European Commission

6th Workshop for the preparation of an ECVET-oriented Nuclear Job Taxonomy

Istanbul, 16 – 20 February 2015

Summary and presentations

ecvet
European Credit system for
Vocational Education & Training

6th Workshop for the preparation of an ECVET-oriented Nuclear Job Taxonomy

DEBRIEFING

Istanbul (Turkey) *16-20 February 2015*

1. INTRODUCTION

The 6th Workshop for the preparation of a nuclear job taxonomy was scheduled as the last of the series, with the objective of carrying out group review of 58 job profiles and finalise the nuclear power plant (NPP) job taxonomy in its three life cycle phases

2. PARTICIPANTS

The Workshop was held in the Hotel Elite World in Istanbul (Turkey) and was attended by the following participants:

The invited experts:

Olivia	COMSA	CITON
Marinela	ILIEVA	Risk Engineering Ltd.
Lyubomir	PIRONKOV	KNPP Training Center
José Enrique	MARTÍN GARCÍA	Gas Natural-Fenosa Engineering
Jesus	IGLESIAS MORÁN	TECNATOM
Gabriel L.	PAVEL	Univ. Politehnica Bucharest
Frank	CHARLIER	RWTH Aachen University
Emilia	VASSILEVA	BG Knowledge Management Assoc.
Eija-Karita	PUSKA	VTT
Edoardo A.	DE MARCO CINOTTI	Sogin s. p. a.
Decebal-Radu	CIURCHEA	Babes-Bolyai University
Biljana	GEORGIEVSKA D.	Radiation Safety Directorate.

Anton	CHAUSHEVSKI	Ss. Cyril and Methodius University Skopje
Abdelouas	ABDESSELAM	Ecole des Mines Nantes

The volunteer contributor:

Elena	BRUGI	Sogin s. p. a.

The internal expert:

Concetta	FAZIO	EC- JRC – ITU Karlsruhe

The organisers:

Willy	MUNTJEWERF	EC- JRC – IET Petten
Mihail	CECLAN	EC- JRC – IET Petten
Massimo	FLORE	EC- JRC – IET Petten
César	CHENEL RAMOS	EC- JRC – IET Petten

3. WORKSHOP SESSIONS

The Workshop consisted of seven half-day sessions. The first and the last ones were plenary, and during the rest of them the participants were distributed in two working groups to carry out the review of the job profiles.

3.1. OPENING SESSION

After the welcome and the self-introduction of the experts, Willy Muntjewerf provided some general information about the practical arrangements relevant for the participants.

Following, Mihail Ceclan explained the JRC/ EHRO-N strategy and road map for ECVET implementation within the nuclear sector.
In the context of the systematic approach of ECVET implementation (JRC/ EHRO-N road map for ECVET implementation), the job taxonomy was integrated in the JRC/ EHRO-N road map and represent the component two: the shift from knowledge based qualification system to the Competence based qualification system. More over the main outcome of the job taxonomy (the job descriptions, ECVET oriented, where Job requirements are defined in terms of KSC/ A) represent the input for component three (of ECVET system for NES): Designing nuclear qualifications based on ECVET approach.

César Chenel showed the concepts and definitions significant for the completion of the job descriptions, the use of the EQF descriptors, and presented practical examples of how to use the template.

Finally the work packages were presented to the participants, who had the chance to sign up for each session in the working group better matching their expertise.

All the interventions were followed by a turn of questions and comments.

3.2. WORK GROUP SESSIONS

The organisers proposed a flexible scheme to allocate the working groups. Given the expertise fields of the participants, an approach based in NPP life cycle phases would have made difficult to cover the tasks properly. Therefore work packages were prepared grouping jobs of functional content as similar as possible, irrespectively of the phase, and the experts were given the choice to join one or other WG for each half-day session. This turn out in the working groups that are detailed in the final Agenda.

3.3 OUTCOME OF THE WORK SESSIONS

The following 58 profiles underwent group review:

NEW BUILD - SAFETY ASSESSMENT	1.0.10.	Safety Design Engineer
NEW BUILD - SITE LOCATION	1.1.03.	Nuclear Engineer
NEW BUILD - SITE LOCATION	1.1.05	Geological experts
NEW BUILD - SITE LOCATION	1.1.06	Environmental expert
NEW BUILD - DESIGN	1.2.02	Civil Technical Draughtsman
NEW BUILD - DESIGN	1.2.03	Electrical Technical Draughtsman
NEW BUILD - DESIGN	1.2.04	Mechanical Technical Draughtsman
NEW BUILD - DESIGN	1.2.09	System Design Engineer
NEW BUILD - CONSTRUCTION	1.3.01.	Construction Project manager
NEW BUILD - DESIGN	1.2.12	HVAC Design Engineer

NEW BUILD - CONSTRUCTION	1.3.02.	Transverse Engineer
NEW BUILD - DESIGN	1.2.13	HVAC Technical Draughtsman
NEW BUILD - DESIGN	1.2.18	I&C Technical Draughtsman
NEW BUILD - COMMISSIONING	1.4.02.	Mechanical Commissioning Engineer
NEW BUILD - COMMISSIONING	1.4.03.	Civil Commissioning Engineer
NEW BUILD - CONSTRUCTION	1.3.14.	Mechanical Construction Worker
NEW BUILD - COMMISSIONING	1.4.04.	I&C Commissioning Engineer
NEW BUILD - CONSTRUCTION	1.3.15	Civil Construction Worker
NEW BUILD - COMMISSIONING	1.4.05.	System Commissioning Engineer
NEW BUILD - CONSTRUCTION	1.3.17.	I&C Construction Worker
NEW BUILD - CONSTRUCTION	1.3.19.	Quality Control Manager
NEW BUILD - CONSTRUCTION	1.3.19.	Quality Manager
NEW BUILD - CONSTRUCTION	1.3.20.	Quality Control Technician
NEW BUILD - CONSTRUCTION	1.3.22.	Welder
NEW BUILD - CONSTRUCTION	1.3.25	HVAC Construction Engineer
NEW BUILD - CONSTRUCTION	1.3.26	HVAC Construction Technician
OPERATION - CHEMISTRY	2.5.02.	Chemistry Supervisor
OPERATION - CHEMISTRY	2.5.04.	Chemistry Operator I
OPERATION - SAFETY AND SECURITY	2.6.01.	Safety and Security Manager
OPERATION - SAFETY AND SECURITY	2.6.02.	Industrial Safety Technician
OPERATION - SAFETY AND SECURITY	2.6.03.	Industrial Safety Supervisor
OPERATION - SAFETY AND SECURITY	2.6.04.	Fire Protection Worker
OPERATION - SAFETY AND SECURITY	2.6.05.	Fire Protection Supervisor
OPERATION - SAFETY AND SECURITY	2.6.06.	Environmental Supervisor
OPERATION - SAFETY AND SECURITY	2.6.07.	Security Manager/Supervisor
OPERATION - MAINTENANCE	2.7.01.	Electrical Technician
OPERATION - MAINTENANCE	2.7.02.	Electronic-I&C Technician

OPERATION - MAINTENANCE	2.7.05.	Electronic-I&C Worker
OPERATION - MAINTENANCE	2.7.06.	Mechanical Worker
OPERATION - MAINTENANCE	2.7.07.	Electrical Supervisor
OPERATION - MAINTENANCE	2.7.08.	Electronic-I&C Supervisor
OPERATION - MAINTENANCE	2.7.09.	Mechanical Supervisor
OPERATION - ENGINEERING	2.8.01.	Mechanical Design Engineer
OPERATION - ENGINEERING	2.7.12.	Operational Locksmith
OPERATION - ENGINEERING	2.8.02.	Civil Design Engineer
OPERATION - MAINTENANCE	2.7.14.	Maintenance Planning Officer
OPERATION - ENGINEERING	2.8.04.	I&C Design Engineer
OPERATION - MAINTENANCE	2.7.15.	Civil Engineering Technician
OPERATION - MAINTENANCE	2.7.16.	Process Equipment Engineer
OPERATION - CANDU	2.9.01	Fuel Machine Operator
OPERATION - CANDU	2.9.02	System Responsible Engineer
DECOMMISSIONING - MANAGEMENT	3.1.06.	Communication Manager
DECOMMISSIONING - MANAGEMENT	3.1.07.	Financial Manager
DECOMMISSIONING - SITE RELEASE	3.10.1	Final Release Process Supervisor
DECOMMISSIONING - MAINTENANCE	3.8.03.	Maintenance Worker
DECOMMISSIONING - HEALTH, SAFETY AND ENVIRONMENT	3.9.01.	Radiation Protection Expert
DECOMMISSIONING - HEALTH, SAFETY AND ENVIRONMENT	3.9.04.	Industrial Safety Engineer
DECOMMISSIONING - HEALTH, SAFETY AND ENVIRONMENT	3.9.06.	Environmental Manager

The following modifications of the List of Jobs were adopted:

- The job profile 1.1.03 *Nuclear Engineer* was proposed for suppression; its content might be partially transferred to or merged with 1.0.02 *Safety Assessment Specialist*.
- The job title for 1.1.06 was changed from *Environmental External Infrastructure Expert* to *Environmental Expert.*
- The job title for 1.3.19 was changed from *Quality Control Manager* to *Quality Manager.*

- The job profile 2.5.04 *Chemistry Worker* was proposed to be merged with 2.5.03 *Chemistry Technician*
- The job profile 2.6.03 *Industrial Safety Supervisor* was proposed to be supressed; its content might be partially transferred to / merge with either 2.6.01 or 2.6.02.
- The content of the job 2.6.06 *Environmental Supervisor* is found insufficient to represent a separate job profile; its functions should incorporate into other jobs.
- The content of the job 2.6.07 *Security Manager/ Supervisor* is proposed to be merged with 2.6.01 *Safety and Security Manager*.
- The job 2.7.12 *Operational Locksmith* is proposed to be supressed and incorporate to 2.7.06 *Mechanical Worker*.
- The job 2.7.16 *Process Equipment Engineer* is proposed to be supressed; its content might be partially incorporated to 2.7.09 and/ or 2.7.14.
- The job title for 2.9.01 *Fuel Machine Operator* is changed into *Fuel Machine Operator for CANDU*.
- The job title of 3.9.01 was changed from *Radiation Protection Expert* into *Radiation Protection Manager*.
- The job title of 3.9.06 was changed from *Environmental Manager* into *Environmental Expert*.
- The job title of 3.9.07 was changed from *Environmental Manager* into *Environmental Expert*.

Remarks referred to the profiles content:

- Although the terminology has been progressively unified, further development is needed to implement standardised expressions for competence items and job titles.

- Similar job titles in the different lifecycle phases should be checked against each other to homogenise them. Examples of this are, among others, jobs in Maintenance, Engineering and Radiation Protection areas. In some case, cross-cutting profiles might result from this verification.

- Sets of common job requirements applicable both horizontally (for jobs of similar occupational category) and vertically (for jobs in similar functional area) might be prepare and applied to the relevant job requirements, providing more consistency to the job taxonomy.

- It should be considered the inclusion of a set of safety-related items to be systematically included for all NPP jobs, adapting the corresponding level descriptor to the responsibility involved for the given job. A first draft list would be: human error prevention techniques; operating experience; safety culture; occupational / industrial safety; maintain a safe workplace.

3.3. CLOSURE SESSION

E.J. Puska intervened to provide some information to the participants about the project NUGENIA and suggested the possibility to develop, as part of it, a pilot experience on the implementation of ECVET.

M. Ceclan has given the presentation: Lessons learned from nuclear qualifications design, presenting an improved workflow for a better correlation of all documents: JD, Learning units design, Learning outcomes design and K, S, C/ A. The proposed workflow defines units derived from the functions of the jobs defined in the job taxonomy. He displayed an example of the development of those units into learning outcomes to create a nuclear qualification.

C. Chenel showed the online tool *skillsbank* from the web http:/ / www.skillstools.eu, as an example of development of software applications to support lifelong learning, recognition and development of qualifications based on learning outcomes.

Finally the organisers summarised the results achieved during the workshop and thank the participants for their contribution.

4. CONCLUSIONS

After the 6th Workshop the Nuclear Job taxonomy can be considered practically finalised. Only four job profiles are still to undergo a second review. Additionally, implementing the recommendations contained in this document to homogenise the job descriptions might enhance the overall final quality.

6th Nuclear ECVET-oriented job taxonomy Expert Workshop

Istanbul (Turkey) 16 – 20 February 2015

AGENDA

(v.4-final) Petten, March 2015
F.04/CCR

Monday 16 February - morning

12:30 *Lunch*

OPENING SESSION

14:00 Welcome and introduction of the participants

14:15 Practical arrangements and logistics — W. Muntjewerf

14:30 Presentation:

The Nuclear Job Taxonomy/NJT as part of the road map for ECVET implementation in the nuclear energy sector — M. Ceclan
Questions and debate — All

15:30 Presentation:

The 6th NJT Workshop: background, methodology and work plan — C. Chenel
Questions and debate — All

16:15 *Coffee break*

16:30 Allocation of the working groups per session

17:15 *End of the first day*

Henceforth the meeting shall split in two working groups

Tuesday 17 February - morning

Work Session 1 - Groups

WG 1.1	**WG 1.2**
Moderator: C. Chenel	Moderator: M. Ceclan
J. E. Martín García **D. R. Ciurchea** **E. Vassileva** **G. Pavel** **M. Ilieva** **B. Georgievska** **E. de Marco Cinotti** **E. Brugi** **L. Pironkov** **A. Abdesselam**	**E. J. Puska** **A. Chaushevski** **O. Comsa** **C. Fazio** **F. Charlier** **J. Iglesias Morán**

09:00 Group review of job profiles

WG 1.1	3.9. HEALTH, SAFETY AND ENVIRONMENT	3.9.01.	Radiation Protection Expert
	3.9. HEALTH, SAFETY AND ENVIRONMENT	3.9.04.	Industrial Safety Engineer
	3.9. HEALTH, SAFETY AND ENVIRONMENT	3.9.06.	Environmental Manager

WG 1.2	1.4. COMMISSIONING	1.4.02.	Mechanical Commissioning Engineer
	1.4. COMMISSIONING	1.4.03.	Civil Commissioning Engineer
	1.4. COMMISSIONING	1.4.04.	I&C Commissioning Engineer

11:00 *Coffee break*

11:15 Group review of job profiles

WG 1.1	2.6. SAFETY AND SECURITY	2.6.01.	Safety and Security Manager
	2.6. SAFETY AND SECURITY	2.6.02.	Industrial Safety Technician
	2.6. SAFETY AND SECURITY	2.6.03.	Industrial Safety Supervisor
	2.6. SAFETY AND SECURITY	2.6.04.	Fire Protection Worker

WG 1.2	1.4. COMMISSIONING	1.4.05.	System Commissioning Engineer
	1.4. COMMISSIONING	1.4.06.	Commissioning Manager
	1.4. COMMISSIONING	1.4.07.	Licensing Manager

13:30 *Lunch*

Tuesday 17 February - afternoon

Work Session 2 – Groups

WG 2.1	**WG 2.2**
Moderator: C. Chenel	Moderator: M. Ceclan
• **E. Vassileva** • **L. Pironkov** • **J. E. Martín García** • **B. Georgievska** • **E. de Marco Cinotti** • **E. Brugi** • **A. Abdesselam** • **A. Chaushevski**	• **Olivia** • **E. J. Puska** • **M. Ilieva** • **D. R. Ciurchea** • **G. Pavel** • **C. Fazio** • **F. Charlier** • **J. Iglesias Morán**

14:30 Group review of job profiles

WG 2.1	3.8. MAINTENANCE	3.8.03.	Maintenance Worker
	1.3. CONSTRUCTION	1.3.22.	Welder
	2.7. MAINTENANCE	2.7.12.	Operational Locksmith

WG 2.2	1.1. SITE LOCATION	1.1.03.	Nuclear Engineer
	1.1. SITE LOCATION	1.1.05	Geological (hydrogeology/seismic) experts
	1.1. SITE LOCATION	1.1.06	Environmental External infrastructure expert

16:00 *Coffee break*

16:15 Group review of job profiles

WG 2.1	1.3. CONSTRUCTION	1.3.17.	I&C Construction Worker
	1.3. CONSTRUCTION	1.3.15.	Civil Construction Worker
	1.3. CONSTRUCTION	1.3.14.	Mechanical Construction Worker

WG 2.2	1.2. DESIGN	1.2.01.	Design Manager
	1.0. SAFETY ASSESSMENT	1.0.02	Safety Assessment Specialist
	1.0. SAFETY ASSESSMENT	1.0.10.	Safety Design Engineer

17:30 *End of the second day*

Wednesday 18 February

Work Session 3 – Groups

WG 3.1	**WG 3.2**
Moderator: C. Chenel	Moderator: M. Ceclan
• **O. Comsa** • **E. J. Puska** • **M. Ilieva** • **C. Fazio** • **G. Pavel** • **J. E. Martín García** • **L. Pironkov** • **J. Iglesias Morán** • **A. Abdesselam**	• **A. Chaushevski** • **D. R. Ciurchea** • **E. de Marco Cinotti** • **E. Brugi** • **F. Charlier** • **E. Vassileva** • **B. Georgievska**

09:00 Group review of job profiles

WG 3.1	2.8. ENGINEERING	2.8.01.	Mechanical Design Engineer
	2.8. ENGINEERING	2.8.02.	Civil Design Engineer
	2.8. ENGINEERING	2.8.04.	I&C Design Engineer

WG 3.2	2.7. MAINTENANCE	2.7.06.	Mechanical Worker
	2.7. MAINTENANCE	2.7.09.	Mechanical Supervisor
	2.7. MAINTENANCE	2.7.14.	Maintenance Planning Officer

11:15 *Coffee break*

11:45 Group review of job profiles

WG 3.1	1.2. DESIGN	1.2.09	System Design Engineer
	1.2. DESIGN	1.2.12	HVAC Design Engineer
	2.7. MAINTENANCE	2.7.16.	Process Equipment Engineer

WG 3.2	1.2. DESIGN	1.2.02	Civil Technical Draughtsman
	1.2. DESIGN	1.2.03	Electrical Technical Draughtsman
	1.2. DESIGN	1.2.04	Mechanical Technical Draughtsman
	1.2. DESIGN	1.2.13	HVAC Technical Draughtsman

13:30 *Lunch*

Wednesday 18 - afternoon

Work Session 4 – Groups

WG 4.1	**WG 4.2**
Moderator: C. Chenel	Moderator: M. Ceclan
• **C. Fazio** • **B. Georgievska** • **E. de Marco Cinotti** • **E. Brugi** • **A. Abdesselam** • **E. J. Puska** • **L. Pironkov** • **J. Iglesias Morán** • **M. Ilieva**	• **A. Chaushevski** • **G. Pavel** • **F. Charlier** • **E. Vassileva** • **D. R. Ciurchea** • **O. Comsa** • **J. E. Martín García**

14:30 Group review of job profiles

WG 4.1	3.10. SITE RELEASE	3.10.1	Final Release Process Supervisor
	2.5. CHEMISTRY	2.5.02.	Chemistry Supervisor
	2.5. CHEMISTRY	2.5.04.	Chemistry Operator I

WG 4.2	2.7. MAINTENANCE	2.7.01.	Electrical Technician
	2.7. MAINTENANCE	2.7.02.	Electronic-I&C Technician
	2.7. MAINTENANCE	2.7.05.	Electronic-I&C Worker

16:00 *Coffee break*

16:15 Group review of job profiles

WG 4.1	2.6. SAFETY AND SECURITY	2.6.05.	Fire Protection Supervisor
	2.6. SAFETY AND SECURITY	2.6.06.	Environmental Supervisor
	2.6. SAFETY AND SECURITY	2.6.07.	Security Manager/Supervisor

WG 4.2	2.7. MAINTENANCE	2.7.08.	Electronic-I&C Supervisor
	2.7. MAINTENANCE	2.7.07.	Electrical Supervisor
	1.2. DESIGN	1.2.18	I&C Technical Draughtsman

17:30 *End of the third day*

Thursday 19 February - afternoon

Work Session 5 – Groups

WG 5.1	**WG 5.2**
Moderator: C. Chenel	Moderator: M. Ceclan
E. de Marco Conotti **E. Brugi** **E. J. Puska** **J. E. Martín García** **J. Iglesias Morán** **A. Abdesselam** **C. Fazio** **D. R. Ciurchea**	**O. Comsa** **G. Pavel** **E. Vassileva** **M. Ilieva** **B. Georgievska** **L. Pironkov** **F. Charlier** **A. Chaushevski**

09:00 Group review of job profiles

WG 5.1	1.3. CONSTRUCTION	1.3.01.	Construction Project manager
	1.3. CONSTRUCTION	1.3.02.	Transverse Engineer
	2.7. MAINTENANCE	2.7.15.	Civil Engineering Technician

WG 5.2	3.1. MANAGEMENT	3.1.06.	Communication Manager
	3.1. MANAGEMENT	3.1.07.	Financial Manager
	1.3. CONSTRUCTION	1.3.19.	Quality Control Manager

11:00 *Coffee break*

11:15 Group review of job profiles

WG 5.1	1.3. CONSTRUCTION	1.3.25	HVAC Construction Engineer
	1.3. CONSTRUCTION	1.3.26	HVAC Construction Technician

WG 5.2	1.3. CONSTRUCTION	1.3.20.	Quality Control Technician
	2.9. CANDU	2.9.01	Fuel Machine Operator
	2.9. CANDU	2.9.02	System Responsible Engineer

13:30 *Lunch*

14:30 *End of the fourth day*

Friday 20 February

09:00 CLOSSURE SESSION (plenary)

Overall assessment of the NJT: Input for final improvements	All

11:15 *Coffee break*

11:30

Lessons learned from nuclear qualifications design	M. Ceclan
Other closure presentations	TBD
Questions and debate	All

13:00 *Lunch*

14:00 ***End of the Workshop.***

6th Nuclear ECVET oriented job taxonomy *Expert Workshop*

Point Taksim Hotel
Istanbul (TR) 16-20 February 2015

The Nuclear Job Taxonomy as part of the JRC road map for ECVET implementation in the NES

mihail.ceclan@ec.europa.eu

AGENDA

European
Commission

1. ECVET implementation in NES part of the EHRO-N project
2. JRC road map for ECVET implementation in NES
3. Component 2: The shift from KB-QS to CB-QS
4. Component 3: Designing nuclear qualifications
5. Summary

ecvet
European Credit system for
Vocational Education & Training

1. ECVET implementation in the NES part of the EHRO-N project

Established as the central information source on HR in nuclear field (cf. EC communications)

JRC SCIENTIFIC AND POLICY REPORTS

PUTTING INTO PERSPECTIVE THE SUPPLY OF AND DEMAND FOR NUCLEAR EXPERTS BY 2020 WITHIN THE EU-27 NUCLEAR ENERGY SECTOR

Demand
Market
Supply
Analyze
EHRO-N

Recognized partner of IAEA KM activities: TecDocs, KM Schools, Multimedia Tools, HR (cf. DDG Nuclear Energy A. Bychkov)

ECVET: European Credit System for Vocational Education and Training

The second major reform of European E&T systems after ECTS.

1. ECVET implementation in the NES part of the EHRO-N project

EHRO-N Project: ECVET implementation in the NES

Workshop

Year	Place	Purpose
2011	**Bergen, NL Oct 2011**	**Preparation of a nuclear job taxonomy / The shift from KB-QS to CB-QS**
2012	**Petten, NL Feb 2012**	
	Thessaloniki, GR Oct 2012	
2013	**Bergen, NL May 2013**	
	Madrid, ES Nov 2013	
2015	**Istanbul, TR Febr. 2015**	

ECVET Seminar

Place	Purpose
Brussels, BE Sept 2012	**To assist the NUC-VET providers in understanding the ECVET**
	To support the NUC-VET providers for creating networks
Budapest, HU Oct 2013	**First exercise on designing: nuclear qualification; Learning Units/LU; LOs**
Rome, IT Nov. 2014	**to support national NUC-VET networks →setting up ECVET pilot projects**

2. JRC road map for ECVET implementation in the NES

- **JRC sectorial strategy & road map:**
  - √ **JRC** developed a **strategy & road map** for ECVET implementation in NES
  - √ **Article**:
    - → **published in**: ECVET Magazine-June issue
    - → **title**:

  - √ ECVET concept for the NES → customised as **NUClear-VET credit system/ NUC-VET CS** → implementation of **NUC-VET CS** is a stepwise process

ecvet

magazine

number 20

June 2014

Keeping you informed about the European Credit system for Vocational Education & Training

Mihail Ceclan, Ulrik Von Estorff - European Commission, Joint Research Centre, Institute for Energy and Transport - The Netherlands

The road map for ECVET implementation in the nuclear energy sector

2. JRC road map for ECVET implementation in the NES

- **The JRC road map for ECVET implementation in the NES:**
  - √ **NUC-VET Credit System** has **five components**
    → the **NUC-VET CS** would be assembled in **six steps**
  - √ **The component (1):**
    → HR Demand-Supply analysis:
    → **"nuclearization" =** upgrading of a non-nuclear qualification to a nuclear qualification
    → **"nuclearization"** the main HR process in the nuclear EU labour market → the way of filling up the GAP between Demand-Supply
    → starting the **"nuclearization"** process → opportunity **to shift from KB- QS to CB-QS**/ **ECVET implementation in the NES**

The NUC-VET CS components and the JRC road map for ECVET implementation

No	Component	Activities	Findings/Achievements
1	Scanning the HR demand & supply of the NES	1 st EHRO-N survey - 2012	• by 2020- deficit of 40 % nuclear experts

2. JRC road map for ECVET implementation in the NES

- **The JRC road map for ECVET implementation in the NES:**
  - √ Five major components of the **NUC-VET Credit System** → that would be assembled in six steps
  - √ **The component 2**
    - → **(2)** shift from KB- QS to CB-QS → **achieved by developing of a NJT**
    - → **NJT -achievements**→ a common language on qualif.
      - → list of the representative jobs (155)– within 3 phases of NPP life cycle (NB, O, D)
      - → JD- ECVET approach/oriented-Job requirements-defined in terms of KSC/A
      - → **NJT a part of road map → what is behind?**

The NUC-VET CS components and the JRC road map for ECVET implementation

No	Goal	Activities	Findings/Achievements
1	Scanning the HR demand & supply of the NES/ market	1 st EHRO-N survey - 2012	• by 2020- deficit of 50 % nuclear experts
2	**The shift from KB-QS to CB-QS**	• **Nuclear Job Taxonomy** • **JD-job require. KSC**	• **155 jobs;** • **140-JD**

Graduate or young professional *:*

principal question in a job interview (KB-QS):

"what did you do to obtain your degree (or your qualification) ?"

2. JRC road map for ECVET implementation in the NES

- **The JRC road map for ECVET implementation in the NES:**
  - √ Five major components of the **NUC-VET Credit System** → that would be assembled in six steps
  - √ **The component 2**
    - → **(2)** shift from KB- QS to CB-QS → **achieved by developing of a NJT**
    - → **NJT -achievements**→ a common language on qualif.
      - → list of the representative jobs (155)– within 3 phases of NPP life cycle (NB, O, D)
      - → JD- ECVET approach/oriented-Job requirements-defined in terms of KSC/A
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The NUC-VET CS components and the JRC road map for ECVET implementation

No	Goal	Activities	Findings/Achievements
1	Scanning the HR demand & supply of the NES/ market	1 st EHRO-N survey - 2012	• by 2020- deficit of 50 % nuclear experts
2	**The shift from KB-QS to CB-QS**	• **Nuclear Job Taxonomy** • **JD-job require. KSC**	• **155 jobs;** • **140-JD**

Graduate or young professional *:*

principal question in a job interview (KB-QS):

“what curricula did you study to obtain your degree (or your qualification) ?”

2. JRC road map for ECVET implementation in the NES

- **The JRC road map for ECVET implementation in the NES:**
  - √ Five major components of the **NUC-VET Credit System** → that would be assembled in six steps
  - √ **The component 2**
    - → **(2)** shift from KB- QS to CB-QS → **achieved by developing of a NJT**
    - → **NJT -achievements**→ a common language on qualif.
      - → list of the representative jobs (155)– within 3 phases of NPP life cycle (NB, O, D)
      - → JD- ECVET approach/oriented-Job requirements-defined in terms of KSC/A
      - **→ NJT a part of road map → what is behind?**

The NUC-VET CS components and the JRC road map for ECVET implementation

No	Goal	Activities	Findings/Achievements
1	Scanning the HR demand & supply of the NES/ market	1 st EHRO-N survey - 2012	• by 2020- deficit of 50 % nuclear experts
2	**The shift from KB-QS to CB-QS**	• **Nuclear Job Taxonomy** • **JD-job require. KSC**	• **155 jobs;** • **140-JD**

***Graduate or young professional** :*

principal question in a job interview (CB-QS) :

“what can you do now

that you have obtained your degree ?”

2. JRC road map for ECVET implementation in the NES

European
Commission

- **The JRC road map for ECVET implementation in the NES:**
  - √ Five major components of the **NUC-VET Credit System** → that would be assembled in six steps
  - √ **The component 2**
    - → **(2)** shift from KB- QS to CB-QS → **achieved by developing of a NJT**
    - → **NJT -achievements**→ a common language on qualif.
      - → list of the representative jobs (155)– within 3 phases of NPP life cycle (NB, O, D)
      - → JD- ECVET approach/oriented-Job requirements -defined in terms of KSC/A
      - → **NJT a part of road map → what is behind?**

The NUC-VET CS components and the JRC road map for ECVET implementation

No	Goal	Activities	Findings/Achievements
1	Scanning the HR demand & supply of the NES/ market	1 st EHRO-N survey - 2012	• by 2020- deficit of 50 % nuclear experts
2	**The shift from KB-QS to CB-QS**	• **Nuclear Job Taxonomy** • **JD-job require. KSC**	• **155 jobs;** • **140-JD**

***Graduate or young professional** :*

principal question in a job interview (CB-QS) :

“what are your competences (K, S, C/A) now that you have obtained your degree ?”

2. JRC road map for ECVET implementation in the NES

European
Commission

- **The JRC road map for ECVET iimplementation in the NES:**

  √ Five major components of the **NUC-VET Credit System** → that would be assembled in six steps

  √ **The component 1-2 …**

  √ **The component 3**

  → **(3)** developing CB-QS → **to structure nuc. qualif. according to ECVET (in LU & LOs)**

  → **ECVET approach:**

  def LU: The smallest part of a qualification that can be assessed, transferred, validated & certified. It can be specific to a single qualification or common to several qualifications;

  def. LO: What an individual understands and is able to do after completion of a learning process, either formal, non-formal or informal/Comp.

The NUC-VET CS components and the JRC road map for ECVET implementation

No	Goal	Activities	Findings/Achievements
1	Scanning the HR demand & supply of the NES/ market	1 st EHRO-N survey - 2012	• by 2020- deficit of 50 % nuclear experts
2	The shift from KB-QS to CB-QS	• Nuclear Job Taxonomy • JD-job requirements KSC	• 155 jobs; • 140-JD
3	Developing competence based-qualification system for NES	Designing nuclear qualifications based on ECVET approach	1st exercise on designing NPP Operator qualifications at 2nd ECVET Seminar - Budapest, HU (Oct. 2013)

2. JRC road map for ECVET implementation in the NES

- **The JRC road map for ECVET implementation in the NES:**
  - √ Five major components of the **NUC-VET Credit System** → that would be assembled in six steps
  - √ **The component 1 – 3….**
  - √ **The components 4 & 5**
    - → The collaboration DG RTD & JRC on ECVET implementation in the NES:
      - - indirect actions/DG RTD (some of you are involved in the EFTS projects)
      - - direct actions/DG JRC

The NUC-VET CS components and the JRC road map for ECVET implementation

No	Goal	Activities	Findings/Achievements
1	Scanning the HR demand & supply of the NES	1 st EHRO-N survey - 2012	• by 2020- deficit of 50 % nuclear experts
2	The shift from KB-QS to CB-QS → from knowledge creation to competence building	• Nuclear Job Taxonomy • JD-job requirements → in terms of KSC • Competence Catalogue: KSC/A	• 155 jobs; • 140-JD • 2200 new entries All these aims to serve as a tool for defining learning outcomes
3	Developing competence based-qualification system for NES	Designing nuclear qualifications based on ECVET approach	1st exercise on designing NPP Operator qualifications at 2nd ECVET Seminar - Budapest, HU (Oct. 2013)
4	The development of the mobility tools for NES	memoranda of understanding, learning agreements and learners' transcripts of records;	• **Developed through the indirect actions (EFTS projects) supported by the DG RTD**
5	The qualification achievement process for NES	Developing specific tools for assessment, validation, recognition and accumulation of learning outcomes.	

2. JRC road map for ECVET implementation in the NES

- **The JRC road map for ECVET implementation in the NES:**
  - √ Five major components of the **NUC-VET CS** → that would be assembled in six steps
  - √ **The step 6: Supporting ……**
    - → having the 5 components of the **NUC-VET CS**
    - → need for testing how these work together - through a **NUC-VET pilot project** → test/PP should be done **at national level** → in the context of mobility
  - √ **Summarizing:**
    - → JRC road map a clear guide- ECVET impl. in NES
    - → **NUC-VET Credit System – 5** components
    - → **NUC-VET Pilot pr.** - dedicated call
    - → **JRC contribution/direct actions:**
      - **- C1:** HR Demand-Supply analysis
      - **- C2:** shift from KB-QS to CB-QS **(NJT/JD** ECVET oriented**)**
      - **- C3:** designing nuclear qualification

The NUC-VET CS components and the JRC road map for ECVET implementation

No	Goal	Activities	Findings/Achievements
1	Scanning the HR demand & supply of the NES/ market	1 st EHRO-N survey - 2012	• by 2020- deficit of 50 % nuclear experts
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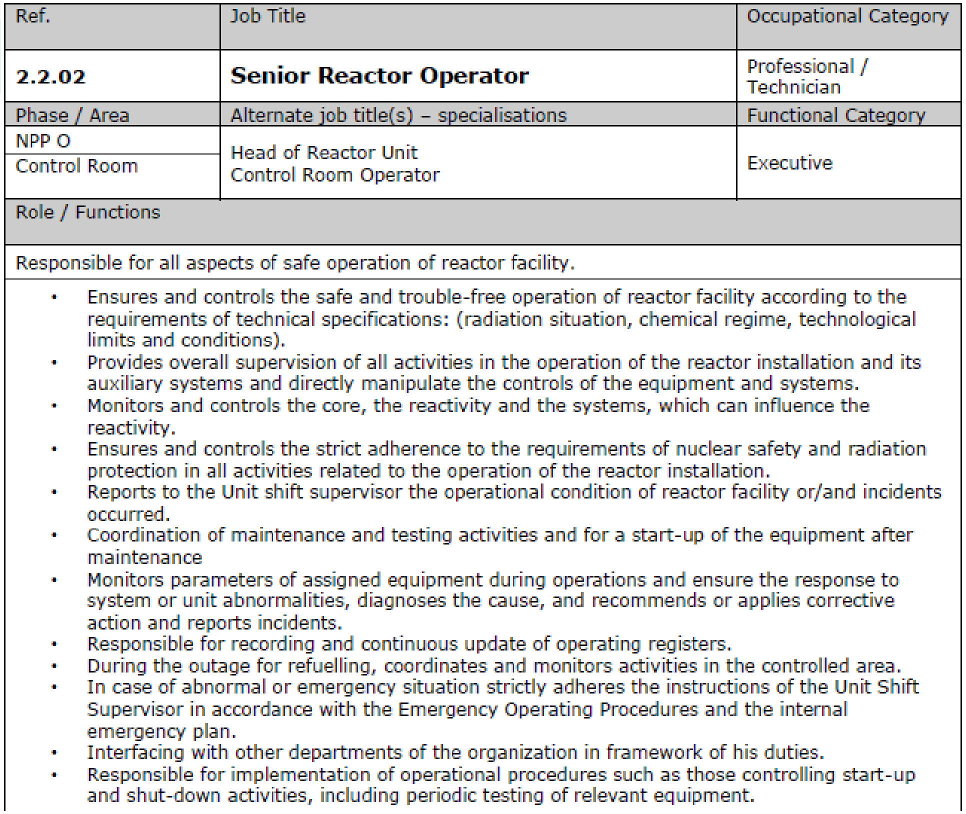
4	The development of the mobility tools for NES	memoranda of understanding, learning agreements and learners' transcripts of records;	• Covered through the indirect actions (EFTS projects) supported by the DG RTD
5	The qualification achievement process for NES	Developing specific tools for assessment, validation, recognition and accumulation of learning outcomes.	
6	Supporting NUC-VET networks in setting up an ECVET PP	• by 5 WS • by 2 ECVET seminars	• testing the ECVET implementation → NUC-VET Pilot pr.

3. Component 2: The shift from KB-QS to CB-QS

3.1 JD based on ECVET approach

Component 2: The shift from KB-QS to CB-QS	
Achieved by developing of a NJT	List of the representative jobs(155) in 3 phases of the NPP life time cycle +JD(140)
	JD- job requirements (140)- K, S, C/A
	Example: JD_CRO_2.2.02 (**Input 1**)



Ref.	Job Title	Occupational Category
2.2.02	**Senior Reactor Operator**	Professional / Technician
Phase / Area	Alternate job title(s) – specialisations	Functional Category
NPP O Control Room	Head of Reactor Unit Control Room Operator	Executive

Role / Functions

Responsible for all aspects of safe operation of reactor facility.

- Ensures and controls the safe and trouble-free operation of reactor facility according to the requirements of technical specifications: (radiation situation, chemical regime, technological limits and conditions).
- Provides overall supervision of all activities in the operation of the reactor installation and its auxiliary systems and directly manipulate the controls of the equipment and systems.
- Monitors and controls the core, the reactivity and the systems, which can influence the reactivity.
- Ensures and controls the strict adherence to the requirements of nuclear safety and radiation protection in all activities related to the operation of the reactor installation.
- Reports to the Unit shift supervisor the operational condition of reactor facility or/and incidents occurred.
- Coordination of maintenance and testing activities and for a start-up of the equipment after maintenance
- Monitors parameters of assigned equipment during operations and ensure the response to system or unit abnormalities, diagnoses the cause, and recommends or applies corrective action and reports incidents.
- Responsible for recording and continuous update of operating registers.
- During the outage for refuelling, coordinates and monitors activities in the controlled area.
- In case of abnormal or emergency situation strictly adheres the instructions of the Unit Shift Supervisor in accordance with the Emergency Operating Procedures and the internal emergency plan.
- Interfacing with other departments of the organization in framework of his duties.
- Responsible for implementation of operational procedures such as those controlling start-up and shut-down activities, including periodic testing of relevant equipment.

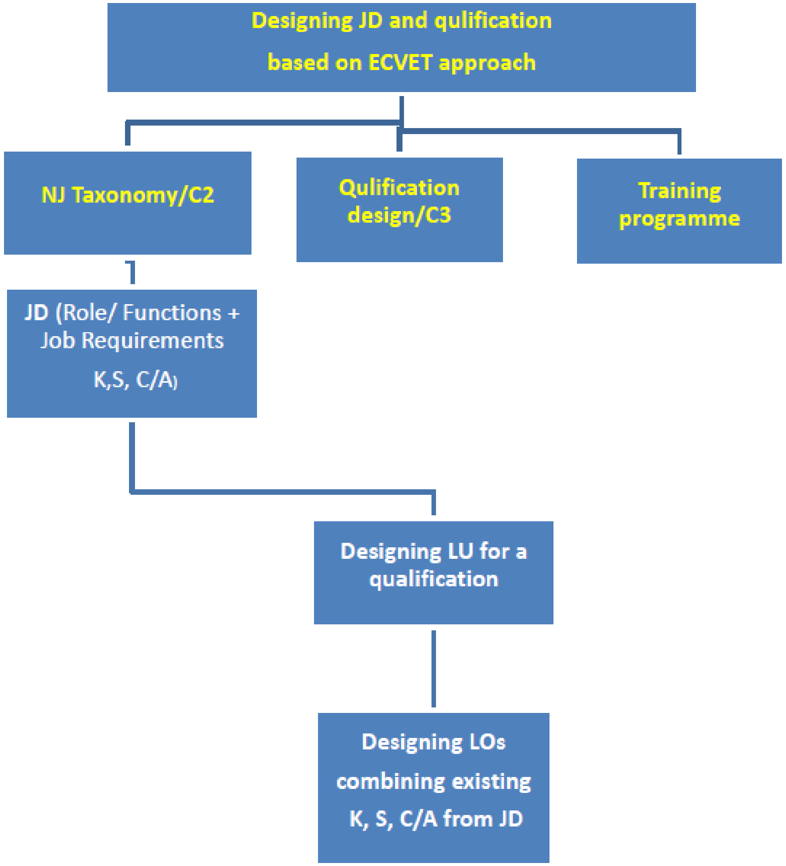
3. Component 2 : The shift from KB-QS to CB-QS

3.2 JD impact on qualification design - component 3

“Cascade workflow”

Component 3: Developing CB-QS for NES

Designing the qualification structure	3a) formal validation of the CRO competence	
	3b) job requirements - in terms of KSC/A; JD-CRO 2.2.02	**JD-CRO 2.2.02 NJT (Input 1 for Comp. 3 (3c+3d));**
	3c) Designing LU	Role/functions/JD→ correlated with LU titles/8-12→ LU is more than a discipline in KB-QS
	3d) Designing LOs/ competences	Assembling K, S, C/A (from JD) in LOs; very difficult task
		LOs competences necessary to exercise that part of the qualification/LU



Designing JD and qulification based on ECVET approach

NJ Taxonomy/C2

Qulification design/C3

Training programme

JD (Role/ Functions + Job Requirements K,S, C/A)

Designing LU for a qualification

Designing LOs combining existing K, S, C/A from JD

4. Component 3: designing nuclear qualifications

4.1 Selecting a qualification to be nuc-up

The labour market in the NES	
The Case study is an example on how would be used the JD for CRO qualification design	
Selecting a profession to be “nuclearized”	**“Nuclearization" major HR process**
	Case study: FPP operator → profession to be "nuclearized" →NPP **CRO**→ upgraded at **Shift Supervisor/ SS**
	CRO JD_2.2.02 (Input 1) **"nuclearization" =** upgrading of a non-nuclear qualification to a nuclear qualification

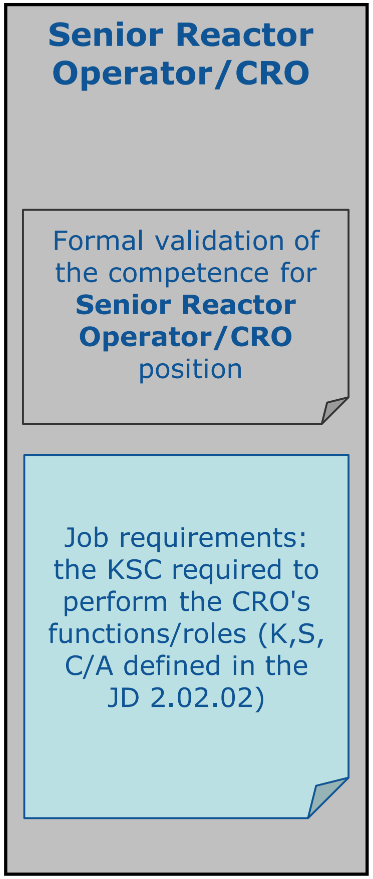
4. Component 3: designing nuclear qualifications

4.2 Prerequisites for nuclearization process

Case study: FPP operator (profession to be "nuclearized") → NPP **CRO** → upgraded at **Shift Supervisor/ SS**

FPP Operator	**NPP-CRO**	**Shift Supervizor**
Secondary studies/EQF4-5	Secondary studies/ EQF 5	• Tertiary studies / EQF 6 • at list one CRO license extention
	Licensed by NPP management	Licensed by national nuclear regulatory body

Component 3: Designing the CRO qualification:



Senior Reactor Operator/CRO

Formal validation of the competence for **Senior Reactor Operator/CRO** position

Job requirements: the KSC required to perform the CRO's functions/roles (K,S, C/A defined in the JD 2.02.02)

CRO qualification structure:

Three dimensions of a qualification in the **CB-QS**:

- 3a) formal validation of the CRO competence;
- 3b) job requirements- in terms of KSC/A; detailed in the JD-CRO 2.2.02 (Input 1);

Source: 2nd ECVET Seminar

4. Component 3: designing nuclear qualifications

4.4 Designing LU for CRO qualification

Component 3: Designing the CRO qualification:

Senior Reactor Operator/CRO

Formal validation of the competence for **Senior Reactor Operator/CRO** position

Job requirements: the KSC required to perform the CRO's functions/roles (K,S, C/A defined in the JD 2.02.02; NucT8 and NucT9)

Unit 6= Management of abnormal/emergency situation

Unit 5=Training programmes for control room crew

Unit 4= Team and technical supervision

Unit 3= Interfacing with other departments

Unit 2=Maintenance and testing activities

Unit 1= Operation of reactor facility

CRO qualification structure:

Three dimensions of a qualification in the **CB-QS**:

- 3a) formal validation of the CRO competence;
- 3b) job requirements- in terms of KSC/A; detailed in the JD-CRO 2.2.02;
- **3c) designing LU for CRO qualification → linked with CRO roles from JD (INPUT 2)**

→ large Units (less time for assessing and certifying)?

→ small Units (more time for assessing and certifying)?

→ 6 Learning Units (depends on designer experience)

Source: 2nd ECVET Seminar

4. Component 3: designing nuclear qualifications

4.5 Designing LOs for CRO qualification

Component 3: Designing the CRO qualification:

Senior Reactor Operator/CRO

Formal validation of the competence for **Senior Reactor Operator/CRO** position

Job requirements: the KSC required to perform the CRO's functions/roles (K,S, C/A defined in the JD 2.02.02; NucT8 and NucT9)

Unit 6= Management of abnormal/emergency situation
6.1 Nuclear incidents assessment/5
6.2 Emergency response management/5

Unit 5=Training programmes for control room crew
5.1 Input for licensing flow for CRO /6
5.2 Input for CRO refreshments-at each 6 month/6

Unit 4= Team and technical supervision
4.1 Technical supervision/6
4.2 Team supervision/5

Unit 3= Interfacing with other departments
3.1 Interfacing with maintenance department/4
3.2 Interfacing with instrumentation and control /4
3.3 Interfacing with other departments/4

Unit2=Maintenance and testing activities
2.1 Nuclear equipment maintenance/5
2.2 NPP systems and components/5

Unit 1= Operation of reactor facility
1.1 Nuclear operation and national lows/6
1.2 Radiation protection and emergency response/5
1.3 Chemical regimes of fluids /4

3d): Designing LOs for CRO qualification

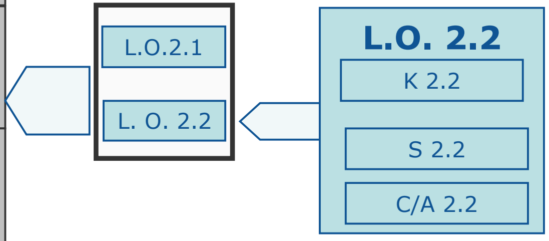
Learning Outcome/LO :

a) def. LO- competence necessary to exercise a LU of a qualification;

b) by assembling K, S, C/A (from JD-CRO 2.2.02) in LOs- **very difficult task**

c) defining K2.2; S2.2&A2.2

- ➢ **are K,S and C/A defined using the proper action verbs?**
- ➢ **could be the LO assessed and evaluated?**



Source: 2nd ECVET Seminar

4. Component 3: designing nuclear qualifications

4.5 Design LOs for CRO qualification

Unit 2	Maintenance and testing activities (ECVET approach-the name of Learning Unit 2 is one of the functions/roles)		**EQF**
LO 2.2	LO 2.2= NPP systems and components		6
	KSC/A	JD_Senior Reactor Operator/CRO_2.02.02	
NPP systems and components	**K 2.2**	• Recall and outline the chain of energy transformations in NPP/EQF 6 • Describe the main systems of NPP (1st loop/ Primary Heat Transport System, 2nd loop/ power circuit, Nuclear security system) • Describe the key components of NPP (Nuclear Reactor; Steam generators; pumps; heat exchangers; etc.) /EQF 5 • Identify construction materials for nuclear equipment/ EQF 4	6
	S 2.2	• Prepare the nuclear equipment for maintenance and tests/EQF 6 • Using and interpreting engineering data and documentation/ EQF 5 • Providing input for the draft of requirements specifications/ EQF 4	5
	C/A 2.2	• Team Working/ EQF 4 • Capacity to act upon problems/ EQF 5 • Demonstrate safety culture/ EQF 5	5
Assessment procedures: K) a written test (multiple-choice or other forms) to assess knowledge; S) a practical test (simulator test for NPP operator) to assess the competence as a whole, including skills; C/A) a set of 'case histories' related to the assessed competence/attitude			

3d): Designing LOs for CRO qualification

Learning Outcome/LO :

a) def. LO- competence necessary to exercise a LU of a qualification;

b) by assembling K, S, C/A (from JD-CRO 2.2.02) in LOs- **very difficult task**

c) defining K2.2; S2.2&A2.2

- ➢ **are K,S and C/A defined using the proper action verbs?**
- ➢ **could be the LO assessed and evaluated?**

4. Component 3: designing nuclear qualifications

4.6 Designing training programme for CRO qualification

		CRO/ EQF 5 Licensing flow ≈2 years
Senior Reactor Operator/CRO Formal validation of the competence for **Senior Reactor Operator/CRO** position Job requirements: the KSC required to perform the CRO's functions/roles (K,S, C/A defined in the JD 2.02.02)	**Unit 6= Management of abnormal/emergency situation** 6.1 Nuclear incidents assessment /5 6.2 Emergency response management /5	**Working under supervision =6 month** LU5, LU6 recognition&validation CRO licensing by NPP management
	Unit 5=Support training programmes for control room crew 5.1 Input for licensing flow for CRO /6 5.2 Input for CRO refreshments-at each 6 month /6	
	Unit 4= Team and technical supervision 4.1 Technical supervision /6 4.2 Team supervision /5	**Practical training on simulator =6 month** LU3, LU4 recognition&validation Review by regulatory body
	Unit 3= Interfacing with other departments 3.1 Interfacing with maintenance department /4 3.2 Interfacing with instrumentation and control /4 3.3 Interfacing with other departments/4	
	Unit 2=Maintenance and testing activities 2.1 Nuclear equipment maintenance /5 2.2 NPP systems and components /5	**Nuclearization = 4 month** **LU1, LU2**
	Unit 1= Operation of reactor facility 1.1 Nuclear operation and national lows /6 1.2 Radiation protection and emergency response /5 1.3 Chemical regimes of fluids /4	

5. Summary

JRC contributions to ECVET implementation	Findings
JRC road map for ECVET impl.	- clear guide- ECVET impl. in NES - NUC-VET CS has 5 components/ 6 steps **- NUC-VET Pilot pr**. - dedicated call
Comp 1: HR demand-supply	- by 2020 – 40% deficit of nuclear experts - "nuclearization"- the main HR proc. in NES - starting **"nuclearization"** → opportunity **to shift from KB- QS to CB-QS/ ECVET implementation**
Comp 2: shift from KB- QS to CB-QS	- NJT (a common language on nuc. qualif.; list of representative jobs (155) – within 3 phases of NPP life cycle (NB, O, D); **JD-140/60 (ECVET approach-Job req. – KSC/A** - JD Input for C3
Comp 3: nuclear qualification design	- Designing LU - Designing LOs - Designing training programs

5. Summary

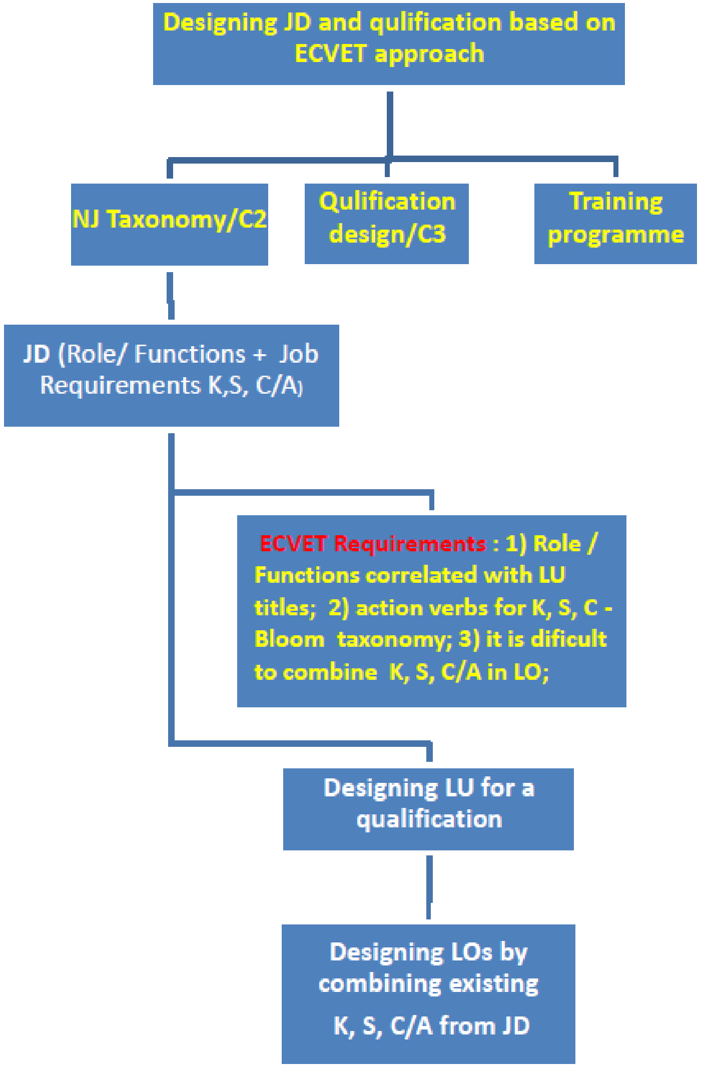
“Cascade workflow” improvements

Better correlation between C2/JD and C3/ nuclear qualifications design

ECVET requirements implementation:

- C2/JD: Role/Functions correlated with LU titles;
  Job req. -def. K,S,C/A, using actions verbs

- C3/JD: Designing LOs: by assembling K, S, C/A – from JD- in LOs: very difficult task (depends on the designer experience (subject matter for further improvement)



Designing JD and qulification based on ECVET approach

NJ Taxonomy/C2

Qualification design/C3

Training programme

JD (Role/ Functions + Job Requirements K,S, C/A)

ECVET Requirements : 1) Role / Functions correlated with LU titles; 2) action verbs for K, S, C - Bloom taxonomy; 3) it is dificult to combine K, S, C/A in LO;

Designing LU for a qualification

Designing LOs by combining existing K, S, C/A from JD

THANK
YOU
Merci
Grazie
Спасибо
Gracias
Paldies
Takk
Obrigado
Danke

6th JRC-IET Workshop for the Definition of an ECVET-oriented Nuclear Job Taxonomy

Hotel Elite World
Istanbul (TU) 11-15 November 2013

Methodology and Work Plan

JRC-IET-ECVET@ec.europa.eu

Methodology and Work Plan

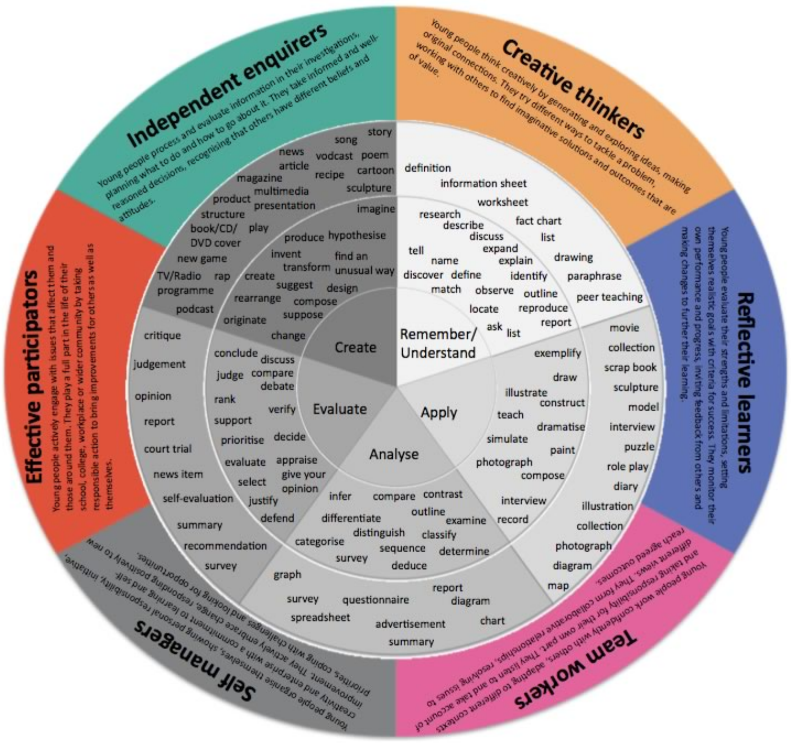
i. **The Nuclear Job taxonomy: objectives and tasks**

ii. **The concep of COMPETENCE and its application in the job taxonomy**

iii. **Work plan and methodology**

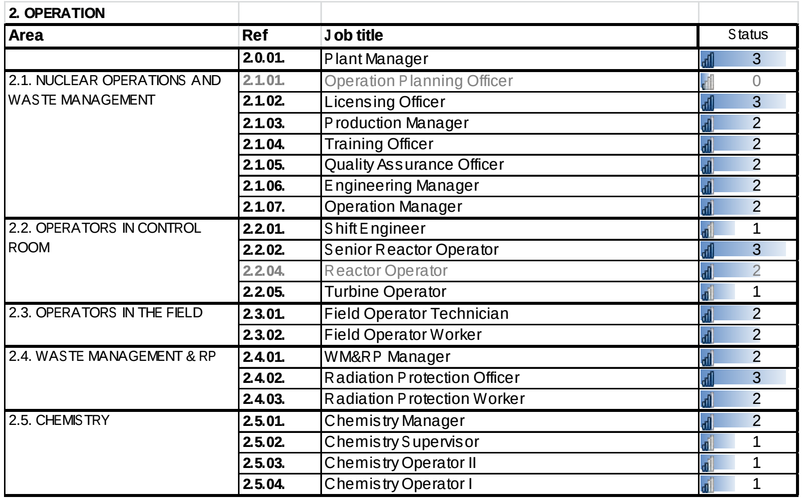
Objective: Support the implementation of ECVET in the Nuclear Sector by the preparation a **competence-based Nuclear Job Taxonomy**.

- Focused in the jobs present in the **Nuclear Power Plant**
- Identify **job requirements** which can be used for the definition of **learning outcomes.**
- Advance towards a **common language**


Independent enquirers
Young people process and evaluate information in their investigations, planning what to do and how to go about it. They take informed and well-reasoned decisions, recognising that others have different beliefs and attitudes.
Creative thinkers
Young people think creatively by generating and exploring ideas, making original connections. They try different ways to tackle a problem, working with others to find imaginative solutions and outcomes that are of value.
Reflective learners
Young people evaluate their strengths and limitations, setting themselves realistic goals with criteria for success. They monitor their own performance and progress, inviting feedback from others and making changes to further their learning.
Team workers
Young people work confidently with others, adapting to different contexts and taking responsibility for their own part. They listen to and take account of different views. They form collaborative relationships, resolving issues to reach agreed outcomes.
Self managers
Young people organise themselves, showing personal responsibility, initiative, creativity and enterprise with a commitment to learning and self-improvement. They actively embrace change, responding positively to new priorities, coping with challenges and looking for opportunities.
Effective participators
Young people actively engage with issues that affect them and those around them. They play a full part in the life of their school, college, workplace or wider community by taking responsible action to bring improvements for others as well as themselves.
Create
Remember/ Understand
Apply
Analyse
Evaluate
story song news article vodcast poem recipe cartoon magazine multimedia sculpture product presentation structure book/CD/ DVD cover play new game TV/Radio programme rap podcast
imagine produce hypothesise invent find an unusual way transform create suggest design rearrange compose suppose originate change
definition information sheet worksheet fact chart list drawing paraphrase peer teaching
research describe discuss tell name expand explain discover define identify match observe outline locate reproduce report ask list
movie collection scrap book sculpture model interview puzzle role play diary illustration collection photograph diagram map
exemplify draw illustrate construct teach dramatise simulate paint photograph compose interview record
infer compare contrast differentiate outline examine distinguish classify categorise sequence determine survey deduce
graph survey questionnaire report diagram spreadsheet advertisement chart summary
conclude discuss judge compare debate rank verify support prioritise decide evaluate appraise select give your opinion justify defend
critique judgement opinion report court trial news item self-evaluation summary recommendation survey

1. Identification of **typical jobs** throughout the three life-cycle phases of a nuclear power plant (NPP)

- **All categories**: reflecting competence at all levels of the European Qualifications Framework (EQF)
- **Simplification**: e.g., including several specialisations in one profile.
- **Harmonisation** of job titles



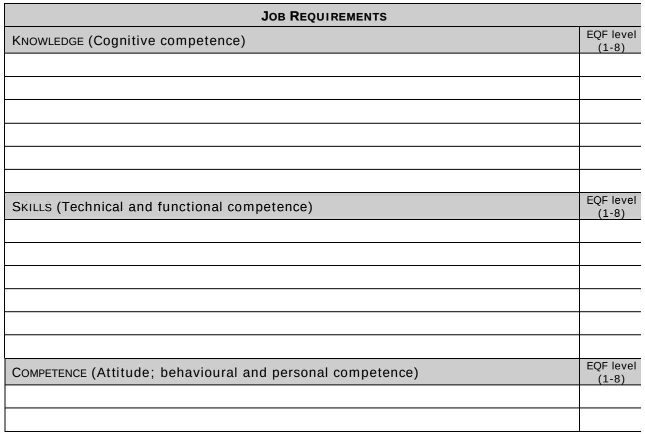
2. OPERATION			
Area	**Ref**	**Job title**	Status
	2.0.01.	Plant Manager	3
2.1. NUCLEAR OPERATIONS AND WASTE MANAGEMENT	2.1.01.	Operation Planning Officer	0
	2.1.02.	Licensing Officer	3
	2.1.03.	Production Manager	2
	2.1.04.	Training Officer	2
	2.1.05.	Quality Assurance Officer	2
	2.1.06.	Engineering Manager	2
	2.1.07.	Operation Manager	2
2.2. OPERATORS IN CONTROL ROOM	**2.2.01.**	Shift Engineer	1
	2.2.02.	Senior Reactor Operator	3
	2.2.04.	Reactor Operator	2
	2.2.05.	Turbine Operator	1
2.3. OPERATORS IN THE FIELD	**2.3.01.**	Field Operator Technician	2
	2.3.02.	Field Operator Worker	2
2.4. WASTE MANAGEMENT & RP	**2.4.01.**	WM&RP Manager	2
	2.4.02.	Radiation Protection Officer	3
	2.4.03.	Radiation Protection Worker	2
2.5. CHEMISTRY	**2.5.01.**	Chemistry Manager	2
	2.5.02.	Chemistry Supervisor	1
	2.5.03.	Chemistry Operator II	1
	2.5.04.	Chemistry Operator I	1

2. Definition of **job requirements** in terms of **competence**

"job requirements: knowledge, aptitudes and skills required to perform specific tasks attached to a particular work position"

(European guidelines for validating non-formal and informal learning, CEDEFOP 2009)

- **Concise:** avoid redundancies and unnecessary wording.
- **Job oriented:** only the aptitudes needed to perform the jo
- **Exhaustive**: all the aptitudes needed to perform the job
- **Explicit and clear**

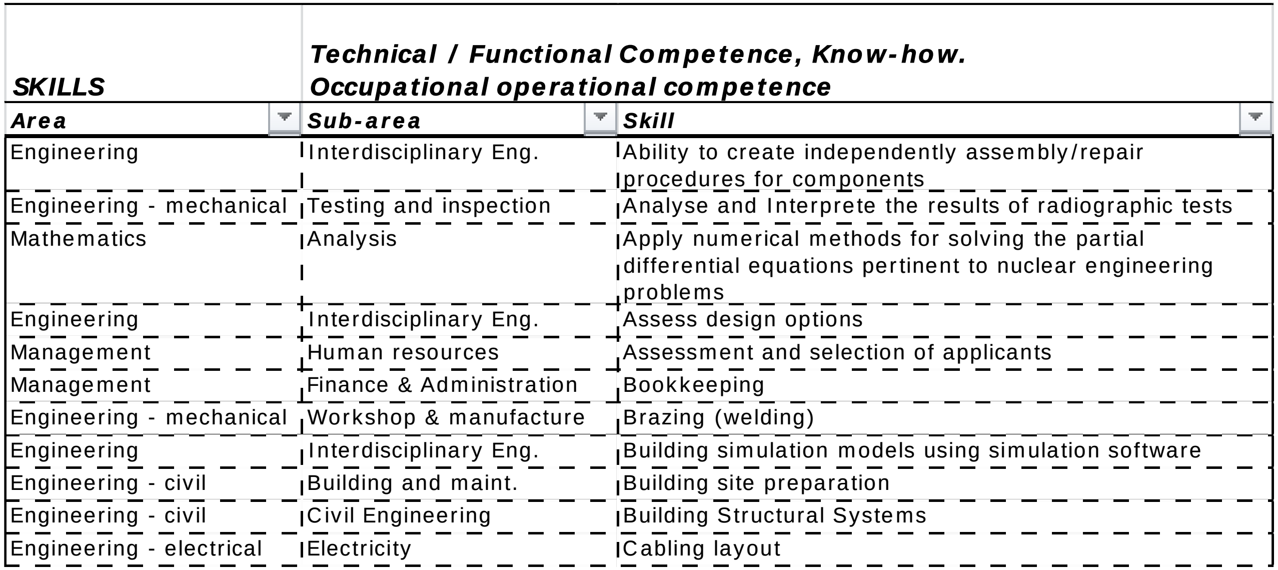


JOB REQUIREMENTS	
KNOWLEDGE (Cognitive competence)	EQF level (1-8)
SKILLS (Technical and functional competence)	EQF level (1-8)
COMPETENCE (Attitude; behavioural and personal competence)	EQF level (1-8)

I'VE ALWAYS WONDERED WHY YOU DECIDED TO BE A DOG..
I WAS FOOLED BY THE JOB DESCRIPTION..

3. Library of knowledge, skill and competence items (KSC catalogue)

- Structured
- Extensive
- Consistent with the **competence typology**



SKILLS	***Technical / Functional Competence, Know-how. Occupational operational competence***	
Area	***Sub-area***	***Skill***
Engineering	Interdisciplinary Eng.	Ability to create independently assembly/repair procedures for components
Engineering - mechanical	Testing and inspection	Analyse and Interprete the results of radiographic tests
Mathematics	Analysis	Apply numerical methods for solving the partial differential equations pertinent to nuclear engineering problems
Engineering	Interdisciplinary Eng.	Assess design options
Management	Human resources	Assessment and selection of applicants
Management	Finance & Administration	Bookkeeping
Engineering - mechanical	Workshop & manufacture	Brazing (welding)
Engineering	Interdisciplinary Eng.	Building simulation models using simulation software
Engineering - civil	Building and maint.	Building site preparation
Engineering - civil	Civil Engineering	Building Structural Systems
Engineering - electrical	Electricity	Cabling layout

The 6th workshop is meant to complete all the tasks included in the three-step workflow for the preparation of job profiles

DRAFTED BY:	1ST REVIEW:	2ND REVIEW:
J. IGLESIAS / F. PASQUALONI	N. SHULEPOVA	5TH ECVET WORKSHOP
24.10.2012	10.11.2013	13.11.2013

GROUP THINKING
IDEAS
RESULTS

Group review of around sixty profiles

Competence typology

The three dimensions of the competence

Knowledge

The outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field of study or work. (1)(2)

Skill

Ability to perform tasks and solve problems. (1)

Ability to apply knowledge and use know-how to complete tasks and solve problems. (2)

Competence

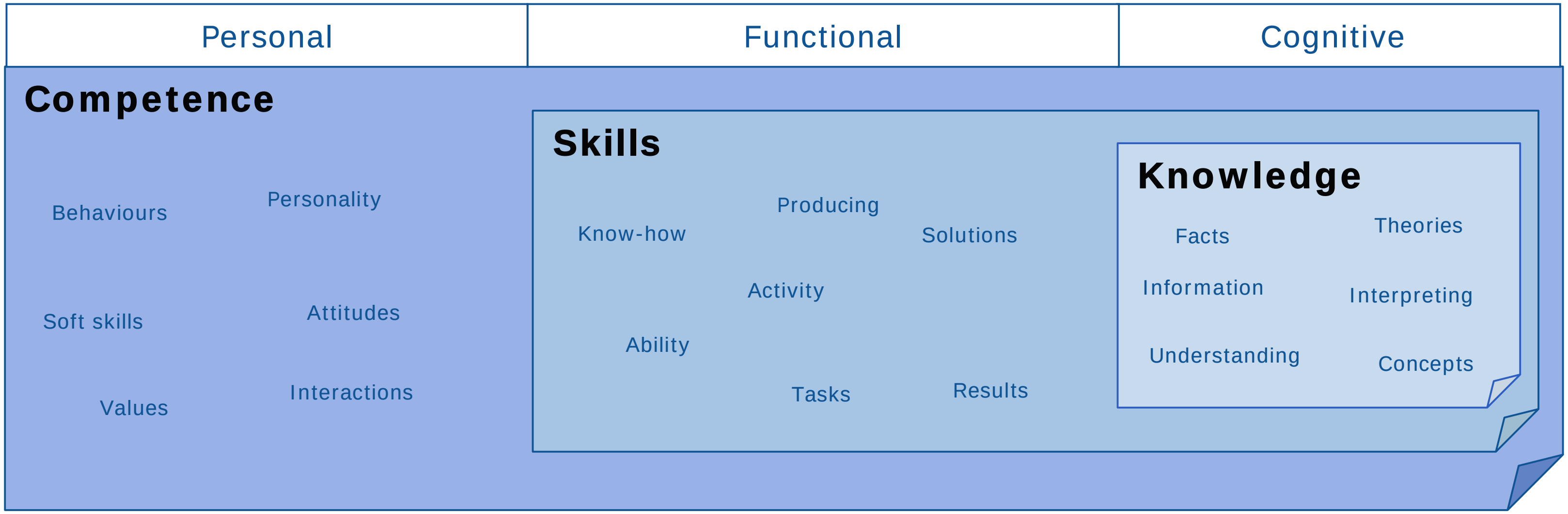
The ability to apply learning outcomes adequately in a defined context (education, work, personal or professional development). Competence is not limited to cognitive elements (involving the use of theory, concepts or tacit knowledge); it also encompasses functional aspects (involving technical skills) as well as interpersonal attributes (e.g. social or organisational skills) and ethical values. (1)

Proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. (2)

(1) Terminology of European education and training policy, CEDEFOP 2008 *(2) Recommendation of the European Parliament and of the Council (2008/C 111/01)*

Competence typology

	COMPETENCE	SKILLS	KNOWLEDGE
EQF Recommendation	*In the context of EQF, competence is described in terms of **responsibility** and **autonomy**.*	*In the context of EQF, skills are described as **cognitive** (involving the use of logical, intuitive and creative thinking) and **practical** (involving manual dexterity and the use of methods, materials, tools and instruments).*	*In the context of EQF, knowledge is described as **theoretical** and/or **factual**.*



Personal

Functional

Cognitive

Competence

Behaviours

Personality

Soft skills

Attitudes

Values

Interactions

Skills

Know-how

Producing

Solutions

Activity

Ability

Tasks

Results

Knowledge

Facts

Theories

Information

Interpreting

Understanding

Concepts

	personal	***occupational***	
conceptual	Meta-competence (facilitating learning)		Cognitive competence (knowledge)
operational	Social competence (attitudes and behaviours)	Functional competence (skills)	

Typology of knowledge, skills and competences: clarification of the concept and prototype, CEDEFOP 2005

Competence typology

Knowledge

Subjects and contents typically acquired from study.

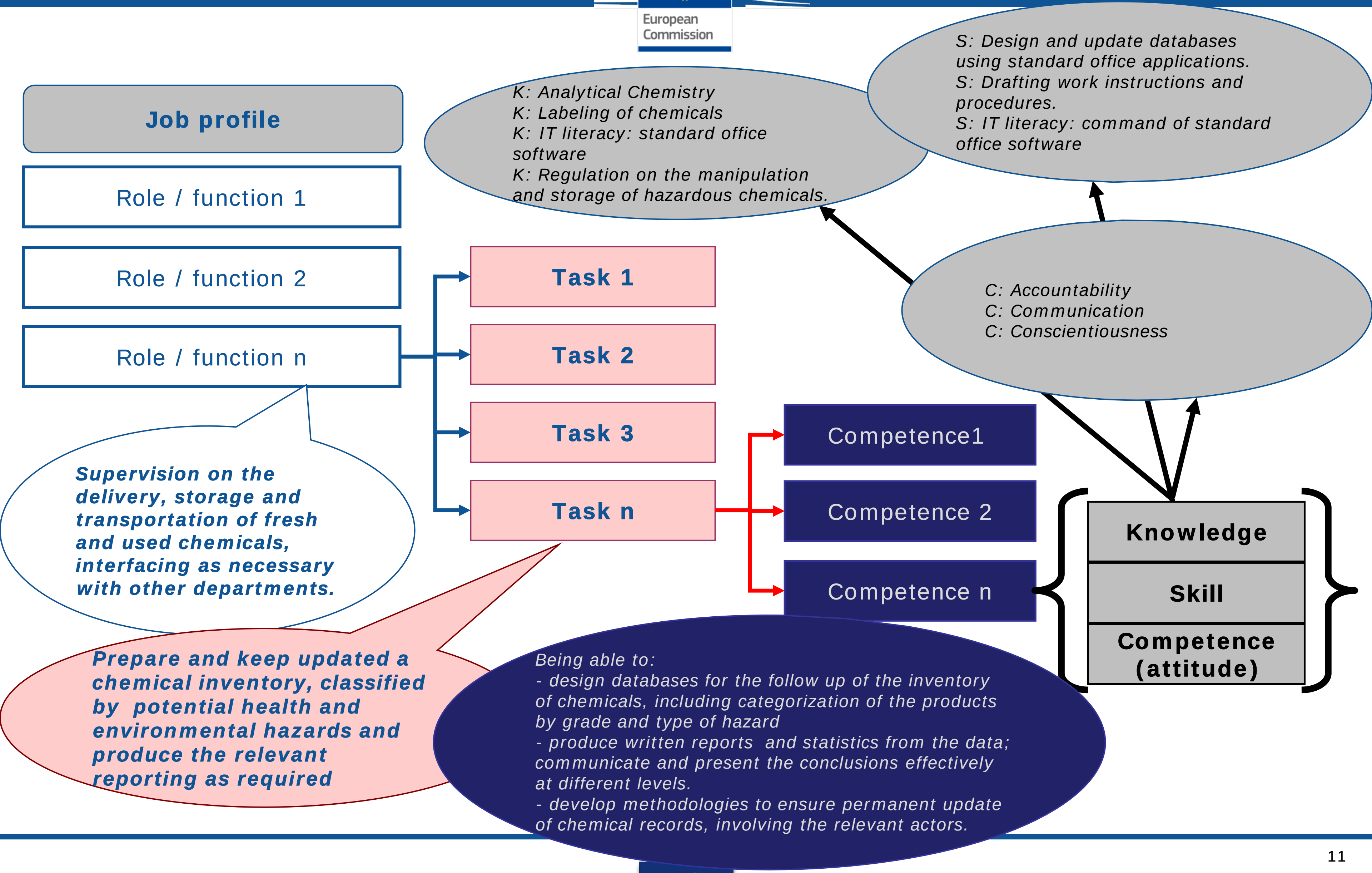
Skills

Capability to use the knowledge to carry out tasks, achieving outcomes and producing concrete results. They are often learnt from experience and practice.

Competence (attitude)

Personal and interpersonal abilities, personality traits and behaviours that can be applied to any work context. They are result of personal development and experience.

Competence typology applied to the definition of job requirements



Job profile

Role / function 1

Role / function 2

Role / function n

Supervision on the delivery, storage and transportation of fresh and used chemicals, interfacing as necessary with other departments.

Task 1

Task 2

Task 3

Task n

Prepare and keep updated a chemical inventory, classified by potential health and environmental hazards and produce the relevant reporting as required

Competence1

Competence 2

Competence n

Being able to:
- design databases for the follow up of the inventory of chemicals, including categorization of the products by grade and type of hazard
- produce written reports and statistics from the data; communicate and present the conclusions effectively at different levels.
- develop methodologies to ensure permanent update of chemical records, involving the relevant actors.

K: Analytical Chemistry
K: Labeling of chemicals
K: IT literacy: standard office software
K: Regulation on the manipulation and storage of hazardous chemicals.

S: Design and update databases using standard office applications.
S: Drafting work instructions and procedures.
S: IT literacy: command of standard office software

C: Accountability
C: Communication
C: Conscientiousness

Knowledge

Skill

Competence (attitude)

Job profile samples

Ref.	Job Title	Occupational Category
3.3.03	**Engineering Support Manager**	Professional
Phase / Area	Alternate job title(s) – specialisations	Functional Category
NPP D Decommissioning Preparation	-----	Specialist
Role / Functions		
Design the plant modifications needed to proceed with the decommissioning. Work in close cooperation with the site engineer, the site manager and the decommissioning project manager		
• Coordinate the design of the plant modifications needed to adapt the systems to the decommissioning activities, attending to the following main drivers: short design life / simplicity / adaptability / non-interference / waste management. • Interact and co-ordinate with the relevant/affected operation sections (Management, Decommissioning Operations, Dismantling, Demolition, Radiation Protection and Safety, Radioactive Waste, Maintenance) to avoid interference and ensure safety. • Interact with the relevant specialists (Mechanical/Electrical/I&C) to ensure a sound design. • Coordinate the elaboration of the drawings and diagrams of the plant modifications. • Coordinate the elaboration of the technical specifications for the purchase of needed equipment and components and for the implementation of the modifications. • Supervise the implementation of the modifications.		

Job Classification and normalised job titles

Occupational Category
Professional
Functional Category
Specialist

FUNCTIONAL CATEGORIES	
MANAGEMENT	Administrative or organisational functions
SPECIALIST	Technical specialised functions
EXECUTIVE	Support functions of clerical or technical nature.

OCCUPATIONAL CATEGORIES		
ADMINISTRATOR	ISCED 6-8	Leadership of multidisciplinary units or organisations, directive functions.
PROFESSIONAL	ISCED 5-8	Highly specialised qualification and/or leadership of departments of sectors
TECHNICIAN	ISCED 3-5	Specialised qualification; possible leadership of reduced teams.
CRAFT	ISCED 2-3	Semi-skilled or non-skilled

Job Classification and normalised job titles

Ref	Job Title	Occupational Category
2.7.14	**Maintenance Planning officer**	Technician
Phase / Area	Alternate job title(s) – specialisations	Functional Category
NPP O	Maintenance Planning Engineer	Management
Maintenance		

Occupational Cat.↓	Management	Specialist	Executive	←Functional Cat.
Professional	Manager	Engineer	Operator	Job titles
	Supervisor	Expert		
Technician	Officer	Technician	Operator	
	Foremen	Specialist	Fitter	
Craft		Welder	Operative	
		Craftsman	Worker	

Competence typology applied to the definition of job requirements

JOB REQUIREMENTS

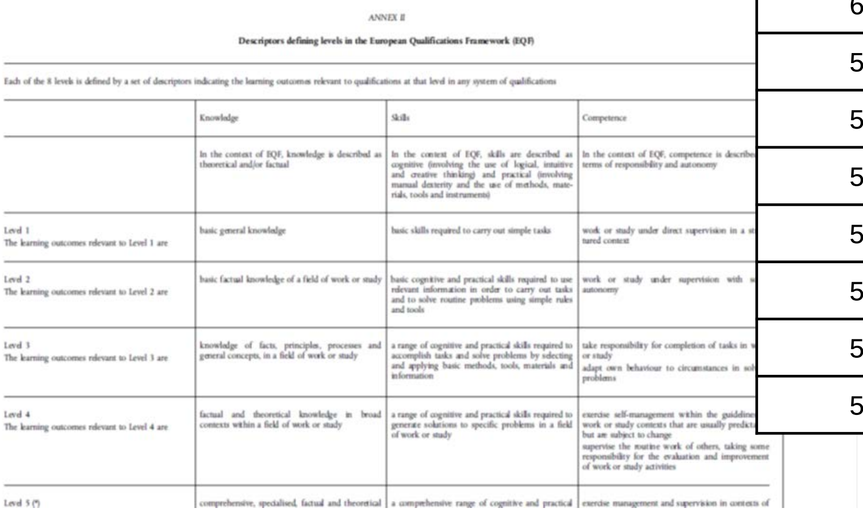
KNOWLEDGE (Cognitive competence)	EQF level (1-8)
Team management	6
Nucle	
Deco	
Proce	
Elect	
Mech	
HVAC	
Fire p	
Radia	

SKILLS (Technical and functional competence)	EQF level (1-8)
Using and interpreting electrical schemes	6
Using engineering computer-aided tools	5
Use technical information and detailed electrical drawings	5
Checking and Calibrating electrical /electronic test equipment and Process Control Instrumentation	5
Specifying electrical Testing Instructions	5
Loading and Proving specific Computer Control Programs	5
Identifying and Rectifying faults in electrical equipment	5
Identification of safety requirements	5
Ability to impl	
Operating ele	
Preparing rec	
Didactic skills	

COMPETENCE (Attitude; behavioural and personal competence)	EQF level (1-8)
Leadership and management	4
Influencing and motivating	4
Organisation and management of complex process	4
Safety culture	4
Comprehensive communication, literacy, ICT and numeracy	3

Competence typology applied to the definition of job requirements

EQF descriptors



ANNEX II

Descriptors defining levels in the European Qualifications Framework (EQF)

Each of the 8 levels is defined by a set of descriptors indicating the learning outcomes relevant to qualifications at that level in any system of qualifications

	Knowledge	Skills	Competence
	In the context of EQF, knowledge is described as theoretical and/or factual	In the context of EQF, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) and practical (involving manual dexterity and the use of methods, materials, tools and instruments)	In the context of EQF, competence is describe terms of responsibility and autonomy
Level 1 The learning outcomes relevant to Level 1 are	basic general knowledge	basic skills required to carry out simple tasks	work or study under direct supervision in a st tured context
Level 2 The learning outcomes relevant to Level 2 are	basic factual knowledge of a field of work or study	basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools	work or study under supervision with s autonomy
Level 3 The learning outcomes relevant to Level 3 are	knowledge of facts, principles, processes and general concepts, in a field of work or study	a range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information	take responsibility for completion of tasks in w or study adapt own behaviour to circumstances in sol problems
Level 4 The learning outcomes relevant to Level 4 are	factual and theoretical knowledge in broad contexts within a field of work or study	a range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	exercise self-management within the guideline work or study contexts that are usually predicta but are subject to change supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities
Level 5 (*)	comprehensive, specialised, factual and theoretical	a comprehensive range of cognitive and practical	exercise management and supervision in contexts of

EQF level (1-8)
6
5
5
5
5
5
5
5

Job Profile Template
Guided template

Ref.	Job Title	Occupational Cat.
0.00.00	**Job Title (as in the list of jobs)**	Professional Technician Craft
Phase / Area	Alternate job title(s) – specialisations	Functional Cat.
NPP D / O / D XXXXX	Other denominations of the same job. Specializations.	Management Specialist Executive
Role / Functions		
Areas of responsibility, scope of competences (1-2 sentences)		
• List of tasks/functions		
JOB REQUIREMENTS		
The items under "job requirements" (KSCs) should not include description of the degree of expertise or proficiency, since this is given by the **EQF level** on the right column, which is assigned in accordance with the descriptors –see Annex II. Terms as *Basic, Advanced, Good command of* should not be present. To improve clarity and facilitate the progress, some items of knowledge and skills can be grouped, provided they belong to the same field and the EQF level applicable is the same for all of them. Example: *- General management: budget management, business improvement, financial management, human resources , QSE, planning, monitoring and evaluation, risk assessment* The goal is keeping the definitions as **concise** as possible. It is advised to **avoid words redundant** with the nature of the items, such as "understanding" –for knowledge- or "ability" –for skill.		

Guided template

Competence typology applied to the definition of job requirements

JOB REQUIREMENTS	
KNOWLEDGE (Cognitive competence)	EQF level (1-8)
Team management	6
Nuclear installation knowledge	4
Decommissioning techniques	4
Process System engineering and design (1)	4
Electrical engineering and design (1)	4
Mechanical engineering and design (1)	4
HVAC engineering and design (1)	4
Fire protection engineering and design (1)	4
Radiation protection	3

COMPETENCE (Attitude; behavioural and personal competence)	EQF level (1-8)
Leadership and management	4
Influencing and motivating	4
Organisation and management of complex process	4
Safety culture	4
Comprehensive communication, literacy, ICT and numeracy	3

AGENDA

Plenary opening session

Five work sessions

Plenary closure session

Work sessions

Participants distributed in two working groups

JRC Moderators: Mihai, Massimo, César

doubts?

questions?

Groups allocation

2.6. SAFETY AND SECURITY	2.6.01.	Safety and Security Manager
2.6. SAFETY AND SECURITY	2.6.02.	Industrial Safety Technician
2.6. SAFETY AND SECURITY	2.6.03.	Industrial Safety Supervisor
2.6. SAFETY AND SECURITY	2.6.04.	Fire Protection Worker
2.6. SAFETY AND SECURITY	2.6.05.	Fire Protection Supervisor
2.6. SAFETY AND SECURITY	2.6.06.	Environmental Supervisor
2.6. SAFETY AND SECURITY	2.6.07.	Security Manager/Supervisor
3.9. HEALTH, SAFETY AND ENVIRONMENT	3.9.01.	Radiation Protection Expert
3.9. HEALTH, SAFETY AND ENVIRONMENT	3.9.04.	Industrial Safety Engineer
3.9. HEALTH, SAFETY AND ENVIRONMENT	3.9.06.	Environmental Manager
2.9. CANDU	2.9.01	Fuel Machine Operator
2.9. CANDU	2.9.02	System Responsible Engineer
3.1. MANAGEMENT	3.1.06.	Communication Manager
3.1. MANAGEMENT	3.1.07.	Financial Manager
3.10. SITE RELEASE	3.10.1	Final Release Process Supervisor
2.5. CHEMISTRY	2.5.02.	Chemistry Supervisor
2.5. CHEMISTRY	2.5.04.	Chemistry Operator I
3.8. MAINTENANCE	3.8.03.	Maintenance Worker
1.3. CONSTRUCTION	1.3.22.	Welder
2.8. ENGINEERING	2.7.12.	Operational Locksmith

1.2. DESIGN	1.2.01.	Design Manager
1.0. SAFETY ASSESSMENT	1.0.02	Safety Assessment Specialist
1.0. SAFETY ASSESSMENT	1.0.10.	Safety Design Engineer
1.1. SITE LOCATION	1.1.03.	Nuclear Engineer
1.1. SITE LOCATION	1.1.05	Geological (hydrogeology/sismic) experts
1.1. SITE LOCATION	1.1.06	Environmental External infrastructure expert
1.3. CONSTRUCTION	1.3.01.	Construction Project manager
1.3. CONSTRUCTION	1.3.02.	Transverse Engineer
1.3. CONSTRUCTION	1.3.19.	Quality Control Manager
1.3. CONSTRUCTION	1.3.20.	Quality Control Technician
1.3. CONSTRUCTION	1.3.25	HVAC Construction Engineer
1.3. CONSTRUCTION	1.3.26	HVAC Construction Technician
1.4. COMMISSIONING	1.4.02.	Mechanical Commissioning Engineer
1.4. COMMISSIONING	1.4.03.	Civil Commissioning Engineer
1.4. COMMISSIONING	1.4.04.	I&C Commissioning Engineer
1.4. COMMISSIONING	1.4.05.	System Commissioning Engineer
1.4. COMMISSIONING	1.4.06.	Commissioning Manager
1.4. COMMISSIONING	1.4.07.	Licensing Manager

2.7. MAINTENANCE	2.7.01.	Electrical Technician
2.7. MAINTENANCE	2.7.02.	Electronic-I&C Technician
2.7. MAINTENANCE	2.7.05.	Electronic-I&C Worker
2.7. MAINTENANCE	2.7.08.	Electronic-I&C Supervisor
2.7. MAINTENANCE	2.7.07.	Electrical Supervisor
1.2. DESIGN	1.2.18	I&C Technical Draughtsman
2.7. MAINTENANCE	2.7.06.	Mechanical Worker
2.7. MAINTENANCE	2.7.09.	Mechanical Supervisor
2.7. MAINTENANCE	2.7.14.	Maintenance Planning Officer
2.7. MAINTENANCE	2.7.15.	Civil Engineering Technician
2.8. ENGINEERING	2.8.01.	Mechanical Design Engineer
2.8. ENGINEERING	2.8.02.	Civil Design Engineer
2.8. ENGINEERING	2.8.04.	I&C Design Engineer
1.2. DESIGN	1.2.09	System Design Engineer
1.2. DESIGN	1.2.12	HVAC Design Engineer
2.7. MAINTENANCE	2.7.16.	Process Equipment Engineer
1.2. DESIGN	1.2.02	Civil Technical Draughtsman
1.2. DESIGN	1.2.03	Electrical Technical Draughtsman
1.2. DES		
1.2. DES		

1.0.01	Nuclear Safety Manager
1.1.01.	Site Characterisation Manager
1.1.02.	Licensing Manager
1.2.06.	Civil Design Engineer
1.3.16.	Electrical Construction Worker
1.3.18.	Occupational Safety Manager
1.3.21.	Environmental Manager
2.5.03.	Chemistry Operator II

58 profiles for group review
+ 8 optional profiles

Working groups

TUESDAY morning

WG 1.1

3.9. DECOMMISSIONING-HEALTH, SAFETY AND ENVIRONMENT	
3.9.01.	Radiation Protection Expert
3.9.04.	Industrial Safety Engineer
3.9.06.	Environmental Manager
2.6. OPERATION-SAFETY AND SECURITY	
2.6.01.	Safety and Security Manager
2.6.02.	Industrial Safety Technician
2.6.03.	Industrial Safety Supervisor
2.6.04.	Fire Protection Worker

J. Enrique
Radu
Emilia
Gabriel
Marinella
Biljiana
Edoardo
Elena
Lyubomir
Abdel

WG 1.2

1.4. NEW BUILD - COMMISSIONING	
1.4.02.	Mechanical Commissioning Engineer
1.4.03.	Civil Commissioning Engineer
1.4.04.	I&C Commissioning Engineer
1.4.05.	System Commissioning Engineer
1.4.06.	Commissioning Manager
1.4.07.	Licensing Manager

Eija Karita
Anton
Olivia
Concetta
Frank
Jesus

TUESDAY afternoon

WG 2.1

3.8. DECOMMISSIONING-MAINTENANCE	
3.8.03.	Maintenance Worker
1.3. NEW BUILD - CONSTRUCTION	
1.3.22.	Welder
1.3.17.	I&C Construction Worker
1.3.15.	Civil Construction Worker
1.3.14.	Mechanical Construction Worker
2.7. OPERATION - MAINTENANCE	
2.7.12.	Operational Locksmith

Emilia
Lyubomir
J. Enrique
Biljiana
Edoardo
Elena
Abdel
Anton

WG 2.2

1.1. NEW BUILD - SITE LOCATION	
1.1.03.	Nuclear Engineer
1.1.05	Geological (hydrogeology/seismic) experts
1.1.06	Environmental External infrastructure expert
1.2. NEW BUILD - DESIGN	
1.2.01.	Design Manager
1.0. NEW BUILD – SAFETY ASSESSMENT	
1.0.10.	Safety Design Engineer

Olivia
Eija Karita
Marinella
Radu
Gabriel
Concetta
Frank
Jesús

WEDNESDAY morning

WG 3.1

2.8. OPERATION ENGINEERING	
2.8.01.	Mechanical Design Engineer
2.8.02.	Civil Design Engineer
2.8.04.	I&C Design Engineer
1.2. NEW BUILD - DESIGN	
1.2.09	System Design Engineer
1.2.12	HVAC Design Engineer
2.7. OPERATION - MAINTENANCE	
2.7.16.	Process Equipment Engineer

Olivia
Eija Karita
Marinella
Concetta
Gabriel
J. Enrique
Lyubomir
Jesus
Abdel

WG 3.2

2.7. OPERATION - MAINTENANCE	
2.7.06.	Mechanical Worker
2.7.09.	Mechanical Supervisor
2.7.14.	Maintenance Planning Officer
1.2. NEW BUILD - DESIGN	
1.2.02	Civil Technical Draughtsman
1.2.03	Electrical Technical Draughtsman
1.2.04	Mechanical Technical Draughtsman
1.2.13	HVAC Technical Draughtsman

Anton
Radu
Eduardo
Elena
Frank
Emilia
Biljiana

WEDNESDAY afternoon

WG 4.1

3.10. DECOMMISSIONING- SITE RELEASE	
3.10.1	Final Release Process Supervisor
2.5. OPERATION - CHEMISTRY	
2.5.02.	Chemistry Supervisor
2.5.04	Chemistry Operator I
2.6. OPERATION – SAFETY AND SECURITY	
2.6.05.	Fire Protection Supervisor
2.6.06.	Environmental Supervisor
2.6.07.	Security Manager/Supervisor

J. Enrique
Concetta
Biljiana
Edoardo
Elena
Abdel
Eija Karita
Lyubomir
Jesus
Marinella

WG 4.2

2.7. OPERATION - MAINTENANCE	
2.7.01.	Electrical Technician
2.7.02.	Electronic-I&C Technician
2.7.05.	Electronic-I&C Worker
2.7.08.	Electronic-I&C Supervisor
2.7.07.	Electrical Supervisor
1.2. NEW BUILD - DESIGN	
1.2.18	I&C Technical Draughtsman

Anton
Gabriel
Frank
Emilia
Radu
Olivia

THURSDAY morning

WG 5.1

1.3. NEW BUILD – CONSTRUCTION	
1.3.01.	Construction Project manager
1.3.02.	Transverse Engineer
1.3.25	HVAC Construction Engineer
1.3.26	HVAC Construction Technician
2.7. OPERATION – MAINTENANCE	
2.7.15.	Civil Engineering Technician

Edoardo
Elena
Eija Karita
J. Enrique
Jesus
Abdel
Concetta
Radu

WG 5.2

3.1. DECOMMISSIONING - MANAGEMENT	
3.1.06.	Communication Manager
3.1.07.	Financial Manager
1.3. NEW BUILD - CONSTRUCTION	
1.3.19.	Quality Control Manager
1.3.20.	Quality Control Technician
2.9. OPERATION - CANDU	
2.9.01	Fuel Machine Operator
2.9.02	System Responsible Engineer

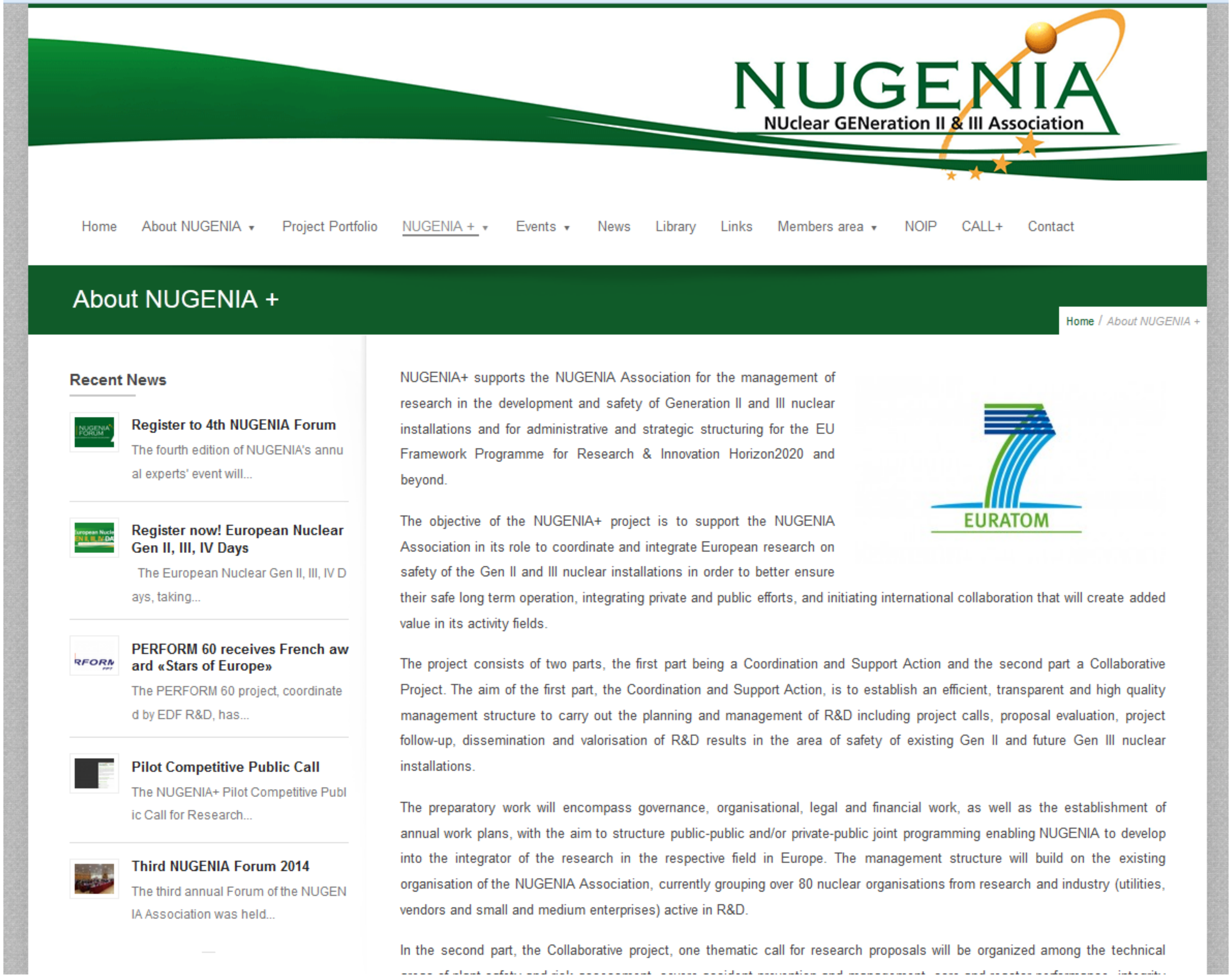
Olivia
Gabriel
Emilia
Marinella
Biljiana
Lyubomir
Frank
Anton

TO DO
Finished X

Teşekkür ederim

NUGENIA

http://www.nugenia.org



About NUGENIA +

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The NUGENIA+ Pilot Competitive Public Call for Research...

Third NUGENIA Forum 2014
The third annual Forum of the NUGENIA Association was held...

NUGENIA+ supports the NUGENIA Association for the management of research in the development and safety of Generation II and III nuclear installations and for administrative and strategic structuring for the EU Framework Programme for Research & Innovation Horizon2020 and beyond.

The objective of the NUGENIA+ project is to support the NUGENIA Association in its role to coordinate and integrate European research on safety of the Gen II and III nuclear installations in order to better ensure their safe long term operation, integrating private and public efforts, and initiating international collaboration that will create added value in its activity fields.

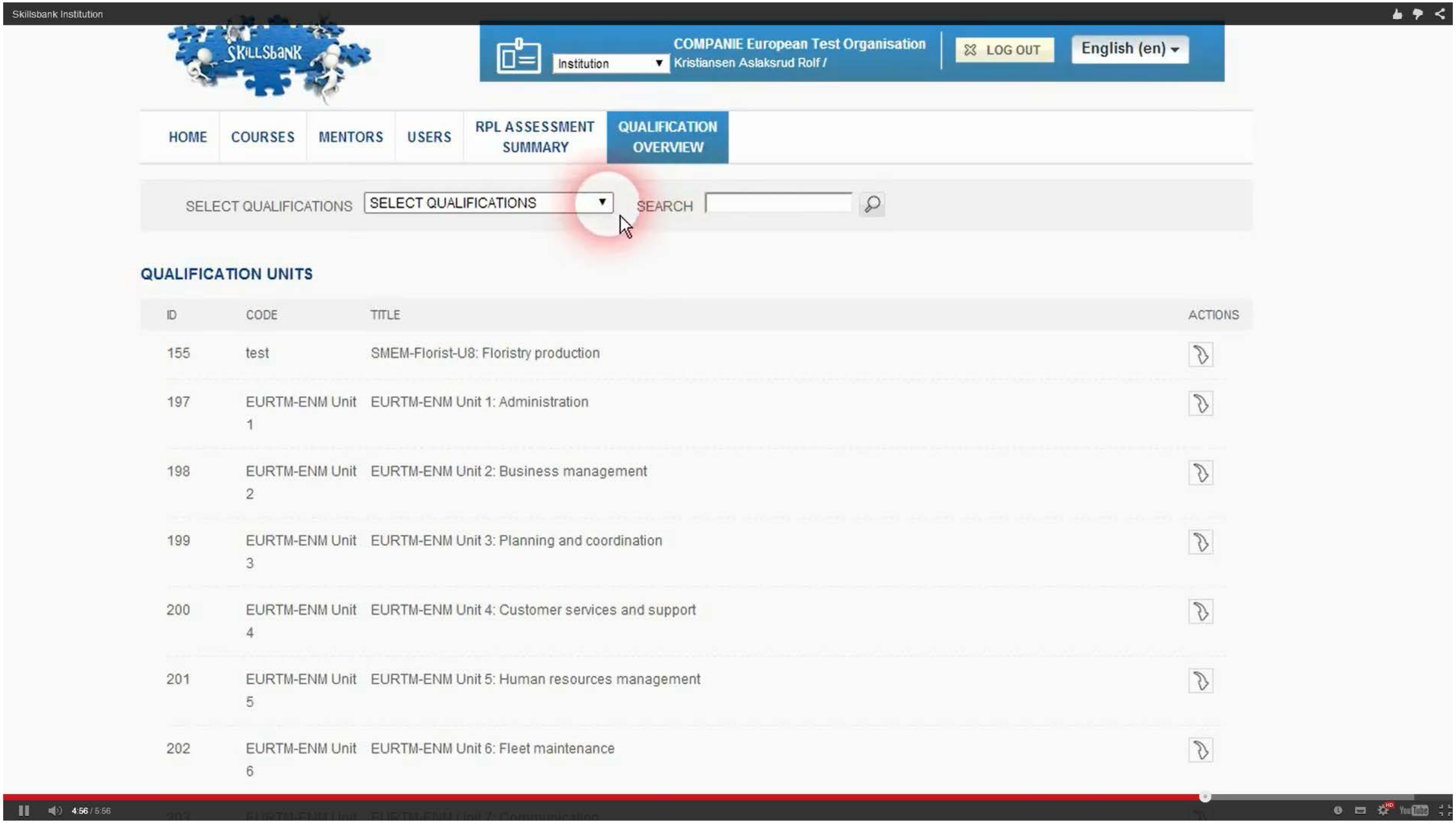
The project consists of two parts, the first part being a Coordination and Support Action and the second part a Collaborative Project. The aim of the first part, the Coordination and Support Action, is to establish an efficient, transparent and high quality management structure to carry out the planning and management of R&D including project calls, proposal evaluation, project follow-up, dissemination and valorisation of R&D results in the area of safety of existing Gen II and future Gen III nuclear installations.

The preparatory work will encompass governance, organisational, legal and financial work, as well as the establishment of annual work plans, with the aim to structure public-public and/or private-public joint programming enabling NUGENIA to develop into the integrator of the research in the respective field in Europe. The management structure will build on the existing organisation of the NUGENIA Association, currently grouping over 80 nuclear organisations from research and industry (utilities, vendors and small and medium enterprises) active in R&D.

In the second part, the Collaborative project, one thematic call for research proposals will be organized among the technical

The Skillsbank online interface

http://www.skillstools.eu/skillsbank/


Skillsbank Institution
SKILLSbANK
LOG OUT
English (en)
HOME
COURSES
MENTORS
USERS
RPL ASSESSMENT SUMMARY
QUALIFICATION OVERVIEW
SEARCH
4:56 / 5:56

Institution

COMPANIE European Test Organisation
Kristiansen Aslaksrud Rolf /

SELECT QUALIFICATIONS: SELECT QUALIFICATIONS

QUALIFICATION UNITS

ID	CODE	TITLE	ACTIONS
155	test	SMEM-Florist-U8: Floristry production	
197	EURTM-ENM Unit 1	EURTM-ENM Unit 1: Administration	
198	EURTM-ENM Unit 2	EURTM-ENM Unit 2: Business management	
199	EURTM-ENM Unit 3	EURTM-ENM Unit 3: Planning and coordination	
200	EURTM-ENM Unit 4	EURTM-ENM Unit 4: Customer services and support	
201	EURTM-ENM Unit 5	EURTM-ENM Unit 5: Human resources management	
202	EURTM-ENM Unit 6	EURTM-ENM Unit 6: Fleet maintenance	
203	EURTM-ENM Unit	EURTM-ENM Unit 7: Communication	

6th Nuclear ECVET oriented job taxonomy ***Expert Workshop***

Point Taksim Hotel
Istanbul (TR) 16-20 February 2015

Lessons learned from nuclear qualifications design

JRC

mihail.ceclan@ec.europa.eu

AGENDA

1. Lessons learned using "cascade workflow " for Chemical Supervisor qualification design

2. Improving the nuclear qualifications design

3. Summary

ecvet
European Credit system for Vocational Education & Training

1. Lessons learned from using "cascade workflow" for ChSv qualification design

1.1 JD impact on qualifications design

"Cascade workflow"

C2-JD development for ChS

Complete development of JD-2.5.02 _ChSv– Annex 1 /Input for C3- qualifications design

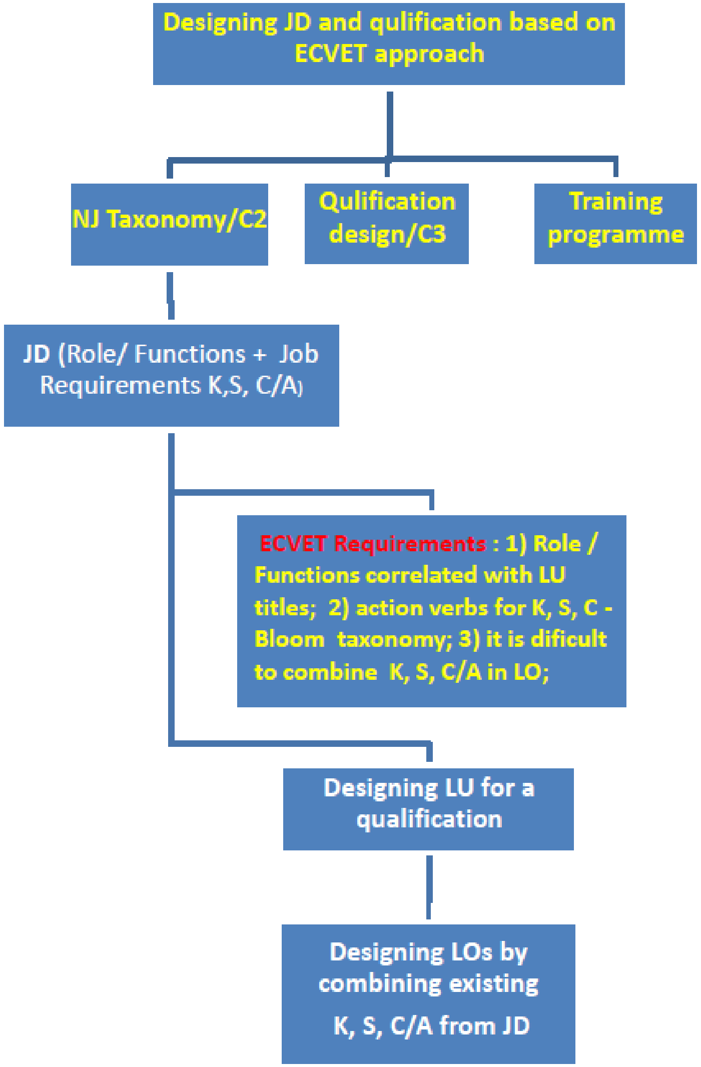
C3- ChSv job/qualification design

3b) Job requirements - KSC/A from JD-2.5.02_ChSv

3c) Designing LU -Role/functions/JD→ **Annex 2**

3d) Designing LOs - by assembling K, S, C/A (from JD) in LOs;

It seems that C2 and C3 are INDEPENDENT activities that take place successively or in a "cascade workflow"


Designing JD and qulification based on ECVET approach
NJ Taxonomy/C2
Qulification design/C3
Training programme
JD (Role/ Functions + Job Requirements K,S, C/A)
ECVET Requirements : 1) Role / Functions correlated with LU titles; 2) action verbs for K, S, C - Bloom taxonomy; 3) it is dificult to combine K, S, C/A in LO;
Designing LU for a qualification
Designing LOs by combining existing K, S, C/A from JD

1. Lessons learned from using "cascade workflow" for ChSv qualification design

1.2 Week points of the "Cascade workflow"

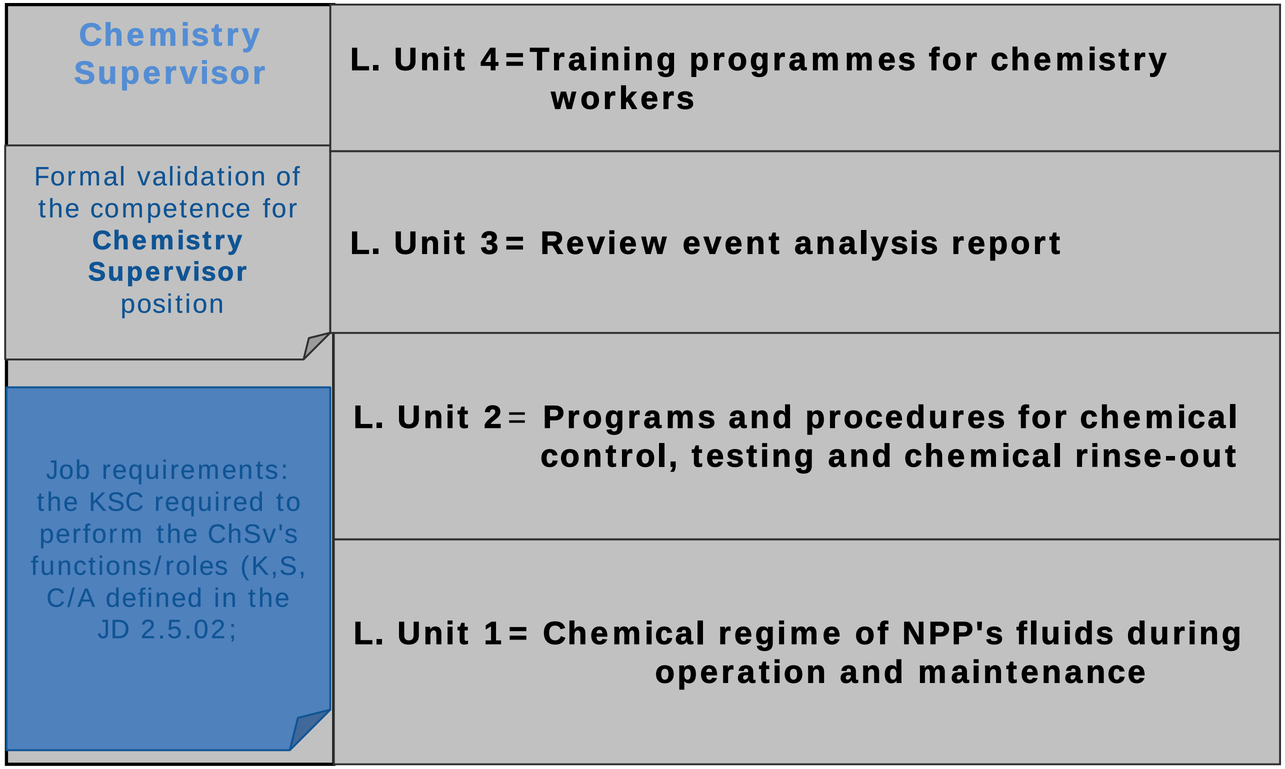
C2-JD development for ChS	Week points
C2/JD-ChSv 2.5.02 – **Annex 1**	- ECVET requirements are not properly implemented: → K defined as content (KB-QS); ECVET approach: should use action verbs (Bloom taxonomy); → K, S, C- are defined in JD without any correlation with the LO

C3- ChSv job/qualification design	Week points
3b) job requirements	→ def. KSC/A should be the same in different ECVET documents: JD & qualification
3c) Designing LU – **Annex 2** (feasible**)**	
3d) Designing LOs	→ by assembling K, S, C/A (from JD_2.5.02) in LOs →Very difficult task -would be more easier to define first LOs linked with a LU→ "Feedback workflow"

1. Lessons learned from using "cascade workflow" for ChSv qualification design

1.3 Illustrating the week points of the "Cascade workflow"

C3- ChSv job/qualification design	ECVET requirements
3c) Designing LU – **Annex 2**	→ LU titles should be related with Role/Functions (from JD) → Role/functions →max. 8-12 → LU is more than a discipline in KB-QS



Chemistry Supervisor

Formal validation of the competence for **Chemistry Supervisor** position

Job requirements: the KSC required to perform the ChSv's functions/roles (K,S, C/A defined in the JD 2.5.02;

L. Unit 4=Training programmes for chemistry workers

L. Unit 3= Review event analysis report

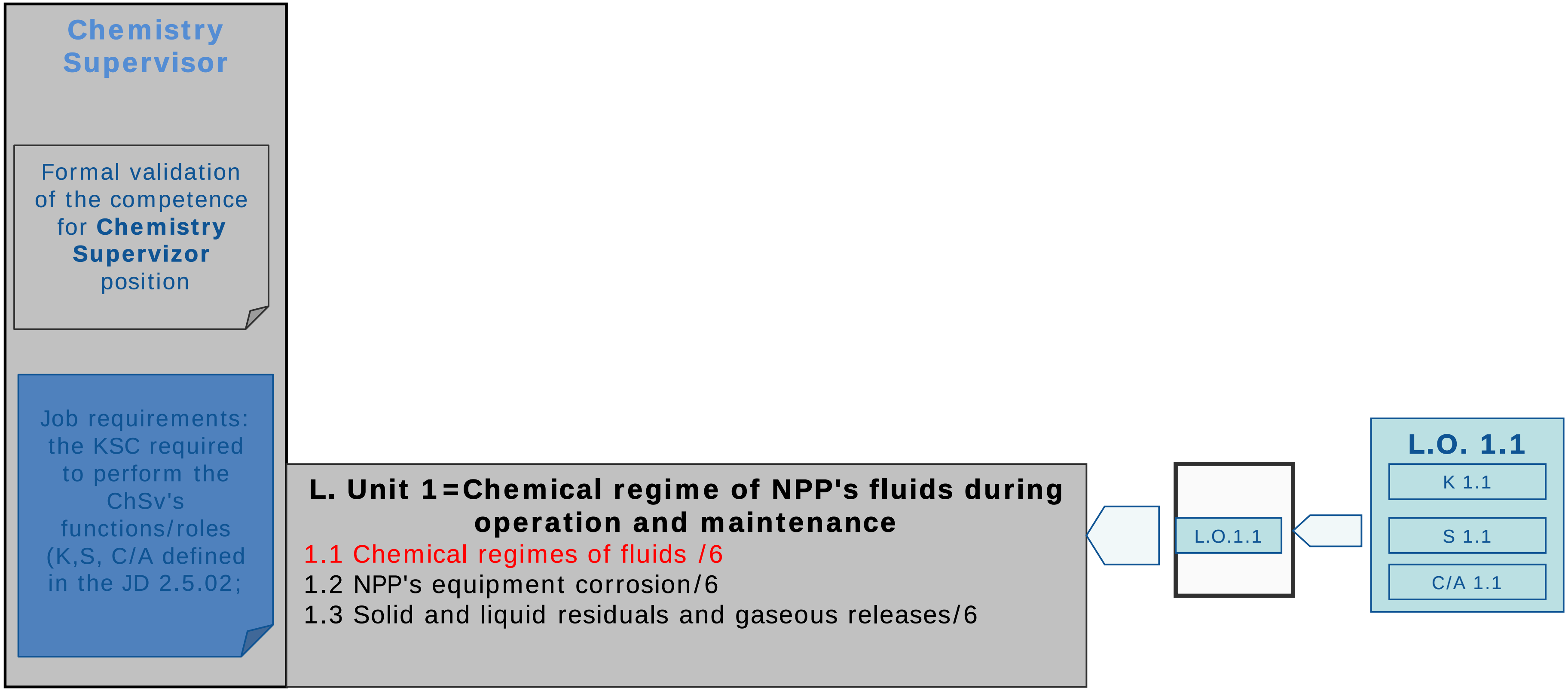
L. Unit 2= Programs and procedures for chemical control, testing and chemical rinse-out

L. Unit 1= Chemical regime of NPP's fluids during operation and maintenance

1. Lessons learned from using "cascade workflow" for ChSv qualification design

1.3 Illustrating the week points of the "Cascade workflow"

C3- ChSv job/qualification design	Week points
3d) Designing LOs – Annex 2	→ by assembling K, S, C/A (from JD_2.5.02) in LOs; →Very difficult task



Chemistry Supervisor

Formal validation of the competence for **Chemistry Supervizor** position

Job requirements: the KSC required to perform the ChSv's functions/roles (K,S, C/A defined in the JD 2.5.02;

L. Unit 1=Chemical regime of NPP's fluids during operation and maintenance

1.1 Chemical regimes of fluids /6

1.2 NPP's equipment corrosion/6

1.3 Solid and liquid residuals and gaseous releases/6

L.O.1.1

L.O. 1.1

K 1.1

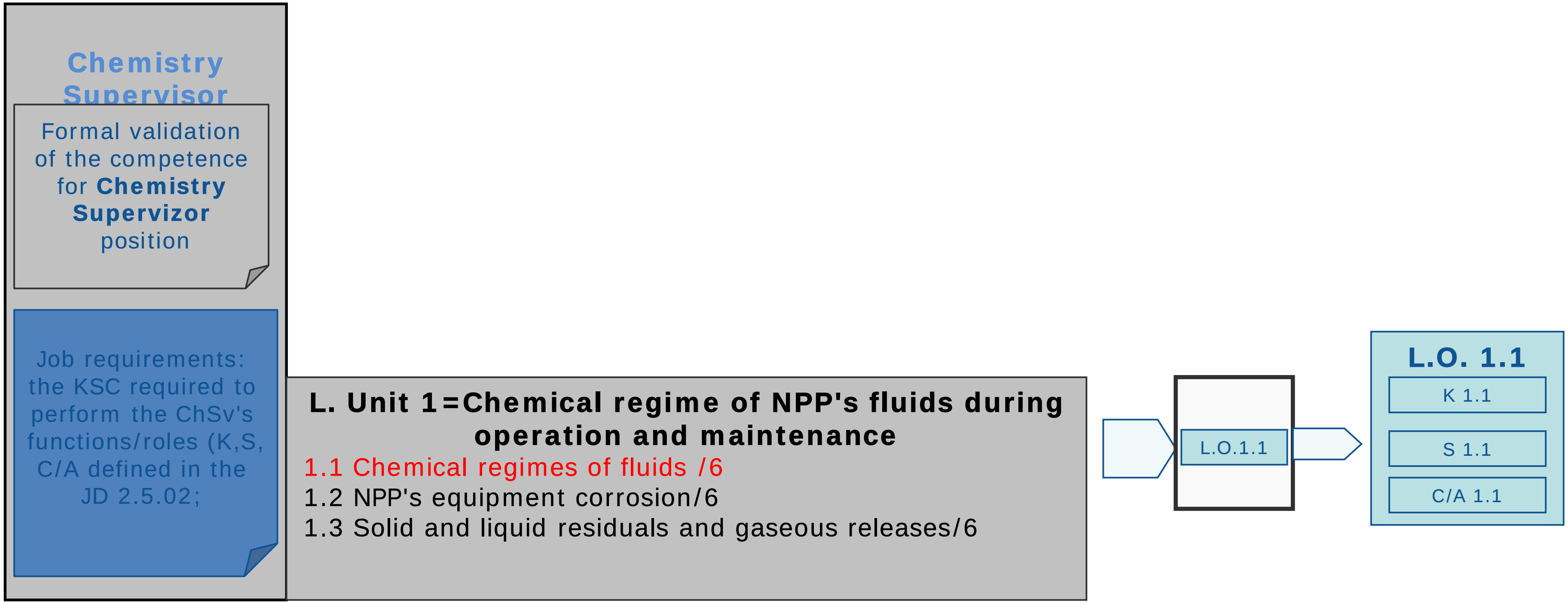
S 1.1

C/A 1.1

2. Improving the workflow for designing nuclear qualification

2.1 Removing the weaknesses of "cascade workflow"

C3- ChSv job/qualification design	Changing the paradigm
3d) Designing LOs – Annex 2	→ by assembling K, S, C/A (from JD_2.5.02) in LOs; →Very difficult task → would be more easier to define first LOs linked with a LU → it make sense to define LOs linked with a LU → **Feedback workflow**



Chemistry Supervisor

Formal validation of the competence for **Chemistry Supervizor** position

Job requirements: the KSC required to perform the ChSv's functions/roles (K,S, C/A defined in the JD 2.5.02;

L. Unit 1=Chemical regime of NPP's fluids during operation and maintenance

1.1 Chemical regimes of fluids /6

1.2 NPP's equipment corrosion/6

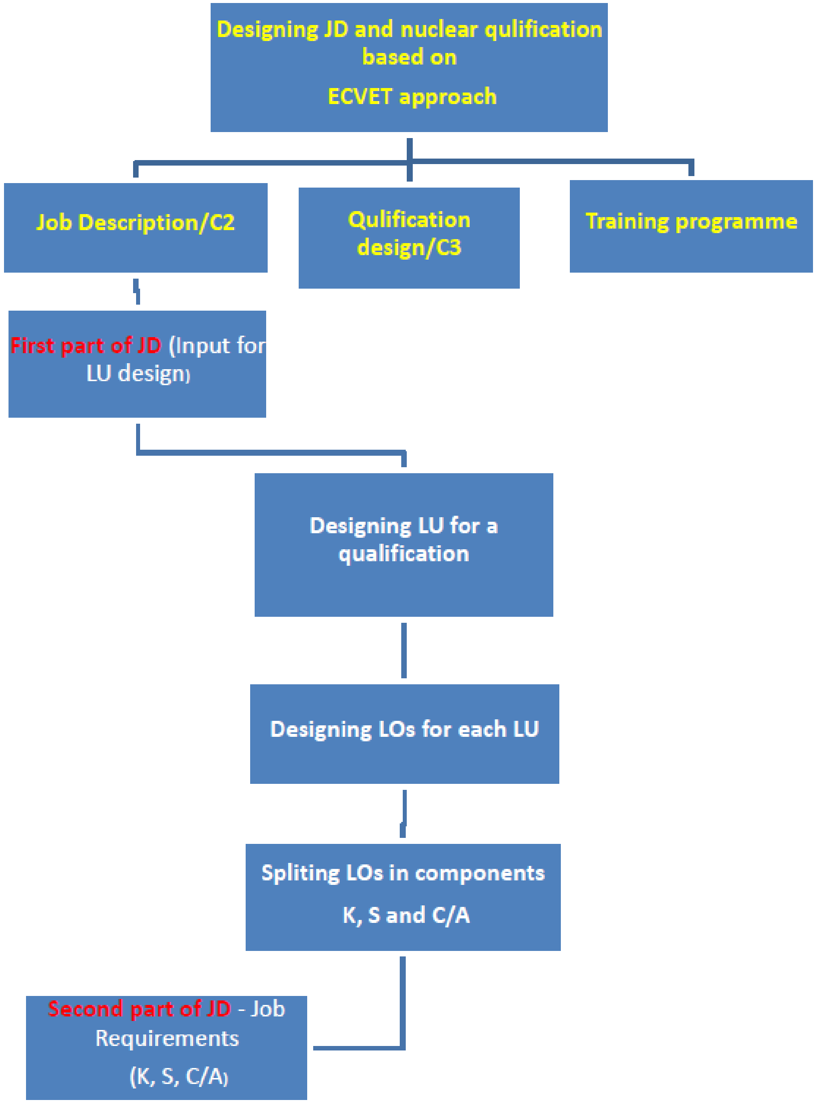
1.3 Solid and liquid residuals and gaseous releases/6

2. Improving the workflow for designing nuclear qualification

2.2 Applying the "Feedback workflow"

Feedback workflow

Activities	Benefits
C2/ First part of JD	Role/Functions **Annex 1**→ Input for C3/ Designing LU → **Annex 2**
C3/ Designing LU	→ back to C2/ First part of JD adding LU titles→ **Annex 3**
C3/ Designing LOs	→ designing LOs/competences necessary to exercise a specific LU → Splitting LOs in K, S. C/A
C2/ Second part of JD/Job Req.	→ back to C2/ Second part of JD adding K, S, C/A → **Annex 3**



Designing JD and nuclear qulification based on

ECVET approach

Job Description/C2

Qulification design/C3

Training programme

First part of JD (Input for LU design)

Designing LU for a qualification

Designing LOs for each LU

Spliting LOs in components

K, S and C/A

Second part of JD - Job Requirements

(K, S, C/A)

2. Improving the workflow for designing nuclear qualification

2.3 Template for designing LOs

C3- ChSv job/qualification design	ECVET requirements
3d) Designing LOs – Annex 2	INPUT: JD- Chemistry Supervisor_2.5.02 (First part- Role/ Func.) a) def. LOs- a competence necessary to exercise a particular LU of the job JD- Chemical Supervisor_2.5.02; b) LO is more than a chapter in KB-QS

Chemistry Supervisor

Formal validation of the competence for **Chemistry Supervizor** position

Job requirements: the KSC required to perform the ChSv's functions/roles (K,S, C/A defined in the JD 2.5.02;

L. Unit 4=Training programmes for chemistry workers

4.1 Team and technical supervision/6

4.2 Input for ChS refreshments-at each 6 month/6

L. Unit 3= Review event analysis report

3.1 NPP systems and components/5

3.2 Events related to chemical equipment/6

3.3 Events related to metal corrosion conditions/6

L. Unit 2= Programs and procedures for chemical control, testing and chemical rinse-out

2.1 Monitoring and assessment of fluids chemical regime/6

2.2 Monitoring and assessment of equipment corrosion/6

2.3 Decontamination and conservation of the equipment during outage or long-term layover/6

L. Unit 1=Chemical regime of NPP's fluids during operation and maintenance

1.1 Chemical regimes of fluids /6

1.2 NPP's equipment corrosion/6

1.3 Solid and liquid residuals and gaseous releases/6

2. Improving the workflow for designing nuclear qualification

2.4 Template for splitting LOs in K, S, C/A

European Commission

ECVET requirements

a) def. K: Cognitive Competence, Know-what

b) def. S: Technical / Functional Competence, Know-how.

c) def. C/A: : Behaviours, Attitudes, (inter-)personal competence/abilities; Know-to-be

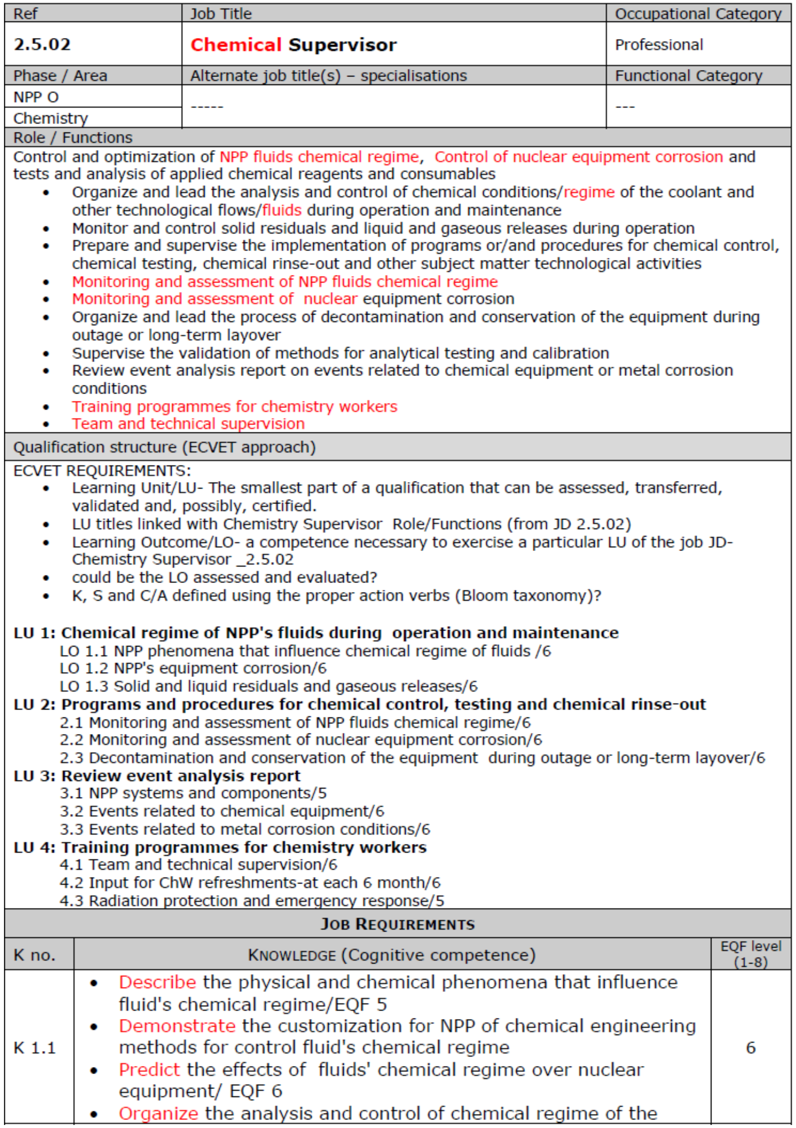
Q1) are K,S and C/A defined using the proper action verbs?

Q2) could be the LO assessed and evaluated?

Unit 1	**Chemical regime of NPP's fluids during operation and maintenance** (ECVET approach-the name of Learning Unit 2 is one of the functions/roles)		**EQF**
LO 1.1	LO 1.1= NPP phenomena that influence chemical regime of fluids		6
	KSC/A	JD_ Chemistry Supervisor /ChSv_2.5.02	5
	K 1.1	• Describe the physical and chemical phenomena that influence fluid's chemical regime/EQF 5 • Demonstrate the customization for NPP of chemical engineering methods for control fluid's chemical regime • Predict the effects of fluids' chemical regime over nuclear equipment/ EQF 6 • Organize the analysis and control of chemical regime of the NPP's fluids/EQF 6	6
	S 1.1	• Perform-autonomously the control of chemical regime of the NPP's fluids /EQF 6 • Adapt the methods of controlling the chemical regime of the NPP's fluids / EQF 5 • Providing input for the Review event analysis report / EQF 6	6
	C/A 1.1	• Analytical thinking and inside/ EQF 6 • Communication - capacity to communicate technical or specialized information / EQF 4 • Eye for detail / accuracy / EQF 5	5
Assessment procedures: K) a written test (multiple-choice or other forms) to assess knowledge; S) a practical test to assess the competence as a whole, including skills; C/A) a set of 'case histories' related to the assessed competence/attitude			

2. Improving the workflow for designing nuclear qualification

2.5 New template for JD_2.5.02



Ref	Job Title	Occupational Category
2.5.02	**Chemical Supervisor**	Professional
Phase / Area	Alternate job title(s) – specialisations	Functional Category
NPP O Chemistry	-----	---

Role / Functions

Control and optimization of NPP fluids chemical regime, Control of nuclear equipment corrosion and tests and analysis of applied chemical reagents and consumables

- Organize and lead the analysis and control of chemical conditions/regime of the coolant and other technological flows/fluids during operation and maintenance
- Monitor and control solid residuals and liquid and gaseous releases during operation
- Prepare and supervise the implementation of programs or/and procedures for chemical control, chemical testing, chemical rinse-out and other subject matter technological activities
- Monitoring and assessment of NPP fluids chemical regime
- Monitoring and assessment of nuclear equipment corrosion
- Organize and lead the process of decontamination and conservation of the equipment during outage or long-term layover
- Supervise the validation of methods for analytical testing and calibration
- Review event analysis report on events related to chemical equipment or metal corrosion conditions
- Training programmes for chemistry workers
- Team and technical supervision

Qualification structure (ECVET approach)

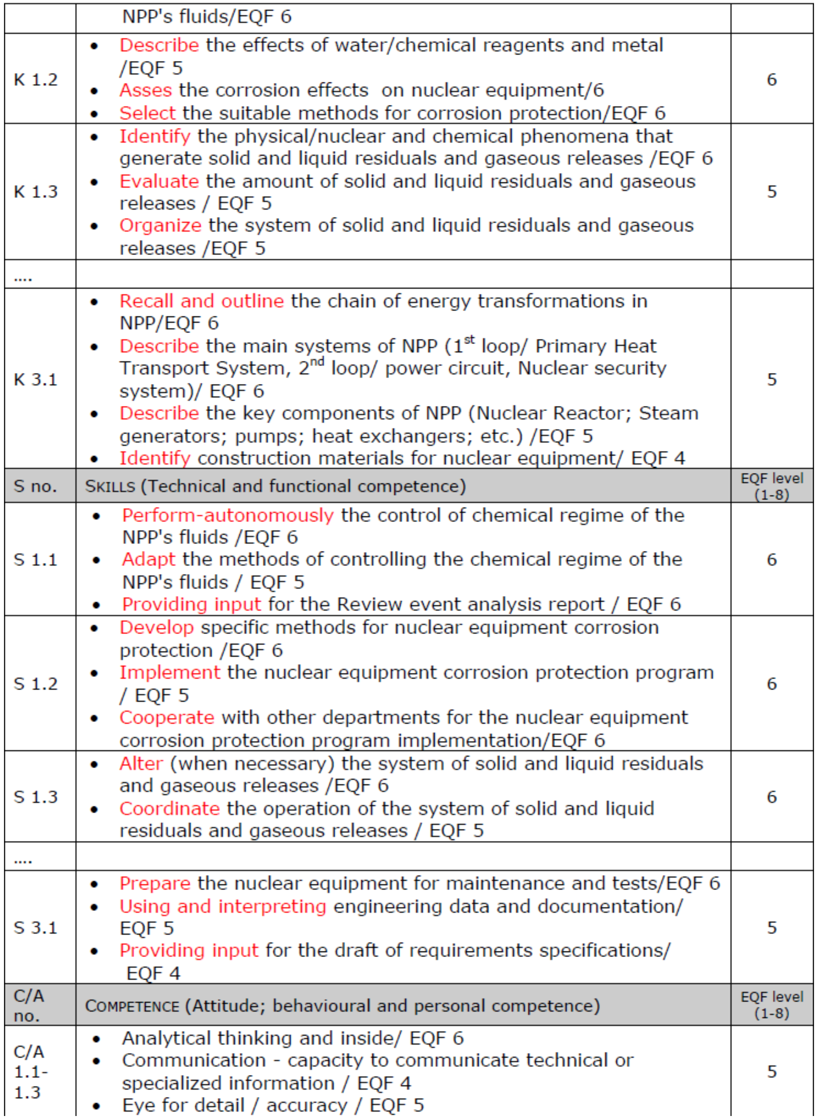
ECVET REQUIREMENTS:

- Learning Unit/LU- The smallest part of a qualification that can be assessed, transferred, validated and, possibly, certified.
- LU titles linked with Chemistry Supervisor Role/Functions (from JD 2.5.02)
- Learning Outcome/LO- a competence necessary to exercise a particular LU of the job JD-Chemistry Supervisor _2.5.02
- could be the LO assessed and evaluated?
- K, S and C/A defined using the proper action verbs (Bloom taxonomy)?

LU 1: Chemical regime of NPP's fluids during operation and maintenance
LO 1.1 NPP phenomena that influence chemical regime of fluids /6
LO 1.2 NPP's equipment corrosion/6
LO 1.3 Solid and liquid residuals and gaseous releases/6
LU 2: Programs and procedures for chemical control, testing and chemical rinse-out
2.1 Monitoring and assessment of NPP fluids chemical regime/6
2.2 Monitoring and assessment of nuclear equipment corrosion/6
2.3 Decontamination and conservation of the equipment during outage or long-term layover/6
LU 3: Review event analysis report
3.1 NPP systems and components/5
3.2 Events related to chemical equipment/6
3.3 Events related to metal corrosion conditions/6
LU 4: Training programmes for chemistry workers
4.1 Team and technical supervision/6
4.2 Input for ChW refreshments-at each 6 month/6
4.3 Radiation protection and emergency response/5

JOB REQUIREMENTS

K no.	KNOWLEDGE (Cognitive competence)	EQF level (1-8)
K 1.1	• Describe the physical and chemical phenomena that influence fluid's chemical regime/EQF 5 • Demonstrate the customization for NPP of chemical engineering methods for control fluid's chemical regime • Predict the effects of fluids' chemical regime over nuclear equipment/ EQF 6 • Organize the analysis and control of chemical regime of the	6



	NPP's fluids/EQF 6	
K 1.2	• Describe the effects of water/chemical reagents and metal /EQF 5 • Asses the corrosion effects on nuclear equipment/6 • Select the suitable methods for corrosion protection/EQF 6	6
K 1.3	• Identify the physical/nuclear and chemical phenomena that generate solid and liquid residuals and gaseous releases /EQF 6 • Evaluate the amount of solid and liquid residuals and gaseous releases / EQF 5 • Organize the system of solid and liquid residuals and gaseous releases /EQF 5	5
....		
K 3.1	• Recall and outline the chain of energy transformations in NPP/EQF 6 • Describe the main systems of NPP (1st loop/ Primary Heat Transport System, 2nd loop/ power circuit, Nuclear security system)/ EQF 6 • Describe the key components of NPP (Nuclear Reactor; Steam generators; pumps; heat exchangers; etc.) /EQF 5 • Identify construction materials for nuclear equipment/ EQF 4	5
S no.	SKILLS (Technical and functional competence)	EQF level (1-8)
S 1.1	• Perform-autonomously the control of chemical regime of the NPP's fluids /EQF 6 • Adapt the methods of controlling the chemical regime of the NPP's fluids / EQF 5 • Providing input for the Review event analysis report / EQF 6	6
S 1.2	• Develop specific methods for nuclear equipment corrosion protection /EQF 6 • Implement the nuclear equipment corrosion protection program / EQF 5 • Cooperate with other departments for the nuclear equipment corrosion protection program implementation/EQF 6	6
S 1.3	• Alter (when necessary) the system of solid and liquid residuals and gaseous releases /EQF 6 • Coordinate the operation of the system of solid and liquid residuals and gaseous releases / EQF 5	6
....		
S 3.1	• Prepare the nuclear equipment for maintenance and tests/EQF 6 • Using and interpreting engineering data and documentation/ EQF 5 • Providing input for the draft of requirements specifications/ EQF 4	5
C/A no.	COMPETENCE (Attitude; behavioural and personal competence)	EQF level (1-8)
C/A 1.1-1.3	• Analytical thinking and inside/ EQF 6 • Communication - capacity to communicate technical or specialized information / EQF 4 • Eye for detail / accuracy / EQF 5	5

3. Summary

Improvements of nuclear qualifications design	Benefits
"Feedback workflow"	Better correlation between C2/JD and C3/ nuclear qualifications design
	JD and qualifications structure: - more ECVET oriented - JD, LU, LOs, Job requirements- completely consistent - more understandable for someone -no nuclear background
Tools for nuclear qualifications design	New template for JD
	Template for LU design
	Template for LOs design
	Template for splitting LOs in components (K, S, C/A)

THANK YOU
Grazie
Спасибо
Gracias
Obrigado
Danke
Paldies
Takk
Merci
Ačiū
Dobre