

EXPERTISE MANAGEMENT IN NUCLEAR ENGINEERING BUSINESS

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Abstract. In the context of the nuclear business growth and wide-ranging renewal of the Tractebel Engineering Nuclear Department teams (due to the workforce ageing), the company which is strongly aware of the importance of maintaining critical knowledge, has set up a knowledge management program explicitly aimed at training those new forces, improving collaboration between colleagues and capitalizing on knowledge.

This paper addresses in a concrete way two of the actions carried out, i.e. the awareness initiative of the importance of sharing and the expertise transfer. It presents the developed methodology, the results of the projects initiated since 2005 as well as the lessons learned.

This expertise transfer intends to respond to those problems related to the loss of critical expertise as a result of staff leaving the company and to prevent such loss of competences worked out along the years.

Even if there has always been some amount of informal expertise transfer between seniors and juniors, it has appeared essential, for several years, to structure a process of knowledge transfer that would make sure that critical and strategic knowledge will be well preserved and transmitted so that know-how remains and renews itself. Moreover, this process contributes to making teams aware of the importance for the company of the knowledge transfer and capitalization even if not directly related to workforce replacement.

1. INTRODUCTION

In the knowledge management strategy developed by Tractebel Engineering Nuclear Department several actions were launched to establish a culture of knowledge sharing and transfer of competences.

The first part of this paper presents the preliminary phase in which we have raised our employees awareness of the interest and the importance of this sharing process.

In the second part, we describe our knowledge transfer strategy in nuclear engineering. It is a question of preserving the essential knowledge acquired throughout our employees careers yet shared among them.

2. AWARENESS OF THE IMPORTANCE OF SHARING KNOWLEDGE

Deploying a knowledge-management programme requires that the people called on to take part in the programme are ready to get involved in the sharing system, that they accept to record their activities and transmit their experiences to colleagues.

This awareness phase is essential so that each one is motivated to enter a process of sharing. Its aim is to encourage attitudinal changes.

To that purpose, we had invited all the employees (280 people : engineers, secretaries, administrative personnel, managers) to take part in awareness arousal sessions. We had organised 18 sessions of 6 hours each, facilitated by 2 trainers, with 15 participants. The groups were composed of a mix of employee grades & ages, and sections. Sessions were divided in three parts which represent the three barriers of sharing knowledge :

- *Why should I share my knowledge?*

The issue taken up in this part of the session concerns the reasons that should encourage us to share our knowledge. The answer to the question “why?” is key to making the employees understand why they must change their work habits.

One of the first exercises consisted of identifying a participant via a written description of his or her skills. This exercise underscored the difficulty of expressing and defining skills as well as misunderstandings of colleagues' skills. Next, accounts of real cases that were recorded on film highlighted certain dysfunctions in the debate within the department. These accounts were used as a basis for discussions. In that way, the participants had an opportunity to express their views on the obstacles that hamper or discourage the sharing of knowledge and to propose solutions that could remedy the problems raised.

- *What do I have to share?*

In this part, we introduced a theoretical framework in which the differences among the terms “knowledge”, “skill”, “information” and “data” were explained. The exercises relating to the questions “what do we need to share?”, “what knowledge is being used and what is missing?” enabled us to identify the knowledge that can be usefully shared in a team, a section or the company.

- *How could I share?*

This third part, “how to share”, presented the technologies and the methods that were developed and that are available to the participants for sharing knowledge and transferring skills, as well as the recommended means for a particular type of knowledge being shared. A discussion enabled the participants to express their degree of satisfaction with these technologies and methods and to suggest new ones.

The sessions ended with an action plan proposal. The participants proposed three actions that they consider important and that they wish to support actively.

These sessions had generated more than 1,000 hours of discussions on 13 questions and more than 1,500 answers or comments were formulated. The facilitators analysed them and, with the assistance of a 10-person working group representing each section, a list of improvement actions was proposed.

For 2 years now, actions to improve collaboration between colleagues and capitalize on knowledge has been set up, e.g. coaching of new employees and juniors, expertise transfer, improving the intranet-based project information sharing, improving the documentation structure and the search tool, creation of thematic intranets, identifying mentors for all disciplines, etc.

3. EXPERTISE TRANSFER

Tractebel Engineering Nuclear Department provides services throughout the complete nuclear life cycle - from design to decommissioning. Considering the size and the complexity of the operational activities, we have chosen a targeted approach aiming at transferring specific expertise from a small number of engineers in order to make sure that we preserve that expertise that one is likely to lose.

3.1. Method

The expertise transfer method is centered on the individual, the expert. A successful transfer supposes that these four questions are dealt with :

- Which expertise to transfer ?
- Who to transfer it to ?
- How to transfer it ? and

- Which form to transfer it ?

The method helps us to answer those questions in the most explicit and systematic way.

It structures the transfer process and comprises 6 successive stages to carry out the transfer of the specific expertise selected. It makes it possible to adopt a pragmatic and progressive approach while selecting what is really critical.

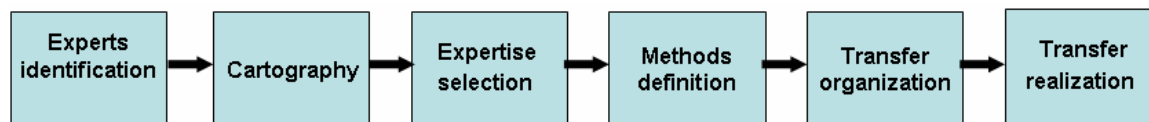


Figure 1. Transfer process stages

3.1.1. Experts identification

The first stage consists in identifying the "senior" experts who would be directly concerned with an expertise transfer. By "senior", one understands the people likely to leave in the near future through retirement, resignation, mobility, a.s.o., those who have taken up a new position, and also those 50-plus-year-old people who have critical expertise. It is each situation as such that will define the duration of the expertise transfer which is considered ideally between 2 and 3 years.

3.1.2. Cartography - Expertise selection

On the basis of the cartography jointly established with the expert, by looking at his/her knowledge, know-how and peripheral knowledge which allow him/her to be effective (e.g. contact lists, tools used, past project, documentation), we will determine which part of the expertise must be transferred. This will take into account various aspects such as the strategic plan, the alternative possibilities of maintenance of the expertise, the possibilities of installation of a transfer.

3.1.3. Methods definition

Once the selection of the expertise carried out, we will determine who could benefit from these competences (one or several people). Then, we will define the optimal transfer methods to use according to the specific character of what is to be transferred.

3.1.4. Transfer organization

A plan of transfer is defined jointly with all the actors involved (expert, manager, learner, methodologist/coordinator) and comprises all the activities of transfer over time. This planning specifies the task break-down, the actors, the methods to be used and the deliverables (qualification level to be reached by learners, documents to be produced, a.s.o.).

3.1.5. Transfer realization

The phase of transfer itself is carried out by the expert and the learners, under the responsibility of the manager. A methodological framework makes it possible to evaluate in a continuous way the effectiveness of the transfer and to possibly rectify certain methods of them.

3.2. Results

In 2005-2006, 17 people were identified and participated in the expertise transfer process. Specifically there were 10 retirement cases, 3 changes of functions, 4 "critical experts".

Four expertise transfers have been completed successfully and 13 are still ongoing. As for future years, we also envisage about fifteen transfers to be initiated per year, i.e. approximately 5% of the population.

At the moment there were 30 people who benefit from such expertise transfer, new employees or those who already have a background in the field.

The established cartographies made it possible to highlight several fields of expertises for which transfer actions were necessary.

Transfer of this know-how is made up as well of theories as of practices. All this abstract and formalized knowledge can be made available in various manners: coaching on the job, codification by the learner and validation by the expert, codification by the expert and consultation by learners, trainings, task simulations, a.s.o. For each identified know-how, the most optimal method to use was given.

To date, we can already say that :

- The application of this method allows more efficient knowledge transfers (structured approach, action planning and prioritisation).
- Activities take-over by the new expertise owners is facilitated.
- Managers better identify the specific knowledge to preserve.
- Seniors are acknowledged and their motivation to transmit their know-how increases.

4. CONCLUSION

Our experience shows the importance of key factors for successful expertise sharing. The preliminary awareness phase is essential. There must be a strong commitment from all the actors in the sharing process, i.e. managers, experts and learners (the expert must be motivated to transfer and the learner to receive). Promote the formalization of knowledge, whenever that is feasible and possible, so that it can be accessible to others. One should be guaranteed the required availability of experts and learners as transfer takes time. Experts need assistance to transmit their know-how efficiently and effectively. The transfer plan formalization permits to follow defined actions. A coordinator provides good transfer implementation mechanisms and interfaces between all actors. One needs to take into account potential gains or losses before launching the knowledge transfer process.

The transfer of knowledge may not be improvised, it has to be organized.