

**IAEA**

International Atomic Energy Agency

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**PROGRAMME OF COORDINATED RESEARCH ACTIVITIES**Webpage: [cra.iaea.org](http://cra.iaea.org)**REQUEST FOR RENEWAL OF RESEARCH CONTRACT No.**

**PLEASE SEND YOUR REQUEST FOR RENEWAL OF RESEARCH CONTRACT TO [Official.Mail@iaea.org](mailto:Official.Mail@iaea.org)  
ONLY DULY FILLED AND SIGNED RENEWAL REQUESTS WILL BE PROCESSED.**

1. CODE OF THE COORDINATED RESEARCH PROJECT (CRP): 17116/R0	
2. TITLE OF THE COORDINATED RESEARCH PROJECT (CRP): Utilisation of a Network of Small Magnetic Confinement Fusion Devices for Mainstream Fusion Research. IAEA CRP F1.30.14.	
3. TITLE OF RESEARCH CONTRACT: Use of a Small Tokamak GOLEM as a test bed for application of High Temperature Superconductors in Fusion Devices	
4. CONTRACTING INSTITUTION: (The contracting institution can only be an institution with independent legal personality)  Inst. Name: The Czech Technical University, FJFI CVUT Prague  Street: Brehova 7 P.O. Box: Postal Code: 11519 City : Prague Region/District : Country: Czech Republic Tel.: +420 224351111 Fax: +420 222320861 Email: <a href="mailto:dekan@fjfi.cvut.cz">dekan@fjfi.cvut.cz</a> Does the institution have an independent legal personality <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. IMPLEMENTING INSTITUTION: (Where the research is performed - contracting institution, sub-institution, branch of the main institution or laboratory)  Inst. Name: Tokamak GOLEM  Street: Brehova 7 P.O. Box: Postal Code: 11519 City : Prague Region/District : Country: Czech Republic Tel.: +420 224358361 Fax: +420 222320861 Email: <a href="mailto:svoboda@fjfi.cvut.cz">svoboda@fjfi.cvut.cz</a>
6. DETAILED WORK PLAN FOR COMING YEAR (including proposed methods or techniques):  i) Further investigation of RF pre-ionisation on GOLEM tokamak (tests of low-power ECR preionization for plasma formation on GOLEM tokamak): optimisation of the use of HTS PF coils on GOLEM requires modifications to the discharge scenario. To reduce AC losses during current ramp-up in HTS coils, reduction in the current ramp-up speed is needed, as this will result in a slower ramp-up of the current in coils. One of possible solutions may be reduction in the loop voltage needed for the plasma breakdown. It is well known that RF pre-ionisation is a powerful tool to achieve this goal. We propose to continue with experiments with the low-power magnetron at the EC fundamental harmonics for the toroidal field of 0.0875 T at 2.45GHz, ~1kW injected power with the aim to reduce requirements for the breakdown electric field.  ii) The GOLEM tokamak has showed it's unique qualification to study MHD phenomena and plasma flow in the plasma edge, we plan to contribute to the development of these novel diagnostic techniques.  iii) There is planned a second campaign to provide experimental data for the development of a new concept of advanced magnets in fusion devices, based on High Temperature Superconductors with a special focus on using poloidal field coils in realtime mode for the plasma stabilization.	

iv) Training of students via participation in operations of the GOLEM tokamak, participation in IAEA Joint experiments and other education activities. The work on fusion-oriented experiments requires a sufficient amount of expertise. Small tokamaks are the most suitable devices for practical training of young scientists, who just start their carrier in fusion-oriented research, because they offer more opportunities to be acquainted with all aspects of the experimental work than possible on large and quite complex machines.

## 7. PROJECT PERSONNEL (if space provided below is insufficient, please attach additional sheets)

## A. Chief Scientific Investigator (CSI)

Family Name :	First Name:	Gender: M/F	Date of birth: yyyy-mm-dd	Nationality:
Svoboda	Vojtech	M	1967-03-11	czech

Telephone (office):	Fax (office):	Email (office):	Position held:
+420 224358361	+420 222320861	svoboda@fjfi.cvut.cz	Assistant Professor

## B. Secondary CSI (if applicable)

Family Name :	First Name:	Gender: M/F	Date of birth: yyyy-mm-dd	Nationality:
Stockel	Jan	M	1944-07-01	czech

Telephone (office):	Fax (office):	Email (office):	Position held:
+420 266053940	+420 286586389	stockel@ipp.cas.cz	

## C. Main additional Scientific Staff

Family Name :	First Name:	Gender: M/F	Date of birth: yyyy-mm-dd	Nationality:
Kocman	Jindřich	M	1987-06-11	czech

## D. Main additional Scientific Staff

Family Name :	First Name:	Gender: M/F	Date of birth: yyyy-mm-dd	Nationality:
Grover	Ondřej	M	1992-04-14	czech

## 8. BUDGET - Estimate for coming project year (please show all amounts in EUR €):

Total Project budget in €	107800
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## A. Equipment, materials, supplies to be purchased by the IAEA on behalf of the Institute:

Items	Estimated project costs in €
GOLEM tokamak operational costs	2500
High Temperature superconductor	2500
Sub-total:	5000

## B. Miscellaneous (including transport\*):

Item	Estimated project costs in €
Sub-Total:	

\* If funds for travel/transportation have been included in the budget, please indicate specific purpose:

## C. Total - All Costs (Budget Items A - B)

Total budget requested from the IAEA in €	5000
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9. WILL RESEARCH BE COMPLETED IN COMING YEAR?

Yes  No

10. SIGNATURES

CHIEF SCIENTIFIC INVESTIGATOR

Name (in capitals) SVOBODA VOJTECH

*Signature* *1/12/2013*  
Signature Date

HEAD OF INSTITUTE

Name (in capitals) MIROSLAV CECH



*Signature* *- 4 - 12 - 2013*  
Signature Date