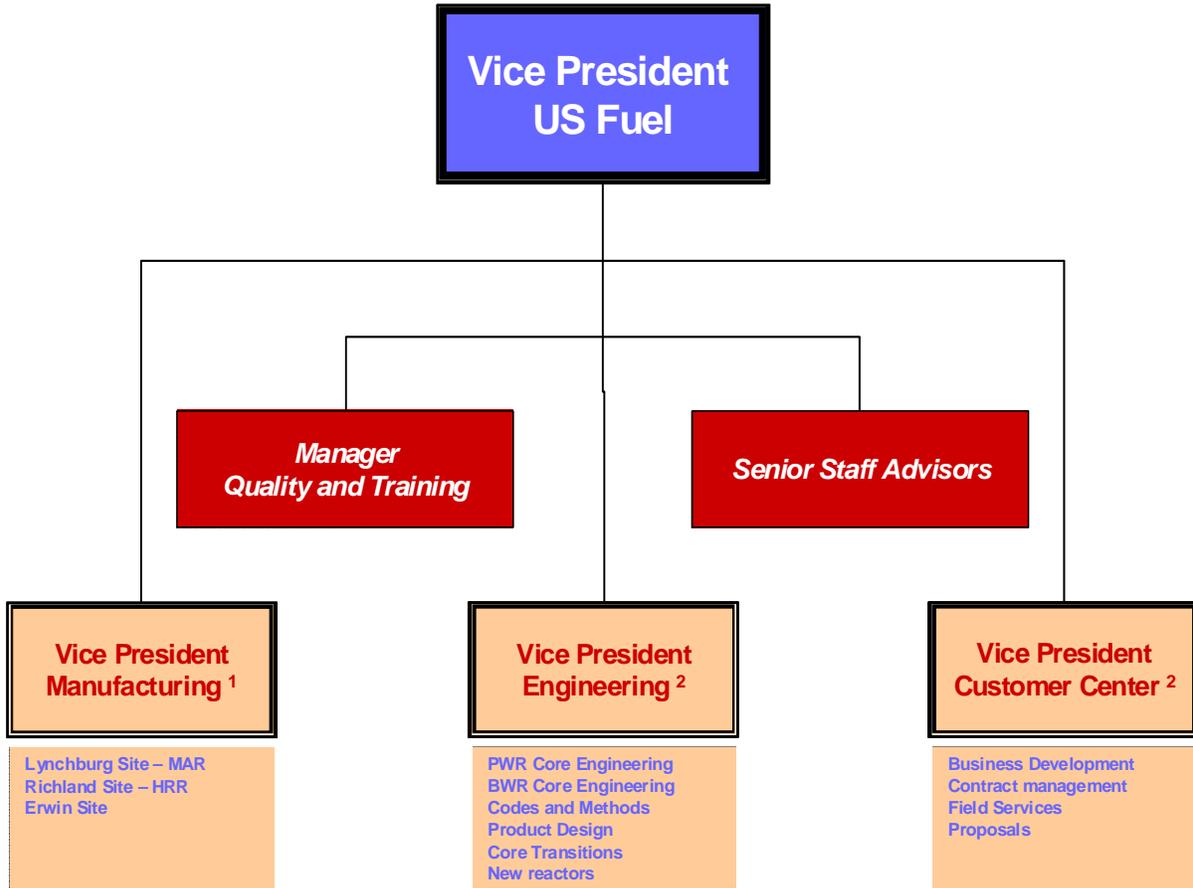
**Attachment 3**

**Matrix Chart of AREVA NP QA Program and  
QA Procedures Related to QA Criteria**

10 CFR 50, APPENDIX B / 10 CFR 71 QA CRITERIA		AREVA NP
		QA PROCEDURES By Number
I / 71.103	Organization	QAP #1
II / 71.101 & 105	QA Program	All Listed QA Procedures
III / 71.107	Design Control	QAP #4
IV / 71.109	Procurement Document Control	QAP #6
V / 71.111	Instructions, Procedures, and Drawings	All Listed QA Procedures
VI / 71.113	Document Control	QAP #5
VII / 71.115	Control of Purchased Material	QAP #6 QAP #7
VIII / 71.117	Identification and Control of Materials and Parts	QAP #8
IX / 71.119	Control of Special Processes	QAP #9
X / 71.121	Inspection	QAP #10
XI / 71.123	Test Control	QAP #10
XII / 71.125	Calibration of Equipment	QAP #11
XIII / 71.127	Handling, Storage, and Shipping	QAP #15
XIV / 71.129	Inspection, Testing, and Operating Status	QAP #12
XV / 71.131	Nonconforming Material	QAP #13
XVI / 71.133	Corrective Action	QAP #14
XVII / 71.135	QA Records	QAP #16
XVIII / 71.137	Audits	QAP #17

Attachment 4

US Region Fuel Organizational Chart



Notes :

<sup>1</sup> This block indicates a FIMBU position as well as an US Fuel Position

<sup>2</sup> These blocks indicate DSBU position as well as an US Fuel Positions

**Attachment 5**  
**NRC Approval**

**To be provided when obtained**

## **Appendix B**

# **Quality Assurance Plan for Projects Regulated Under KTA 1401**

### **1. Applicability**

This appendix is fully applicable at all Fuel Sector facilities conducting work on projects under KTA 1401. It is not applicable to projects conducted under other national regulatory requirements.

### **2. QA Program Elements**

All sections of this Manual apply to work on projects conducted under KTA 1401. Additionally, the following requirements shall be applied:

- Supplier shall prepare, implement and maintain a Quality Assurance Program which is commensurate with the applicable requirements of KTA 1401. The QA program shall be documented in a Quality Manual or, if agreed, in a Quality Assurance Plan which must be kept up-to-date.

### **3. Correlation of KTA-1401 Requirements with ISO 9001 Requirements**

See Attachment 1.

## Attachment 1

### Correlation of KTA 1401 Requirements with ISO 9001 Requirements

KTA 1401 Criteria		Corresponding ISO 9001 Requirements	Section Which Imposes Criteria/Requirement
I	Scope	Scope	0.1
II	Terminology	Terms and Definitions	0.5 & 0.6
III	Basic Requirements	Quality Management System	3.0
IV	Organization	Management Responsibility	4.0
V	Planning and Design	Product Realization	7.5, 3.4 & 3.5
VI	Procurement	Purchasing	7.4
VII	Fabrication, Assembly and Erection Including Quality Tests and Inspections	Purchasing	7.4, 7.5.5 & 8.2.3
VIII	Commissioning	Not Applicable	Not Applicable
IX	Specified Normal Operations and Incidents	Production and Service Provision	7.5 & 8.3.1
X	Inspection, Measuring and Test Equipment	Control of monitoring and measuring devices	7.6
XI	Nonconformance Control	Control of nonconforming product	8.3.1
XII	Documentation and Document Storage	Documentation Requirements	3.2, 3.4 & 3.5
XIII	Auditing of the Quality Assurance System	Internal Audit	8.2.3

## Appendix C

### Comparison between FMM, ISO 9001:2008, ISO 14001:2004, OHSAS 18001:2007 and GS-R-3

FS Management Manual	ISO 9001:2008	ISO 14001:2004	OHSAS 18001:2007	GS-R-3
<b>0. Introduction</b>	<b>Title only</b>			
0.1 Scope	1	1	1	1.10 - 1.11 - 1.12 - 1.13
0.2 Purpose	1	1	1	
0.3 Applicability	1	1	1	
0.4 Responsibility	5.5.2.a	4.4.1	4.4.1	
0.5 Terms and definitions	3	3	3	
0.6 Abbreviations	3	3	3	
<b>1. Fuel Sector Presentation</b>				
1.1 AREVA and AREVA NP				
1.2 Fuel Sector				
1.3 Fuel Sector Business Units				
<b>2. External and Internal requirements</b>	<b>Title only</b>			
<b>2.1 Internal requirements</b>				2.1 - 2.2 - 2.3 - 2.4
<b>2.2 Stakeholders requirements</b>	Title only			
2.2.1 Customer requirements	5.2			
2.2.2 Other stakeholders		4.3.2	4.3.2	
<b>2.3 Legal requirements</b>		4.3.2	4.3.2	
<b>2.4 EHS requirements</b>	Title only			
2.4.1 Hazard identification, risk assessment and determining controls			4.3.1	
2.4.2 Identification and assessment of environmental aspects		4.3.1		
<b>3. Integrated Management System</b>	<b>Title only</b>			
<b>3.1 Process Management</b>	4.1	4.1	4.1	2.1 - 2.2 - 2.5 - 2.6 - 2.7
3.1.1 Continuous Improvement	8.5.1			6.17 - 6.18
3.1.2 Process approach	4.1			5.1 - 5.2 - 5.3 - 5.4 - 5.5
3.1.3 Process owner				5.6 - 5.7 - 5.8 - 5.9 - 5.10 - 5.11
<b>3.2 System documentation</b>	4.2.1 - 4.2.2	4.4.4	4.4.4	2.8
<b>3.3 Classification of characteristic</b>				
<b>3.4 Control of documents and data</b>	4.2.3	4.4.5	4.4.5	2.9 - 2.10 - 5.12 - 5.13
<b>3.5 Control of records</b>	4.2.4	4.5.4	4.5.4	5.21 - 5.22
<b>4. Management responsibility</b>	<b>Title only</b>			
<b>4.1 Management Commitment and Policy</b>	5.1 - 5.3	4.2 - 4.4.1	4.2 - 4.4.1	3.1 - 3.2 - 3.5 - 3.7
<b>4.2 Customer focus</b>	5.2			
<b>4.3 Planning</b>	5.4.1 - 5.4.2	4.3.3	4.3.3	3.8 - 3.9 - 3.10 - 3.11

<b>4.4 Responsibility and authority</b>	5.5.1 - 5.5.2	4.1 - 4.4.1	4.1 - 4.4.1	3.12 - 3.13 - 3.14 - 5.28 - 5.29
<b>4.5 Management review</b>	5.6	4.6	4.6	6.7 - 6.8 - 6.9 - 6.10
<b>5 Communication, participation and consultation</b>	<b>Title only</b>			
<b>5.1 Communication</b>	Title only			3.3
5.1.1 Internal communication	5.5.3	4.4.3	4.4.3.1	5.26 - 5.27
5.1.2 External communication	7.2.3	4.4.3	4.4.3.1	5.26
<b>5.2 Participation and Consultation</b>			4.4.3.2	3.4
<b>6 Resource management</b>	6.1	4.4.1	4.4.1	4.1 - 4.2
6.1 Human resources	6.2	4.4.1 - 4.4.2	4.4.1 - 4.4.2	4.3 - 4.4
6.2 Other resources	6.3 - 6.4	4.4.1	4.4.1	4.5
<b>7 Product realization</b>	<b>Title only</b>			
<b>7.1 Realization processes</b>	7.1	4.4.6	4.4.6	
<b>7.2 Customer related processes</b>	Title only			5.14 - 5.16 - 5.17
7.2.1 Determination of requirements related to the product	7.2.1	4.4.6	4.4.6	
7.2.2 Review of requirements related to the product	7.2.2	4.3.1 - 4.4.6	4.3.1 - 4.4.6	
<b>7.3 Design and Development processes</b>	Title only			
7.3.1 General				
7.3.2 Design and Development Planning	7.3.1	4.4.6	4.4.6	
7.3.3 Design, Organizational and Technical Interfaces	7.3.1			
7.3.4 Design and Development Input	7.3.2			
7.3.5 Design and Development Output	7.3.3			
7.3.6 Design and Development Review	7.3.4			
7.3.7 Design and Development Verification	7.3.5			
7.3.8 Design and Development Validation	7.3.6			
7.3.9 Design and Development Changes	7.3.7			
<b>7.4 Purchasing</b>	Title only			
7.4.1 Purchasing process	7.4.1	4.4.6	4.4.6	5.23 - 5.24 - 5.25
7.4.2 Purchasing data	7.4.2			
7.4.3 Verification of purchased product	7.4.3			
7.4.4 Product and Service Transfer between Entities				
<b>7.5 Production and Service Processes</b>	Title only			
7.5.1 Control of production and service processes	7.5.1	4.4.6	4.4.6	
7.5.2 Qualification or validation of production and service processes	7.5.2			5.18
7.5.3 Identification, traceability and status control	7.5.3			5.15 - 5.19
7.5.4 Customer property	7.5.4			
7.5.5 Preservation of product	7.5.5	4.4.6	4.4.6	5.20
<b>7.6 Control for measuring and test equipment</b>	7.6	4.5.1	4.5.1	
<b>8 Measurement, analysis and improvement</b>	<b>Title only</b>			
<b>8.1 Planning of measurement, analysis and improvement</b>	8.1	4.5.1	4.5.1	

<b>8.2 Monitoring and measurement</b>	Title only			
8.2.1 Assessment of stakeholders satisfaction	8.2.1	4.3.2	4.3.2	3.6 - 6.1 - 6.2 - 6.3 6.4 - 6.5 - 6.6
8.2.2 Evaluation of compliance		4.3.2	4.3.2	
8.2.3 Audits	8.2.2	4.5.5	4.5.5	
8.2.4 Monitoring and measurement of processes	8.2.3	4.5.1 - 4.5.2	4.5.1 - 4.5.2	
8.2.5 Monitoring and measurement of product	8.2.4	4.5.1 - 4.5.2	4.5.1 - 4.5.2	
<b>8.3 Control of event</b>	Title only			
8.3.1 Control of Nonconforming Product	8.3			6.11 - 6.12 - 6.13 - 6.16
8.3.2 Emergency preparedness		4.4.7 - 4.5.3	4.4.7 - 4.5.3.2	
<b>8.4 Incident investigation</b>			4.5.3.1	
<b>8.5 Analysis of data</b>	8.4	4.5.1	4.5.1 - 4.5.3.2	
<b>8.6 Corrective and preventive actions</b>	Title only			
8.6.1 Corrective action	8.5.2	4.5.3	4.5.3.2	6.14 - 6.15
8.6.2 Preventive action	8.5.3	4.5.3	4.5.3.2	6.15