



Schweizerische Eidgenossenschaft
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Eidgenössisches Nuklearsicherheitsinspektorat ENSI



Overview of Information about

Responsibilities, Competences and Training in Radiation Protection of NPP

presented and discussed at the
ISOE Regulatory Body Representatives Meeting (RBM)
8th April 2014, Berne



Full title:

Legal Rules and Regulatory Requirements
regarding Responsibilities and Functions in RP in NPP
and the necessary Competences, Skills, Education
and Training

Participants at RBM

5 presentations

France, Finland, Spain, Sweden, Switzerland

8 answers to the questionnaire returned

+ Germany, Japan, Slovenia

16 participants from 9 countries

+ the Netherlands, Czech Republic

Content

- **Motivation** for choosing ET on RP in NPP as a topic
- Why starting with the declaration of **Functions in NPP (and around)** when exchanging information about ET?
- Results of comparison of the **most Important Positions in RP** at NPP (EU-Directive, national legislations) and their necessary competences (and formation)
- **Swiss Approach** on Determination of Requirements about Education and Training in RP
- **Lessons learned form the RBM** in the sight of Switzerland
- **Chances** / Education and Training in RP in the future

Motivation of Topic

well qualified persons in RP (knowledge, skills, competences) is an important issue to any successful RP Program

- But which competences are necessary for which person?
- How to acquire and keep this competences?
- Which legal requirements on education and training are useful?
- How should the recognition process look like?
- How do they do it in other countries?

Motivation of Topic



In 2013 we (in Europe) had the enactment of the revised **EU Directive 13675/1/13** (also called as EU Basic Safety Standard), which has to be implemented into **national legislation** before 2018 in all EU-member states, including

new definitions of RP Expert, RP Officer, ...

the instruction: Member States shall establish an adequate legislative and administrative framework ensuring the provision of appropriate radiation protection education, training and information **to all individuals whose tasks require specific competences in radiation protection.**

Motivation of Topic



Switzerland as a non-EU-member state aspires at an **harmonization** as close as reasonable achievable

- Does these definitions fit to any functions in the existing organization of license holders (NPP Companies)?
- How does the countries interpret the new EU-Directive?
- Which country needs a more or less big change within its legislation to fulfill the EU-Directive? How?

Why starting with consideration about functions, responsibilities and tasks?



Functions/positions within NPP, companies, the national RP society

responsibility and tasks

necessary competences, skills and abilities

requirements on education and training: educational objectives, range and comprehensiveness of knowledge (Syllabus), professional experiences

assessment of training courses and individual qualification (how and who should do the examination)

recognition of education and training

New Definitions for RPE and RPO as determined in the **EU directive**

RPE:

- main task: giving advice in all matter of RP to licensee
- therefore the competence should be very high, but EU directive gives no further guide,
- therefore interpretations differ widely
- qualification has to be recognized by authority

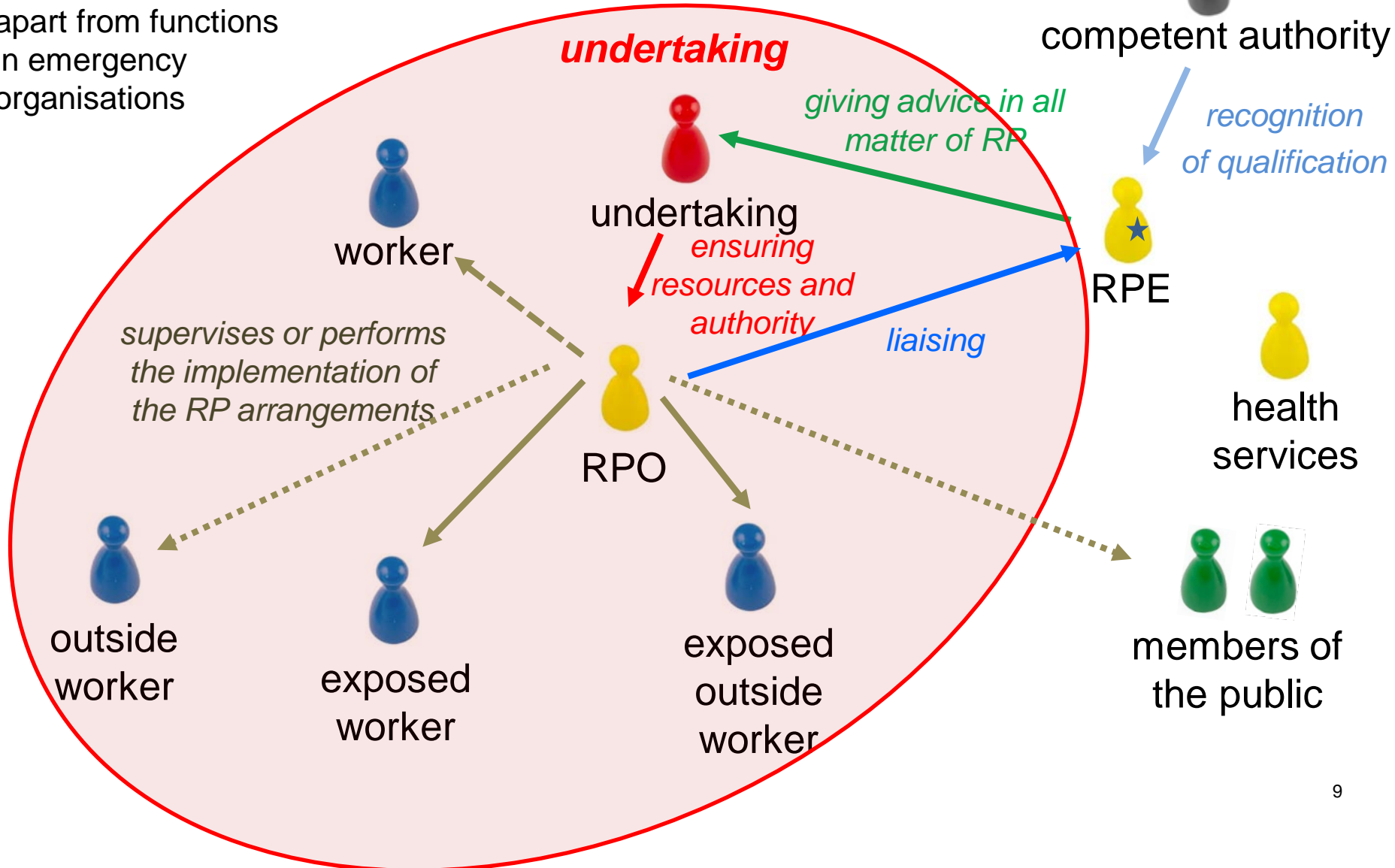
RPO:

- main task: to supervise or perform the implementation of the radiation protection arrangements
- technical competent
- No requirement about recognition

Functions in RP as determined in the **EU directive**



apart from functions
in emergency
organisations

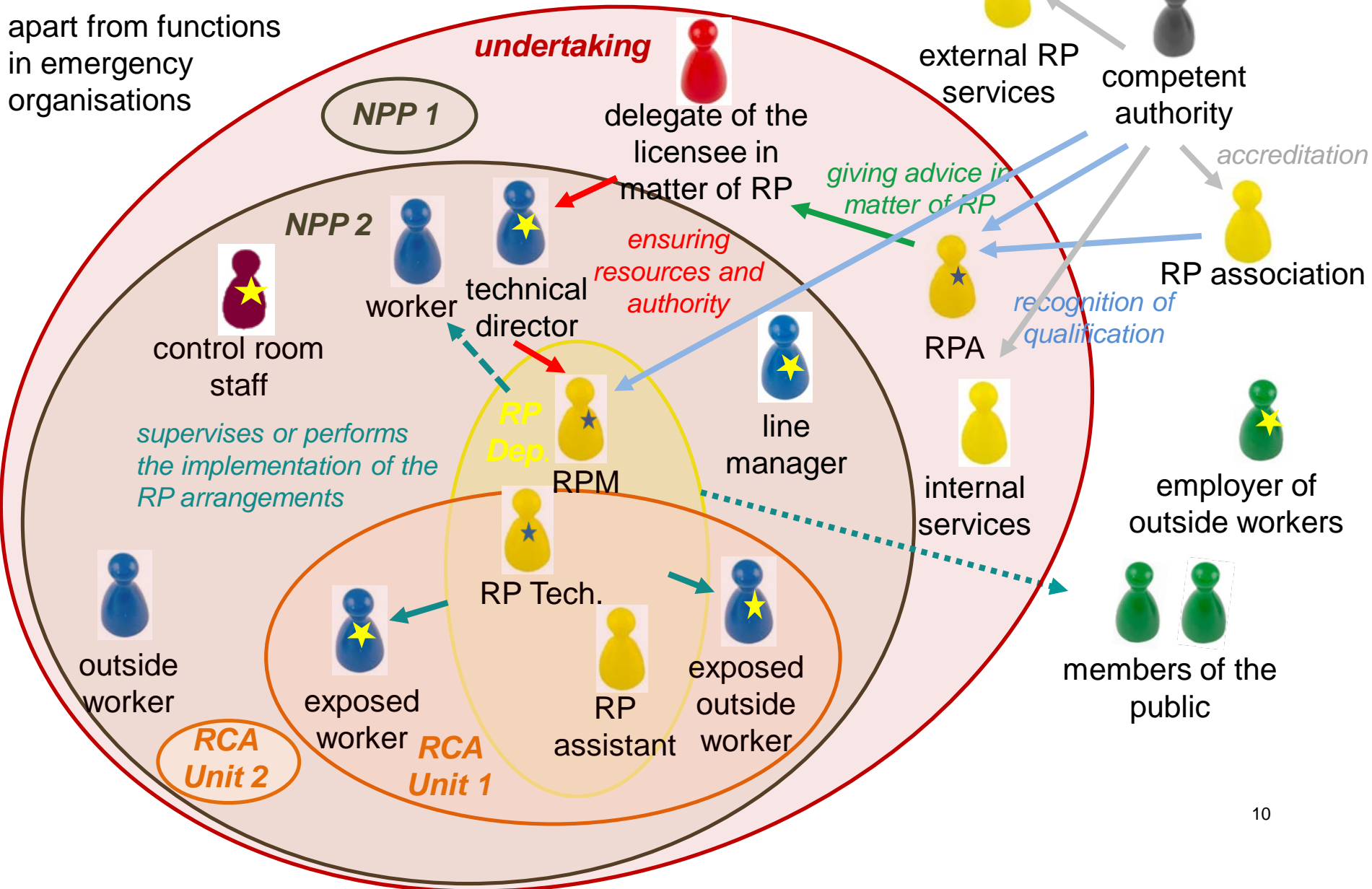


Functions in RP as they exist in NPP

in the participating countries



apart from functions in emergency organisations



Functions in RP of NPP in reality



Undertaking

licensee (mostly not a person)

delegate of the licensee in matter of RP

radiation protection advisor (RPA) = RPE

NPP organisation

NPP director

senior staff members / heads of departments

line manager

exposed worker handling radioactive material

exposed worker not handling rad. mat.

worker not occupational exposed

RP department / RP unit / supervision dep

Radiation Protection Manager (RPM)

RP group leader / RP senior staff

RP junior staff / RP assistants

Dekont staff / shielding specialists

Dosimetry staff / instruments specialists

Control room staff

operator / chief operator / support engineer

Emergency Response Organisation

emergency response coordinator

emergency superintendence

emergency worker

Outside Worker Services

employer of outside workers

exposed outside worker

outside RP controller

Other internal or external RP Services

Delegate in matter of transportation class 7

Occupational health services

Dosimetry services

Radiological analysis laboratory

Calibration office

Education and Training facilities

Specialized consulting Institute of Science

Competent authority and delegate

RP inspectors

RP consultant

Most important RP-functions

- Radiation protection advisor (RPA) = (qualification level: RPE)

RP department / RP unit / supervision dep

- Radiation Protection Manager (qualification level: RPE)
- RP group leader (qual. Level: RP-technician or RPE)
- RP senior staff (qualification level: RP-Technician)
- RP junior staff (qualification level: RP-Controller)

NPP organisation

- NPP director / senior staff members / heads of departments (taking responsibility)
- line manager (planning and charging work)
- exposed worker handling radioactive material

Control room staff

- chief operator
- on call support engineer (emergency cases)

Results from RBM



In most countries:

- the significant part of responsibilities and tasks in RP is taken by a **RP-Unit** which is a part of NPP organisation and has to be independent to the other departments as operation, maintenance, ...
- the **Head of RP-Unit** and its deputies have the function of RPE and RPO
- (around 3 – 4) different **qualifications levels** for RP-Professionals (RPE and RPO) exist mostly determined by the associations of NPP utilities

Results from RBM

Differences and Specialities:

- Only two countries (SE, NL) have **separated** positions in NPP organisation for the two functions RPA and RPO.
- The required **RP education and training program** for “RP-Manager”/”Head of RP-Unit” (corresponding with the RPE-qualification level) differs between some weeks (SE) and ½ year (ES).
- The minimum **duration of on-the-job experience** in the particular NPP requested for recognition as RP-Manager ranges between ½ year (CH) up to 3 years (ES)

Results from RBM

Differences and Specialities:

The assignment of tasks to either **exposed workers or RPO** differs a lot:

- in several countries (DE, CH) the responsibility of exposed workers are restricted to complying with self protection instructions and RPO are doing all RP arrangements (even supporting workers by getting dressed with protective clothes)
therefore the duration of **ET in RP for exposed workers is about 2-3 days**
- but in other countries (UK, FR) exposed workers are responsible for monitoring the workplace, choosing the right protection measures etc.
therefore the **ET in RP for exposed workers lasts several weeks**



from Tasks to Competences / Learning Objectives

Example from the revised Swiss
RP-Education-and-Training-Ordinance

AS 2015

RP-Expert

RP-Technician

RP-Controller

Tabelle 2: Kompetenzen

Die anerkannten Ausbildungslehrgänge stellen sicher, dass die Personen folgende Kompetenzen, Fähigkeiten und Kenntnisse besitzen

Kompetenzen / Berufsnummer	K1	K2	K3
Den Bewilligungsinhaber sowie das Betriebspersonal in Kernanlagen bei Fragen zum Strahlenschutz beraten	x	x	x
Die Einhaltung der Grenzwerte im Strahlenschutz durch die Erstellung von betriebsinternen allgemeinen Weisungen insbesondere durch Festlegung von Interventionswerten (Warnschwellen) sicherstellen, Aufgabenverteilung im Strahlenschutz dokumentieren	x	–	–
Kontroll- oder Überwachungsbereiche festlegen, den Zonen- und Gebietstypen zuordnen und die dazugehörigen Massnahmen definieren	x	x	x
Für freigabepflichtige Anlagenänderungen sowie komplexe Tätigkeiten eine Strahlenschutzplanung unter Berücksichtigung des Optimierungsprinzips erstellen, inklusive insbesondere der Festlegung der technischen und administrativen Schutz- und Überwachungsmassnahmen, Dosisabschätzung, Festlegung von Dosiszielen und spezifischen Interventionswerten sowie Erstellung tätigkeitsbezogener Weisungen	x	x	–
Für einfache Tätigkeiten die technischen und administrativen Schutz- und Überwachungsmassnahmen unter Berücksichtigung des Optimierungsprinzips festlegen	x	x	x
Einteilung des Personals und der Besucher der Expositions-kategorie (nicht beruflich, beruflich A/B)	x	x	–
Die Administration der beruflich strahlenexponierten Personen organisieren und die individuelle Dosimetrie aller betroffenen Personen sicherstellen	x	x	x
Die Korrespondenz mit den zuständigen Behörden sicherstellen, insbesondere die Freigabe-, Melde- und Berichtserstattungspflichten zu Händen des ENSI wahrnehmen	x	x	–
Sich im Kontrollbereich strahlenschutzkonform verhalten, tätigkeits-spezifische Schutz- und Überwachungsmassnahmen vorbereiten, Schutzmittel korrekt anwenden, Weisungen einhalten	x	x	x
Radioaktive Quellen gesetzeskonform handhaben und lagern	x	x	x
Den gesetzeskonformen Betrieb von Anlagen zur Erzeugung ionisierender Strahlung sicherstellen	x	x	x



from Learning Objectives to Syllabus

Example from the Swiss
RP-Education-and-Training-Ordinance

RP-Expert

RP-Technician

RP-Controller

Tabella 2

Ausbildungsinhalte zur Erlangung der Sachkunde nach Artikel 16 StSV oder des Sachverständigen nach Artikel 18 StSV für Personen aus den **Bereichen Kernanlagen und Paul Scherrer Institut.**

Berufsgruppen	9.1	9.2	9.3
Empfohlene Gesamtstundenzahl ohne Anteil der Ausbildung am Arbeits-/Praktikumsplatz	550	350	150
Gesetzliche Grundlagen	1	2	3
Atomgesetz, Atomverordnung	X	X	X
Strahlenschutzgesetz/-verordnung	X	X	X
Transportvorschriften (SDR/ADR)	X	X	X
Richtlinien, Reglemente, Empfehlungen, Normen, Merkblätter und internationale Empfehlungen (ICRP, IAEA)	X	X	X
Aufgaben und Pflichten des Sachverständigen			3
Rechtstellung			X
Interne Weisungen			X
Strahlenschutz – Information, Aus- und Fortbildung			X
Überwachung beruflich strahlenexponierter Personen			X
Vorgehen bei Störfällen			X
Aufzeichnung, Buchführung, Meldewesen			X
Wartung			X
Strahlenwechselwirkungen	1	2	3
Aufbau der Atome/Nuklidkarte	X	X	X
Radioaktive Zerfälle und Strahlenarten	X	X	X



ET in Switzerland for RPE & RPO and its recognition

The ET of RPE, RP technician and RP controllers comprises

- **precondition** as educational requirements and vocational experience
- education and training **courses**, which are a mixture of
 - theoretical lessons (given by well experienced RPE),
 - table-top-exercises,
 - practical exercises in laboratory or in RCA,
 - projects oneself or in a small group (example ALARA plannings)
 - and written, oral and practical examinations

they are recognised by ENSI

- **on the job training**
- participation in **emergency response exercises**
- periodical **continuing training** (ex.: participation ISOE-Symposia)



Lessons Learned in the sight of Switzerland



The requirements on the competences of Swiss **RPE** are comparable with the most other countries

except the necessary experience (on the job) is short in comparison with others

- *because there are more than one RPE per NPP (at least 4) the averaged experience duration over all RPE is sufficient*
- *And the function of the head RPM is filled mostly by an RPE with a multiyear experience*

We decided to keep the minimal experience periode ½ year in RP

The requirements on ET for **exposed workers** who are handling with radioactive materials are imprecisely in comparison with other countries

The learning objectives and the training content of the course have been checked and partially improved



Future of ET in RP in NPP in EU



Beside of EU directive the **ENETRAP** developed several documents including guidance about the ET of RPE and RPO (**non-specific on nuclear or other applications**)

HERCA (Heads of Radiological Protection Competent Authorities) decided an mutual recognition system is not important (HERCA will not aspire after an harmonized ET system)

but to produce exemplary guidance how to improve the national legislations about ET including recognition procedures for RPE and RPO on the basis of ENETRAP results as well as the good practices in the national systems (**application specific consequently also for NPP**)

HERCA WG ET will start with the work 2017:

as a member of this WG

I will keep in contact to all ISOE members responsible about ET and will introduce our knowledge and experience to the guidance



Merci, für`s Zuelose

thank you, for your attention



New Questions arises during RBM



- How to exam and recognise competences like **safety culture, behaviour, attitude, leading qualifications, communication readiness?**
- How to establish and improve education and training programs for RP-Manager for “**small**” **countries?**
- How does the NPP-organisation, the responsibilities and tasks in RP and the necessary competences will change regarding the turn from normal operation to **decommissioning?**

Output of Regulatory Body Meeting



a **report** was written - but not yet finished - containing

- **the status and content of**
 - national legal basis
 - regulatory guidelines as well as
 - recommendations of association
- **overview of similarities**
- **specialities, good practices and remarkable ideas**

This report would be very interesting for those organisations, which are developing guidance on ET for the future (ENETRAP and HERCA)