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|  | EUROPEAN COMMISSION  DIRECTORATE-GENERAL ‘RESEARCH’ | INTERNATIONAL  SCIENCE AND  TECHNOLOGY  CENTRE |  |

**CONTACT EXPERT GROUP on SEVERE ACCIDENT MANAGEMENT (CEG-SAM)**

*To:* R. Burmanjer (EC, DG-RTD / D.3) *Advice no.:* A -19

*Project code:* ISTC # 3876 *Date: 22nd* May 2008

*Signatures:* P. Hofmann (CEG-SAM Secretary)

*Linked meeting:*  13th CEG-SAM meeting, Budapest, March 5-7th, 2008.

*Attending members:* Altstadt (FZD); Bottomley (JRC/ITU); Clement (IRSN); Ducros, Journeau (CEA); Güntay (PSI); Herranz (CIEMAT); Hozer (AEKI); Krause (AECL); Miassoedov, Stuckert, Tromm (FZK); Lamy (EdF); Oriolo (Uni.Pisa); Trambauer (GRS); Willschütz (E.ON)

*Copies:*  CEG-SAM members; M. Hugon, J. Sanders (EC, DG-RTD / D.3), S. Webster (EC, DG-RTD / J.2), L.Tocheny (ISTC, Moscow)

\* Subject: - “Thermo-Hydraulics of Oxidising Melt in Severe Accidents (THOMAS)”

\* EU Collaborators: - CEA, FZK, IRSN, IVS Trnava, JRC-ITU

\* Documents: - ISTC project proposal; “Thermo-hydraulics of U-Zr-O molten pool under oxidising conditions in multi-scale approach (crucible - bundle - reactor scales) (THOMAS), Leading Institution: Nuclear Safety Institute of Russian Academy of Science (IBRAE), Moscow, Russia.

\* Advice: - **EU funding recommended with top priority**

\* Justification: - This project proposal will last for 3 years for a total cost of 310,000 USD. The project focuses on two issues with a high uncertainty: in-core melt formation and progression and melt behaviour in the lower Reactor Pressure Vessel (RPV) head, treated by coupling the mechanistic code SVECHA/MELT (oxidation of the molten pool) to the CONV code (a 3–dimensional (3-D) thermal hydraulics code for oxidised melt), respectively, in which updated and improved physical models developed in the project #2936 will be implemented and verified. The topics addressed in this project are ranked as “high priority” (in-vessel core and debris coolability) and as “medium priority” (in-vessel melt retention aspects) issues in the SARNET evaluation of the severe accident research priorities (SARP list). Presently in-vessel modelling has been mostly limited to 1-D or 2-D codes and recent results have shown local effects that demand full three dimensional modelling to ensure their proper understanding. This is particularly the case with heterogeneous, viscous and heat-generating melts. This information is necessary for accurate knowledge of material behaviour of the in-vessel corium melts. THOMAS will be further developing the models constructed and tested in the previous programmes and will both provide consistent modelling using all available data for validation, particularly when applied to in-vessel melts. The CEG-SAM group very strongly supports this project as the Nuclear Safety Institute of Russian Academy of Science (IBRAE) have shown themselves to be both competent and thorough in the execution of this very time-consuming and arduous work.

Comments: The project is of direct relevance for the all reactor types (both Russian & Western European designs). It will also have links with the SARNET-CORIUM, PLINIUS FP6 and LIVE programmes and with the proposed SARNET-2 and LACOMECO projects, where the analyses will be of great interest to the corium topics. It is hoped to be able to use some of the data from these projects for validation of the coupled codes.

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| Dissemination level : RE: restricted to EC, CEG-SAM members, ISTC and CIS beneficiaries |