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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 -18

*Project code:* ISTC # 3919 *Date:* 24th November 2008

*Signatures:* P.Hofmann (Secretary)

*Linked meeting:*  13th CEG-SAM meeting, Budapest, March 5-6th, 2008.

*Attending members:* Altstadt (FZD); Bottomley (JRC/ITU); Clement (IRSN); Ducros, Journeau (CEA); Lamy (EdF); Güntay (PSI); Herranz (CIEMAT); Hozer (AEKI); Oriolo (Uni.Pisa); Miassoedov, Stuckert, Tromm (FZK); Krause (AECL); Trambauer (GRS), Pretzsch (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: - “**V**VER **E**xperiments on **R**elease due to **O**ver-heating: **N**ormal**i**zation and **K**nowledge **A**ugmentation (VERONIKA)”

\* EU Collaborators: - FZK, ITU, IRSN, CEA

\* Documents: - ISTC project proposal #3919; “**V**VER **E**xperiments on **R**elease due to **O**ver-heating: **N**ormal**i**zation and **K**nowledge **A**ugmentation (VERONIKA), Leading Institution: All Russian Institute for Research in Atomic Reactors (RIIAR), Dmitrovgrad.

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

\* Justification: - This project proposal is composed of two phases: Part I will take 2.5 years and Part II 3 years and will cost ~800,000 US $. This proposal will investigate fission product release from high burn-up fuel annealed under oxidizing and reducing conditions. The objective is to obtain experimental data (on-line & post-test gamma spectroscopy and mass spectroscopy) on the release of volatile, non-volatile & gaseous fission products from highly irradiated VVER fuel of 60 MWd/kgU in the temperature range between 1400 and 2300°C. The fuel will be re-irradiated before performing the ramps with fuel in both cladded and uncladded condition. This will enable both short-lived isotopes to be seen as well as seeing the effects of cladding in fission product release. The results will be used to develop, validate and improve physical models and mechanistic codes (e.g. Model for Fission Products Release (MFPR) to describe fission product behaviour and release under severe accident conditions in high burn-up fuel. In contrast to earlier similar tests (VERCORS), it is planned to perform comparative tests with and without cladding, as well as turning off the heating at intermediate temperature before fuel collapse, in order to analyze thoroughly the fuel microstructure and fission product distribution at each stage.

The VERONIKA proposal has been discussed at SARNET meetings and SARNET has proposed various improvements. The test matrix has been revised by RIIAR on several occasions and the final test matrix presented at the above meeting includes all these improvements regarding the important issues of experiments conducted in air, improved fuel characterization, cladding oxidation state and the re-irradiation history. We believe it represents a very impressive set of experiments. It will provide valuable data for the short-lived fission product behaviour. Moreover it will be very important for projects in Western Europe such as VERDON (CEA), Phèbus PF and Phébus International Source Term Programme (IRSN). VERONIKA will particularly complement and add substantially to the value of the results coming from integral VERDON & Phébus PF tests. But this data will be mutually benefit both VERONIKA & the separate effects tests Phébus ISTP. The group very strongly supports this project as the Dimitrovgrad All Russian Research Centre of Atomic Reactors have both the capacity to perform the re-irradiation but have also competently performed other large scale projects and have always been competent in the project work.

Comments: This will run in parallel with VERDON (also using re-irradiated fuel) to the benefit of RIIAR experts as well as the projects. The data will assist the development of the MFPR code jointly undertaken by IRSN & IBRAE, Moscow. The tests also correspond to the severe accident research priorities (SARP) established by SARNET and so will be of benefit for all European severe accident research.

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