

KNOWLEDGE MANAGEMENT IN SPANISH NUCLEAR POWER PLANTS

RETENTION OF TACIT KNOWLEDGE IN NUCLENOR

The experience on the application of the different succession plans in Nuclenor since 2003 has revealed the necessity of identifying and retaining, as far as possible, the tacit knowledge, important and may be in possession by a reduced number of people.

Nuclenor has developed a internal Guide that includes four stage within the knowledge transference process:

- Stage 1: Experts' identification.
- Stage 2: Assessment and classification.
- Stage 3: Knowledge transference process.
- Stage 4: Process evaluation.

The current situation of Santa María de Garoña Nuclear Power Plant has led to enhance the flexibility and versatility of our workforce. The retirements, along with the need to perform additional functions, have become more important, if possible, to the processes of knowledge transfer.

Nuclenor, in its 5 Years Action Plan, has set as one of its objectives the expert knowledge retention.

INTRODUCTION

The experience on the application of the different succession plans in Nuclenor since 2003 has revealed the necessity of identifying and retaining, as far as possible, the tacit knowledge, important and may be in possession by a reduced number of people.

We understand that as tacit knowledge that is not clearly documented and resides in specific individuals.

To this end, Nuclenor has developed a internal Guide that includes four stage within the knowledge transference process:

- Stage 1: Experts' identification.
- Stage 2: Assessment and classification.

- Stage 3: Knowledge transference process.
- Stage 4: Process evaluation.

Stage 1: Experts' Identification

Experts' identification is carries out in two ways:

- By decision of the hierarchical structure.
- Within the panel of experts, where knowledge transference processes will be analyzed and proposed, as part of the formative actions.

Once the expert has been identified, throughout a questionnaire made to that end, a personal interview is carried out, addressing the different aspects of their knowledge and skills (Figure 1):

CUESTIONARIO PARA LA IDENTIFICACIÓN DEL CONOCIMIENTO CRÍTICO			
ACTIVIDAD: GCF-PR-OJT-06 Vigilancia y control de los trabajos. Controles administrativos			
CONOCIMIENTO: 6.2 Descripción y equipos de la sala de calibración			
a) ¿Está documentado?	SI	X	
	NO		
c) ¿Cuántas personas lo conocen?	1		
	2	X	
	3		
	Más de 3		
b) ¿Es importante?	SI	X	
	NO		
d) ¿Tiempo necesario de aprendizaje?	Más de 3 años		
	3 años		
	Entre 1 y 2 años	X	
	Menos de 1 año		

Figure 1.



JAVIER PATÓN FERNÁNDEZ

Human Resources Technician

He has worked as an operator in the Castellón Thermal Power Plant, and Valdecaballeros Nuclear Power Plant.

Later he joined the Planning section of the Garoña Nuclear Power Plant, and currently works as a technician of development in Human Resources.

- Knowledge is documented?
- Knowledge is important? For safety, radiation protection, production, etc.
- How many people have the knowledge?
- Learning time.

Stage 2: assessment and classification

Using the data from the previous questionnaire, a table called Knowledge's Assessment Matrix is elaborated, where the knowledge is classified according to criteria established from documents of the International Atomic Energy Agency (IAEA):

- Expert's running time.
- Knowledge's classification (Figure 2).

Based on the above criteria each knowledge is placed in one area within the matrix. In the latter, we can observe different areas (Figure 3):

- Red area: Critical knowledge. Implement immediate measures to retain knowledge.
- Yellow area: Implement, within a year, measures to retain knowledge and prevent it reaches the red area.
- Blue area: Implement in a mid-term period (2 years, measures of knowledge's retention).
- Green area: Knowledge free of risks in assessments 1 and 2. In assessments 3 and 4, implement mid-term measures to prevent its entrance in the blue area.

Based on this classification, an internal report where proposed actions to be taken in accordance to the assessment of each knowledge is elaborated.

Stage 3: knowledge transference process

Through Knowledge Transfer Guide, data sharing is settled between the expert and the receptor, in a systematic and organized way. The guide is composed by the following sections:

- Collaborators.
- Contacts. Internal, external, support, etc.
- Working groups and forums to which they belong.
- Applicable procedures, normative, bibliography.
- Generated documentation. Reports, historical outline.
- Software applications.

ASSESSMENT OF KNOWLEDGE TACIT / CRITICS	VALUE
Knowledge not documented and 1) unique and important or 2) It requires 3 or more years of training	5
Knowledge not documented and 1) known by a small group (up to 3 people) and important or 2) It requires between 1 and 2 years of training	4
totally or partially documented knowledge and 1) known by a small group (up to 3 people) and important or 2) It requires 3 or more years of training .	3
totally or partially documented knowledge and important and It requires between 1 and 2 years of training	2
not important knowledge or It requires less than one year of training .	1

Figure 2.

VALORACIÓN DEL CONOCIMIENTO TÁCITO					
	1	2	3	4	5
1	C6 C7 C8		C1 C2 C3 C4 C5		
2					
3					
4					
A partir del 5 año					

Figure 3.

- Audits and inspections.
- Target tracking and indicators: plans, programs and budgets.
- Facilities, equipment and components.
- Activities.

The Human Resources Department convenes a meeting for the launching of the process and carries its monitoring itself. Subsequently, the receptor must lead the process all along with the support and supervision of hierarchical responsible and Human Resources.

Stage 4: process evaluation

Lastly, a final report is elaborated, in which, through a system of indicators, the degree of transference throughout the process is determined and

specific actions are recommended when necessary.

The established criteria for the assessment of the different phases and activities are the following (the greatest scoring):

- Discussion / simulation. 10%
- Observing/ doing. 30%
- Working under supervision. 60%
- Working with responsibility. 100%

We implement the following table (Figure 4) covering the different sections of the guide.

With the former data, the process indicator is obtained (Figure 5), which assesses the transference degree within the knowledge transference process. It is considered that the process as satisfying ever since we reach a degree of transference of 60%.



10. Relación de actividades y conocimientos	CONOCIMIENTO	RECEPTOR	DISCUSIÓN	SIMULACIÓN	VER HACER	TRABAJO BAJO SUPERVISIÓN	TRABAJO CON AUTONOMÍA	INDICADOR
Normas administrativas sobre el control dosimétrico del personal	C1	AEH	X				X	100%
Dosimetría personal externa	C2	AEH	X				X	100%
Dosimetría interna	C3	AEH	X				X	100%
Dosis por contaminación externa	C4	AEH						NA
Descripción y equipos de la sala de calibración	C5	AEH		X		X	X	100%
Manejo de los detectores de contaminación	C6	AEH					X	100%
Estimación de dosis al público en caso de emergencia	C7	AEH						0%
Medidas de protección y asistencia al personal	C8	AEH						0%

Figure 4.

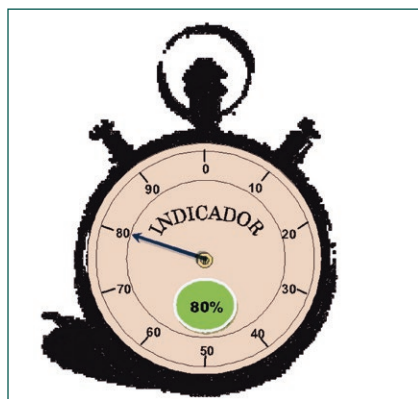


Figure 5.

In the final report, elaborated by the Human Resources Department, actions to strengthen the weak points detected during the process are proposed, when necessary.

CURRENT SITUATION

The current situation of Santa María de Garoña Nuclear Power Plant has led to enhance the flexibility and versatility of our workforce. The retirements, along with the need to perform additional functions, have become more important, if possible, to the processes of knowledge transfer.

In this line, Nuclenor's Management, within their Performance Plan, has determined expertise knowledge retention as one of the main objectives. A report is issued monthly (Figure 6) depicting the situation of each running process.

In the last 5 years, they have initiated 26 formal knowledge transference processes. The goal for this year is maintaining 7 processes active at all times.

Datos a 31 de mayo de 2016 GESTIÓN DEL CONOCIMIENTO: INFORME DE SEGUIMIENTO									
EXPERTO	SECCIÓN	RECEPTOR	LANZAMIENTO	INFORME	GUÍA	SEGUIMIENTO	FECHA PREVISTA DE FIN	PROCESO	OBSERVACIONES
	PR		✓	N/A	✓	✓	Finalizado	✓	Informe final en comentarios. RH-GCON-JMPB
	DC		✓	N/A	✓	✓	31/05/2016	✓	Informe final en borrador
	GM		✓	N/A	✓	Pte	30/06/2016	Pte. Informe	Recopilación de información e informe final
	GP		✓	N/A	✓	Pte	30/06/2016	Pte. Informe	Recopilación de información e informe final
	QR		✓	N/A	N/A	✓	30/06/2016	Pte. Informe	Recopilar información para realizar el informe final
	QR		✓	N/A	✓		30/06/2016	En marcha	Realizada la reunión del lanzamiento y guía de transferencia
	DC		Pte				30/06/2016	Pte. Lanzamiento	Reunión de lanzamiento
	GR		Pte				30/04/2016	¿?	Reunión de lanzamiento
	CF		Pte				30/04/2016	¿?	Reunión de lanzamiento

Figure 6.

The Monitoring Committee Training by Management is the periodic meeting which realizes the status of each process and the start of new processes is promoted.

The collaboration with the University of Burgos (UBU), and the Feder-

ation of Business Associations (FAE) has been an important frame of reference for the development of joint, such as OGECON prizes, stamp of belonging, learning club, and even the development of final projects initiatives within the facilities. ■

- STI/PUB/1248 - Risk Management of Knowledge Loss in Nuclear Industry Organizations.
- IAEA-TECDOC-1399 - Ageing Workforce: Transfer of Knowledge To The Next Generation.
- IAEA-TECDOC-1510 - Knowledge Management for Nuclear Industry Operating Organizations.
- GG-GUIA-001: Preparación, revisión y aprobación de guías en la Central.
- GCF-sección- OJT: Guías de entrenamiento en el puesto de trabajo.