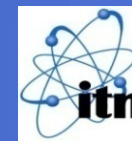


ETRAP Lisbon 2009

Professional Qualification in Radiological Protection: Update on the Portuguese Needs

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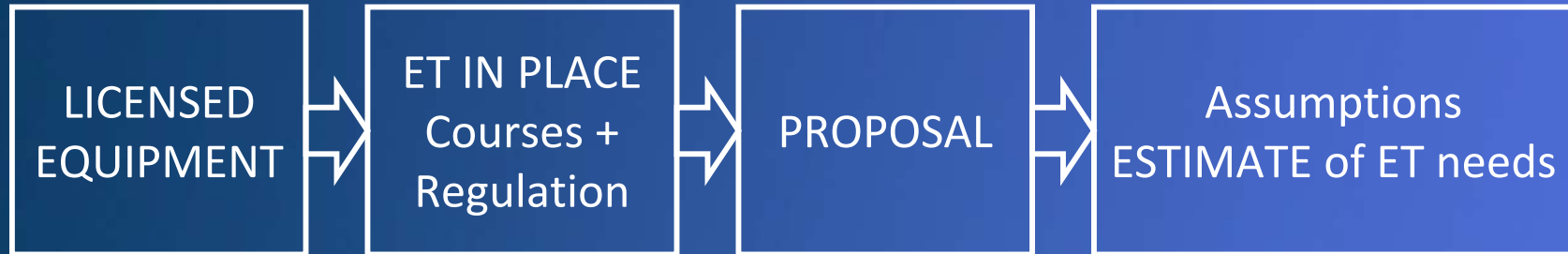


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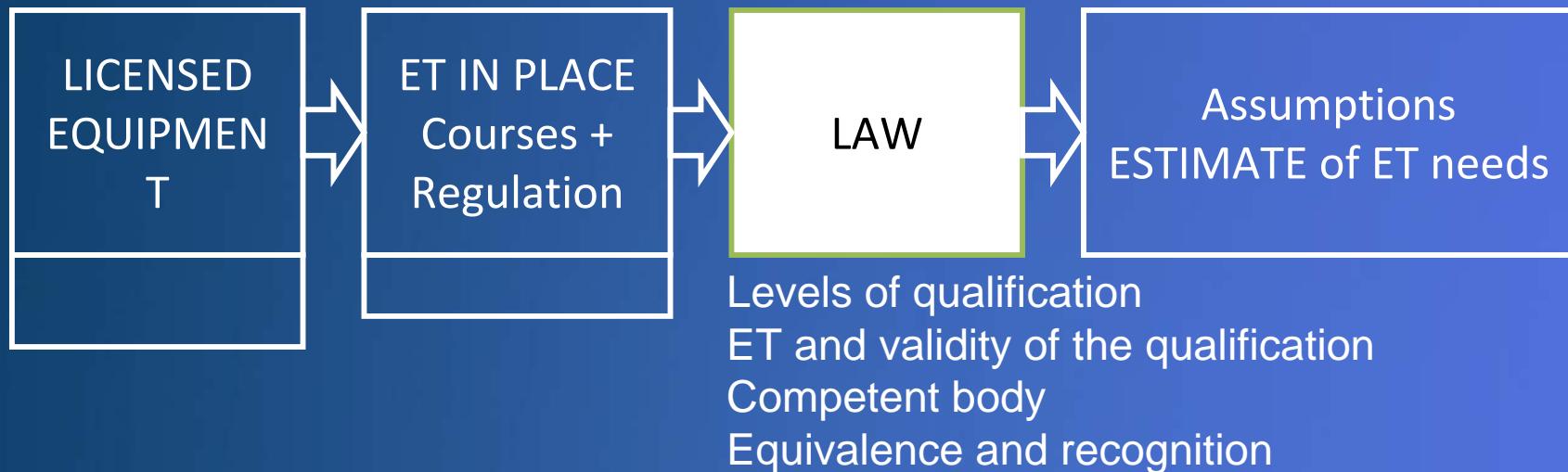


2009 versus 2005 (outline)

Brussels, 2005



Lisbon, 2009



Licensed Equipment

Data from Oct 2009

Equipment	Total
	2009
CT scanner	249
Veterinary X-ray	202
Dental X-ray	1137
Conventional X-ray	383
Orthopantomograph	394
Nuclear Medicine	32
Mammography	318
Bone densitometry	290
Brachytherapy	41
Ext. radiotherapy	38
Industry	829
Radioisotope lab.	88
Heavy ions cyclotron	2

No NPP

The territorial distribution is very similar to that of 2005

and can be easily correlated with the population density map of the country

There is a large concentration in the north and the coast, especially near Lisbon and Oporto, the southern and in-land regions have a much lower equipment (and population) density



Present- ET Legal Requirements

Health sector

legal framework imposing ET for a sub-set of the professionals involved

Industry and Research sectors

no legal framework imposing ET

Present: ET

No basic level university degrees in RP

Pre-Bologna Master course on RPS: IST in collaboration with ITN (*UPSR*)

2 Post – Graduation courses (2 semesters, 54 ECTS): IST + ITN (*UPSR*)

ET programmes (including on-the-job training) for the higher educated professionals (doctors, physicists and technologists) working with radiations on the **health sector**

1 day to 1 week courses regularly available for professionals dealing with radiation:

Civil Protection officials, Army personnel, Firemen, Technical operators of nuclear gauges, Radiologists, Health technicians ...

ET programmes carried out by various institutions to train their staff, and topics in RP are regularly included in various courses

There are no common approved and recognized ET programmes so the existing ones vary from institution to institution

Recent legal framework

Introduces in the Portuguese law, **3 different levels of qualification** of RP professionals (Qualified Expert, Qualified Technician, Operator)

For each of the 3 qualification levels defines:

Duties

Training duration and basic syllabus including pre-qualification to access training

Conditions for the renewal of certificates

Identifies the **competent authority** for the recognition of the competence of training entities and for issuing qualification certificates and elaborates on competent ET entities;

Addresses the **recognition of professional qualification** of professionals, *including those coming from other EU countries*

Legal framework - **levels of qualification**

The QE advises the employer

- provides comprehensive, professional advice on a wide range of radiation protection matters.
- establishes the radiation protection and safety programme in accordance with the relevant national requirements. He/her is expected to supervise radiation protection and safety within a facility.
- where appropriate, and within the frame of RP, coordinate the activities of the QTs working at the same facility (institution)

The QT – practice oriented

- The primary function of the QT is to guarantee the application of the relevant legislative requirements and ensure that the work is carried out safely in compliance with the established RP programme.
- The specific duties of the QT will somehow depend on the nature of the practice

The OT

Legal framework - ET

	QE LEVEL 1	QT LEVEL 2	OT LEVEL 3
Background required to access the ET level	<p>University degree in Physics; Technological Physics; Physical Engineering or Biomedical Engineering</p> <p>University degree in other areas through CV analysis</p>	Those mentioned for LEVEL 1 plus : Chemistry; Engineering; Medicine; Dental Medicine or Veterinarian Medicine	High school:
Duration	300 h in class (50% practical) + (on-the-job training – 6 months)	100 h in class (50% practical)	12 hours
Programme	IAEA and EU syllabus (apart from the training, there is no distinction between the ET programme of a health or a industry QE or QT)		Fitting the working environment
Evaluation	Final exam + analysis of a detailed report produced during the 6 months on-the-job training	Final exam	

Legal framework - **competent authority**

The General Directorate of Health (DGS) (under the Health Ministry) is the **competent body**:



1. To **recognize the scientific and technical competence** of the ET entities.
2. To **approve specific ET programmes**
3. To **certify the professional qualification** of professionals

BUT

ITN and the institutions of higher education are recognized as competent ET entities by the law

All ET programmes have to be approved by the DGS, even if they are proposed by a competent ET entity

Legal framework - **validity of certificates**

Once approved in the ET course, the candidate gets a certificate of professional qualification

The certificate is **valid for a 3 year period** after which it needs renewal

*For that the professional has to deliver a **detailed report** of his 3 year activity.*

No specific mention to refreshment courses , except that the candidate seeking for renewal should include proof of all those attended.

Legal framework - **equivalence schemes**

Professionals already in activity can apply for the certificate of professional qualification

However, the certificate will be automatically issued if the applicant is a **medical physicist** in activity

For all other cases, issuing of the certificate depends on a positive **evaluation of the curriculum of the candidate**, provided the following pre-requisites are fulfilled

	QE Level	QT Level
Education	University Degree in Physics; Physical Engineering, Technological Physics; Technological Chemistry or Biomedical Engineering	University Degree in Physics; Chemistry; Engineering; Medicine or other Health Sciences Degree Or Bach in the same subjects
Experience <i>performing technical duties in the area</i>	5 years	3 years

Professionals coming from a foreign EU country, can apply for equivalence provided his training was carried out at “**a recognized entity**”

Legal framework - notes

although some aspects of the law that could have been done differently

it was a major breakthrough

but effectiveness is dependent on:

- ❑ strengthening the team dealing with these matters at the DGS
- ❑ publication of complementary **legislation**:
 - **imposing that all operation** of equipment that uses ionizing radiation sources **must have the supervision of certified qualified professionals is published**
 - setting up an effective control scheme

Licensed Equipment (2005 versus 2009)

Equipment	Alentejo		Algarve		Lisboa e vale do Tejo		Centro		Norte		Madeira e Açores		Total
	2005	2009	2005	2009	2005	2009	2005	2009	2005	2009	2005	2009	2009
CT scanner	10	10	9	12	51	83	15	28	55	111	NA	5	249
Veterinary X-ray	6	10	0	15	24	64	6	21	45	91	NA	1	202
Dental X-ray	30	30	37	42	419	490	91	93	317	377	NA	105	1137
Conventional X-ray	19	4	26	47	189	126	58	47	140	168	NA	18	383
Orthopantomograph	6	9	6	21	87	148	30	48	79	146	NA	22	394
Nuclear Medicine	0	0	1	1	9	13	7	6	14	11	NA	1	32
Mammography	14	11	11	14	84	107	23	39	92	140	NA	7	318
Bone densitometry	10	11	6	13	76	106	25	41	68	116	NA	3	290
Brachytherapy	0	2	0	1	14	24	4	4	8	7	NA	3	41
Ext. radiotherapy	0	2	1	1	11	20	3	3	3	9	NA	3	38
Industry	6	48	9	47	181	346	66	94	103	256	NA	38	829
Radioisotope lab.	2	2	2	3	22	48	9	7	8	25	NA	3	88
Heavy ions cyclotron								1		1			2

Estimate of ET – assumptions

to make an estimate of the personnel needs in the country:

the number of licensed equipment was first multiplied by a factor of 1.2

facilities are still undergoing licensing;

new facilities are scheduled to be installed;

some licenses have expired and are seeking renewal.

adapted from published tables for the ratios physicist/equipment

the reference personnel/equipment ratios presented in the table were used to make a rough estimate of the personnel needs for each type of equipment.

Equipment	QE	QT
Linear accelerator	0.37	2
Conventional X-ray	0.03	0,2
Brachytherapy	0.18	1
Gamma Camera	0.2	2

Estimate of ET – assumptions

The following additional assumptions were made:

CT scanners, bone densitometers and veterinary x-ray units:
same personnel needs as conventional x-ray units

dental x-ray and orthopantomograph units:
1 QE/QT would be able to monitor 40 facilities

radioisotope laboratories:
have the same personnel needs as those of nuclear medicine units

industrial applications:
1 QE could handle 20 facilities of high radiological risk, and 1 QE
could supervise 40 facilities of low radiological risk

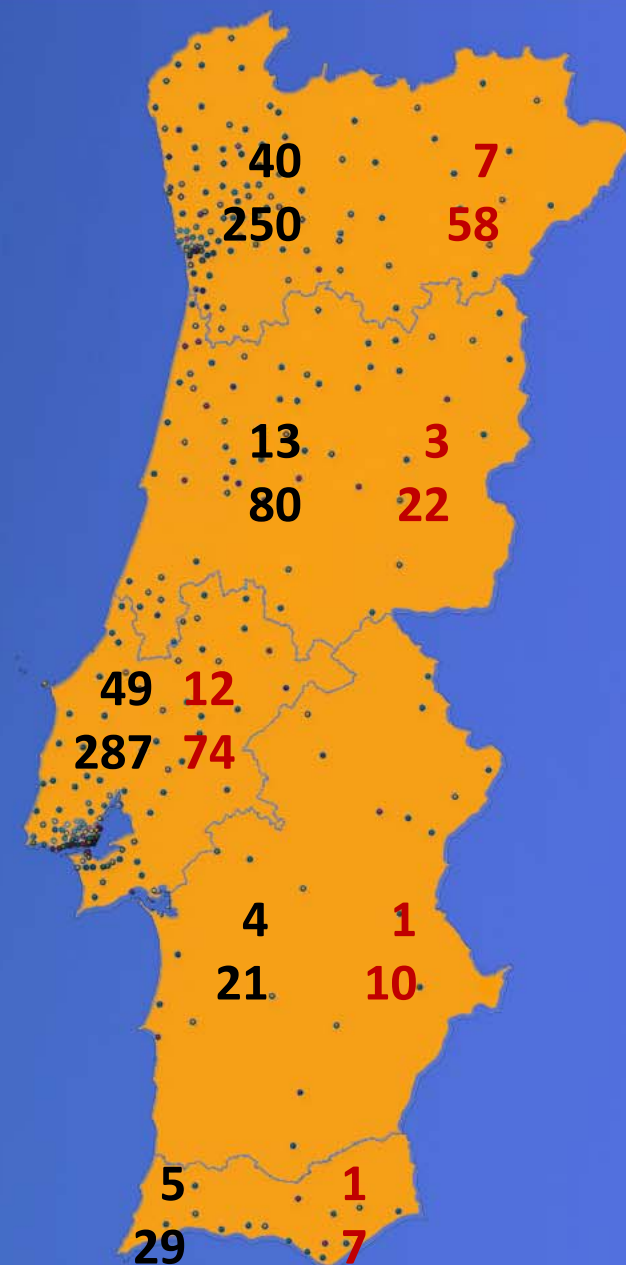
numbers of QT's were adjusted taking into consideration the
number of equipment per installation.

Estimate of ET

Estimated number of qualified experts and technicians required in the country.

Region	QE (Med.)	QT (Med.)	QE (Ind.)	QT (Ind.)
Alentejo	4	21	1	10
Algarve	5	29	1	7
LVT	49	287	12	74
Centro	13	80	3	22
Norte	40	250	7	58
Total	111	667	24	178

QE	QE
QT	QT
Med.	Ind.



Estimate of ET

Region	QE (Med.)	QT (Med.)	QE (Ind.)	QT (Ind.)
Alentejo	4	21	1	10
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Total	111	667	24	178

these numbers are round numbers that give a hint of the ET training effort necessary to meet the legal requirements

In the medical field, there are already in activity many very qualified professionals whose qualification will be recognized through the equivalence scheme

This is however not the case in industrial applications of ionizing radiation

All together the training effort required will be considerable

In brief

Essential aspects of recently published legislation addressing ET in radiation protection were outlined

An estimate of the number of higher qualification professionals required in the country was made, giving a rough idea of the training effort required

We stress that the real numbers and the true impact on ET can only be known and felt upon publication of legislation making mandatory that all installations should hire qualified professionals in RP and that it is necessary to strengthen the DGS team that is in charge of dealing with these matters

THANK YOU FOR YOUR ATTENTION