FRENCH NUCLEAR KNOWLEDGE MANAGEMENT EXPERIENCE
Summary

Introduction

Building personal knowledge

Building collective knowledge

Long term Knowledge Management

Beyond one’s own entity

An example of success

Conclusion
INTRODUCTION

Personal knowledge / « know-how »
• What I need to know to do my job and to take good decisions now
• A question of competencies & skills
• Managed through personal learning experiences e.g.
  • Training
  • Companionship
  • Tools and Databases
• Materialized by
  • Employees (especially current experts)
  • Courseware, readings, videos, models, codes (procedural)

Collective knowledge / « know what »
• What we need to know to deliver according to expectations
• A question of management & teams
• Managed through organizational learning experiences, e.g.
  • Peer Reviewing
  • Debriefing
  • Lessons Learned
• Materialized by
  • Organizational structures
  • Processes, standards, codes to use (declarative knowledge)

Memory of past contexts / « know why »
• What we need to know to question our current mental models
• A question of legacy
• Managed through conservation of historical memory, e.g.
  • Archiving
  • Storytelling
  • Investigating
• Materialized by
  • Records / commentaries
  • Witnesses
  • Compendia, Books
Train the trainers approach: train the first personnel with sufficient anticipation, even before the availability of training equipment in the country.

- **Explicit knowledge**: benefit from the vendor’s facilities to train early the “first waves” of personnel, e.g. process and maintenance.

- **Tacit knowledge**: immersion in the engineering and operation teams to participate actively to the activities, capture the know-how and the nuclear culture (personal behaviour and safety culture).
Set up early your own training organisation, infrastructures and tools: simulators, workshops, mock-ups, flow loop simulators, digital tools.

Full-scope Simulator is particularly useful for the Operator as well as for other stakeholders of the project: Safety Authority and Universities:

- **Training of the first experts of the process that can train the others and spread their knowledge across the organisation**
- **Support the development and validation of plant operation procedures in normal, abnormal and accident transients**
- **Support the tuning of plant systems I&C functional design**
- **Human Factor Engineering**
- **Support the development of plant testing procedures**
It must be a learning organisation able to:

- Integrate experience feedback
- Adapt to business changes
- Adapt to modifications of context
- Integrate modifications in the design of the plant
- Keep memory of the decisions taken for continuous improvement of the performance
LONG TERM KNOWLEDGE MANAGEMENT

Manage the long term, anticipate the changes

- Renewal of personnel, retirement,
- Change in the organisations, in the jobs,
- Modifications of the installation, of the environment

Develop of new approaches and tools

- Skills mapping and successions plans
- Anticipation of the recruitments
- Identification of the rare and critical skills
- Recognition of experienced staff who transfer their knowledge
- Development of new training tools

**SKILLS CARTOGRAPHY**

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<th>Name</th>
<th>n°1</th>
<th>n°2</th>
<th>n°3</th>
<th>n°4</th>
<th>Leave</th>
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- Succession plans
- Recruitment
- Training
- Mentoring
- OJT

Manager’s observation

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LONG TERM KNOWLEDGE MANAGEMENT

**Transparency**

**Knowledge Management**
Provisional management of jobs and skills, annual appraisal, rare and highly specialized skills

**Plant Training Centre**
Subject Matter Experts
Full-time and part-time instructors

**Training Committees**

**Task to training Matrix SAT**

**Staff training**

**Evaluation, Job Observation authorizations**

**Training infrastructures and equipment**
Simulators, Flow Loop Simulators, Mockups, Innovatives tools

**Quality of Operations**
Management guide in competencies

**Trust**

**Performances**

CAP, OPEX
BEYOND ONE’S OWN ORGANISATION

• Share and explore beyond your community and beyond your company to benefit from experience and knowledge of the other operators
  • Peer groups across the company
  • Technical networks and groups
  • Experts communities on calculation codes (user groups)
  • Technical Sections (SFEN-FORATOM)
  • Knowledge networks: FROG, EPРООG

• Typical activities
  • Technical Support Missions, Peer Reviews, OSARTs, OPEX Lessons learned, personal assistance to other members
  • Elaboration of proposals of standards and norms

Develop of a common nuclear culture across the organisations: academics, Industry, R&D

YOUR CONTACT POINT
Providing France’s international partners with the best nuclear E&T solutions for human capacity building

EDUCATIONAL INSTITUTIONS
- Specialized institutes
- High schools
- Graduate Schools of Engineering
- Universities
- Continuing education institutes

INDUSTRY
Players
- AREVA
- GIIIN
- ENGIE
- EDF
- Other nuclear suppliers

R&D NUCLEAR SAFETY
Players
- ANSTO
- ANSTO
- IRSN
- CEA
- CNRS
- CEA

Assets
- Teach to operate NPP in a safe and competitive way
- On-site operation-like experience using simulators
- Full-scale NPP models allowing to train the entire supply chain staff
- Provide internships for students
- PhDs

Academic education
Hands-on training
Vocational training and research training

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AN EXAMPLE OF SUCCESS

DAYA BAY: the first commercial NPP in China
EDF responsible for overall coordination, interfaces management, construction follow up and plant commissioning
1st step to self reliance

LING AO: the technical route with its own proprietary brand
EDF assistance to Architect Engineer
Towards architect engineering and design self reliance

TAISHAN: the construction of the Chinese fleet
EDF co investor with CGN

HINKLEY POINT: International Reference
CGN co investor with EDF

CGN Installed capacity

Technology transfer from AREVA
Joint venture with AREVA

Indigenously built NPP

DAYA BAY
Full access to AREVA’s technology

NA5
2G fuel
Nuclear Island

LING AO
3G fuel
Reactor coolant pump manufacturing

TAISHAN

HINKLEY POINT

0
1 000
2 000
3 000
4 000
5 000
6 000
7 000
8 000

The starting point is to have early qualified personnel able to get up to speed and acquire the necessary knowledge and skills.

The company must then develop collaborative mindsets so that it can capture useful knowledge in the flow of work and organise its storage and spread across the organisation.

To become a learning organisation, the Operator must be able to develop, adapt and update methods and tools that incorporate the cumulated knowledge of the company.

Keeping the memory of past decisions (records management) is a key component of a good KM policy.

Mastering digital technologies is essential to succeed in knowledge sharing, capture and transmission over the lifecycle of plants.

Take benefit from all the opportunities to increase and share your knowledge beyond your own organisation.
THANK YOU FOR YOUR ATTENTION