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"Bridging required capabilities and training"

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Abstract:

For Bel V, the Belgian TSO, developing and maintaining required competence and expertise is of utmost importance. Essential activities to achieve this goal are embedded within several processes of the Bel V integrated management system (IMS) which is certified according to ISO 9001:2008. The main processes of interest are:

- Deliver expert services in nuclear safety and radiation protection;
- Manage expertise and technical quality;
- Manage Human Resources

This presentation explains the role of Bel V's Technical Responsibility Centres (TRC) that play a key role in the process on "Deliver expert services in nuclear safety and radiation protection", especially for the identification of required expertise, and for daily managing and periodic evaluation of the expertise.

The process "Manage expertise and technical quality" covers aspects related to knowledge management. Examples of available tools are presented that are important for evaluating the vulnerability of our expertise (by using the in house developed Knowledge Critical Grid) or for ensuring knowledge transfer where needed.

Further, the process "Manage Human Resources" plays an important role by covering all aspects related to recruitment, by providing role descriptions, and by describing how to manage competence and training. Within that integrated process, an important effort was recently started in view of a more structured identification of the individual existing competence (KSA) gaps using the SARCoN tool, on the basis of a reference list of KSAs and the role descriptions. Our first findings after having performed a pilot-project for implementation are presented.

Besides the investments on developing and maintaining technical expertise, Bel V also decided recently to launch an important effort on non-technical training through participation of the whole staff in an "Interpersonal Effectiveness Development Path", coordinated by an external consultant company. The main aspects of this effort are presented.

1 Introduction concerning Bel V

Since 1 September 2001 the supervision of nuclear activities is within the responsibility of the Federal Agency for Nuclear Control (FANC), which constitutes the Belgian Safety Authority. This mission has been given to the FANC by the Law of 15 April 1994 [1]. According to articles 14bis and 28 of this law (as amended), the FANC may call upon the assistance of authorised bodies for health physics control, or on legal entities especially created to assist it in the execution of its missions.

The FANC has made use of this provision and created Bel V in September 2007, as a subsidiary with the statute of a so-called 'foundation' as defined in Belgian law. Bel V is given a mandate to perform regulatory missions that can be legally delegated by the FANC.

The FANC delegates different tasks to Bel V, in particular related to on site routine inspections and safety assessment. Consequently, Bel V acts as the TSO (Technical Safety Organisation) to the Belgian Safety Authority FANC. Together, FANC and Bel V constitute the Belgian regulatory body [3].

Although Bel V became operational as a new legal entity in 2008, a large part of the staff has a (very) longstanding experience in nuclear safety and/or radiation protection, since many staff members were working before at AVN, being at that time the TSO to the Belgian Safety Authority. Since its creation, an important effort for recruitment of new staff members has been undertaken.

2 Organisation of Bel V

Bel V's technical personnel is composed of 66 (62 full-time equivalent on 31/07/2014) university graduates (engineers and scientists), and recruitment is in step with the foreseeable workload. Since Bel V is performing inspections and safety assessment, its organisational structure is built around three technical departments: one on inspections, one on safety assessment, and one for the coordination of major projects. The structure is shown in Figure 1.

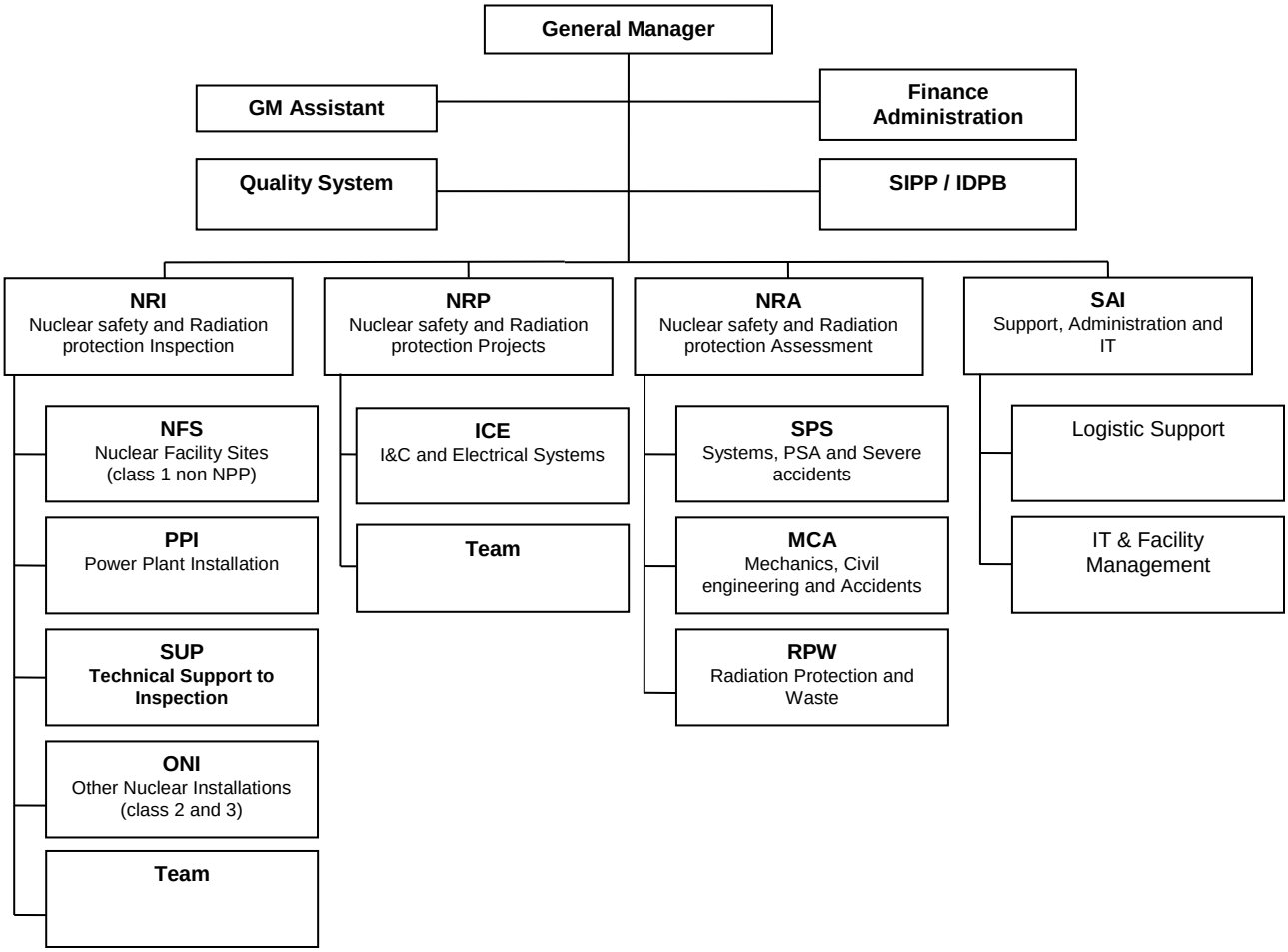

Figure 1. Organisational structure of Bel V

Besides this hierarchical structure, Bel V has a transversal structure organised in Technical Responsibility Centres (TRCs). These TRCs have been created in the nineties (within AVN), with the objective to use the staff as effectively as possible. About 20 TRCs are operating. The goal is to involve all people, having expertise in a technical domain, in review and assessment work for that domain, wherever the staff member is positioned in the Bel V organisation chart. In other words, TRCs are made up of experts from the whole organisation and some experts can be member of several TRCs. Since the creation of Bel V in 2008, also staff members of FANC can be integrated in a Bel V TRC, when it is felt that they can contribute important expertise to the TRC. The list of TRCs is given in the table below.

Code	Technical Responsibility Centre
200	Site analysis, external hazards, meteorology, atmospheric diffusion models
308	Civil engineering + hydrology, geology, seismology
310	Environmental and seismic qualification of electrical equipment
400	Core design (neutronics and thermal-hydraulics) and reloads

500	Mechanics
690	Safeguard systems, auxiliary and secondary fluid systems, fuel handling and storage
700	I&C and Safety Critical Software
800	Electrical systems
905	Fire protection, ventilation
1100	Waste management and releases, chemistry
1101	Decommissioning and Dismantling, Clearance
1201	Radioprotection, ALARA, radiation measurements
1301	Management of safety & Human & organizational factors
1303	Emergency planning
1306	Nuclear security
1501	Accident analyses, thermal-hydraulics, simulator models
1502	Accidental radioactive releases, confinement systems
2000	PSA, including human reliability
2100	Severe accidents
3300	Special mathematical methods
4100	Accelerator technology

3 Important processes for bridging required capabilities and training

Essential activities for bridging required capabilities and training are embedded within several processes of the Bel V integrated management system (IMS) which is certified according to ISO 9001:2008. The main processes of interest are:

- Deliver expert services in nuclear safety and radiation protection (Process A06);
- Manage expertise and technical quality (Process A07);
- Manage Human Resources (Process A08);

This paper presents some specific aspects embedded in these processes and that are important for our expertise management, without having the ambition to be complete in our description.

3.1 Aspects related to Knowledge Management

Within Bel V attention is being paid to knowledge management (KM) aspects on an individual scale and on a collective scale.

Aspects of KM on an individual scale are for instance integrated in Process A07 of our management system through the application of a procedure using a Knowledge Transfer Form that is applied whenever a person leaves Bel V or retires from Bel V. Starting from the functions and/or roles that the staff member fulfils, his knowledge, skills and attitudes (KSA) are inventoried in relation to regulatory practices (including legal bases and regulatory guides), technical disciplines and personal and interpersonal effectiveness. For the different identified KSA it is documented which other person(s) will take over and whether any specific knowledge transfer actions have to be envisaged.

For KM aspects on a collective scale, a tool was recently developed to evaluate the critical aspects of knowledge of given entities. The tool, the “Knowledge Critical Grid” (KCG), was first applied to the Technical Responsibility Centres, but could be applied

also to other internal entities within Bel V. The overall structure of the tool is given in Figure 2.

		Volatility issues				Vulnerability issues				
	K Domains	K Documentation	K Complexity	Number of possessors	Volatility level	Profile Rarity	Risk of loss	Vulnerability level	K critical level	Actions proposed
TRC 0		1			4			4		
		2			3			3		
		3			2			2		
		4			1			1		

Roles and responsibilities	TRCCs Proposal	
	MID validation	Date and signature
	PM07 validation	Date and signature
	SC validation	Date and signature

Figure 2. Knowledge Critical Grid

In the TRC Annual Reports (requested by the Bel V management system) the TRCs can make proposals for actions (concerning documentation, for additional staff, concerning training, …): the KCG is typically applied to identify such needs and to present the underlying reasons to the upper management.

3.2 Application of the SARCoN tool for human resources management

Within Process A08 of the Bel V management system, process A08.02 (HRM by competences) is related to the management of competence. It consists of 5 sub-processes:

- Describe roles and qualification requirements (A08.02.01)
- Competence Gap Analysis (A08.02.02)
- Training programme of staff (A08.02.03)
- Organise & Manage Training (A08.02.04)
- Manage individual development plans (A08.02.05)

The objective of process A08.02 is to ensure the competence of the staff and an appropriate match between the needs of the organization and the available resources.

At Bel V, the competence needs (both number of staff and required competences) are periodically evaluated at the level of the whole organization; the evaluation may lead to publication of new positions, internal job rotations or appropriate training for the staff.

The initial phase of competence management consists of defining an organizational structure and describing the different roles necessary to fulfil all the functions assigned to Bel V. Actually, 36 roles are described with the associated qualification and competence requirements and one or several roles are assigned to each staff member according to an IMS procedure entitled: “Tree of roles and affectation of people”.

The Bel V competence management process is presently being adapted to include the SARCoN in the evaluation of the competence needs. SARCoN stands for “Systematic Assessment of the Regulatory Competence Needs”. It is an IT tool developed by the IAEA which can be used to analyse competence gaps of each staff member, and on the

basis of this analysis, allows the identification of training needs and establishment of training programs.

SARCoN is a step-by-step approach to identify the gaps between the existing and the required competences or KSAs (Knowledge, Skills and Attitudes) using a quadrant model of competence as a structure (4 quadrants and 18 quadrant areas).

In Bel V, a specific reference list of KSAs tailored to the individual characteristics of the organization has been established by adapting the list provided by the IAEA safety standards.

The competence gap analysis process is described in the procedure A08.02.02. The process consists of 3 main sub-processes:

- Determine the competence profile for each role (levels of required KSAs) and then for each staff member taking into account all the assigned roles; this is the responsibility of the managers.
- Determine the existing KSA level by a self-assessment, followed by an evaluation interview with the supervisor in order to agree on the results of the self-assessment.
- Perform the competence gap analysis using the SARCoN tool (by training manager)

A pilot application of SARCoN has been launched recently, consisting in the use of the SARCoN tool by 9 staff members: the individuals chosen are mainly newcomers with a role of inspector or safety analyst. A training session has been organized to familiarize the 9 people with the use of the tool. Then the competence profiles have been defined for each individual (they have only one role) and a self-assessment of the existing KSAs has been performed by each individual.

A detailed analysis of the results of the pilot application is ongoing with the goal to take a decision about the suitability of the SARCoN tool and approach to satisfy the Bel V expectations, i.e. to improve the establishment of training programs by use of the results of the competence gap analysis and a systematic assessment of the training needs. At the present time, a training approach based on SAT (Systematic Approach to Training) is adopted in Bel V and fully incorporated in the Bel V IMS.

3.3 Investment in non-technical skills

Although technical expertise is of primary and utmost importance for a TSO, the management of Bel V recently took a decision to make a considerable investment in the non-technical skills of its staff. With this initiative, the Bel V management wants to strengthen the capabilities of the whole staff in their relationships, both with external stakeholders and internally amongst colleagues.

An external consultant has been hired and proposed an extensive “Interpersonal Effectiveness Development Path” for the staff. The development path is adapted to different groups of the staff (for instance, depending on the degree of management tasks to be fulfilled by the staff member). The planned modules include (not to be followed by everyone):

- Knowing my-self
- Knowing my leadership style
- Communicating with others
- Integrating the generations
- Motivating and leading my team

Given the important manpower effort to be devoted to this training program (that might amount up to +/- 3000 man-hours), the program has been spread over 15 months.

4 Conclusions

At its creation in 2008, Bel V could build on the long-standing experience of its staff in the areas of nuclear safety and radiation protection, most staff members working already before in the nuclear regulatory domain. Nevertheless, there was a need to increase the Bel V staff to be able to respond in an adequate manner to the existing workload and upcoming challenges.

By the nature of its core business which is strongly expertise driven and by the important increase in technical staff (from 35 FTE in 2008 to 62 FTE today), further developing and maintaining Bel V's expertise was of utmost importance in the preceding years. Some organisational aspects, tools and initiatives that contributed to this effort are explained above. Many of them are not finalized, either because they were recently started, either because they require a continuous effort.

5 References

[1] Law of 15 April 1994; which has created the Federal Agency for Nuclear Control (FANC)

[2] Royal Decree of 20 July 2011; General Regulation for radiological protection of the public, the workers and the environment (GRR-2001)

[3] National report to the Convention on Nuclear Safety; August 2013