



## *I ECVET Nuclear Job Taxonomy Meeting*

*IET - JRC, Bergen, The Netherlands*

*10<sup>th</sup> - 14<sup>th</sup> October 2011*

### **1. OBJECTIVES OF THE MEETING**

The ECVET (European Credit System for Vocational Education and Training) has the aim to facilitate the validation, transfer, recognition and accumulation of learning outcomes, including those obtained outside the formal training, and considered as part of a long-life process. In the ECVET system it is necessary a common language for recognition, throughout EU-27.

Regarding above, the initial goals in the nuclear implementation of ECVET is the development of a common European nuclear job taxonomy. This taxonomy should become a base for the further definition of learning outcomes, units and qualifications in the nuclear area.

Therefore the Institute for Energy and Transport (IET-JRC) has organized a meeting with experts in human resources, training and education within the nuclear area with the objective for developing a job taxonomy as future tool for implementing nuclear ECVET.

### **2. INTRODUCTION**

The meeting was held in Park Hotel in Bergen (The Netherlands) with the attendance of the following external experts:

BUHAI, Bodgan from AREVA (France), expert in NPP Construction

CECLAN, Mihail from UBA -University of Bucharest- (Romania), expert in NPP Operation

IGLESIAS MORÁN, Jesús from TECNATOM (Spain), expert in NPP Operation

MAJOKOVA, Zuzana from ENEL (Italy – Slovakia), expert in NPP Operation

And the organizers:

CHENEL RAMOS, César from IET-JRC (The Netherlands)

LACAL MOLINA, María Alicia from IET-JRC (The Netherlands)

### **3. SESSIONS**

The meeting was divided in five sessions with different characteristics:

- Introduction session held on Monday 10<sup>th</sup> October
- Workshop sessions held from Tuesday 11<sup>st</sup> October until Thursday 13<sup>rd</sup> October
- Final workshop session and closure debate held on Friday 14<sup>th</sup> October.

#### **3.1. Introduction session**

The participants introduced themselves, explaining their professional background and their knowledge about the ECVET system.

Besides, the organizers made three presentations:



- IET – JRC: objectives, structure, history, strategy and mission as support of the European policies.
- ECVET within the action CAPTURE: what is CAPTURE, what are the main objectives of CAPTURE regarding ECVET system, stakeholders involved, what is ECVET, objectives of ECVET in the nuclear area, nuclear ECVET planning, activities undergone.
- I ECVET Nuclear Job Taxonomy Meeting: description, definitions, objectives, tools, methodology, stressing the absolute flexibility of the proposed work procedure.

A preliminary discussion was devoted to meet common agreement and understanding on the basic concepts and the work tools: KSC list, template, use of the EQF descriptors, and initial list of jobs, work system.

### 3.2. Workshop sessions

The discussion to define the job profiles was parallel to the modification of the initial job profile list. The sessions were divided in two, devoted to two processes of the life cycle of a NPP.

The first session was devoted to the NPP Design. In this session, after the modification of the job profiles list, five positions were completed:

- Mechanical Design Engineer
- Civil Design Engineer
- Electrical Design Engineer
- I&C Design Engineer
- System Design Engineer

The second and the third sessions were focused on NPP Operation and nine positions were completed:

- Operation Manager
- Shift Supervisor / Reactor Manager / Head of Reactor Unit
- Shift Manager
- Operator
- Field Operator I
- Field Operator II
- Radiation Protection Officer
- Radiation Protection Worker / Agent Packing and Transport (RPO)
- WM&RP manager / Radiation Protection Expert (RPE)

Besides, in these sessions, several comments were adopted regarding the job profiles list as is reflected in the Annex I (last version of the Job Profiles List adapted in the meeting).

## 4. MATTERS OF DISCUSSION

Both in the course of the work sessions and in the final debate several issues came on the table that are relevant for the improvement of work methods and the clarification of key concepts:

### Terminology:



**JOB NAMES:** In several cases it became evident that the differences in the designation of the job positions across different countries and organizations led to confusions. It was agreed the convenience of including initially different possible names for the same position with the aim of doing the job taxonomy understandable for all nuclear stakeholders, and perhaps in a later stage undertake an attempt for harmonization.

**KSCs/KSAs:** The standard nuclear job guidelines (as IAEA guidelines or NRC) for nuclear training and education are based in KSAs (Knowledge, Skills and Attitudes) but the ECVET guidelines refer to KSCs (Knowledge, Skills and Competence). This caused a debate on the suitability to adopt either of these terminologies, as well as the definition of the concepts, such as the correspondence between "attitude" and "behavioural competence". It was agreed that terminology and definitions should be reviewed before or during next meetings, taking into account the fact that ECVET promotes also horizontal mobility, what implies recognition in non-nuclear sectors. At the same time the importance of the experience as asset to include in the taxonomies, in addition to KSC/As, took a part of the discussion.

#### Work tools:

**JOB CATEGORIES AND EDUCATIONAL REQUIREMENTS:** For certain jobs the boundaries between professional categories and the definition of education entry levels were difficult to establish, mainly due to the diverse career schemes and education system structures in the different countries.

**KSCs CATALOGUE:** The list of areas of knowledge provided as working tool was found useful, but there was a unanimous opinion that it should be structured and completed, and has to encompass items describing not only knowledge, but also skills and competences.

**EQF DESCRIPTORS:** They are considered practical as markers of the KSCs in order to make them more intelligible and for a direct link with an equivalent educational level in the corresponding learning outcomes. Nevertheless they could be adapted to improve their applicability to job competences.

#### Methodology:

**SPECIFIC SYSTEM DEMANDS - CANDU:** One of the experts came from the only one European country with CANDU reactors -Romania. This brought up the inclusion in the list of some positions specific for this type of reactors, involving distinct tasks and competences. Perhaps similar situation can occur for other particular technical configurations.

**TAXONOMIES:** The definition of roles and functions for the jobs covered can be considered quite complete. Regarding the KSCs they have focused essentially in the first (knowledge) and still lack of proper descriptions of skills and competences –which perhaps should be formulated separately. Having an initial draft for every job description could help to speed up the work in future workshops.



## 5. PROPOSED ACTIONS

- 1/ Initiating practical arrangements of a second meeting, with inclusion of more experts with the aim of involving the different stakeholders of the nuclear world (research institutions, industry, stakeholders' associations, public organisms...).
- Resp.: JRC team
- 2/ Establishing continuous communication with the potential participants to share, review and improve the work documents in order to establish an optimal foundation for the next meeting, to review and check the work done and to put in common possible improvements of the tools, work system and other issues.
- Resp.: JRC team
- 3/ Reformulating the KSCs Catalogue to make it more extensive and structured, including Skills and Competences and both general and specific items.
- Resp.: C. Chenel
- 4/ Adapting the EQF descriptors used as markers for the KSCs to make them more suitable.
- Resp.: M. Ceclan
- 5/ Reviewing the job profile list with the aim to have it completed, checked and confirmed by the participants, with special attention to the chapter *Decommissioning*, which was not reviewed during the meeting.
- Resp.: All participants
- 6/ Modifying the template to allow a separate description of items corresponding to the categories Knowledge, Skills and Competences.
- Resp.: A. Lacal
- 7/ Elaborating more extended preliminary information on ECVET concept, terminology, definitions and overall objectives (especially a nuclear ECVET work flow).
- Resp.: A. Lacal
- 8/ Preparing draft versions of every job profile that can be used as starting point for the positions not done in this meeting.
- Resp.: All participants

## 6. CONCLUSIONS

Once evaluated the results after the meeting, several conclusions are drawn.

Regarding the meeting outcomes, there is a need to organize one or more additional meetings to finalize the taxonomies. For them a first version of the job descriptions should be drafted in advance, as well as more documents explaining ECVET and its objectives, related concepts and definitions helpful for the adaptation and understanding of the approach.



Moreover, for the jobs covered this time, while the description of roles and functions can be considered finished, the description of related KSCs needs further development, which could be facilitated by means of a more comprehensive catalogue.

Therefore the preliminary circulation and review of the working documents is considered essential as preparation of future meeting(s).

It is important to remark the interest of the participants in the development of the nuclear job taxonomy which it was very high. In fact, they were very interested in continuing the task and in helping the JRC team in the preparation of the next meeting.

And finally it is important to mention the interest of this meeting coming from several important stakeholders like DG Research or ENS.



ANNEX I. JOB PROFILES LIST

NPP- C (Construction)

FUNCTION	NOTES	LEVE L
Design	Civil Design Technician (1)	T
	Electrical Design Technician (1)	T
	Mechanical Design Technician (1)	T
	<b>Mechanical Design Engineer</b>	<b>T/P</b>
	<b>Civil Design Engineer</b>	<b>T/P</b>
	<b>Electrical Design Engineer</b>	<b>T/P</b>
	<b>I&amp;C Design Engineer</b>	<b>T/P</b>
	<b>System Design Engineer</b>	<b>T/P</b>
	Safety Design Engineer	T/P
	Project Integration Engineer	P
Construction	Construction Project Manager	P
	Transverse Engineer	P
	Mechanical Construction Engineer	P
	Civil Construction Engineer	P
	Electrical Construction Engineer	P
	I&C Construction Engineer	P
	Mechanical Construction Technician	T
	Civil Construction Technician	T
	Electrical Construction Technician	T
	I&C Construction Technician	T
	Mechanical Construction Worker	C
	Civil Construction Worker	C
	Electrical Construction Worker	C
	I&C Construction Worker	C
	Occupational Safety Manager (2)	P
	Quality Control Manager (2)	P
	Quality Control Technician (2)	T
	Environmental Manager (2)	P
	Welder (2)	C
	Locksmith (2)	C
Test Engineers / Technicians / Workers (3)		
Commissioning	(4) Commissioning Crew(s): Jobs under "Nuclear Operations"	
	Electrical Commissioning Engineer	P
	Mechanical Commissioning Engineering	P
	Civil Commissioning Engineer	P
	I&C Comm. Engineer	P
	System Commissioning Engineer	P
	Commissioning Manager	P
	Permission-to-work Officer	P
Permission-to-energize Officer	P	

NPP- O (Operation)



Nuclear Operations and Waste Management	Operation Planning Officer / Technician		T
	<b>Operation Manager</b>		<b>P</b>
	Operators in Control Room	<b>Shift Supervisor / Reactor Manager / Head of Reactor Unit</b>	<b>P</b>
		<b>Shift Manager</b>	<b>P</b>
		<b>Operator</b>	<b>T</b>
	Operators in The field	<b>Field Operator I</b>	<b>T</b>
		<b>Field Operator II</b>	<b>C</b>
	Waste Management & RP	<b>Radiation Protection Officer</b>	<b>T</b>
		<b>Radiation Protection Worker / Agent Packing and Transport (RPO)</b>	<b>C</b>
<b>WM&amp;RP manager / Radiation Protection Expert (RPE)</b>		<b>P</b>	
Chemistry	Chemistry Operator I / Chemistry Worker		C
	Chemistry Operator II / Chemistry Lab Technician / Analyst		T
	Chemistry Supervisor		T / P
	Chemistry Manager (5)		P
Safety and Security	S (S)&E Manager		P
	Industrial Safety / Occupational Safety / Technician (2)		C / T
	Industrial Safety / Occupational Safety / Supervisor (2)		T
	Fire protection Technician		C / T
	Fire protection Supervisor		T
	Environmental Supervisor (2)		T
	Security Manager / Supervisor (2)		T / P
Maintenance	Electrical Technician		T
	Electronical / I&C Technician		T
	Mechanical Technician		T
	Electrical Worker		C
	Electronical / I&C Worker		C
	Mechanical Worker (2)		C
	Electrical Supervisor		T / P
	Electronical / I&C Supervisor		T / P
	Mechanical Supervisor		T / P
	Process Equipment Technician		P
	Welder (2)		C
	Operational Locksmith (2)		C
	Maintenance Manager		P
	Maintenance Planning Officer / Technician		T
	Civil Technician (2)		T
Process Equipment Engineer (2)		P	
Fuel Machine (CANDU)	Nuclear fuel Operator (6)		T
Engineering Support (CANDU)	Responsible System Engineer-RSE (6)		P
Engineering	<b>Mechanical Design Engineer (7)</b>		<b>T / P</b>
	<b>Civil Design Engineer (7)</b>		<b>T / P</b>
	<b>Electrical Design Engineer (7)</b>		<b>T / P</b>
	<b>I&amp;C Design Engineer (7)</b>		<b>T / P</b>
	<b>System Design Engineer (7)</b>		<b>T / P</b>
	<b>Safety Design Engineer (7)</b>		<b>T / P</b>

NPP-D (Decommissioning) (To be reviewed)



Dec. Operations	Operator		T
	Planner/Programmer		T
	Supervisor/Team Leader		P
	Business		P
	Site Engineer		P
	Site Manager		C
Maintenance	Fitter		T
	Technician		T
	Team Leader		P
	Project Engineer		P
	Senior Engineer		C
Waste Management	Operative		T
	Supervisor/Team Leader		P
	Support Service Engineer		P
Safety	Operations Manager		T
	Health Physics	Radiation Protection Supervisor/Team Leader	P
		Radiation Protection Monitor/Surveyor	T
		Health Physicist	P
		Safety Case Officer	P
	Safety Case	Safety Case Lead Author	P
		Safety Case Process Owner	P
		Safety Case Peer Reviewer	P
		Environment	
Environment	Environment Compliance Manager		

**(Bold) Initiated**

**(Grey) Low priority excluded of definition.**

- (1) The difference in roles Technician / Professional seem not to exist in practice. They would merge in only one profile where concrete job-holders can have different level of seniority / competence.
- (2) To be ascertained if there is a need for competences which are specific of the nuclear area.
- (3) Testing activities are systematically outsourced. This staff do not belong usually to the organization of the NPP and is neither evident that they need special nuclear competences.
- (4) Similar jobs (P/T/C) as in Construction with some specific functions for commissioning procedures
- (5) This position is often combined with the *WM & RP Manager*
- (6) Specific positions for CANDU reactors
- (7) Similar profiles to the equivalents in DESIGN