Research and development of ICSI Ramnicu Valcea are focused on the following general objectives:

- To sustain the national nuclear program – fission and fusion
- To develop studies and researches in the field of cryogenics
- Hydrogen and Fuel Cell
- Environment and quality of life
- Production and Services
- Infrastructure development, technology transfer and innovation services
- Increase of competitiveness and bring ICSI Rm. Valcea at specific EU policies by developing capacity to assimilate the techniques and technologies
- Development of management of public and private financial resources allocated to scientific research, technological development and innovation of ICSI Rm. Valcea.
- Human resource development in the sphere of research activities by encouraging the formation and development of young researchers and research teams for high performance.
ICSI RM. VALCEA UNDERSTRUCTURES

- Experimental Pilot Plant for Deuterium and Tritium Separation
- Laboratories of Research, Development, Innovation and Technology transfer
- National Center for Hydrogen and Fuel Cells
- Technological and Business INCUBATOR – ITA–ICSI Rm. Valcea
EXPERIMENTAL PILOT PLANT FOR DEUTERIUM AND TRITIUM SEPARATION

OBJECTIVES:

☆ Develop of the technology for heavy water detritiation, used as moderator in CANDU reactors.

☆ Verification of specific equipment and materials in cryogenic environments and tritium.

TECHNOLOGY:

☆ Pilot plant has a continuous process training and authorization, in accordance with CNCAN rules.

☆ Review of the technical design of reference, procedures for operating the pilot plant system.
• Personnel training and operator verification / testing it in relation to nuclear safety requirements.

• Pair installation program EURATOM / EFDA-JET and EFDA-ITER on fusion and water detritiation system that will function within the ITER reactor.

SECURITY SYSTEM:

• Protection of premises by implementing technological protection systems in accordance with EU legislation and requirements of the IAEA.

• Improving the system of radiological protection of personnel and operating environment.

• Accreditation of the dosimetry laboratory of installation.

• Development environmental laboratory.

• Implementation of the safeguard rules and physical protection by providing technological spaces and annexes with a controlled access and intrusion protection.
TECHNOLOGY TRANSFER

- The beneficiary of the heavy water detritiation technology is NUCLEARELECTRICA for Cernavoda NPP Unit 1 and Unit 2.
## INTERNATIONAL PROJECTS

### Programme EURATOM

<table>
<thead>
<tr>
<th>Project title</th>
<th>Coordinator (Institution/Country)</th>
<th>Partners (Country / Institution)</th>
<th>International program that enrolls project</th>
<th>International Project Value</th>
<th>ICIT share</th>
<th>International Project duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upgrade of Gamma-Ray Cameras JET-EP2-GRC-NA</td>
<td>Romania/ICIT (INFLPR)</td>
<td>MHST Slovenia, UKAEA United Kingdom, ENEA Italy, JOC (JET OPERATING CONTRACT)</td>
<td>EURATOM/EFDA JET</td>
<td>1,116,000 Euro</td>
<td>Of which: MER Notification 683,000 Euro Orders 148,000 Euro</td>
<td>Notification 521,000 Euro Art. 6.3 ORDERS 101,000 Euro</td>
</tr>
<tr>
<td>KM6T (JET-EP2-KM6T)</td>
<td>Romania/ICIT</td>
<td>JOC (JET OPERATING CONTRACT)</td>
<td>EURATOM/EFDA JET</td>
<td>29,000 Euro</td>
<td>29,000 Euro</td>
<td>6 months</td>
</tr>
<tr>
<td>“Fuel Cycle” Fusion Training Scheme</td>
<td>FZK Karlsruhe/Germany;</td>
<td>CEA Cadarache; ENEA; MTA ATOMKI; ICIT Rm. Valcea</td>
<td>EURATOM EFDA-ITER</td>
<td>750,000 Euro</td>
<td>144,469 Euro</td>
<td>48 months</td>
</tr>
<tr>
<td>“TRI-TOFFY” Training Programme</td>
<td>FZK Karlsruhe/Germany;</td>
<td>CEA Cadarache; ENEA; MTA ATOMKI; UKAEA; ICIT Rm. Valcea</td>
<td>EURATOM EFDA-ITER</td>
<td>2,721,000 Euro</td>
<td>342,000 Euro</td>
<td>48 months</td>
</tr>
</tbody>
</table>
LABORATORIES OF RESEARCH, DEVELOPMENT, INNOVATION AND TECHNOLOGY TRANSFER

OBJECTIVES:

- Advanced gas separation and purification by physical adsorption, selective adsorption and chemical processes.
- Study of electrochemical and physical processes for PEM-FC and demonstration
- Obtaining and characterization of advanced materials with applications in industrial waste gas purification
- Analysis Techniques: mass spectrometry, gas-chromatography, physico-chemical, IR-spectrometry
- Procedural system according to the European and national norms for establishment of analytic data bank and annual wine identification record
Intercommunication analysis – Eurofins Scientific – NMR Laboratory, Nantes, France

- High vacuum system pumps
- Design and production of cryogenic installations, experimental research and implementation of data acquisition system
- Investigation and characterization of materials studied in the field of cryogenic temperatures (LN₂, LH₂, LHe)
OBJECTIVES:

- Implementation of hydrogen energy technologies.
- Achieving an environment conducive to research activity for production of energy from unconventional sources.
- Implementation of educational programs for training on the use of hydrogen as energy vector, the training of young researchers in the field.
Connecting of researchers from Romania in scheduled activities at European/international level for energy production from renewable sources.

Dissemination of activities and their results in order to promote renewable energy, design, implementation and demonstration of technologies at laboratory and prototype.

ICSI Rm. Valcea – National Center for Hydrogen and Fuel Cell

- Full member of JTI-N ERGHY Group
- Partner of the University of Lorens/France in the project KIC-EIT: Energy, Education, Entrepreneur ship and Eco-Engineering Management of the project: ARTTIC, France
TECHNOLOGICAL AND BUSINESS INCUBATOR ITA - ICSI RM VALCEA

ITA-ICSI Ramnicu Valcea - innovation and technology transfer entity, established in the INC-DTCI - ICSI Ramnicu Valcea, without personality legal. - part of the National Network of Innovation and entities ReNITT Technology Transfer.

MISSION: To facilitate the start-up and development of new enterprises (SMEs) innovative based on advanced technology.

GENERAL OBJECTIVES:
* Sustaining innovation effort in the economy and society.
* Stimulation of innovation and technology transfer to introduce in economic cycle of research results.
* Increase quality and competitiveness of products, processes and services.
* Support sustainable regional development strategies.

Area: 650 m², furnished in areas modulated.
SME COMPANIES INCUBATED

- SC MECRO SYSTEM SRL
- SC ECOSYSTEM EXPERT SRL
- SC ECOPROTOMED SRL
- SC ECOTESTGAS SRL
- SC. CARPE SRL
- SC METINSTAL SRL
- SC MONTINDUS SRL
- MESSER MAGNICOM GAS
- MESSER ENERGO GAS
- MESSER ROMANIA GAS

Facilities:

- Access to infrastructure - offices, furniture, telephones, computers, servers, multifunctional printers, and Internet communications networks.
- Professional services - technological information, technological audit, technological forecasting, exploiting intellectual property rights.
- Assistance services: raising funds, identifying partners, access to specialized databases, national priorities, regional and local.
- Security services and protocol.
DISSEMINATION / APPLYING THE RESULTS 2008

- Scientific papers published in professional journals ISI: 30
- Scientific papers published in specialized journals without ISI: 118
- Participation at scientific (symposiums, conferences, congresses):
  - National: 89 papers
  - International: 60 papers
REVENUES ACHieved IN 2008 (thousand LEI)
HUMAN RESOURCES

Total no of staff
- Staff with higher education: 102 (43%)
- Staff developing R&D activities: 165 (75%)
- Staff developing marketing and production activities: 23 (10%)
- Administrative staff: 33 (15%)

Number of staff on 31.12.2008
- Average age on 31.12.2008: 68

Age distribution:
- < 35 years: 56
- 35-45 years: 68
- 46-55 years: 93
- > 55 years: 14
STAFF IN HIGHER EDUCATION

STAFF OF HIGHER EDUCATION ON OFFICERS AND PROFESSIONAL GRADE
INTERNAL PARTNERS

RESEARCH AND DEVELOPMENT INSTITUTE

- Institute of Atomic Physics, Bucharest-Magurele
- National Institute of Research and Development for Physics and Nuclear Engineering "Horia Hulubei", Bucharest-Magurele: behavior of materials and equipment in environmental tritium.
- National Institute for Research and Development for Isotopic and Molecular Technologies, Cluj Napoca: instrumentation and equipment for isotopic analysis.
- National Institute for Research and Development for Electrotechnical products ICPE - CA Bucharest: vacuum equipment, materials and zeolites new carbon structures, hydrogen energy.
- Autonomous nuclear activities - Branch SCN - Pitesti: study behavior of materials in corrosive media.
- National Institute for Research and Development for Technical Physics, Iasi: study of advanced materials and their applications to isotope separation and hydrogen storage.
- Institute of Physical Chemistry, Bucharest: Physical and structural characterization of materials.
- Romanian Marine Research Institute, Constanta: environmental radiation protection.
- National Institute of Laser Physics, Plasma and Radiation, Bucharest-Magurele
- National Institute of Materials, Physics, Bucharest-Magurele
HIGHER EDUCATION INSTITUTIONS

- University of Bucharest - Faculty of Chemistry: Techniques for investigating organic substances.

- Polytechnic University of Bucharest - Faculty of Power: processes and equipment in nuclear energy, hydrogen energy and its associated.

- University of Craiova - Faculty of Electrical Engineering: Materials Science and Engineering; cryogenic applications in electrical.

- University of Pitesti - Faculty of Science: study material - thermodynamics and corrosion of materials, physical and structural characterization of materials.

- Ovidius University: study materials and environmental protection.

- University of Civil Engineering Bucharest - Faculty of Plants: thermodynamics, heat transfer and thermal engineering, environment protection.

- Transylvania University of Brasov: hydrogen and its associated energy.
UNITS IN INDUSTRY

- Autonomous nuclear activities – ROMAG Drobeta-Turnu Severin;
- RAAN-SITON Bucharest-Magurele
- Nuclear Fuel Factory Pitesti
- National Mineral Water Company
- National Society Nuclearelectrica SA
- CNE - PROD - Unit 1 and Unit 2 Cernavoda
- SC PROIMSAT SA Rm. Valcea
- SC MECROSYSTEM Bucharest
- SC ROMIB Bucharest
- SC OLTCHIM SA Rm. Valcea
- SC IMUC SA Pitesti - Bucharest Branch
- SC Govora S.A.
- SC METINSTAL Rm. Valcea
- SC ELECTRONICS Rm. Valcea
INTERNATIONAL PARTNERS

- **FZK Karlsruhe - Tritium Laboratory, Germany** - compare performance of catalysts for hydrogen-water isotopic exchange; detritiation of water systems.

- **NUCLEAR ENERGY CENTER in MOL, Belgium** - isotopic exchange catalyzed $H_2$ - water, testing the endurance of the catalyst Pt / C / PTFE, decontamination of liquid waste and solid modeling.

- **ATOMIC ENERGY COMMISSION - CEA, France** - *ITER* fuel cycle.

- **CENTER FOR RESEARCH AND ENGINEERING MATERIALS in Toulouse, France** - study materials and their processing.

- **MESSER GRIESHEIM GmbH, Austria** - the production of pure gases and gas mixtures.

- **Kanagawa University, Japan** - water with low in deuterium and its associated processes.

- **University "CHALMERS" of Gothenburg, Sweden** - removal of radionuclides from liquid radioactive wastes, development of new materials and techniques with applications in environmental protection.
- INSTITUTE FOR ITEMS TRANSURANIENE in Karlsruhe, Germany - JRC project - techniques and methods for measuring radioactivity in the environment.

- INTERNATIONAL INSTITUTE OF COOLING, France – Cryogenic processes and equipment.

- Nuclear Research Institute in St. Petersburg, Russia – computer programs and computer simulation of hydrogen isotope separation processes, fillings and catalysts for separating isotopes of hydrogen, tritium storage equipment.

- UNIVERSITY OF ANTWERPEN (U.I.A.), Belgium – production and investigation of new materials for environmental separation and purification techniques of gas.

- KRYOTECHNIK LINDE AG, Switzerland - Cryogenic equipment.

- UNIFIED INSTITUTE NUCLEAR RESEARCH, Dubna, Russia - measurements at very low temperatures, high vacuum equipment.

- NUCLEAR RESEARCH INSTITUTE of the Hungarian Academy of Sciences - ITER fuel cycle.
EDWARDS, England – vacuum production equipment, measurement systems and purchase of controlled high vacuum cryogenic.


NUCLEAR RESEARCH INSTITUTE Belgrade, Serbia – cooperation in the analysis of stable isotopes, environmental monitoring.

Analytic JENA GmbH, Germany – equipment and instrumentation for analysis of gas and aqueous solutions.

INSTITUTE FOR REFERENCE MATERIALS AND MEASURES, EC-JRC Geel, Belgium - instrumental methods of analysis of isotopes.

VARIAN INSTRUMENTS, Germany - instrumentation and analysis equipment accessories for vacuum equipment.

KRAFTANLAGEN HEIDELBERG GmbH, Germania – Design and manufacture of nuclear energy production equipment.
CONFERENCE
“Progress in Cryogenics and Isotope Separation”
28-30 October 2009

15th edition, the resort hotel complex “COZIA” of Calimanesti-Caciulata

CONFERENCE TOPICS:

★ Physics, technology and applications of stable isotopes;
★ Cryogenic Technology and Equipment;
★ Materials Science and Engineering;
★ Nuclear Power – fission and fusion;
★ Hydrogen and its applications in power. Fuel Cells;
★ Environmental Protection and Industrial Risk;
★ Laboratory Analysis Methods;
★ Agriculture and food security.
Participants: 188
- country: 180
- abroad: 8

Conference plenary / invited lectures: 12

Oral papers: 20

Posters papers: 66
Edit:


THANK YOU FOR ATTENTION!