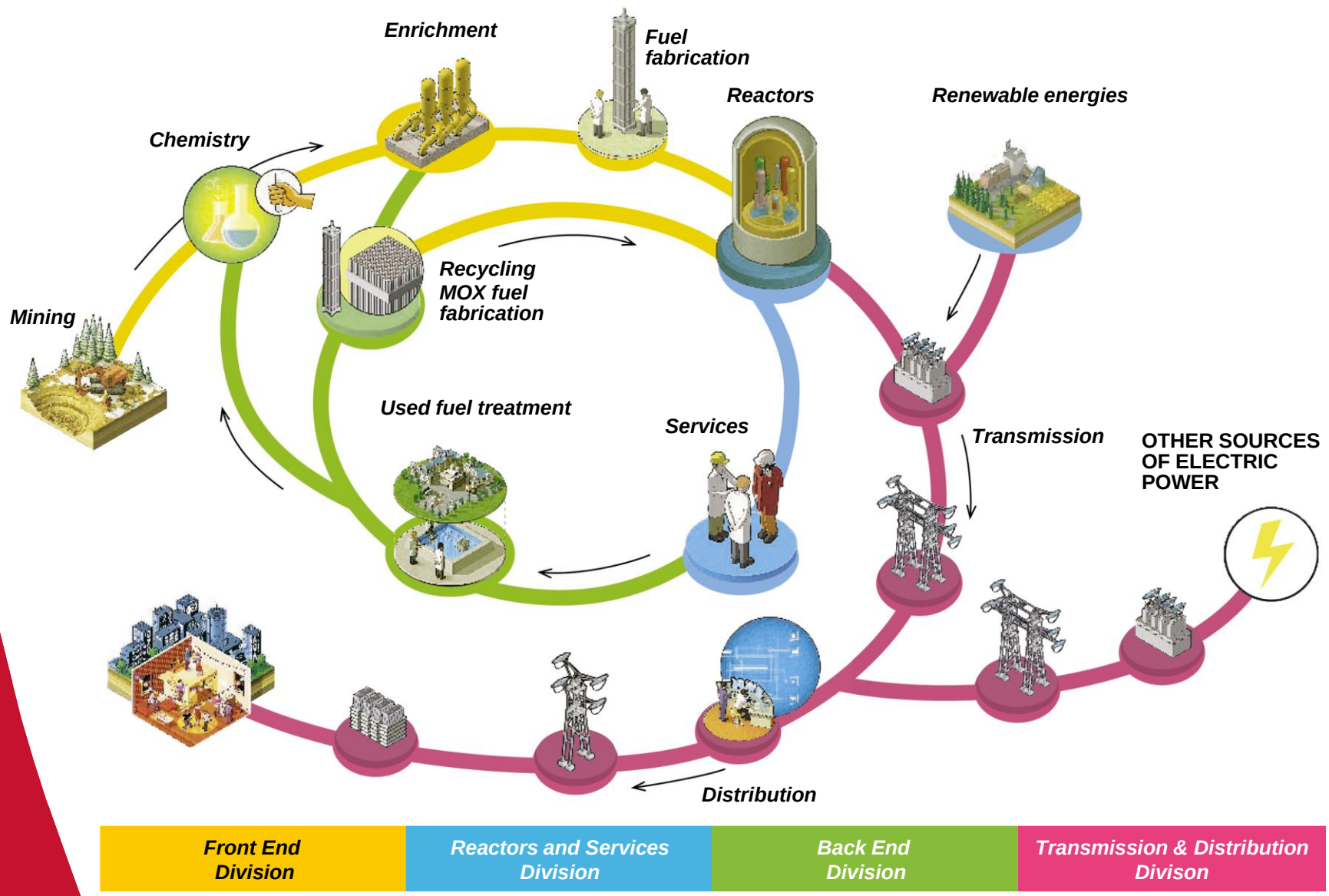
The exchange of experience from a global fuel cycle operator point of view

Workshop on Fuel Cycle Safety
Wilmington, NC October 2007

Philippe BOSQUET
Deputy VP Safety, Health & Security
AREVA

Introduction to the AREVA group

An integrated offer serving energy professionals

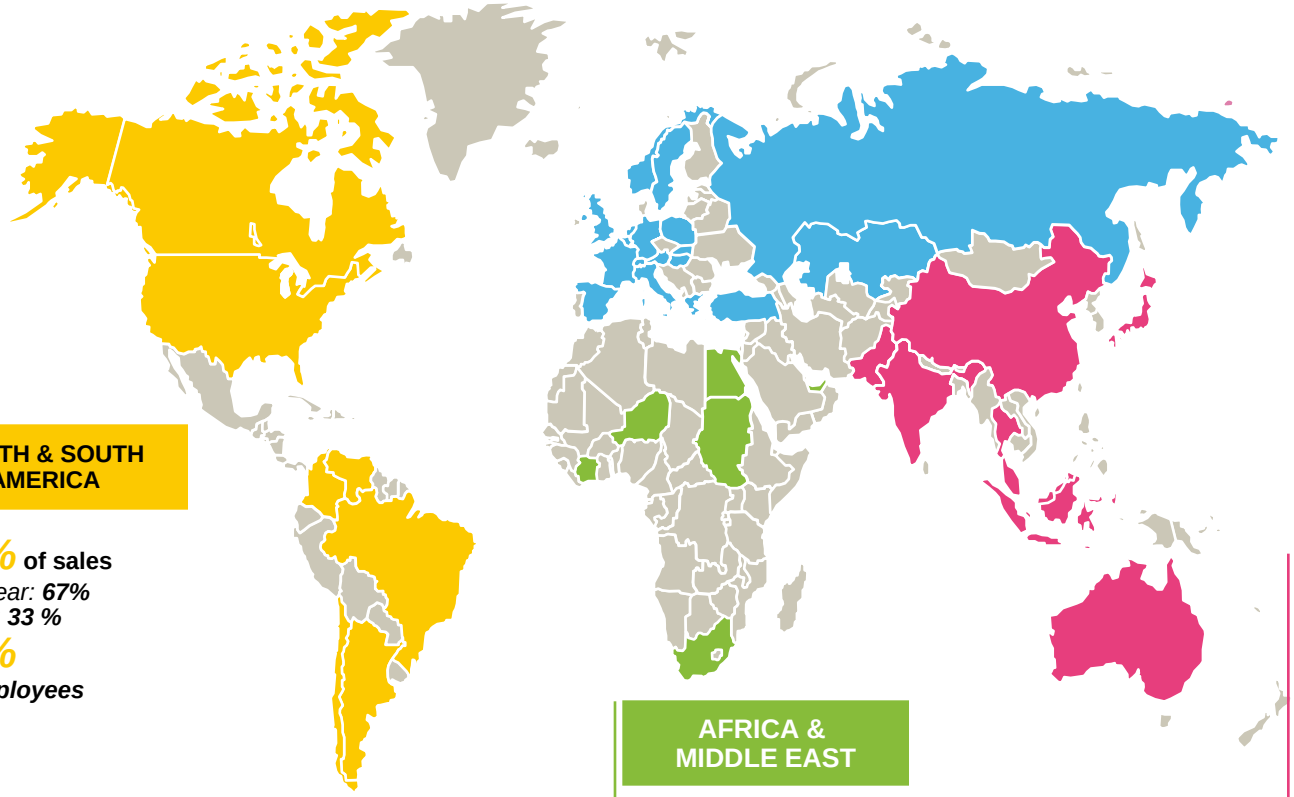


AREVA across the globe

41 countries
Production & Manufacturing

100 countries
Marketing & Sales

Two-thirds of AREVA's sales revenue
Are coming from outside France



NORTH & SOUTH AMERICA

17% of sales
- *Nuclear:* ***67%***
- *T&D:* ***33 %***

12%
of employees

EUROPE & CIS

62% of sales
- *Nuclear:* ***76%***
- *T&D:* ***24%***

73%
of employees

AFRICA & MIDDLE EAST

7% of sales
- *Nuclear:* ***9%***
- *T&D:* ***91%***

4%
of employees

ASIA-PACIFIC

14% of sales
- *Nuclear:* ***47%***
- *T&D:* ***53%***

11%
of employees

Main AREVA Group Nuclear Installations

The main nuclear installations of the AREVA group :

Place	Business Unit	Description
Front and Division		
Romans, France	Fuel	Fuel Fabrication
Dessel, Belgium	Fuel	Uranium and MOX Fuel Fabrication
Lingen, Germany	Fuel	Fuel Fabrication
Richland, USA	Fuel	Fuel Fabrication
Lynchburg, USA	Fuel	Fuel Fabrication
Tricastin, France	Chemistry	Preparation of uranium hexafluoride (UF_6)
Tricastin, France	Chemistry	Conversion of uranyl nitrate into U_3O_8
Tricastin, France	Enrichment	Georges Besse Plant –isotopic separation of uranium by gaseous diffusion
Tricastin, France	Enrichment	Dismantling of the former military enrichment plants
Tricastin, France	Enrichment	Plant for uranium decontamination and recovery
Tricastin, France	Chemistry	Conversion of enriched uranium-bearing materials
Reactors and services division		
Maubeuge, France	Equipments	Maintenance of contaminated equipment
Back end division		
Cadarache, France	Recycling	MOX Fuel Fabrication (Commercial Production shut down in July 2003)
La Hague, France	Treatment	Used fuel treatment plant
Marcoule, France	Recycling	Melox – MOX Fuel Fabrication
Marcoule	Treatment	Used fuel treatment plant undergoing dismantling
Veurey, France	Treatment	Experimental facilities and uranium oxide pellet manufacturing facility (currently being Dismantled)

Main AREVA mining activities are located in Canada, Niger & in Kazakhstan

Safety: a commitment

A group united around sustainable development values

- **Clearly expressed values (Values Charter) based on the 10 principles of the U.N. Global Compact linked to human rights, labor conditions, environmental protection and anti-corruption efforts**
- **Implementation through AREVA Way, a continuous improvement process structured around our 10 sustainable development commitments and integrated into the general management system**
- **AREVA Way is also a way of being and a way of acting, every day:**
  - **The will to improve, anticipation, responsiveness and openness to dialogue**

A sustainable development program structured around 10 major commitments

PREVENTION AND CONTROL OF TECHNOLOGICAL RISKS

Ensure and maintain the highest level of safety in all the group's activities to preserve employee and public health and to protect the environment

FINANCIAL PERFORMANC

CUSTOMER SATISFACTION

COMMITMENT TO EMPLOYEES

Promote our employees' professional development and provide good working conditions.

DIALOGUE AND CONSENSUS-BUILDING

Establish relations with our stakeholders built on trust.

ECONOMIC DEVELOPMENT

Risk management and prevention: a shown priority (1)

In terms of policies and programs:

- **AREVA Charter Values**

- **Sustainable development program**

- **AREVA Occupational Safety Policy**

- **AREVA Nuclear Safety Charter**

Risk management and prevention: a shown priority (2)

- **Integrated in the management process: First item on each BU budget presentation agenda**

SAFETY Accidents at work with sick leave	2003 actual	2004 actual	2005 actual	2006 actual	2006 AREVA Group objectives	2006 AREVA Group Actual	12 rolling months 2007 fiscal year UPDATE 1 actual	Local objective trim.1	trim.2	trim.3	trim.4	2010 AREVA Group objectives
Frequency					5,00							3,00
Seriousness					0,20							0,15

DOSIMETRY Average exposure rate to ionizing radiation (mSv)	2003 actual	2004 actual	2005 actual	12 rolling months 2006 actual half year.1	target half year.2	2006 AREVA Group objectives	2007 AREVA Group Actual	12 rolling months 2007 fiscal year UPDATE 1 Local objective half year.1	half year.2	2010 AREVA Group objectives
Group employees										
Subcontractor employees										
N° of persons > 14 mSv										
N° of persons > 20 mSv						0				0

Corporate Safety, Health and Security missions

Lead and Coordinate

Check the implementation of policies

Report

Promote experience feedback and Share good practices

Represent the group and make its realisations known

Prepare the group policies

Missions

Complementary missions

- **Site**
  - **Respect the licenses and authorizations**

- **Business Units**
  - **Take into account safety & security in the strategic, commercial & financial decisions**

- **Corporate Department**

A mission for each level of the organization…

…complementary assignments

The exchange of experience: A primary mission

Organization

- **A department in charge of General Inspectorate & Nuclear Safety reports to the Executive Board**

A double competence under the responsibility of the General Inspector

- **6 Inspectors with previous experience of responsibilities on site**
  - Verification independent of the operating organization
  - Can demand the shut down of a facility & report thereon to the Executive Board

- **8 safety specialists, on different fields of expertise:**
  - Lead network of the field specialists on site

- **Complementarities between inspectors & specialists**
  - Enhance the internal benchmarking effect
  - Inspectors are not judges & deciders

The control

- **Experienced Inspectors**
  - **Examination of the entity situation regarding Safety (organizational, technical, human factor …)**
  - **Detection of operations & behaviors that may be detrimental to safety (weak signals, deviations, tendencies…)**
  - **Dispositions based on examination of processus**

THEMATIC INSPECTION

SAFETY CULTURE INSPECTION

INSPECTION FOLLOWING AN EVENT

Inspections Program 2006-2008

Strategic and context-related thematic inspections

- 2006 Radioactive and hazardous materials transportation
- 2006 Services operations at customer facilities
- 2006/2007 Criticality risk control
- 2007 Radioactive waste management
- 2008 Radiation Protection for workers
- 2008/2009 Events : detection, analysis and operational feedback process
- 2009 Skills and qualification

A thematic inspection is performed on several sites representative of the different activities of the group allowing for generic lessons learned, including best practices than can be shared in all the group's facilities

Using the control as a tool for continuous improvement

- **Inspectors**
  - **Formulate recommendations to the inspected entity, written as objectives to be reached in a facility specific report**
  - **Make available, for all the entities, a summary of main findings for feedback purpose in a generic report**

- **The generic report may lead to the implementation of the recommendations & feedback for the entire group**
  - **Examples:**
    - **Creation of a network of sealed sources managers**
    - **Release of a transport directive**
    - **Revision of work operating processes**

The exchange of experience thru networks

- **Safety specialists:**
  - **Exchange lessons learned and best practices through a network of specialists on sites**
  - **Leads and coordinates the implementation of AREVA's safety policy and/or regulations (through directives and guides when necessary)**
  - **Represent the group in relation with stakeholders:**
    - **WG with Safety Authorities,**
    - **Other licensees: EdF, CEA….**
    - **Professional associations**
- **Fields of specialists**
  - **Waste safety**
  - **Radiation protection of workers**
  - **Environmental radiation protection**
  - **Transportation**
  - **Fire prevention**
  - **Feedback experience**
  - **Criticality**
  - **External hazards**
  - **Emergency preparedness**

The internal reporting of events

Internal reporting of events: the objectives

- **Group commitment in the nuclear safety charter:**
  - **“Nuclear events are evaluated in accordance with the International Nuclear Event Scale (INES) at all of the group’s facilities, even when this is not a regulatory requirement. Level 1 or higher events are put on record.”**

- **Important source of experience feedback**
  - **Especially for the fuel cycle facilities where no external structure, (such as WANO) exists**

Internal reporting of events: the challenges

- **How to rank events on the INES?**
  - **Information and training locally**
- **Which events are to be reported internally and then screened into INES?**
  - **Scope need to cover:**
    - **Nuclear Safety**
    - **Radiation Protection**
    - **Transportation of radioactive material**
    - **Environment for nuclear sites: radioactive or chemical release**

    including situations where AREVA entity is not the licensee (operator for a licensee, services activities, transport)
  - **BUT criteria for declaring events to national or local authorities are different**
- **Possible misinterpretation by external stakeholders**

Internal reporting of events: the path forward

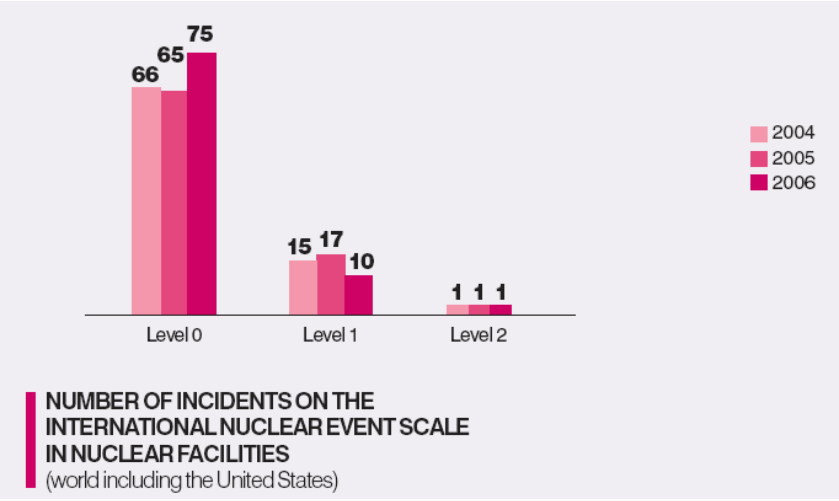
- **Testing for a probation period of a common set of criteria based on the "French safety authority" criteria for nuclear entities worldwide**

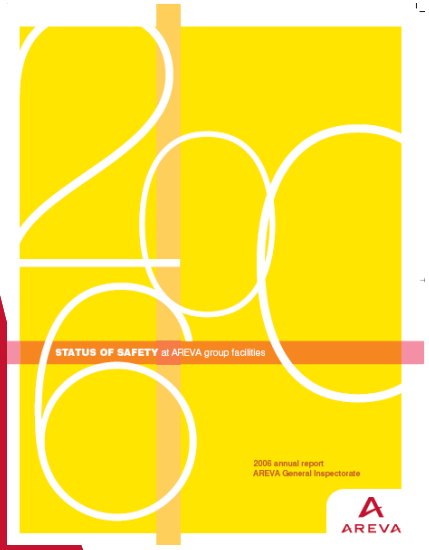
- **Experience showed that the main difficulty was to interpret the "nuclear safety" scale in the US**
  - **Thanks to an extensive Corrective Action Program the data base exists, BUT screening remains a challenge:**
    - **Criteria for "defense in depth" are not black and white**
    - **There are significant differences in safety documentation (ISA vs SAR) and the notion of authorized operating regime (existence of OL&C)**
  - **Dialogue between corporate in charge of collecting and sites is key to reach common understanding**

Main interest is to exchange experience internally
Cannot be used as an indicator to compare sites

Internal reporting of events: External Communication

- **Reported annually in the SD report**





- **Results commented in the AREVA General Inspectorate annual report**

- ***For more information see http://www.areva.com***