

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.**

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Radiation Safety and Monitoring Section

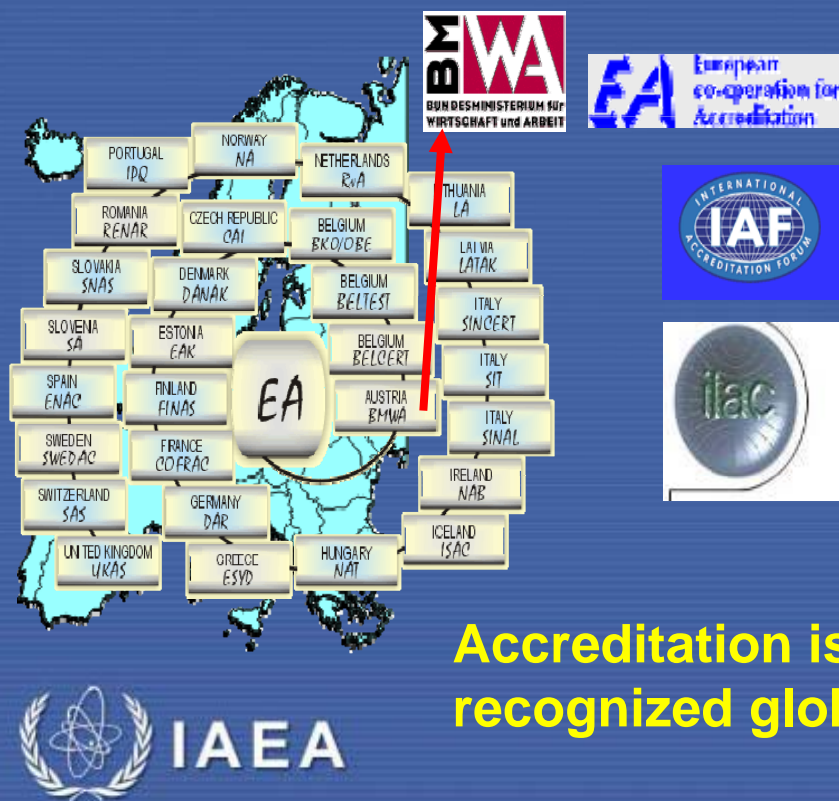


IAEA

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**.



Accreditation is recognized globally

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



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

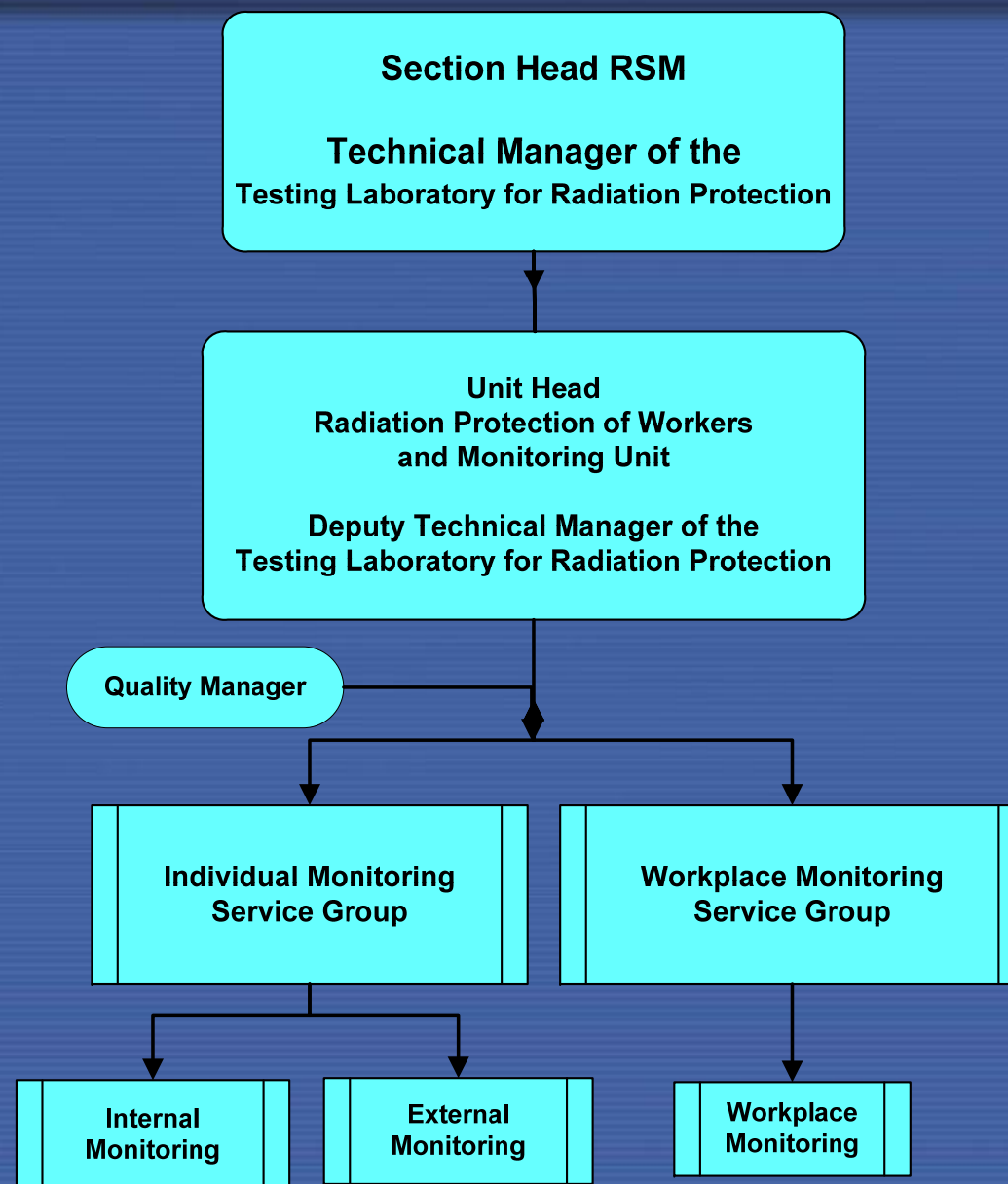
for protecting people and the environment

The Management System for Technical Services in Radiation Safety

Safety Guide
No. GS-G-3.2



Testing laboratory - (ID 251)



Assessment of occupational exposure

The following equation is used for assessment of occupational exposure and demonstration of compliance with dose limits:



$$E_t = H_p(10) + \sum_j e(g)_{j,ing} I_{j,ing} + \sum_j e(g)_{j,inh} I_{j,inh}$$

Where,

$H_p(10)$ is the personal dose equivalent,

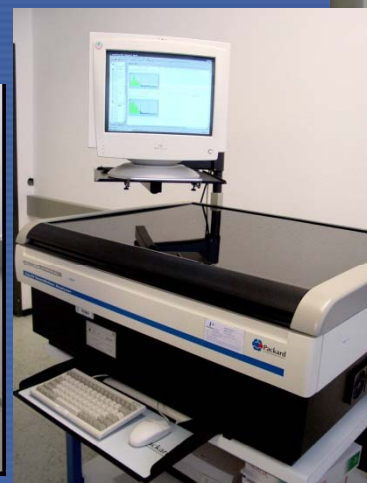
$e(g)_{j,ing}$ is the dose coefficient for ingestion,

$I_{j,ing}$ is the intake from ingestion,

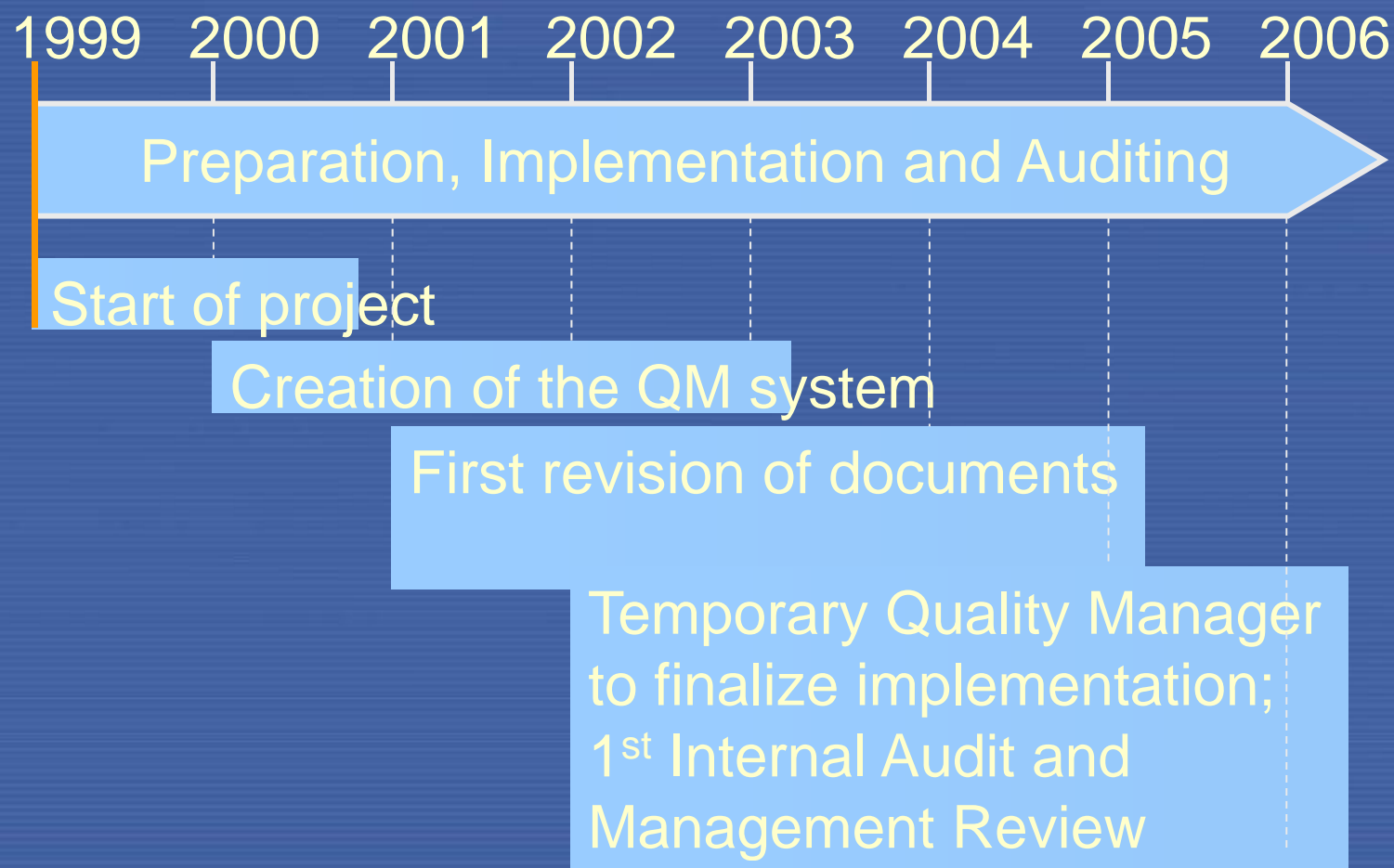
$e(g)_{j,inh}$ is the dose coefficient for inhalation, and

$I_{i,inh}$ is the intake from inhalation

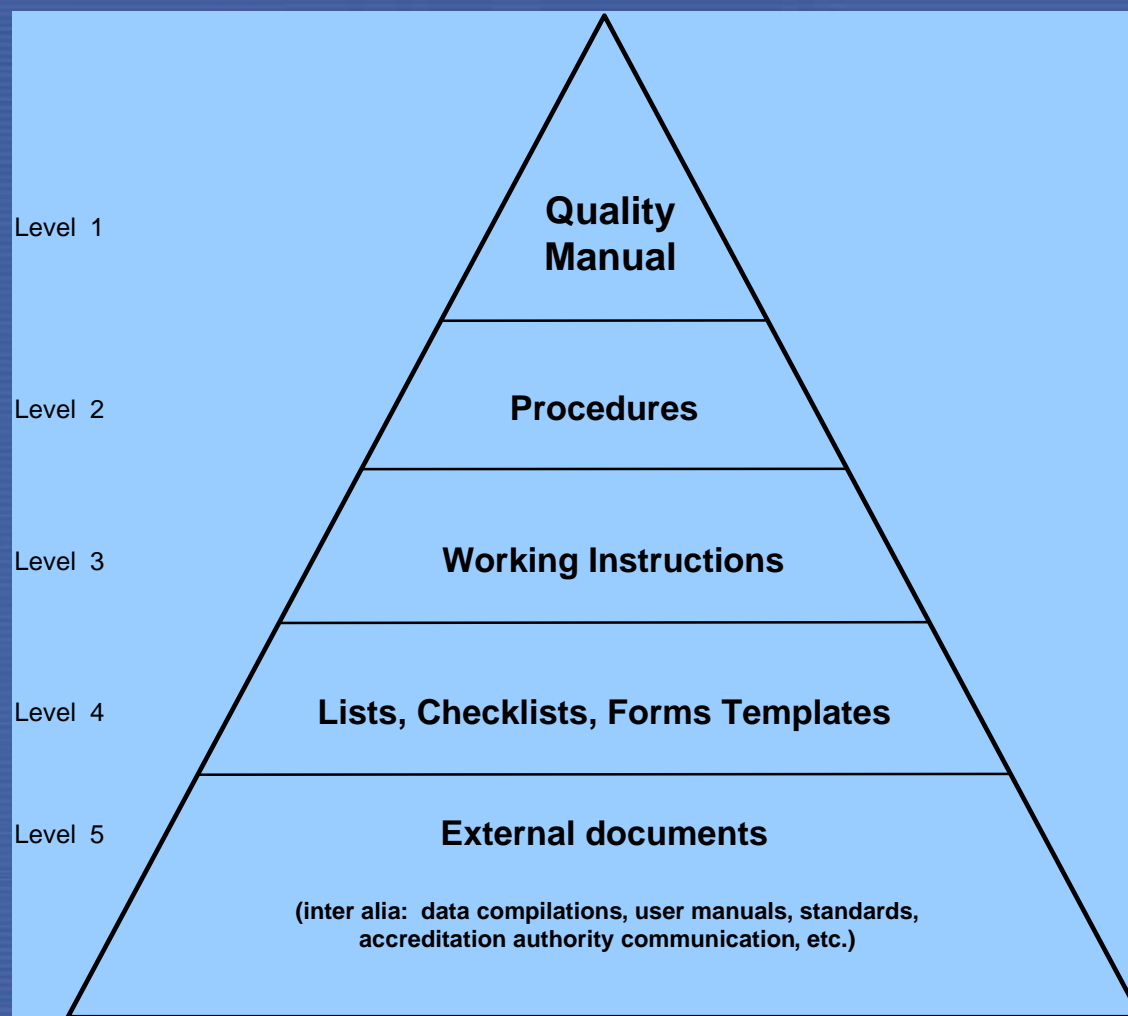
Methods



Accreditation: The project



Quality documentation



Governing document contains top management commitment to quality.

Describe processes relevant to all staff members.

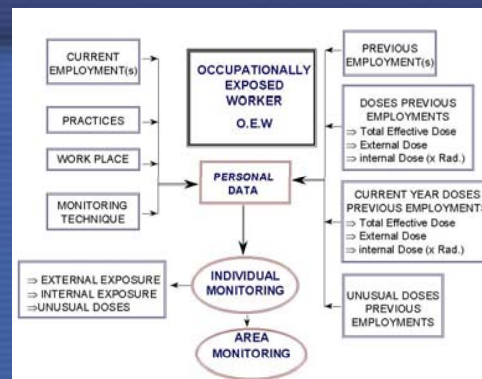
Describe specific processes relevant to few staff members.

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



Classifiers of Individual Monitoring Techniques (SERVICES that carries out the Laboratory)

Code of the Service: 0
Service name: Extremely FR

Type of Monitoring:
☒ Routine
☐ Special
☐ Task Specific

Type of Exposure:
☒ External Exposure
☐ Internal Exposure

Frequency Monitoring:
 Monthly

Techniques:
 TLD

Types of Radiation:
☒ Photons all energies
☐ Photons below 250 keV
☐ Photons above 250 keV
☒ Beta radiation
☐ Thermal neutrons
☐ Fast neutrons
☐ Alpha Emitters
☐ Beta Emitters
☐ Photon Emitters

Quantity Evaluated:
☒ Personal Dose Equivalent Hp(10)
☒ Personal Dose Equivalent Hp(0.07)
☐ Personal Dose Equivalent Hp(3)

Location of the dosimeter on the body:
 Extremity (finger)

OK Cancel

Personal Management Information System - Microsoft Internet Explorer provided by IAEA

References:

- Customer Information on Individual Monitoring Service Group
- ML Radiation Response Data
- Issue a request for Radiation Protection and Monitoring
Can be initiated by: staff member
(More info) [more info] [application help]
- Issue a request for Initiating Personnel Monitoring
Can be initiated by: Administrative Assistants/Officers, Division Directors, Staff and Persons in Charge
(More info) [application help]
- List of evaluated requests for individual Personnel 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/OSRP Technicians and Laboratory Assistants, and Medical Clerks
- Overview of exposure data and monitoring due dates by staff
Can be accessed by: Division Directors, Section Heads and Persons in Charge for areas
- Service Desk Statistics

ICPRINT - Microsoft Internet Explorer provided by IAEA

Mission 02: Commissioning of Radiotherapy Equipment

Mission Details: (Don't modify, please do not enter only text)

Duty Period: (excluding travel or working/working days) Preferred Start: 2006-07-18 End: 2006-07-27
 Number of working days: 10 Alternative Start:

Fund: Fund Availability Estimated Cost \$: 7500.00 Help: Project Status Summary

Fund Remarks:
 Team Size: 1
 Equipment: 1

Notes: 1 Radiotherapy
 subunit and the activity at the workplace:
 when calibration of linear accelerator and associated activities
 of Monitoring: TLD (7774)

Change: Radiotherapy TECHNICAL OFFICERS
 port required to complete commissioning of linear accelerator and assist with advice on appropriate quality control procedures.

Trusted site

Equipment Database

Update of Status for Equipment

Select the equipment number to be updated for Status

RMPS Inv. No.: 339
 Description: Beam Monitor
 CM 200

Updated On: 2006-02-22

To Be Checked: []
 Date: []
 To Be Repaired: []
 Date: []
 Repeat Location: []
 Contaminated: []
 Contains Action Taken: []

Removed IAEA Inv. []
 Removed RMPS Inv. []
 Removed On: []
 Sent To Max Remov. Inv. []
 Equip. Status Comments: []

Equip. Cal. Comments: []

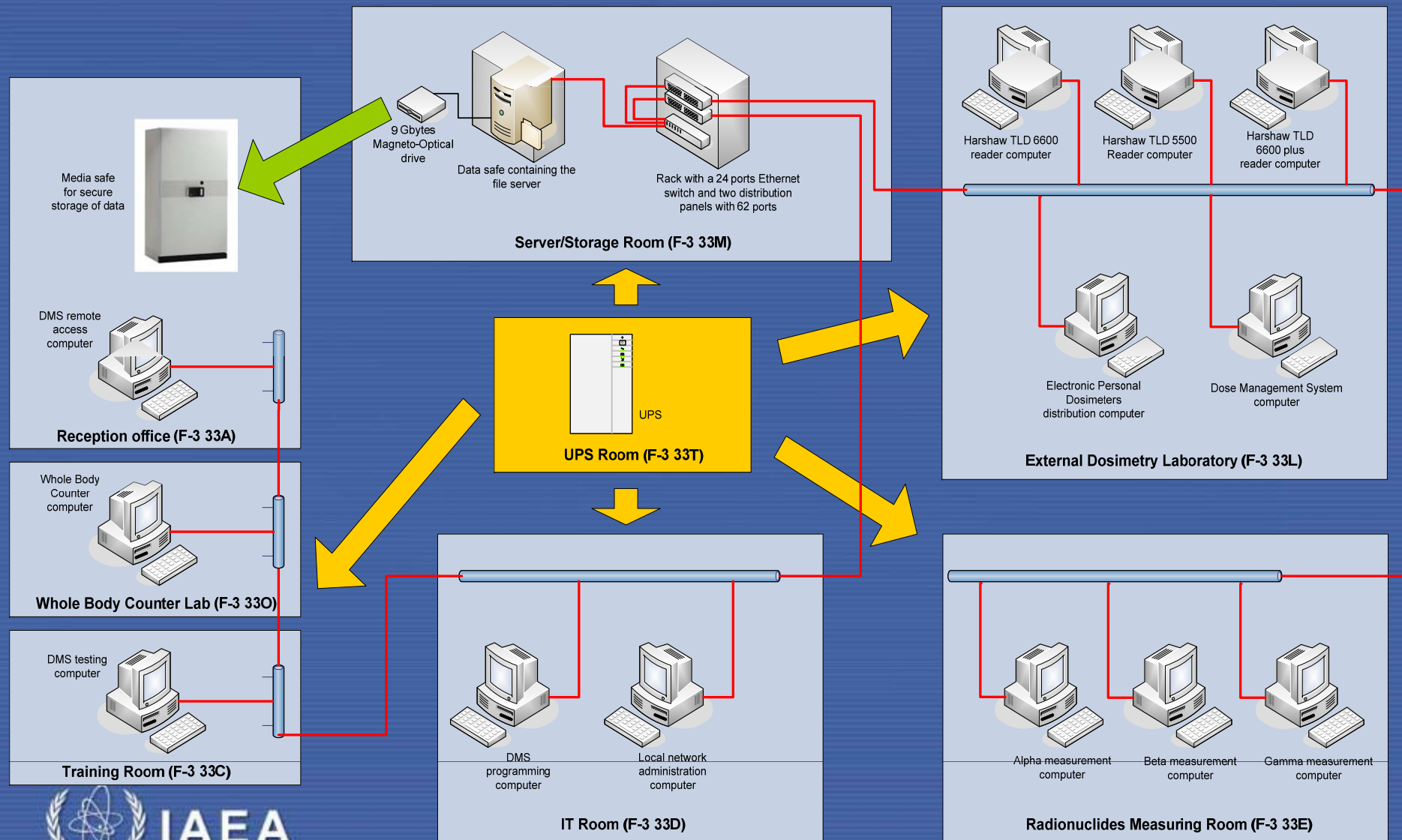
Efficiency: []

Label analysis made to the selected equipment: PRELIMINARY DOSE RESPONSE RESPONSE IN LA VENTANA: (More info) [application help]

ID	RMPS Inv. No.	Updated On	Next Cal. Due On	Efficiency	To Be Checked	Date	To Be
609	339	2006-12-04	2007-11-28	0	[]		
562	339	2006-05-05	2006-05-12	0	[]		
256	339			0	[]		

Save Print New Close

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 !



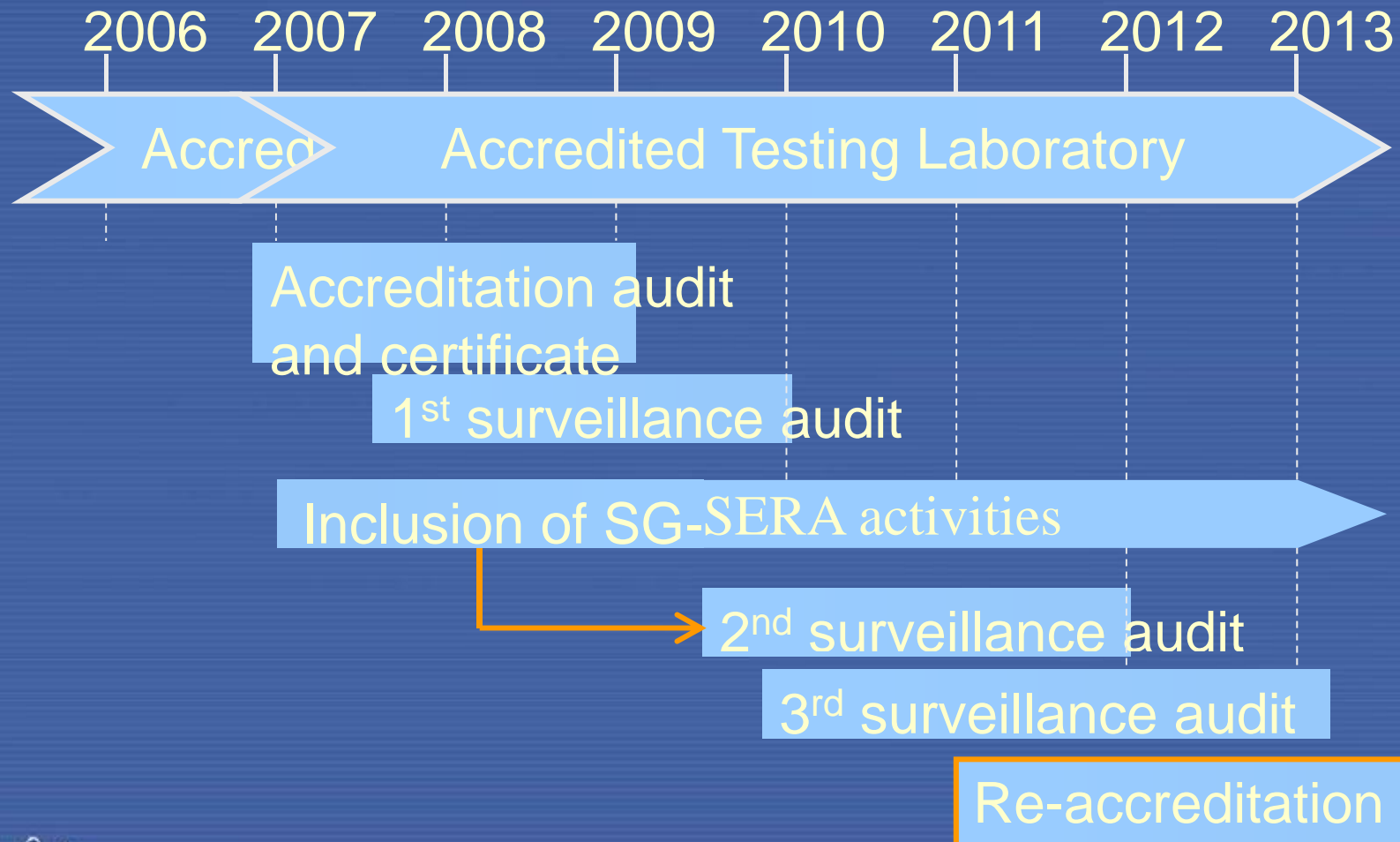
Accreditation: Success





1

Accreditation: Moving on



Interdepartmental Expansion

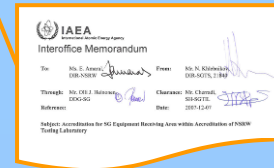
NSRW

Radiation Safety and
Monitoring Section

Radiation Protection
of Workers and
Monitoring Unit



VIC, FM333



SGTS

Inspection
Logistics
Section

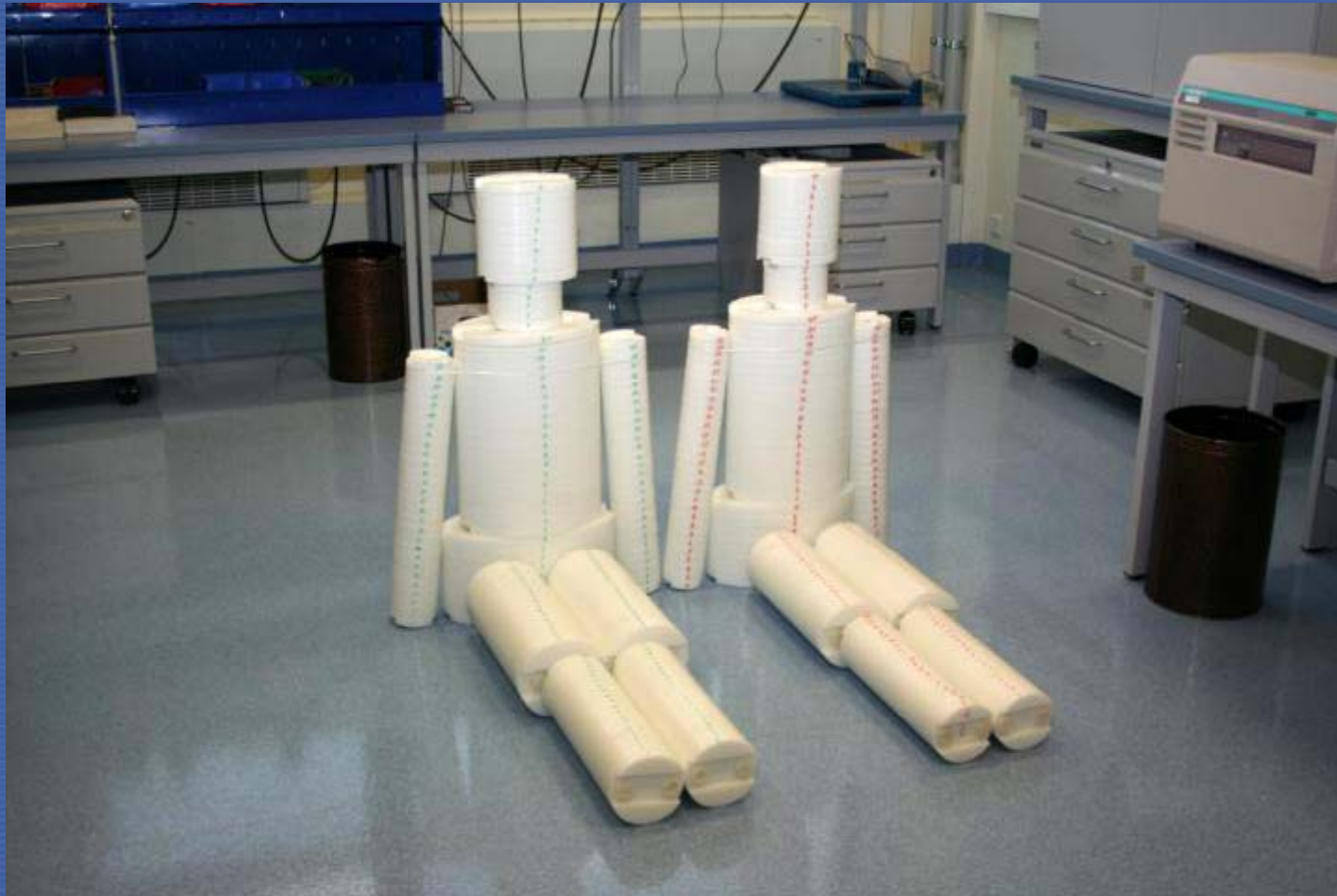
Equipment
Handling and



Accredited Testing
Laboratory

VIC, FM333

New Development

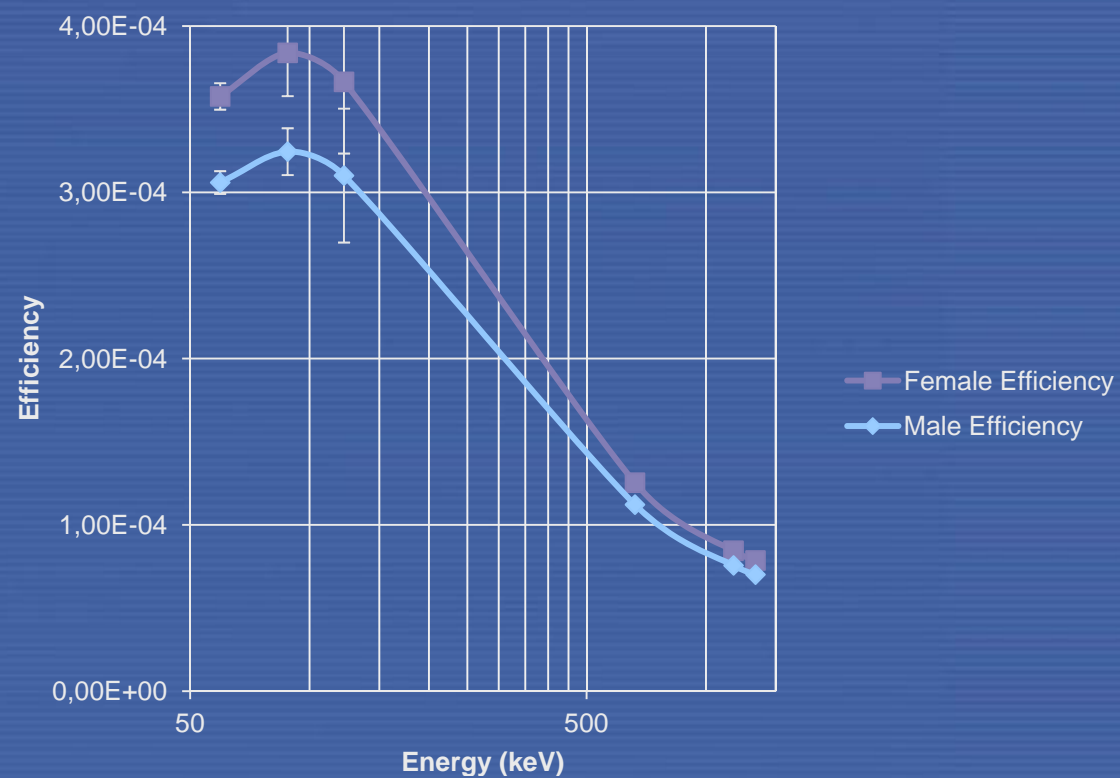


IAEA

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
Σ	6.97E+03	1.49E+03	6.49E+03	7.49E+03
σ	k=1	0.75%	0.70%	0.80%

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>