



Education and Research at the Royal Military School



Candidature
Charte
Universitaire
Erasmus

Accepted Dec 2005
from 2006-2007



Introduction

Aims of the presentation:

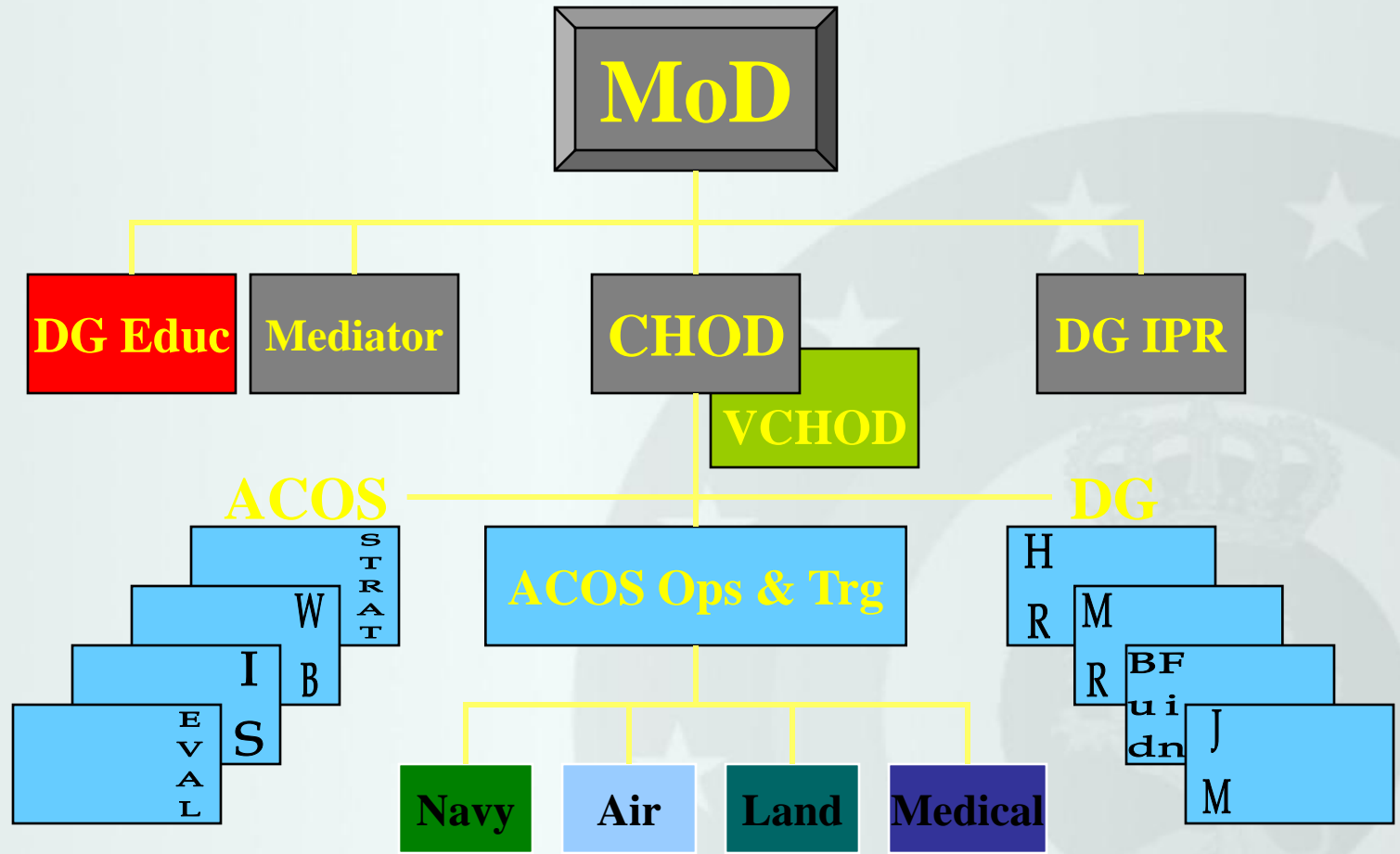
- Show the restructuring of the education at the RMS in the framework of the Bologna process;
- Present the impact of the European research program on security (EPSR) on the research in the RMS.

The RMS, institution of university level military education

(law of August 1, 2006)

nucleus of a European synergy between military, naval and air force schools

Belgian Defence





Educational Project



GENERAL CULTURE	SENSE OF VALUES	CAPACITY FOR LEADERSHIP	PROFESSIONAL COMPETENCE
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Mission of the School

Organic Law of the RMS of March 18, 1838

To assure in an integrated way

- **Academic** education
- **Military** education
- **Physical** education

Leadership



RMS

DEAO

DFCVV

DFBV











DACS

		FAC POLYTECHNIQUE						FAC SCIENCES SOC & MIL					CENTRE LINGUISTIQUE				
		MATHEMATIQUE	PHYSIQUE	CHIMIE	SYSTEMES D'ARME	CONSTRUCTION & MATERIAUX	MECANIQUE	CISS	SCIENCES DU COMPORTEMENT	HISTOIRE & GEOGRAPHIE MILITAIRES	SECURITE & DEFENSE	ECONOMIE, MANAGEMENT & LEADERSHIP	OPERATIONS	Français	NEERLANDAIS	ANGLAIS	ALLEMAND
		Directeurs de formation															
1 ^{er} Cycle BACHELORS	1 POL	X	X	X			X	X			X			X	X	X	X
	2 POL	X	X	X			X	X	X		X			X	X	X	X
	3 POL	X	X	X		X	X	X	X	X		X	X	X	X	X	X
	1 SSMW	X				X	X	X	X	X	X	X	X	X	X	X	X
	2 SSMW	X		X	X			X	X	X	X	X	X	X	X	X	X
	3 SSMW		X		X		X	X	X	X	X	X	X	X	X	X	X
	El-Pilotes Aux		X				X	X	X	X	X	X	X			X	
2 ^{ème} Cycle MASTERS	4 POL			X	X	X	X	X		X		X		X	X	X	X
	5 POL		X	X	X	X	X	X	X	X	X	X		X	X		
	4 SSMW		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	4 bis ou 5 SSMW ?											X				X	X
2 ^{ème} Cycle Formation Continuee	C Tech EM				?	?	?	?			X	X	X				
	C Cand Offr Sup			?	?	?	?	?		X	X	X	X	?	?	?	
	C Sup d'EM				?			?		X	X	X	X				
	C Sup Adm Mil	X							X		X	X					
	Hautes Etudes Sec & Def										X	X	X			?	
	C Cons Droit Conflits armés								X		X						
	C Marchés publics								X			X					
	Séminaire Chef de Corps											X	X				
	IMM	?	?	?	?	?	?	?			X	X				?	
	Extra Muros	?	?	?	?	?	?	?			X	X				?	
3 ^{ème} Cycle	Ecole doctorale	X	X	X	X	X	X	X	X	X	X	X	?	X	X	X	X



The academic year

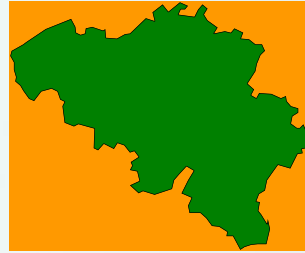


	JUL	AOU	SEP	OCT	NOV	DEC	JAN	FEV	MAR	AVR	MAI	JUN
1 Ba SSMW												
1 Ba Pol												
2 Ba SSMW												
2 Ba Pol												
3 Ba SSMW												
3 Ba Pol												
1 Ma SSMW												
1 Ma Pol												
2 Ma SSMW												
2 Ma Pol												
2 Ma Pol Bis												

Characteristics of the Military Education in the RMS



Simple
Small groups
Known environment & terrain
(Belgium)
National Languages



Progressive



Hardening-stamina
Courage
(Commando B)
(Parachute B)

Complex
Platoon level (30 à 40 men)
Unknown Terrain
(Benin, Marocco, Slovenia, Ireland)
International



The officer holds an **exemplary function** and must himself respect and make others respect the **values** and norms operative within the Armed Forces:

**integrity, loyalty,
sense of duty, openness,
sense of responsibility,
discipline, respect for
himself and for others**





Bologne: Objective imposed by the Minister of Defence:

Integrate the RMS into the new scheme of the **European** higher education in 3 cycles (Bachelor, Master, Doctor)

Introduce quality control into **education, research, laboratories**

Education: ISO 9001:2000

Research: ISO 9001:2000

Laboratories; ISO 17025



As a result, the RMS ...

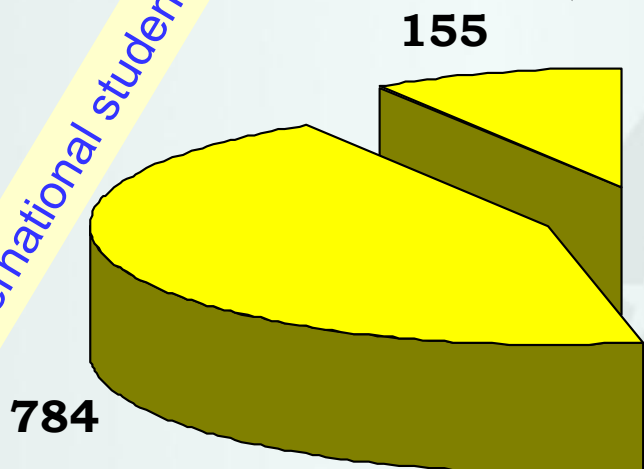
- Intensifies the **exchanges of students and lecturers**
 - with other military, naval and air academies at university level, e.g. the schools of the DGA in France
 - with Belgian, European and foreign universities.
- Focuses its research
 - on **centres of excellence** in the field of **security and defence**;
 - preferably oriented at the benefit of **Europe**

Personnel at the RMS

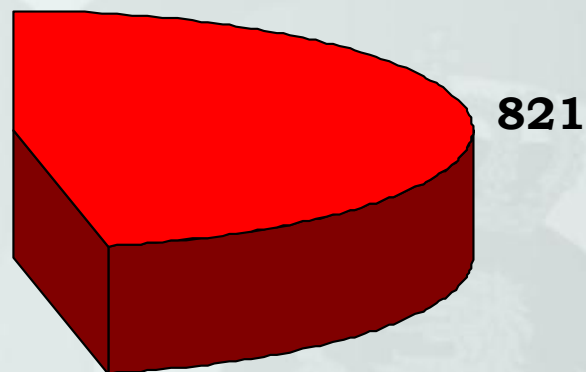
Situation february 2007

Students :
Continued Formation

196 international students



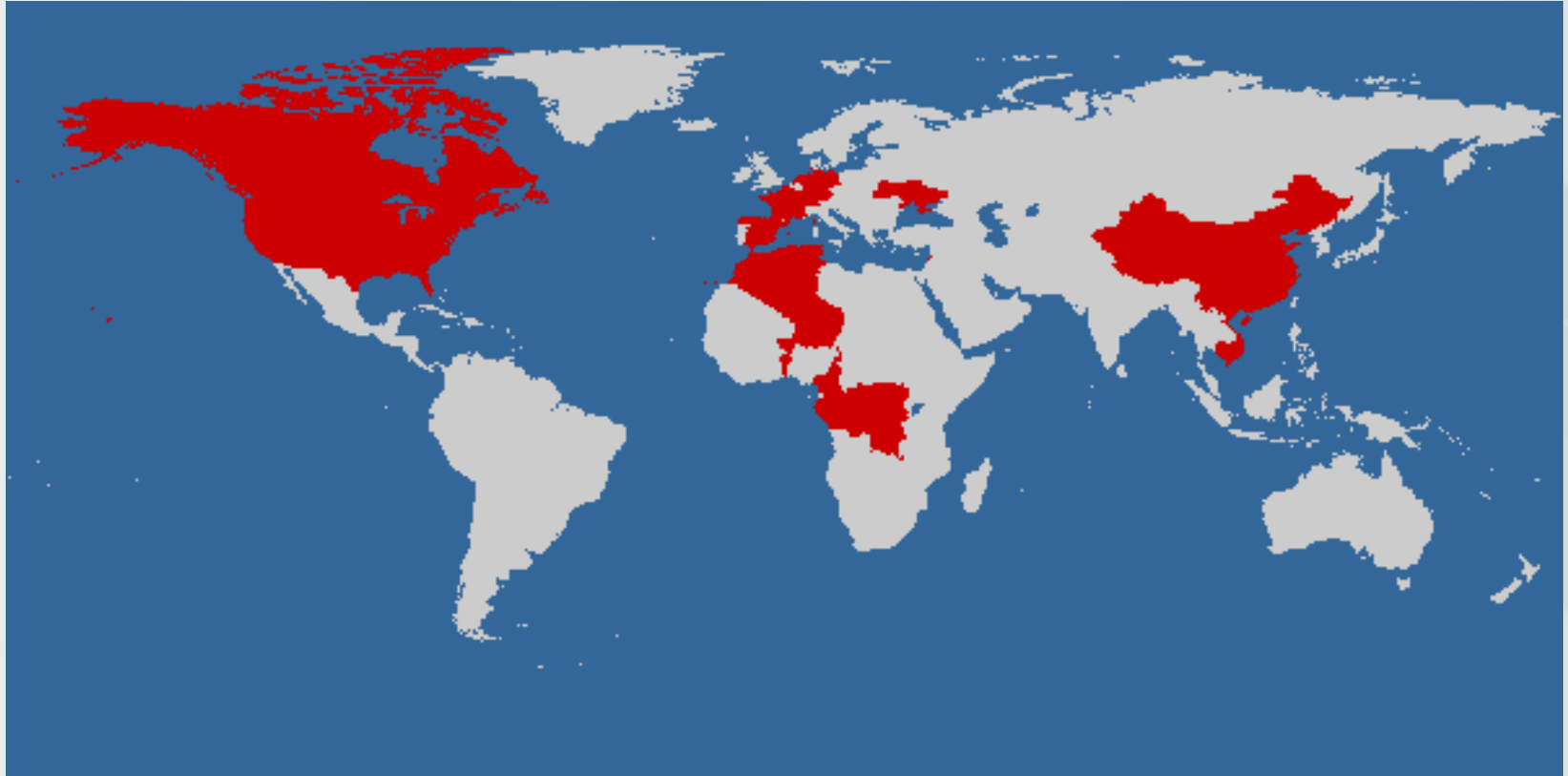
Instructors, professors,
researchers, adm & log, ...



Student :
Basic Formation



RMS and the world





Inserting the RMS in the new landscape of the European higher education



Habilitation



Law of Sep 11, 1933 on the protection of titles of the higher education - Modification of Nov 25, 2004

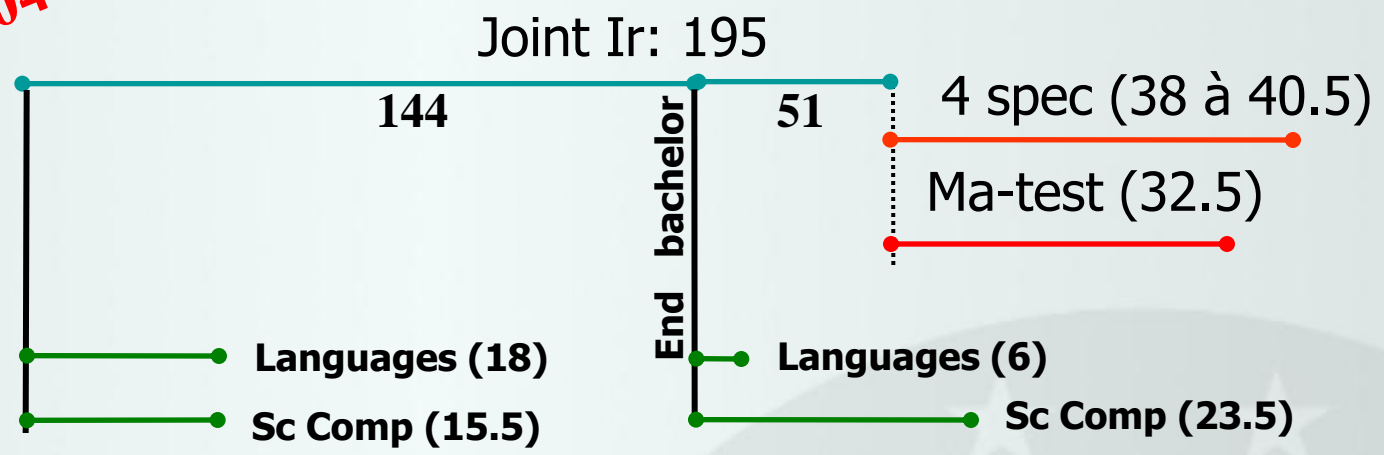
(MB 15/12/2004)

Art 1, III, d, was completed with the next article:

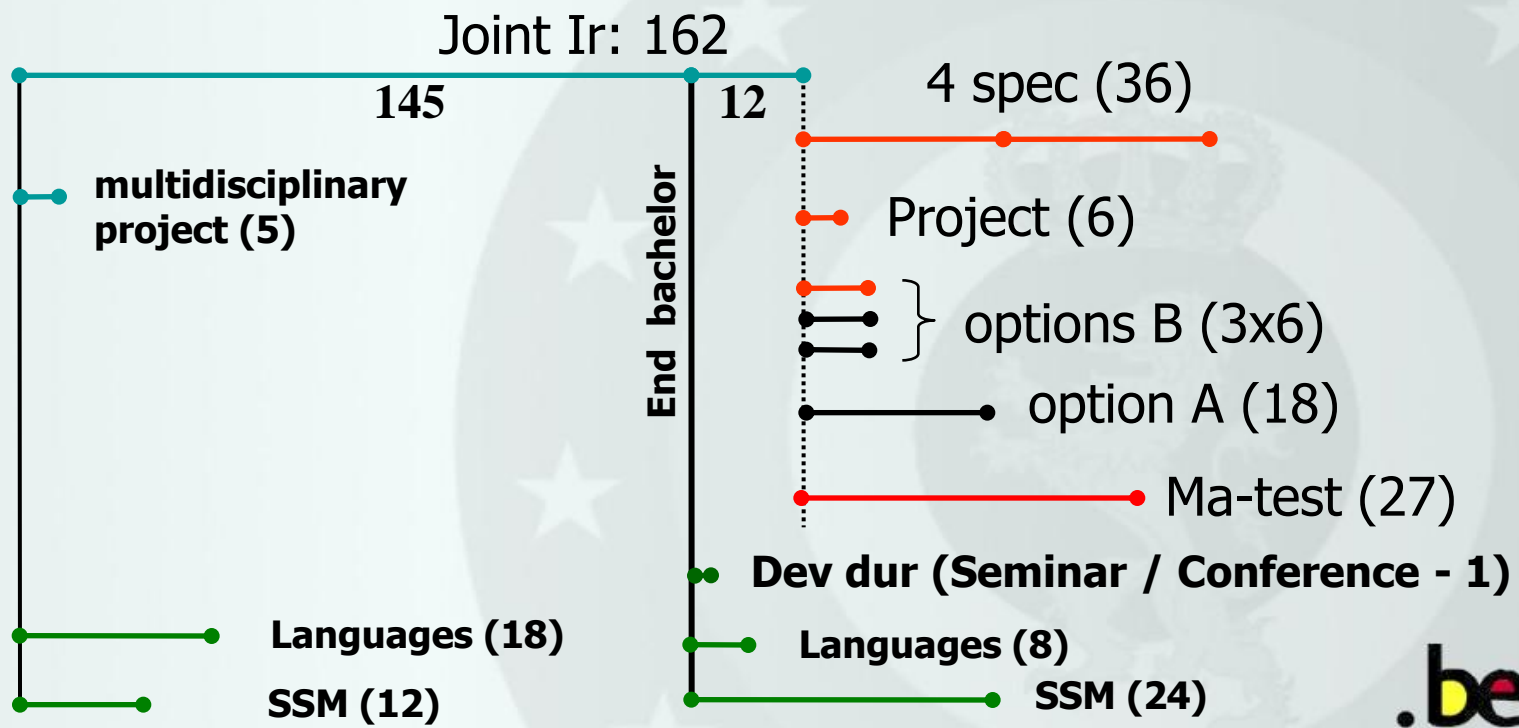
« *May be granted the title of bachelor in engineering science or in social and military sciences, or of master in engineering science or master of arts in social and military sciences, or of master in military engineering science, or of master of arts in political and military sciences or of master of arts in public and military administration, or of doctor in applied sciences or of doctor in social and military sciences, those who have obtained the degrees of the these titles at the Royal Military School.* »



2003-2004

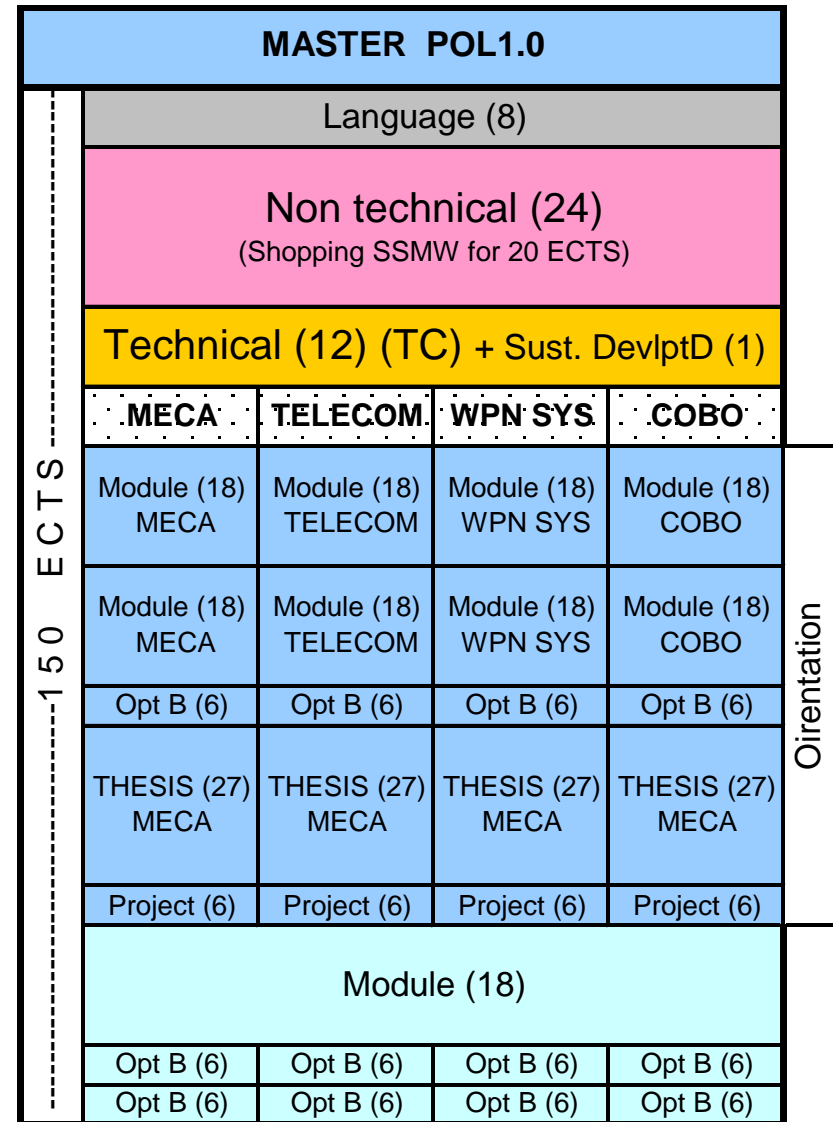
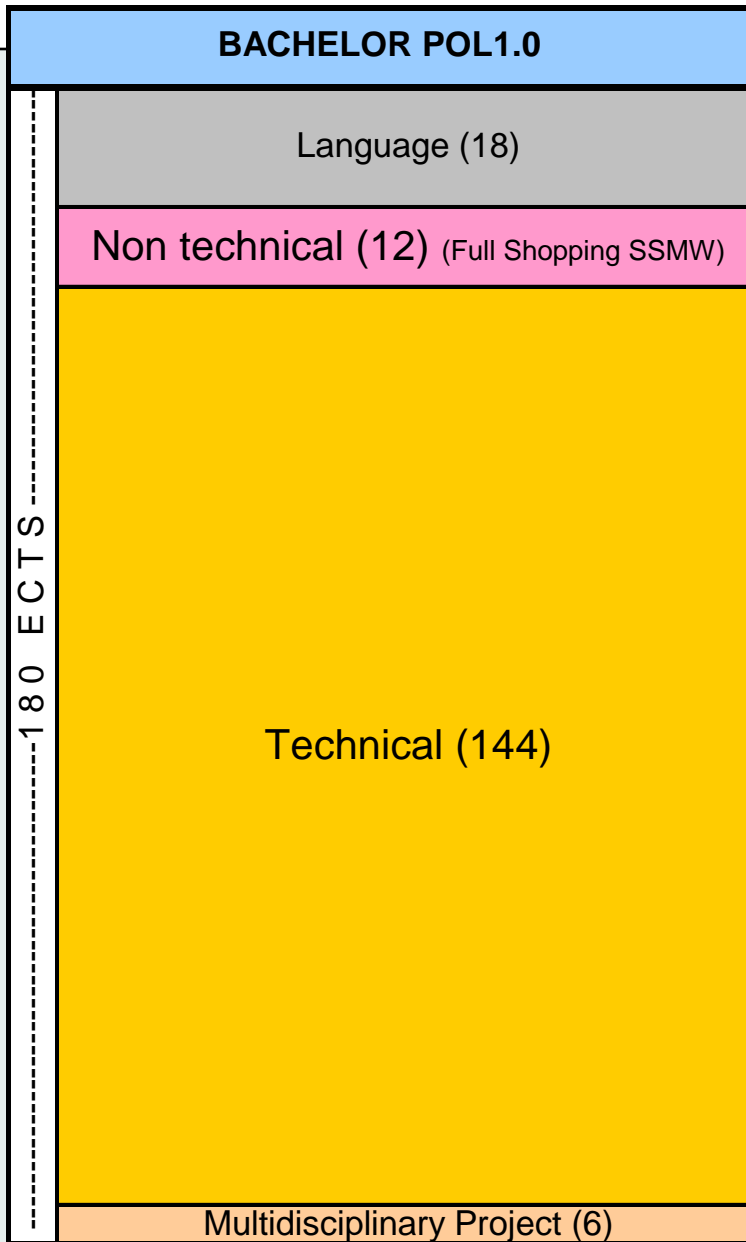


Project





POL 1.0 : Global overview





BACHELOR SSMW 3.5.4

TECHNICAL (45 ECTS)

MANAGEMENT (21 ECTS)

LAW (12 ECTS)

**SOCIETY AND BEHAVIOURAL
SCIENCES (51 ECTS)**

MILITARY SCIENCES (12 ECTS)

LANGUAGES (21 ECTS)

6 FREE OPTIONS (18 ECTS)

COMPULSORY OPTIONS FOR
PILOTS AND NAVY

MASTER SSMW 3.5.4

LANGUAGE (6 ECTS)

MANAGEMENT (6 ECTS)

SYSTEMS (6 ECTS)

LAW (6 ECTS)

INTERNATIONAL SECURITY (6 ECTS)

ORIENTATIONS

Not for pilots & navy

MANAGEMENT & WEAPONS SYSTEMS

DEFENSE & POLITICAL SCIENCES

THESIS (24 ECTS)
MANAGEMENT OR
WEAPON SYSTEMS

THESIS (24 ECTS)
DEFENCE & POLITICAL
SCIENCES

THESIS OR PROJECT

THESIS OR PROJECT

MANAGEMENT MODULE
(12 ECTS)

HISTORY and/or
SOCIETY AND BEHAVIOURAL
SCIENCES and/or
LANGUAGE and/or
MILITARY OPERATIONS

WEAPON SYSTEMS MODULE
(12 ECTS)

MODULES (36 ECTS)

MANAGEMENT OR WPN SYST
MODULE (12 ECTS)

COMPULSORY Module for Pilots, ATC/ADC & NAVY

FREE MODULE (12 ECTS)

FREE MODULE (12 ECTS)

2 FREE OPTIONS

2 FREE OPTIONS
(12 ECTS)

2 COMPULSORY OPTIONS FOR PILOTS+ATC/ADC
2 COMPULSORY OPTIONS FOR NAVY
1 COMPULSORY OPTION FOR MEDICAL

1 COMPULSORY OPTION FOR MEDIC. STUDENTS

SSMW 3.5.4 : GLOBAL OVERVIEW





ACADEMIC education of PILOTS (officers)



Polytechnic Faculty: (19) – 5 years and 3 months

Faculty of Social and Military Sciences (45) – 5 years

Auxiliary Pilots (Prom Pil) (31) – 1 year



- **Responsibility of Department Air Operations (DAir)**
- **70% courses in synergy SSMW–Prom Pil -> gain 8 months of Fmn for the Pilots SSMW and POL**
- **Equivalence of military pilot license with civilian license (RD)**
(European Norms: Joint Aviation Requirement - Flight Crew licensing)
- **Cooperation with l'Ecole de l'Air (FR) -> E-learning**

See website RMS : www.rma.ac.be > DEAO > DAir



Initial ACADEMIC education of AIR CONTROL officers

Faculty of Social and Military Sciences (9) – 5 years
(starting from 3th year)

Auxiliary (Prom ATC) (10 EI) – 1 an

- **Responsibility of the Department Operations - Air (DOps-Air)**
- **60% of courses in synergy Prom ATC - Prom Pil -> gain in personnel**
- **80% of courses in synergy Prom ATC - SSMW -> gain of 1 year of Fmn for the ATC SSMW**
- **Valorization of the military brevet ATC**
Eurocontrol norms : “Guidelines for ATCO Common Core Content”



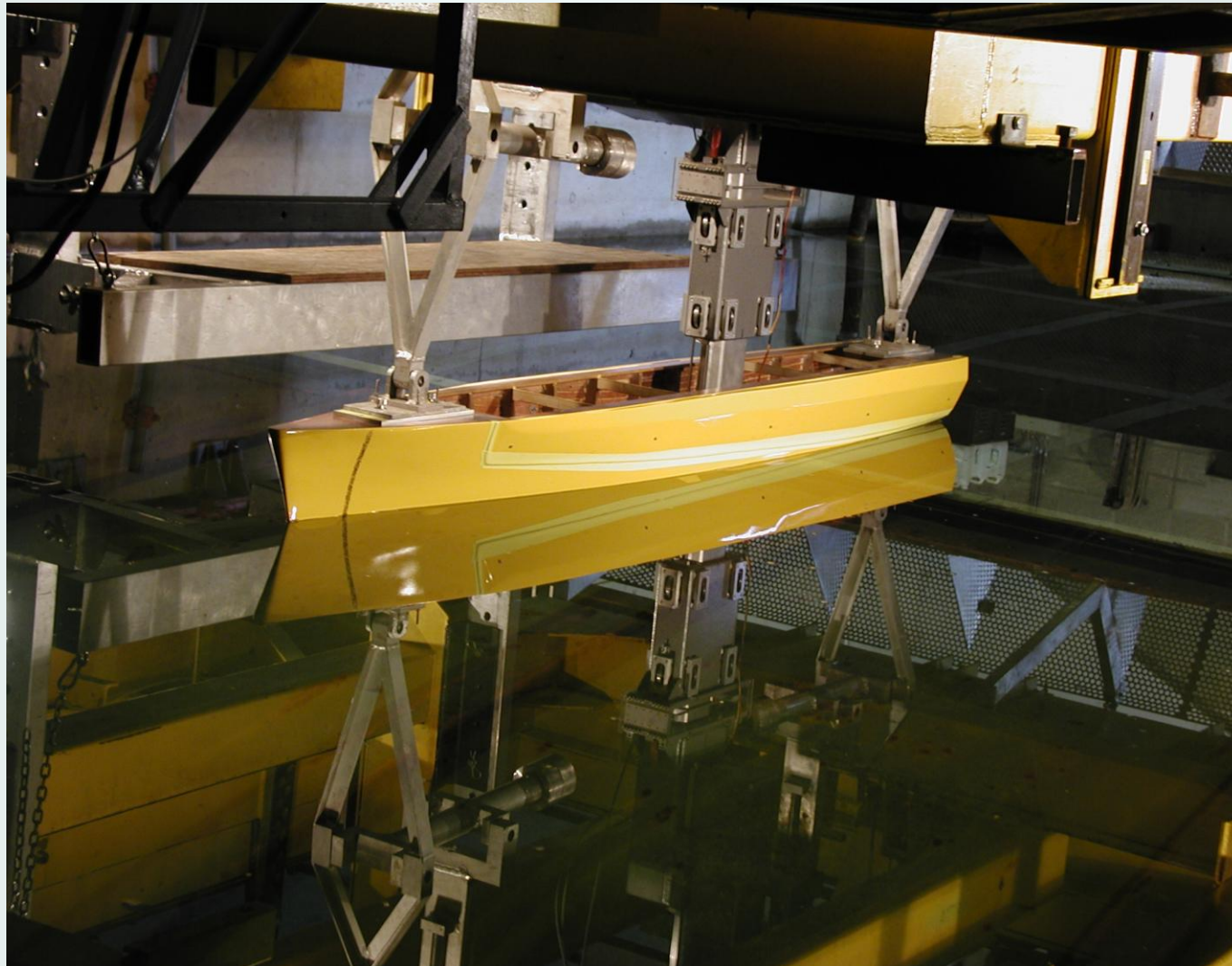


Academic education of **navy** students

- Academic education at the RMS
 - Polytechnic faculty 
 - Faculty of Social and Military Sciences 

Application to military, maritime and naval problems
- Naval instruction at the “Application school of the Navy” (OCA)
 - Certification “STCW” **Standards and Training Certification for Watchkeeping for Seafarers** IMO (International Maritime Organization) to be Watch Officer
 - “Navalisation”

Laboratory of hydrodynamics ULg





Future perspectives for the shipbuilding



- Contacts with BREST (FR):
 - L'Ecole nationale supérieure des ingénieurs des études et techniques d'armement (ENSIETA)
March 2006



- L'Ecole navale
October 2005



- In the light of creating a **European** Master in shipbuilding



VOORR
PRIOR



International cooperation



- **Netherlands:** Since 1997, the RMS organises a year of ballistics training for the Adelborsten (students of the [Koninklijk Instituut voor de Marine](#)) leading up to their Master and training sessions for the students of the [Koninklijke Militaire Academie de Breda](#).
- **France:** Since 1995, the RMS welcomes in its laboratories students from [Saint-Cyr](#) and since 2002 students of the [Ecole de l'Air](#) for a practical in their 2nd year of for their engineering project in their 3rd year;
 - since 2002, the RMS sends some of its students to the Ecole de l'Air to finish their dissertation there;
 - since 2004, the RMS welcomes students from Saint-Cyr, reading behavioural sciences, for a semester.





Air and Spaceflight

Lucht- en Ruimtevaart (LuRu)

- The RMS offers courses of
 - Helicopters (3 ECTS) - P. Hendrick
 - Aircraft Performance (2 ECTS) - W. Bosschaerts
- The KU-Leuven and the VUB exchange courses of
 - Turboreactors
 - Turbopropulsers (turboprops)
- The ULB offers
 - Aircraft Propulsion (5 ECTS) - P. Hendrick
 - Aircraft Flight Dynamics (3 ECTS) - G. Degrez



Vrije Universiteit Brussel





The RMS

The nucleus of a
European research
center of excellence

in matters of
security and defense



Researchers DEAO: 80 (Dec 2006)

- Civil service: 1

- Under contract

Defense	46
Euratom	16
Renaissance	16
Patrimoine	1

- Countries of origine (since 1997):

Algeria, Germany, Brasil, Bulgaria, Canada, China, Colombia, Congo (RDC), Croatia, Spain, France, Greece, Israel, Laos, Morocco, Niger, Rumania, United Kingdom, Rwanda, Togo, USA.



PhD's at the RMS

1946 – 12 March 2007

	Total	Presented	In work
Polytechnic faculty	102	84	18
In common		4	18
M. Idesbald van den Bosch – UCL-ERM 27/01/2006			
Mme le Capt d'Avi M. Vandewal – VUB-KMS – 15/09/2006			
M. le Capt d'Avi E. Colon – VUB-KMS – 28/11/2006			
M. le Capt D. Lecompte – VUB-KMS – 12/09/2006			
Faculty SSMW	24	15	9
In common			9
Language center	8	6	2
Total	134	105	29



PhD projects RMS 12 Mar 07



Polytechnic faculty: 18

UCL Gilles, Lopera, Druyts

UGent Vergote

ULg Neyt, Denis

KUL Vanderhasten, Van Utterbeek, Lauwens

VUB Giannopoulos, Suy, Harri

ULB Herbiet, Recker, Vandeveld, Santafé

Ecole Centrale de Lyon, VKI, Marinus

ENSupTélécom Thonnard

Faculty SSMW : 9

ULB Resteigne, Leroy

KUL Quanten

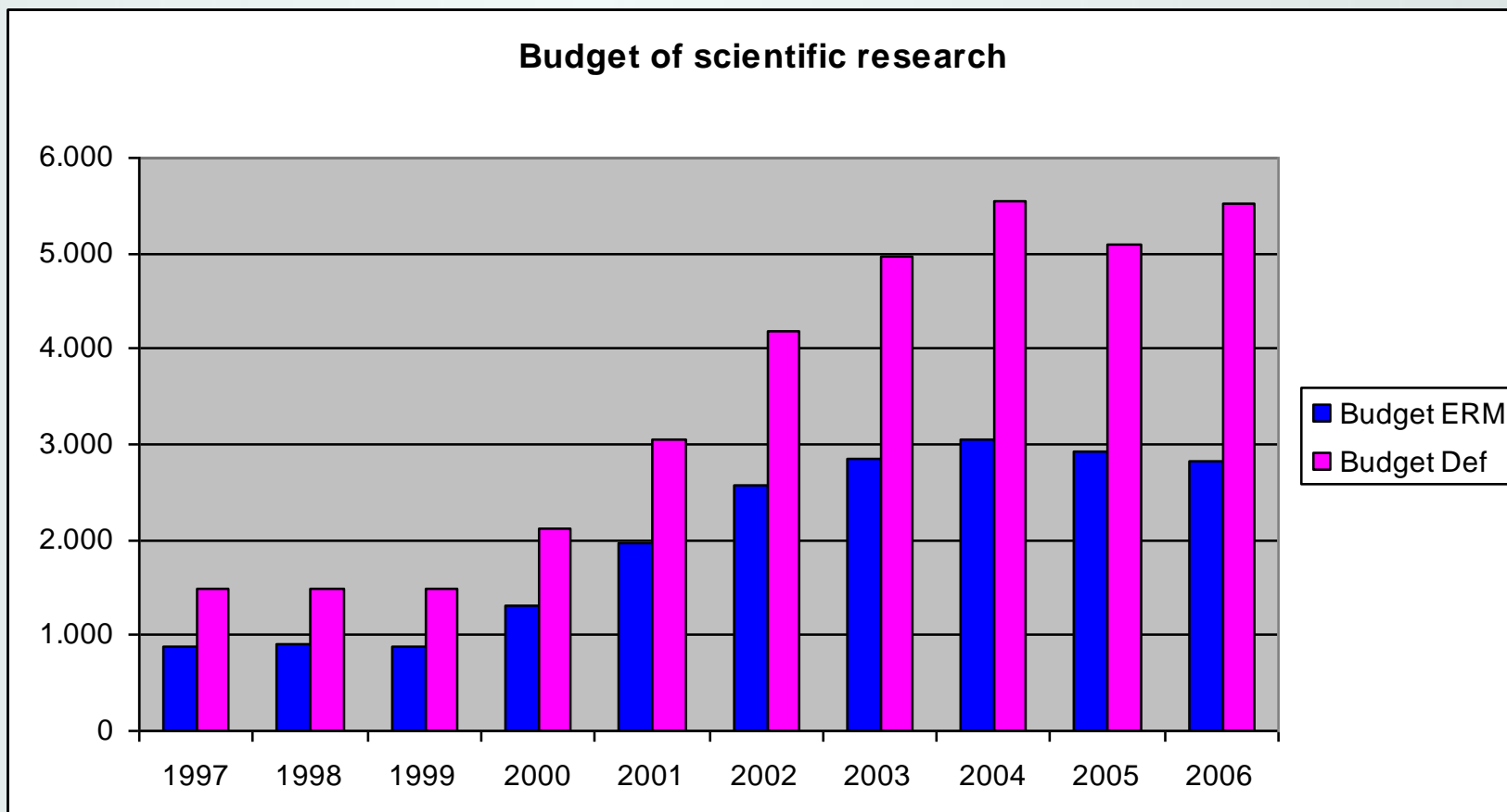
VUB Gerits, Rabaey, Pattyn, Hallot

Ecole Polytechnique de Palaiseau De Smet

UA Van Der Linden



Evolution of the Research Budget 1997-2006



In 2006 : Defence = 5530 k€

RMS = 2835 k€



Research policy of the RMS



Goals

- *In strategic plan of the BE Defense, Chap VIII (Prg RS&TD)*
 - ✓ Optimalization of the academic education at the RMS
 - ✓ Promotion of the behavioural sciences
 - ✓ Operational readiness of existing weapon systems
 - ✓ Technical-operational evaluation of new systems
 - ✓ Protection of the nation against emerging threats
- *Cited in the European program on security research (EPSR)*
 - ✓ Protection of the member States against emerging threats
 - ✓ Security of EU units in peace keeping missions
 - ✓ Development of the EU defense industry
 - ✓ Development of a long term vision on security issues



Research policy of the RMS



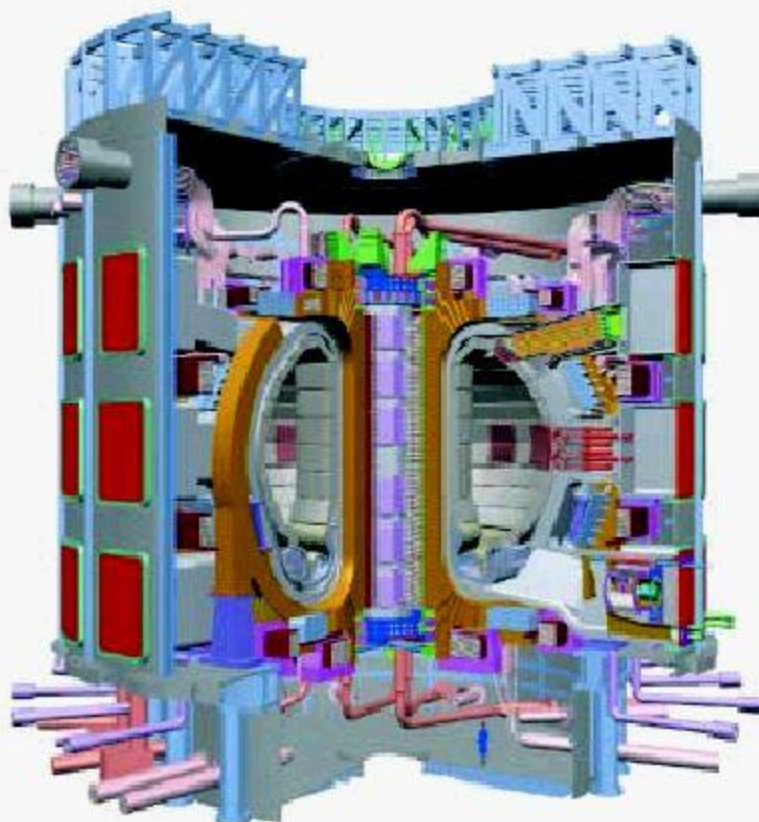
Method : Reach the European level of excellence and the critical mass of researchers by establishing :

- A limited number of thematic poles
- Well-chosen interdisciplinary and interuniversity partnerships
- Synergies with other European partners in order to avoid fragmentation and duplication of research efforts

Specifically :

- ✓ European pole on nuclear fission (LPP)
- ✓ Signal and Image treatment Center (SIC)
- ✓ Dynamic behaviour of materials for security applications (DYMASEC)
- ✓ Land, air and naval mobility (MOBINISS)
- ✓ Risk and crisis management (SSMW)

Recreating the sun on earth in the LPP



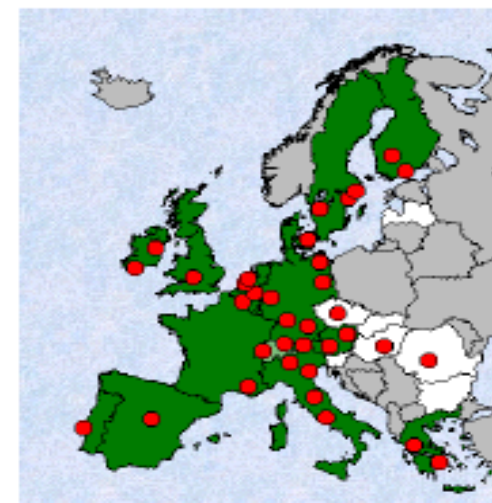
ITER-FEAT, CAD Isometric view (version 2000)

THE sustainable energy:
unlimited, reliable and respectful
for the environment

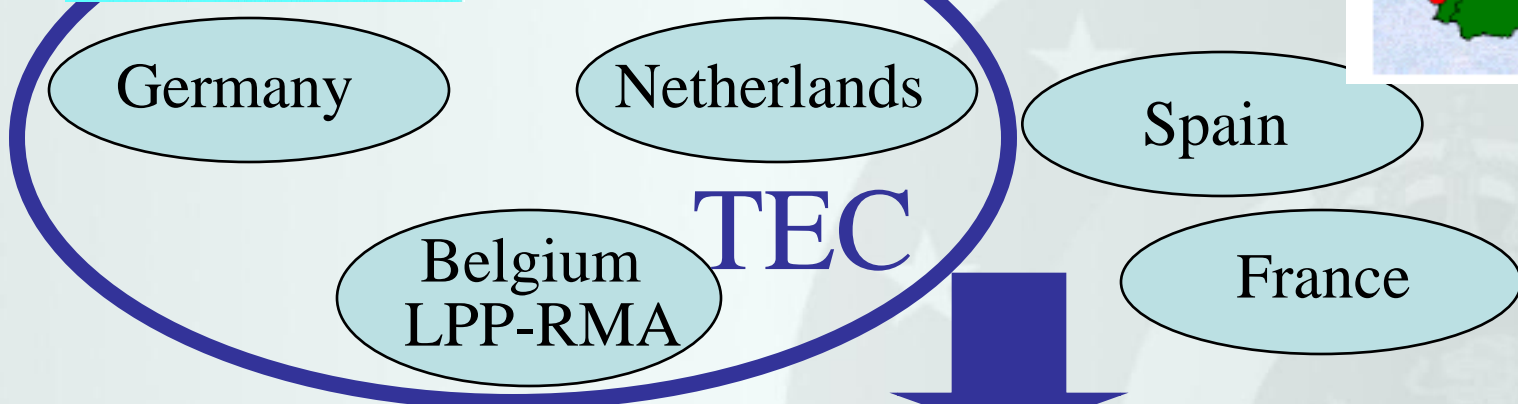
The laboratory of Plasma Physics
of the RMS develops heating
systems for Textor (Juelich), JET
and ITER

25 PhD theses in LPP

The (inter)national context



EURATOM



TEC

EFDA

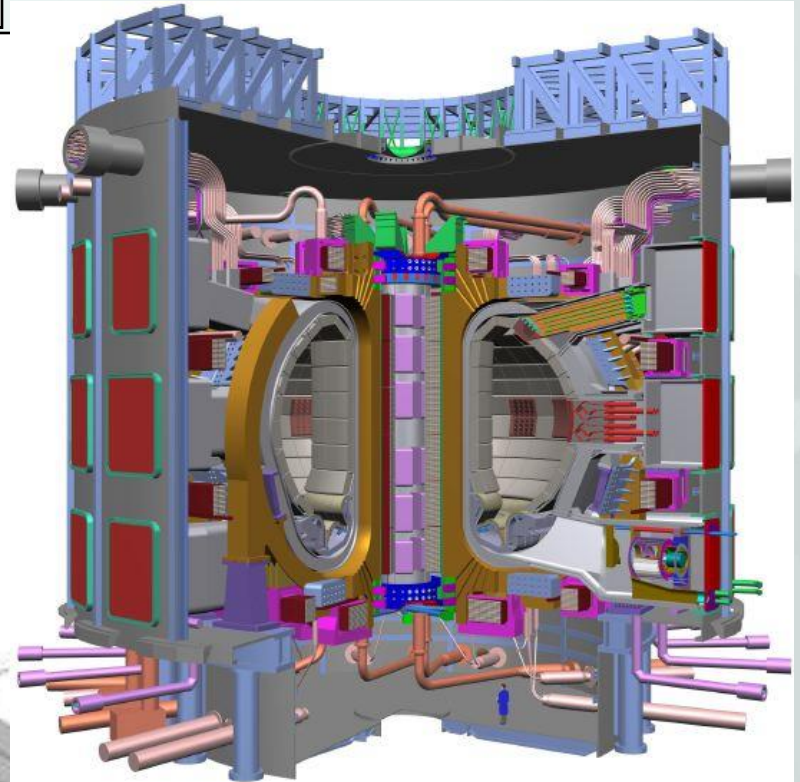
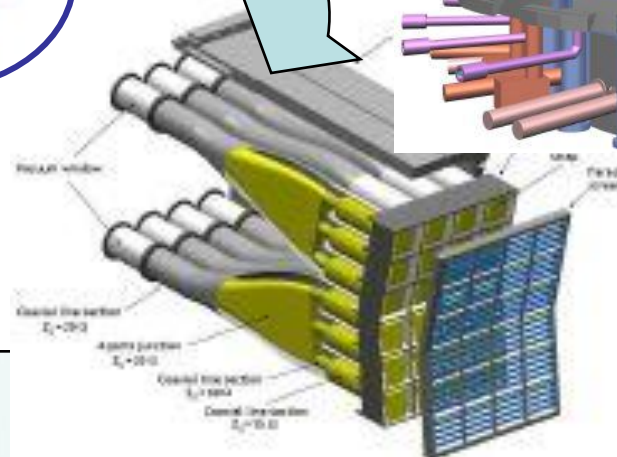
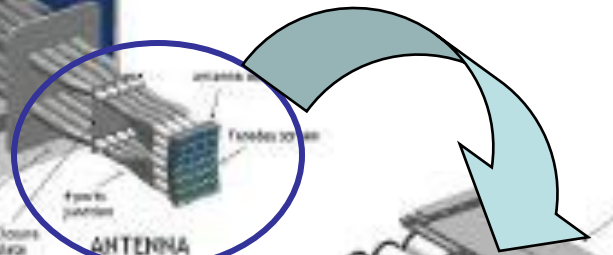
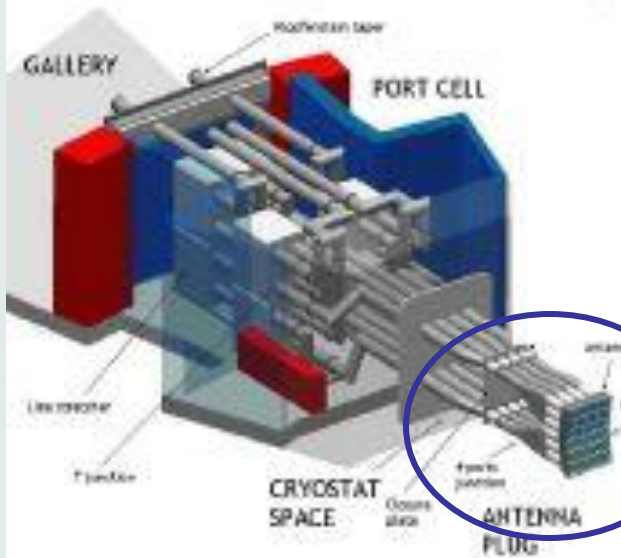
JET

ITER

From European to global level



ITER





SIC: Environment for SGRS-IM



teledet

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Layers: C:\users\beumier\REM_SENS\ETATS_DATA\SHP [Layers ON] [Select Layers] [Attributes]

Linear: Centre [Curtain ON] [Profile OFF] Region: Zoom: 0.5

Marker: Centre [Colormap]

Display: Image [1760 704] 137 [136860 207595]

Layer=19, Type=5, ID 1692, idx 14394 (nParts=1)
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[Run Selected] [Clear Unselected]



Mun assessment

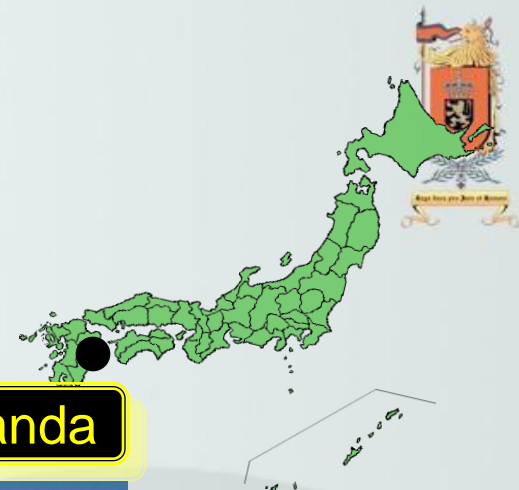


SOP validation

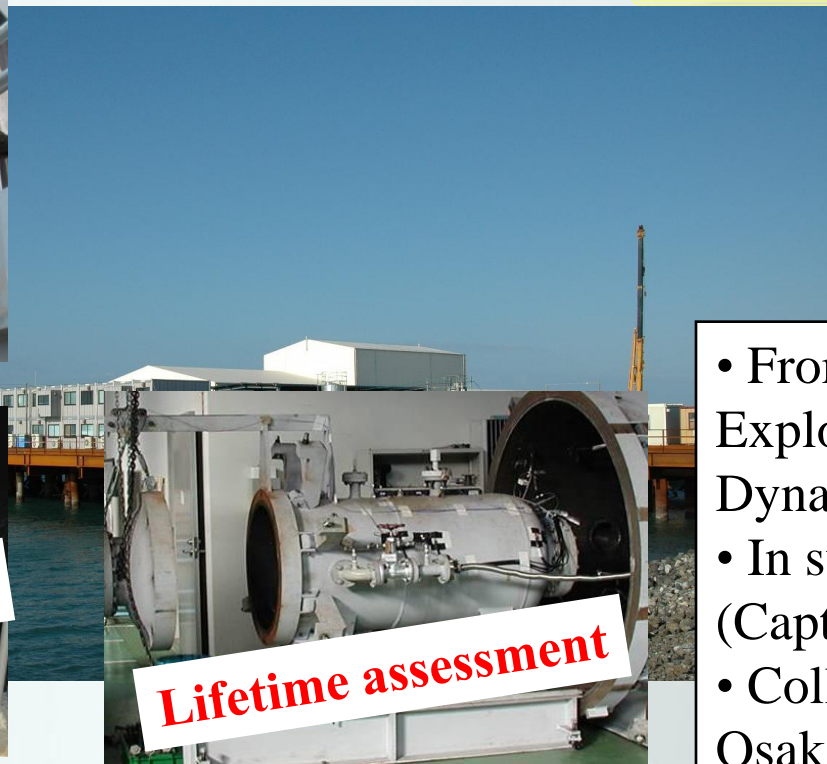


Performance assessment

KANDA



Kanda



Lifetime assessment

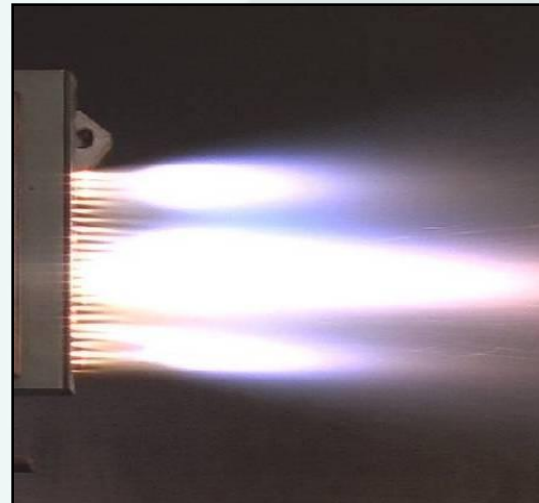
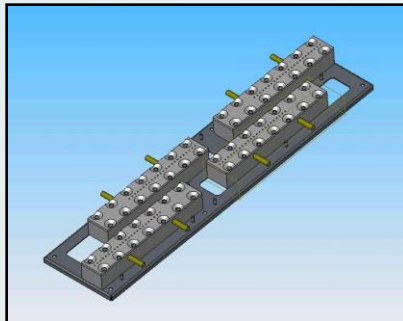
- From Toxics to Explosives to Dynamic of structure
- In support of PhD (Capt Simoens)
- Collaboration with Osaka University



AGIS



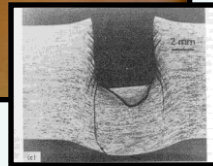
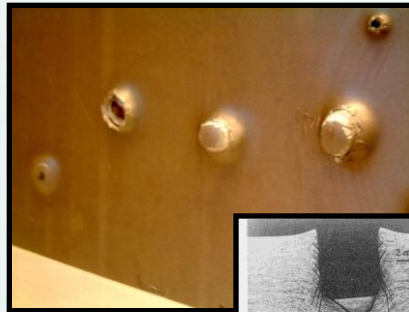
IWT



SCIENTIFIC RESEARCH FOR SECURITY



- Mechanical and microstructural behavior of materials



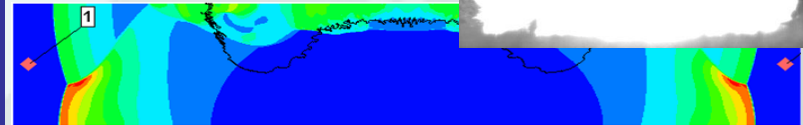
- Composite protective clothing for deminers



- Breaching for security



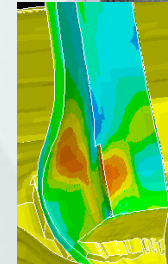
- Air blast experiments and simulations



- Effect of various projectile impacts on structures and vehicles



- Buckled flanges in mixed column



- Blast damage



SCIENTIFIC RESEARCH FOR SECURITY



Aircraft Bird Impact



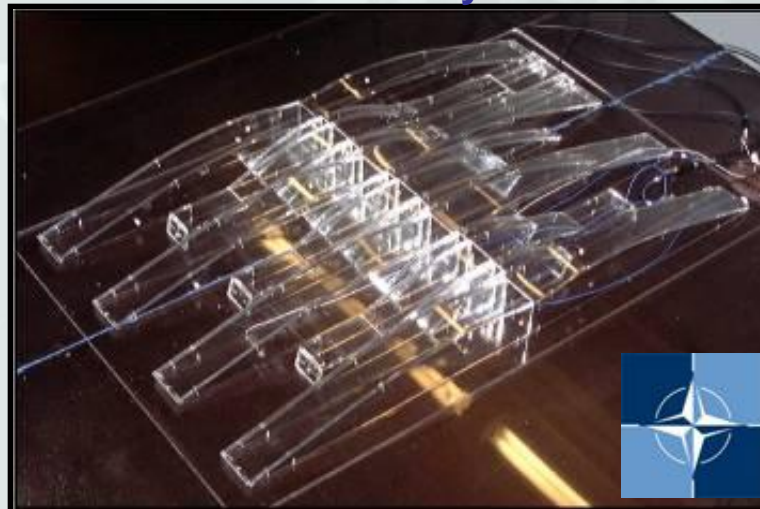
Protecting People & Materials



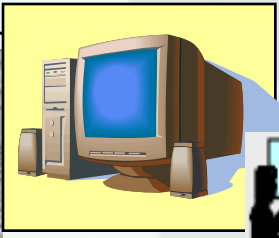
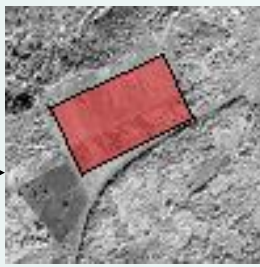
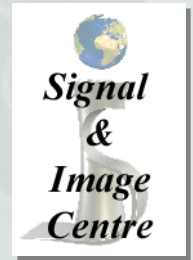
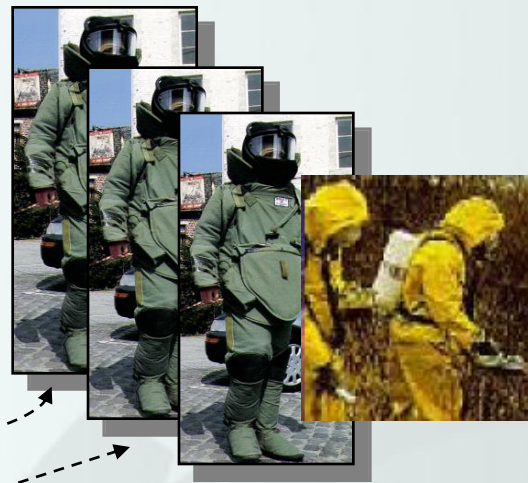
Force Protection European Quarters



Scale Model Analysis NATO HQ



MOBINISS: VIEW-FINDER



2D





Example of scientific study oriented towards security and teaching support

*Military operations in Congo in 1964 :
an example of cooperation after the decolonization*





Fundamental study in security



Centre for the Study of Stress and Trauma of the RMS

•The domain of research and expertise of the CEST:
psychological trauma in
high risk professions:

•military, firefighters, police,
paramedics, ER-personnel,
wardens, journalists, etc.



Impact of the **Ghislenghien** disaster on first aid personnel Firefighters – Police – Civil Protection







Exemples of fundamental scientific studies concerning security in the Department of Behavioural sciences

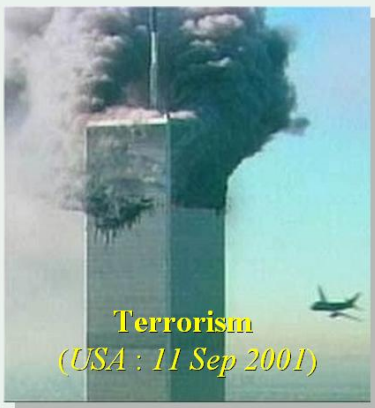


Study of the day-to-day life, the well-being and the psycho-social aid of military personnel in operations and their families (ERM/HF-04)

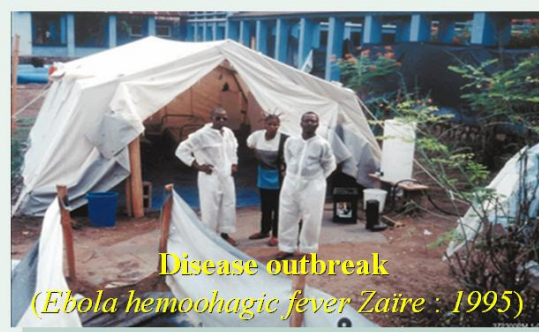
Partner: **KMA Breda** (Sociale en Gedragwetenschappen en Wijsbegeerte Departement)



Developing a robust network of crisis management organisations



Disruptive crisis



*Individual Crisis Mgt Organisations
may no longer be operational*



Research on

Risk-, crisis and disaster-management



Scientific studies

- Performance Management in Defence **Risk-, Crisis-and Disaster management**: Prof LEYSEN, Maj BAM DE SMET, L. VAN NUFFEL
- **GMOSS** (Global Monitoring for Security and Stability)

Joint PhD: H. De Smet

- **Ecole Polytechnique** (PALAISEAU): Prof LAGADEC
- **RMS**: Prof LEYSEN



In cooperation with:

- **Ecole Spéciale Militaire** (Saint-Cyr / Coëtquidan): Prof DANET, Prof DUTHEIL



Partners

- **Katholieke Universiteit Leuven**: Instituut voor de Overheid





Questions?

Вопросы?

Vragen?



Questions?

Fragen?

¿Preguntas?