Association EURATOM - IPPLM

ANNUAL REPORT
2007

IPPLM
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ANNUAL REPORT 2007 of the
ASSOCIATION EURATOM-IPPLM
covers the period
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1 Introduction

The year 2007 was essential in the European and world programme for fusion. In November 2006 ITER Agreement was signed in Paris and next year the ITER Organisation was created, which is a key driving element of the programme. As a result, European Fusion Research programme has been modified: the role of EFDA has changed and a new organisation Fusion for Energy (F4E) was created. F4E is supervised by F4E Governing Board with two committees – Executive Committee and Technical Advisory Panel. New EFDA coordinates fusion programme in Europe using new instruments: Call for participation, Task agreements, Task forces and Topical groups. Research financing has also changed and a new Contracts of Association was prepared. In the preface I would like to report how Polish Association has adopted to the above changes.

The Work program of F4E for 2008 was accepted in December 2007. Some tasks done before as orders types Art. 5.1b in EFDA have been transferred to F4E.There are two of them done by Polish institutes: Warsaw University of Technology (Mechanical Analysis of a Blanket Manifold Concept for ITER) and AGH University of Science and Technology (Nuclear Data: Benchmark Experiments to Validate EFF/EAF data). Those tasks are planned to be finished in the year 2008. Wroclaw University of Technology has concluded a contract with the IO related to the ITER cryogenic system.

As regards our participation in JET experimental program in 2007, 8 people took part in C18-C19 campaigns (in all 42 pw). We participated in diagnostics of X-ray and VUV spectroscopy, neutron activation diagnostics and Integration of transport and MHD codes at JET. In C20-C25 campaigns 11 people are expected to take part (in all 104 pw). Apart from the above-mentioned diagnostics we are also interested in polarimetry and we are considering our participation in modernization the system of Neutron activation diagnostics with Joint Fund financial help. We also take part in Task agreement as regards Tritium processes and waste management. Our task is Laser diagnostics of in-vessel components and dust generated during detritation process using optical spectrometry. It is worth emphasizing that involvement in the JET programme provides a very important platform for integration of the Polish fusion community. In the year 2008 researchers from five Association's units will take part in JET program.

Polish Association has answered Call for participation (CFP) as regards Plasma-wall interaction, which was launched in November 2007. There are four tasks – one carried out by IPPLM, three by WUT in areas of dust, fuel removal, chemical erosion and transport, as well as high-Z materials and material mix. CFP for Fusion materials is expected in Summer 2008. WUT is considering participation in three activities related to W/steel joints and ODS ferritic steels.

In November 2007, CFP for ITM (Integrated Tokamak Modelling) was also launched. Association was willing to take four tasks, one of which under Preferential Support. In Task Force on ITM, IPPLM is the most involved developing module for impurities for the European Transport Solver. Szczecin University of Technology carries out its task, which is Global stability analyses of Alfvén and Energetic Particle Modes, in cooperation with Chalmers University in Goeteborg and IPP Greifswald. Opole University will be doing its task (Stochastic techniques to the study of phenomena relevant to the physics of fusion) in cooperation with CNRS, Centre de Physique Theorique, Marseille.

In the last Committee Meeting, Polish contribution in Wendelstein 7-X programme was considered to play a very important role in the integration of all Polish parties, that form our Association. Polish involvement in W7-X programme is quite extended, ranging from cooperation on device assembly, development of NBI system through development of several diagnostics (X-ray PHA, C/O monitor, neutron and microwave diagnostics), structural mechanical calculations and neutron MCNP calculations to plasma theory and edge plasma modelling.

As regards accompanying programme, Soltan Insitute for Nuclear Studies is engaged in experimental research on TS, ISTOK, TEXTOR and CASTOR/COMPASS tokamaks. IPPLM takes part in Edge plasma modelling in cooperation with CEA, ENEA, IPP Juelich and IPP Prague. A special agreement with IPP.CR has been prepared. It presents Association involvement in COMPASS project in Prague as regards diagnostics (Cerenkov detectors, SSNTD) and edge plasma modelling. The Association continued its involvement in the IFE keep-in-touch activity.

The Association also contributed to the EFDA Technology Programme (High Temperature Superconducting Materials, Thermal-hydraulic problems in CICC, Activation and the decay heat of

the components) as well as to the Socioeconomics (Exploring lay understanding and reasoning about fusion technology, Direct costs of nuclear treaties, agreements and agencies).
As regards PI we continued a wide range of activities. The most important is an educational project for secondary school teachers. Articles and brochures on fusion for the general public are translated into Polish and posted on the website. We continue our cooperation with small, professional theatre GO.
In September 2007 Association Days were held in Kudowa Zdroj with participation of members of the Association research teams and invited Polish nationals working abroad on the European fusion programme. Jan Stoeckel and Pavol Pavlo from IPP.CR in Prague presented COMPASS programme.
Finally, I would like to thank all those who contributed to the Polish Association Work programme and helped the Association to find its place in the European and worldwide fusion programme.

Andrzej Gałkowski
Head of Research Unit

1.1 General Information

Association Steering Committee

European Commission	Poland
Yvan Capouet Head, Unit J4, "Fusion Contracts of Association", DG Research	**Leszek Grabarczyk** Deputy Director, The National Centre for Research and Development
Steven Booth Scientific Officer, Unit J4, "Fusion Contracts of Association", DG Research	**Zygmunt Składanowski** Director, Institute of Plasma Physics and Laser Microfusion
Carles Dedeu Fontcuberta Financial Officer, Unit J5, "Finance and Administration", DG Research	**Stanisław Szpilowski** Director, Polish National Atomic Energy

Association Council

Chairman

Krzysztof J. Kurzydłowski	Warsaw University of Technology, Poland
Michel Chatelier	CEA Cadarache, France
Maurizio Gasparotto	EFDA Close Support Unit Garching
Marek Jeżabek	PAS Institute of Nuclear Physics, Poland
Thomas Klinger	Max-Planck Institute of Plasma Physics, Germany
Yuri Kravtsov	Maritime University of Szczecin
Józef Musielok	Opole University, Poland
Marek Rubel	Royal Institute of Technology, Sweden
Marek J. Sadowski	Sołtan Institute for Nuclear Studies, Poland
Zygmunt Składanowski	Institute of Plasma Physics and Laser Microfusion, Poland
Stefan Taczanowski	AGH University of Science and Technology, Poland
Michael Watkins	EFDA Close Support Unit Culham
Harald W. Weber	Vienna University of Technology, Austria
Andrzej Zaleski	PAS Institute of Low Temperature and Structure Research, Poland

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Figure 1.1 Research Unit in Poland

Polish representatives in the European committees relevant to fusion research and development

Consultative Committee for the EURATOM Specific Research and Training Programme in the Field of Nuclear Energy (Fusion) – CCE-FU

Leszek Grabarczyk – Deputy Director, The National Centre for Research and Development
Andrzej Gałkowski – Head of Research Unit, IPPLM
Adam Sołtan – Director, Polish National Atomic Energy Agency

Governing Board of the European Joint Undertaking for ITER and the Development of Fusion Energy (Fusion for Energy) – F4E

Łukasz Ciupiński – Warsaw University of Technology, WUT
Leszek Grabarczyk – Deputy Director, The National Centre for Research and Development

F4E Technical Advisory Panel

Jarosław Mizera – WUT

EFDA Steering Committee

Andrzej Gałkowski – IPPLM
Ryszard Miklaszewski – IPPLM

Inertial Fusion Energy Working Group

Jerzy Wołowski – IPPLM

Industry Liaison Officer	Maciej Chorowski – WTP
Public Information Officer	Helena Howaniec – IPPLM

EU Task Forces

Plasma-wall interaction	Jerzy Wołowski – IPPLM
Integrated tokamak modeling	Roman Stankiewicz – IPPLM

EU Topical Groups

Materials	Elżbieta Fortuna – WUT
Transport	Sebastian Głowacz – IPPLM
MHD	Ryszard Miklaszewski – IPPLM
Diagnostics	Marek Scholz – IPPLM

EFDA contact persons

Quality Assurance	Łukasz Ciupiński – WUT
CEG-Fusion	Ryszard Miklaszewski – IPPLM

JET contact persons

SCP	Jerzy Brzozowski – IPPLM
ACP	Paweł Nadrowski – IPPLM
TFD	Marek Scholz – IPPLM
TFE/T	Sebastian Głowacz – IPPLM
PR	Helena Howaniec – IPPLM
RP	Radosław Wawrzusiak – IPPLM

1.2 Financial Information

		Expenditure (Euro)
General Support		**1 935 337**
	Physics	1 490 158
	Inertial Confinement Fusion	158 448
	Underlying Technology	286 731
EFDA		**270 794**
	Basic Support Technology	192 828
	Preferential Support Technology	63 418
	EFDA Art. 6. contracts	14 548
Mobility		**64 601**
TOTAL		**2 270 732**

Table 1.1 Expenditures for 2007

1.3 Statistics

The work programme of the Association EURATOM-IPPLM includes 29 R&D tasks on physics, underlying technology, technology and inertial confinement fusion. Table 1.2 contains information about tasks distribution.

	Physics	**Underlying Technology**	**Technology**	**Inertial Confinement Fusion**
IPPLM	6	1	1	3
SINS	2	-	-	-
WUT	2	3	1	-
OU	1	-	-	-
SUT	1	1	-	-
MUS	1	-	-	-
INP	1	-	-	-
AGH	-	-	2	-
ILTSR	-	-	1	-
IAE	-	-	1	-
WULS	-	-	1	-
	14	5	7	3

Table 1.2 Tasks distribution for Association Euratom-IPPLM (2007)

Distribution of tasks by institution is also shown in the Figure 1.2.

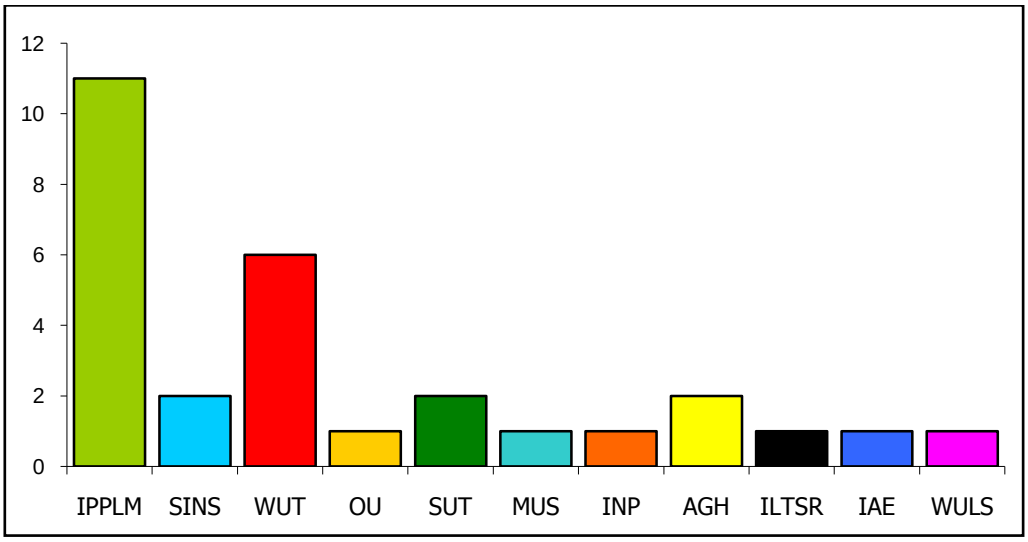

Figure 1.2 Number of tasks for year 2007 by institution

Manpower in 2007 is shown in the Table 1.3 below.

	professional	non professional	TOTAL
IPPLM	32	16	48
SINS	10	7	17
WUT	47	3	50
IEA	4	-	4
ILTSR	6	1	7
INP	7	2	9
AGH	4	8	12
OU	4	-	4
SUT	8	-	8
MUS	4	-	4
WULS	7	1	8
	133	**38**	**171**

Table 1.3 Association EURATOM-IPPLM staff in 2007

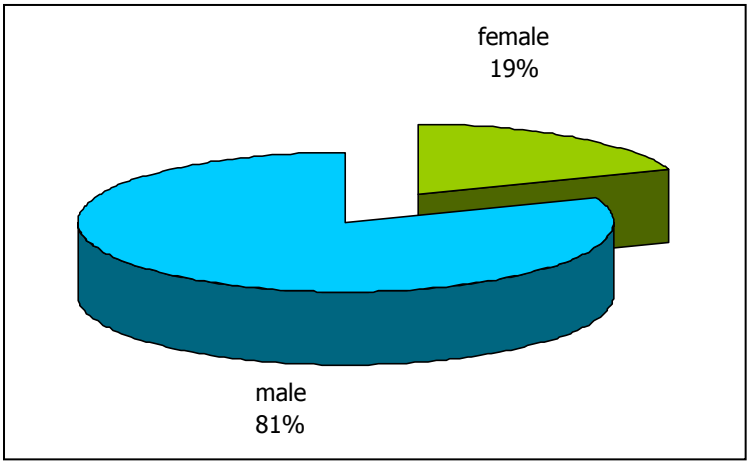

Figure 1.4 Association EURATOM-IPPLM staff in 2007 by gender

The following part of the Annual Report contains information of a preliminary and/or tentative nature and must not be quoted in publications nor listed in abstract journals. It is the executive summary of the full annual report, summarizing activities performed by the Association EURATOM-IPPLM in 2007. The full annual report is available on the CD attached to this document.