

**PIANOLIB Workshop**  
**Gothenburg 15-16 September 2011**

**IAEA EXPERIENCE IN ISO 17025  
ACCREDITATION OF WHOLE BODY  
COUNTER AS PART OF THE RADIATION  
MONITORING AND PROTECTION  
SERVICES.**

**Rodolfo Cruz Suárez**

**Radiation Safety and Monitoring Section**

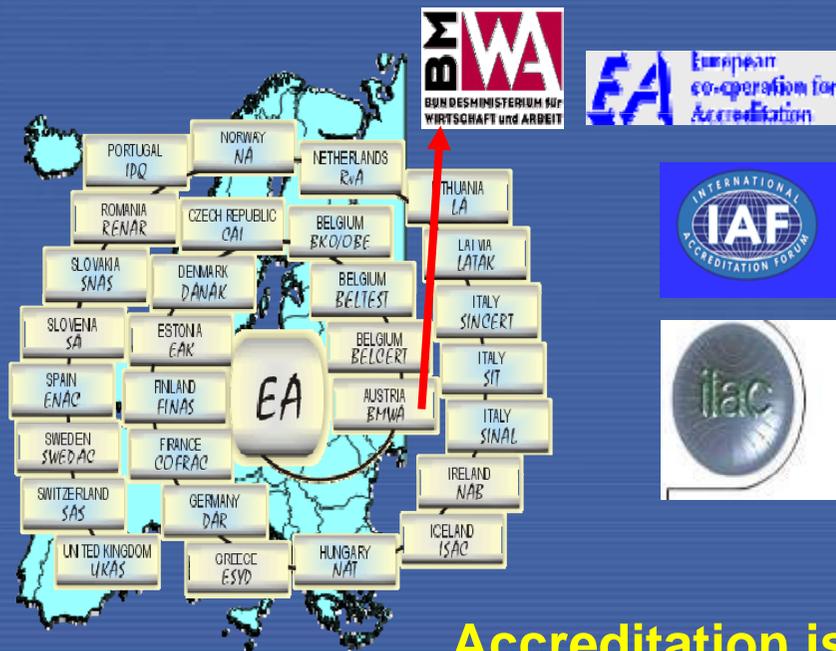


**IAEA**

International Atomic Energy Agency

# Accreditation & benefit

The formal recognition by a third party, after an extensive audit, that an organisation is competent in performing measurements, tests, inspections or calibrations according to well accepted routines (standards) producing **correct results**.



Results from accredited laboratories are traceable to the International System of Units (SI) and through this have additional impact in all Member States.



Accreditation is recognized globally



# IAEA standards for QM

**IAEA Safety Standards**  
for protecting people and the environment

The Management System  
for Facilities and Activities

Safety Requirements  
No. GS-R-3



**IAEA Safety Standards**  
for protecting people and the environment

Application of  
the Management System  
for Facilities and Activities

Safety Guide  
No. GS-G-3.1



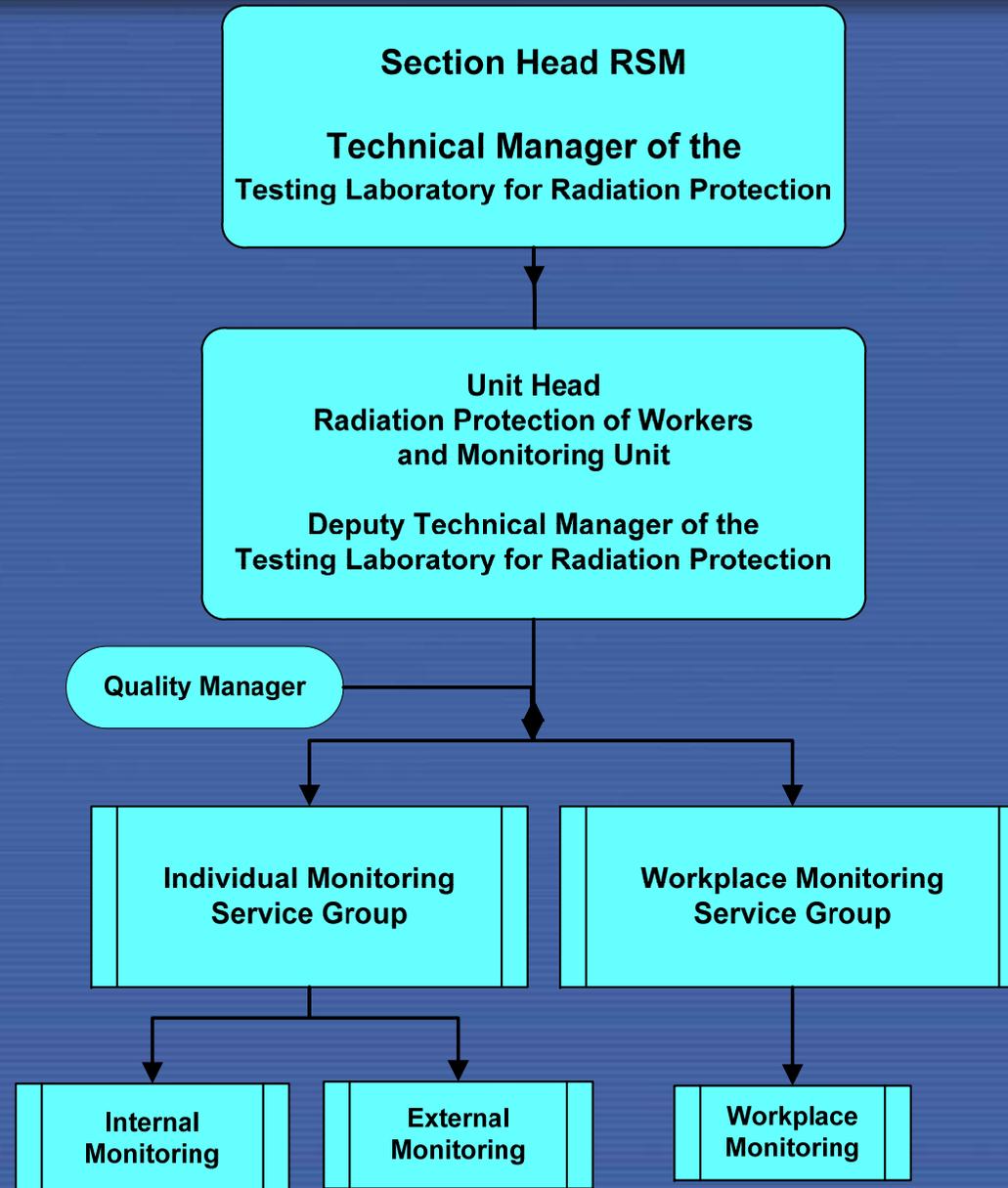
**IAEA Safety Standards**  
for protecting people and the environment

The Management System  
for Technical Services  
in Radiation Safety

Safety Guide  
No. GS-G-3.2

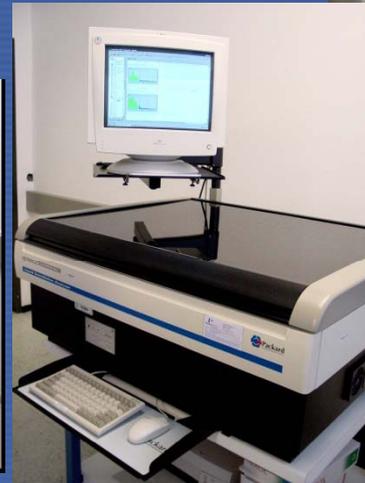


# Testing laboratory - (ID 251)

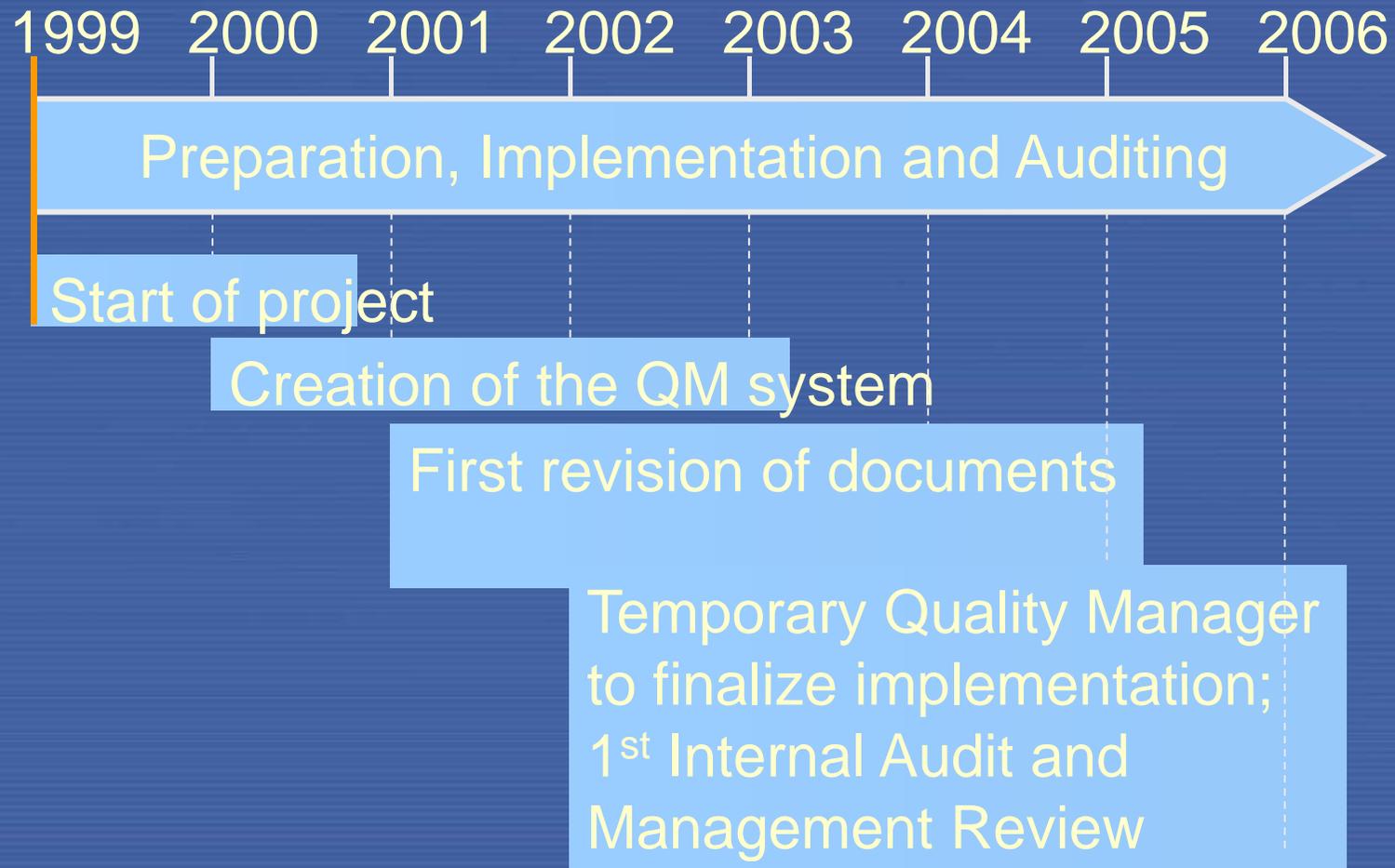




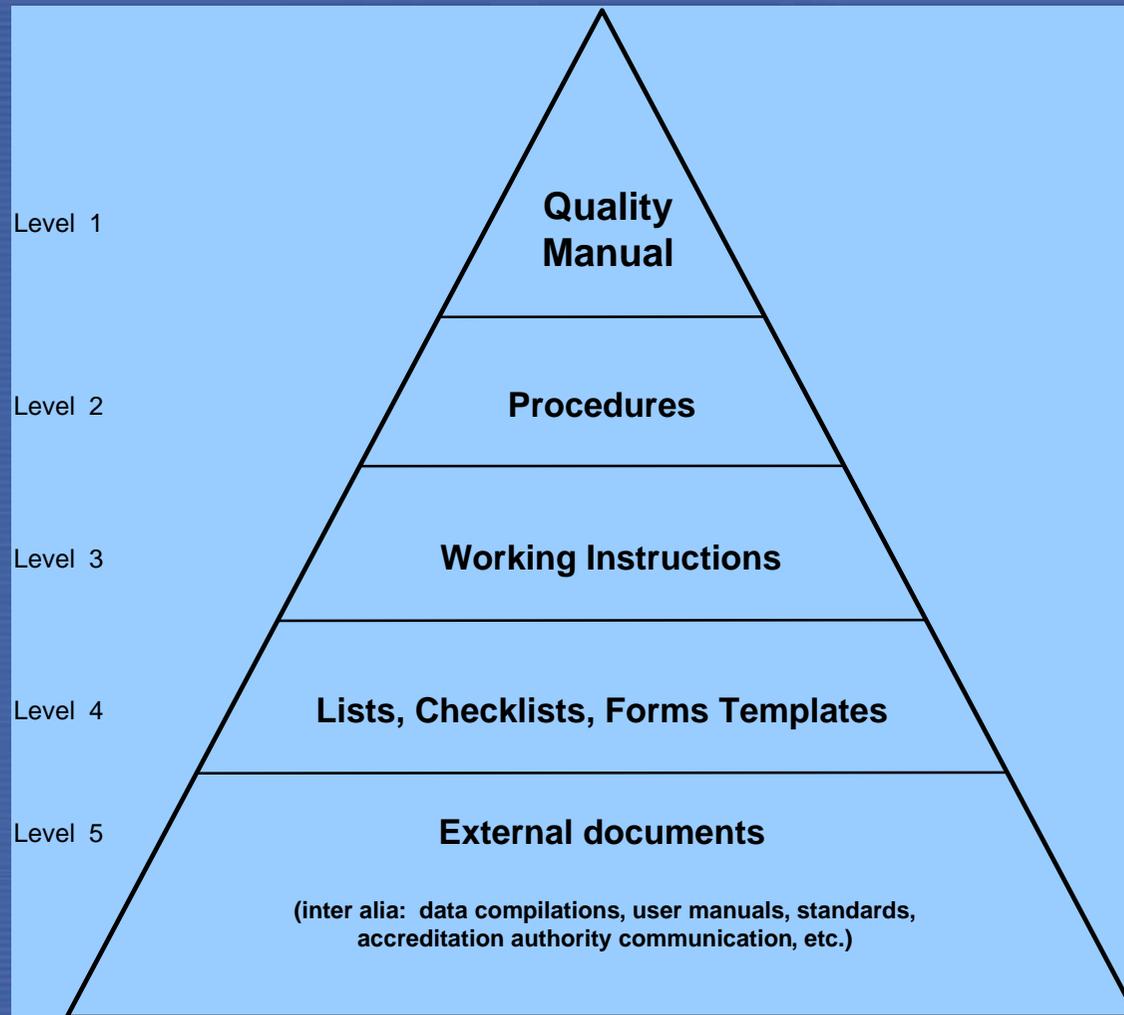
# Methods



# Accreditation: The project



# Quality documentation



Governing document contains top management commitment to quality.

Describe processes relevant to all staff members.

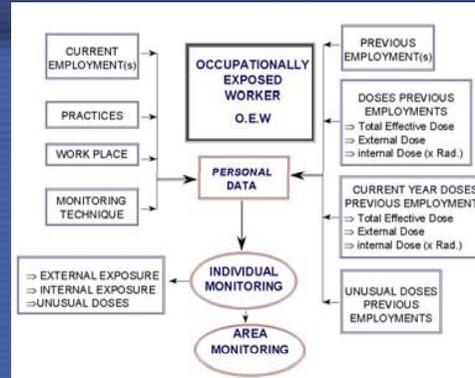
Describe specific processes relevant to few staff members.

Record performed activities.

Input data governing activities of all staff members.

# New IT tools developed

- Dose management system
- Several web applications to facilitate the customers' actions in requesting services;
- Database for equipment and software



This screenshot shows a web application window titled "Classifiers of Individual Monitoring Techniques (SERVICES that carries out the Laboratory)". It contains several configuration options:

- Code of the Service:** 8
- Service name:** Externity FR
- Type of Monitoring:** Radio buttons for Routine, Spatial, and Task Specific.
- Type of Exposure:** Radio buttons for External Exposure and Internal Exposure.
- Frequency Monitoring:** A dropdown menu set to "Monthly".
- Techniques:** A dropdown menu set to "TLD".
- Types of Radiation:** Checkboxes for Photons all energies, Photons below 250 keV, Photons above 250 keV, Beta radiation, Thermal neutrons, and Fast neutrons.
- Quantity Evaluated:** Checkboxes for Personal Dose Equivalent Hp(10), Personal Dose Equivalent Hp(0.07), and Personal Dose Equivalent Hp(3).
- Location of the dosimeter on the body:** A dropdown menu set to "Extremity (finger)".

This screenshot shows a web browser displaying the "Personal Management Information System". The page contains a list of links for various services:

- Customer Information on Individual Monitoring Service Group
- My radiation exposure data
- Issue a request for Radiation Protection and Monitoring (Branch) [more info] [application help]
- Issue a request for Initiating Personal Monitoring (more info) [application help]
- Get an evaluation requests for personal Dosimeter Monitoring by staff (Can be accessed by Division Directors, Section Heads, Persons in Charge, and Administrative Officers/Technicians for their areas. Can also be accessed, for all by IRRS/CRSU Technicians and Laboratory Assistants, and Medical Clerks)
- Overview of exposure data and monitoring due dates by staff (Can be accessed by Division Directors, Section Leads and Persons in Charge for areas)
- Service Desk Statistics

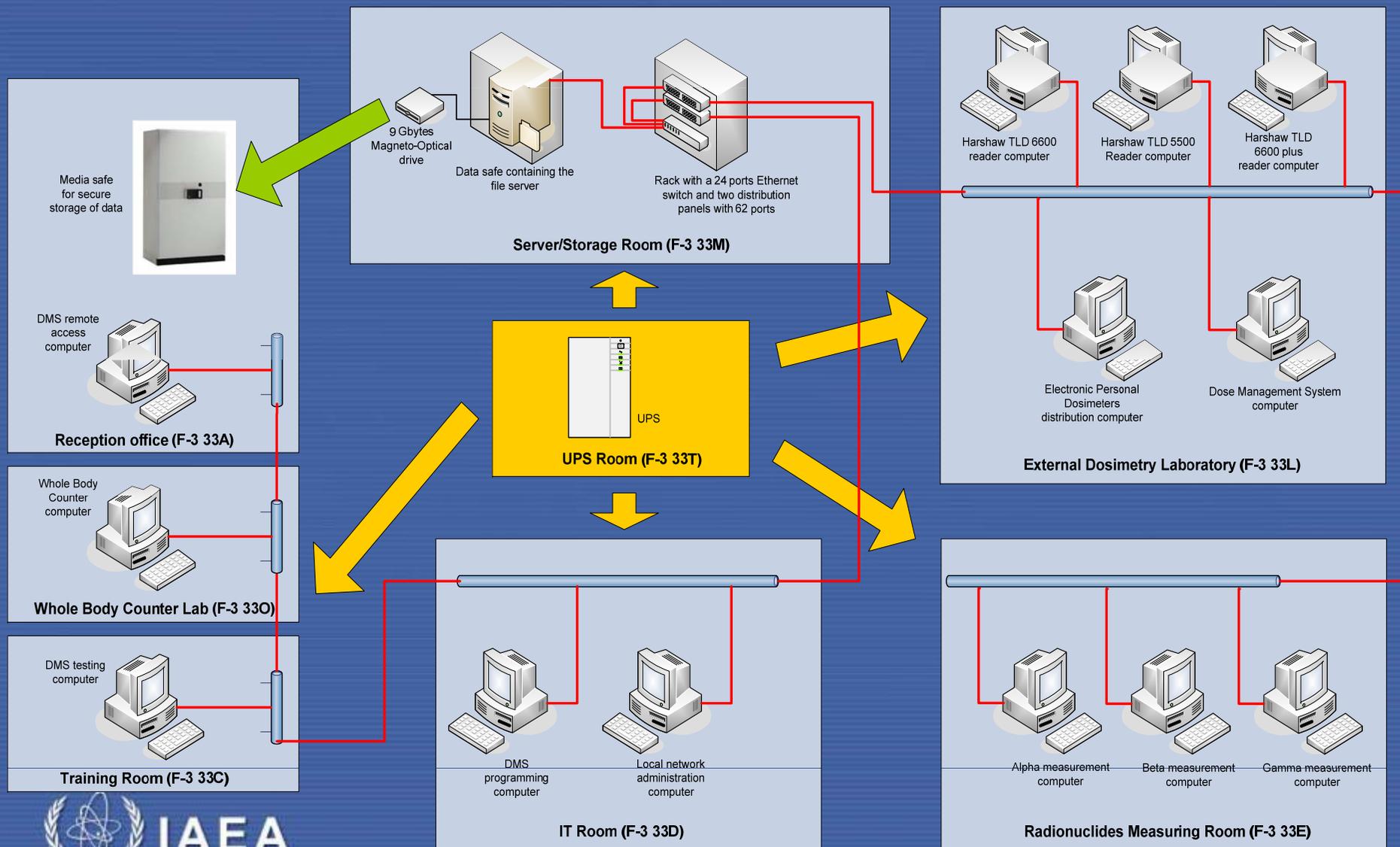
This screenshot shows a web application window titled "Mission 02". It displays details for a specific mission, including:

- Mission Details:** Commissioning of Radiotherapy Equipment
- Duty Period:** 2006-07-14 to 2006-07-27
- Fund Availability:** \$7500.00
- Team Size:** 10
- Equipment:** 1
- Personnel:** 1 (Chang, Fath) (PROJECT TECHNICAL OFFICER)

This screenshot shows a web application window titled "Equipment Database" with a form for "Update Status for Equipment". The form includes fields for equipment ID, name, and status, and a table for tracking equipment updates.

ID	RMPS Inv No	Updated On	Next Cal. Due On	Efficiency	To Be Checked	Date	To Be
690	339	2006-12-04	2007-11-20	0	<input type="checkbox"/>		
562	339	2006-05-05	2006-09-12	0	<input type="checkbox"/>		
256	339			0	<input type="checkbox"/>		

# An independent server and local Network



# ACCREDITACION AUDIT

- 3 auditors & 3 days. Visit to all labs.
- All documents within QMS sent to accreditation body.
- 10 dosimeters sent to accreditation body for blind test.
- Staff and customer interviews.
- Real time methods observations .
- Verification of all types of records & reports.
- Simulation of intakes of radionuclides for dose calculation.

# ACCREDITACION AUDIT

- 14 non conformities!!!
- Few related to Management Requirements
- Few related to Workplace Monitoring
- Few related to Individual Monitoring :
  - Validation performed out of the method's scope declared. (Easy to correct by extending the scope)
  - No acceptance of calibration phantoms as reference material and therefore the WBC methods were not recognized as validated.

**3 months to solve the non-conformities !**

# WBC Move



1979- 2008





# WBC Services

1. Direct monitoring of fission products and actinides in the human body
2. Routine and ad hoc monitoring for IAEA staff more than 650 staff/year
3. Large range of radiation fields in nuclear fuel cycle facilities, research facilities medical and industrial applications covered as well as emergency response
4. Participation in international intercomparison exercises
5. Technical assistance to IAEA Member States in the field

# Phantoms available



# Traceability of the Phantoms!!!

BOMAB - HML (Canada) & NIST (USA) - 2000

Knee - UC & NIST (USA) - 2004

JAERI - JAERI (Japan)-IAEA TECDOC (SRM) -1998

Livermore - LLNL (USA) - 1982

## **A brief history:**

**In 1981, NBS and NBL entered into an Interagency Agreement that NBL would serve as a distribution center for many of the NBS special nuclear material SRM's.**

**In 1986, NBS approached NBL suggesting that the responsibility for special nuclear materials be fully transferred from NBS to NBL.**

**In 1987, DOE/NBL accepted the proposal and stated "...we will continue to support NBL in its expanded role as the federal governments certifying organization for nuclear materials.**

**New Brunswick Laboratory's Certified Reference Materials are essentially national standards -- DOE Office of Quality Assurance Programs !**



# Accreditation: Success



Recruitment of Quality Manager

2<sup>nd</sup> revision of documents;  
new organizational structure

2<sup>nd</sup> internal audit and  
management review

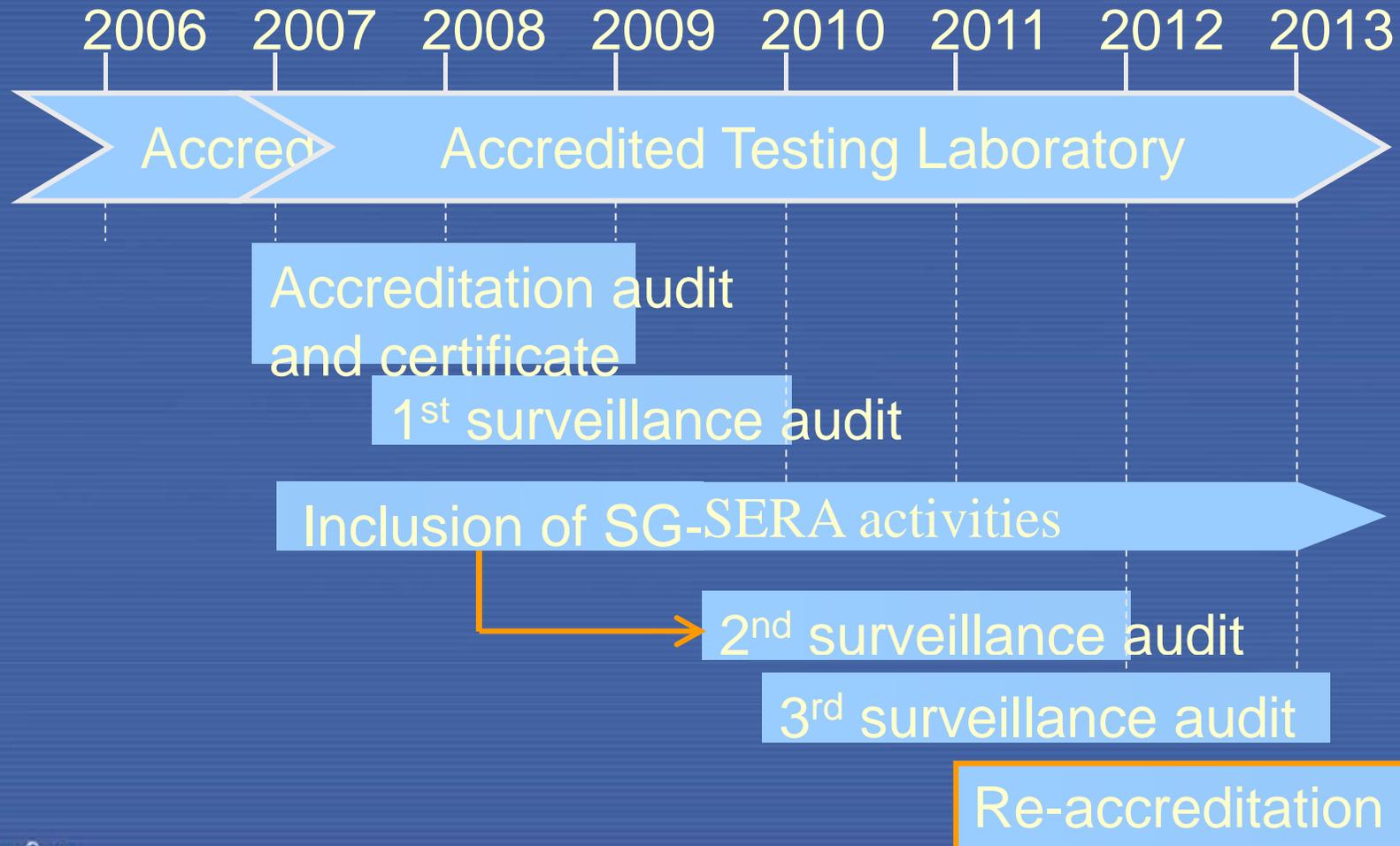
Accreditation application

Accreditation  
audit and  
certificate





# Accreditation: Moving on



# Interdepartmental Expansion

## NSRW

Radiation Safety and  
Monitoring Section

Radiation Protection  
of Workers and  
Monitoring Unit



## SGTS

Inspection  
Logistics  
Section

Equipment

Handling and



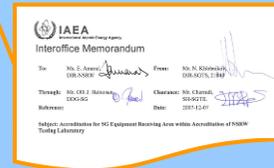
VIC, FM333



Seibersdorf

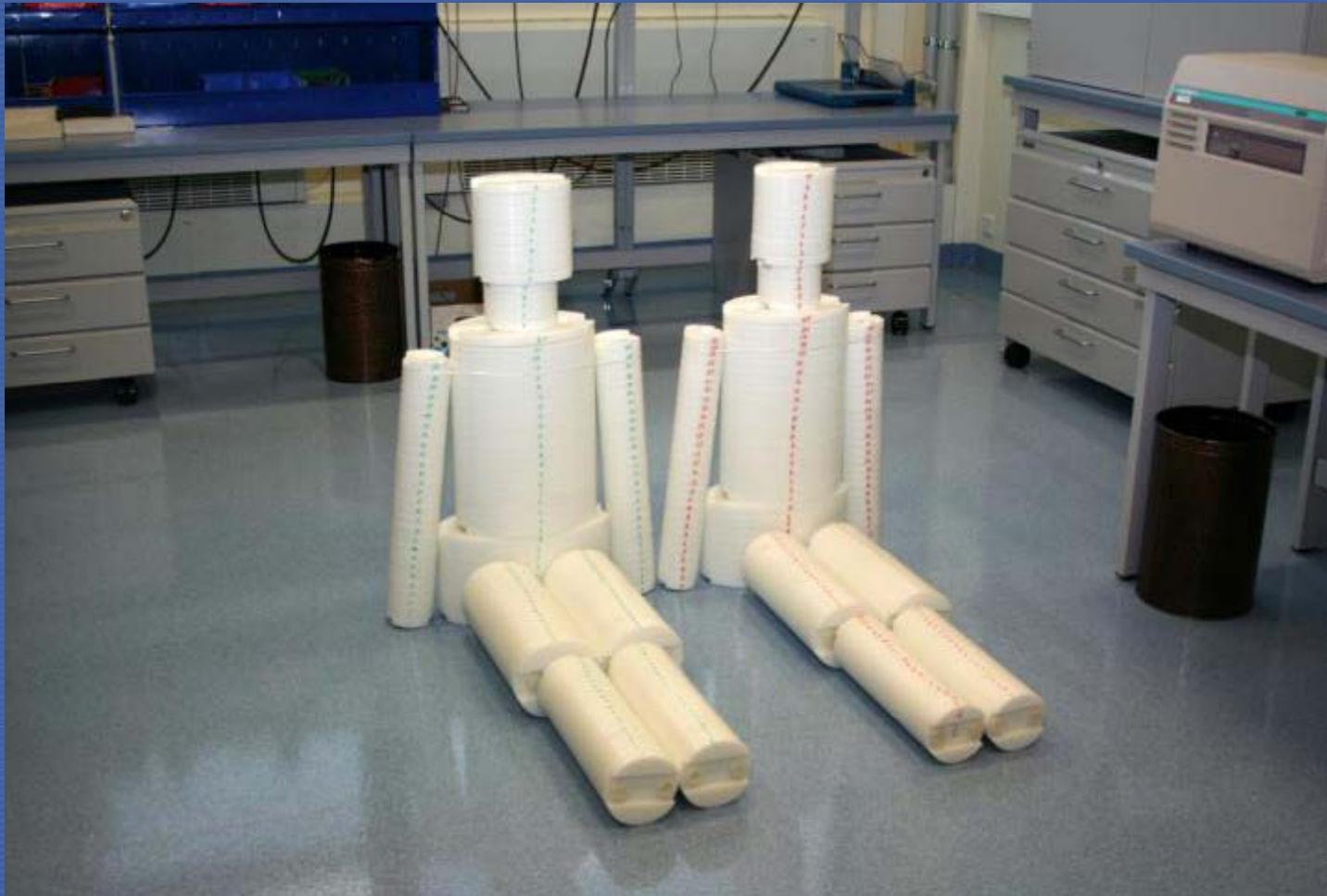


VIC, FM005



Accredited Testing  
Laboratory

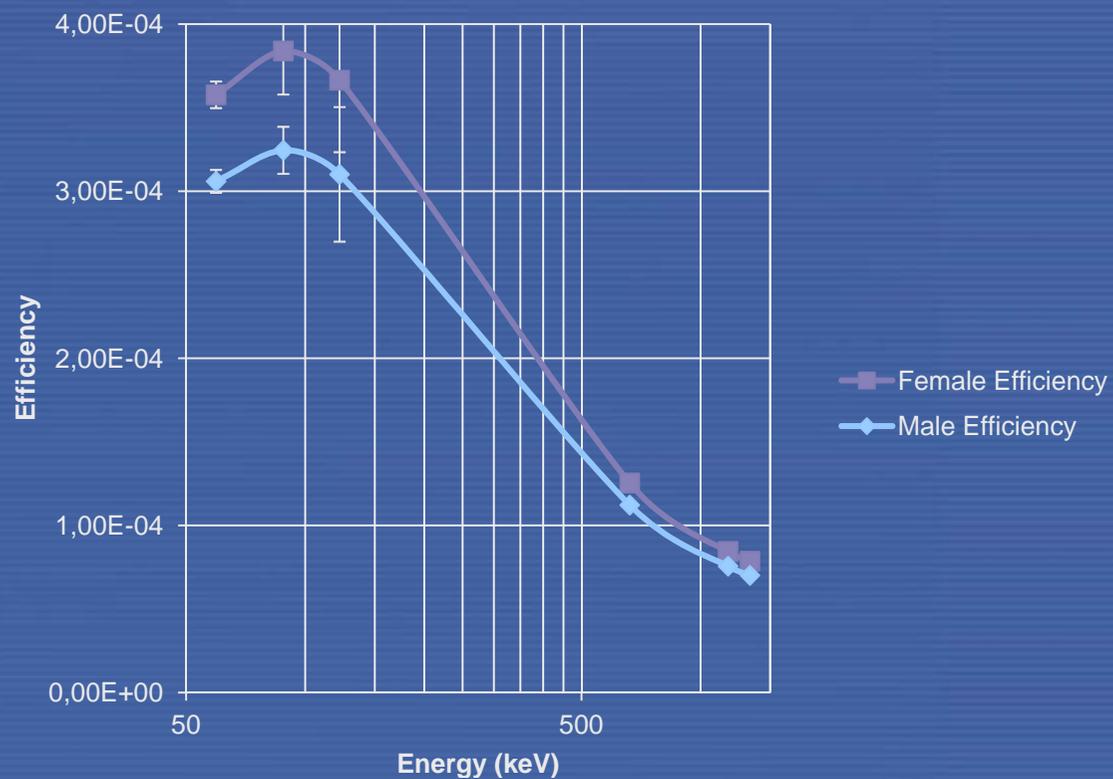
# New Development



# Male Sliced BOMAB



## Efficiency Curves



Section	Activity [Bq]			
	Am-241	Co-57	Cs-137	Co-60
Left calf	4.50E+02	9.65E+01	4.20E+02	4.84E+02
Right calf	4.62E+02	9.90E+01	4.30E+02	4.96E+02
Left thigh	7.15E+02	1.53E+02	6.66E+02	7.69E+02
Right thigh	7.94E+02	1.70E+02	7.40E+02	8.53E+02
Gut	1.17E+03	2.52E+02	1.09E+03	1.26E+03
Chest	2.04E+03	4.37E+02	1.90E+03	2.19E+03
Neck	1.28E+02	2.75E+01	1.19E+02	1.38E+02
Head	4.02E+02	8.62E+01	3.75E+02	4.33E+02
Left arm	4.06E+02	8.69E+01	3.78E+02	4.36E+02
Right arm	3.99E+02	8.55E+01	3.72E+02	4.29E+02
<b>Σ</b>	<b>6.97E+03</b>	<b>1.49E+03</b>	<b>6.49E+03</b>	<b>7.49E+03</b>
<b>σ</b>	<b>k=1</b>	<b>0.75%</b>	<b>0.70%</b>	<b>0.80%</b>

## Actions to be carried out by each group

- To explore and acquire newly published technical standards relevant to the method, eg, ISO, IEC, ICRP, ANSI, Austrian standards, etc...
- To assess impact of the new standards in the current accredited methods.
- To verify and confirm the method validation, including uncertainty budget, against the new standards.
- Identification of the resources needed for new validation, if needed. Validation plan.

## Actions to be carried out by each group

- To implement all previous internal audit findings, recommendation and identified improvement possibilities.
- Modification and **updating** of all procedures and working instruction reflecting previous actions above and new staffing situation.
- Preparation of documentation for **new method** developed and implemented in the testing lab.
- To prepare **information to the customer** with potential modifications in the services delivery.

## Actions to be carried out by the RSM & SG management

- To complete the **Service Agreements** with all Division/Departments.
- To update the **MoU** with SL(Austria) , HZM(Germany) and potential IRSN (France).
- To regularize **meeting with RPO and RSR** as a main to survey the quality of the services provided.
- To update the RSR authorization of Services.

**THANK YOU !**

<http://www-ns.iaea.org/home/rtws.asp>