

SARNET NEWS N°3

June 2005

MANAGEMENT

Thanks in particular to the efforts and involvement of the topical coordinators all the first-year technical deliverables have been completed (except two, related to excellence spreading activities) and transmitted in due time to the European Commission.

Regarding administrative deliverables the coordinator is still not in position to present to the EC a complete view of the cost statements. End of June a dozen of cost statements were still missing (the dead line for transmission to the EC was mid May). Such a delay blocks the budget approval by the EC and the further distribution of the grant.

An expert panel nominated by the EC (J. Royen, K. Rahbar, G. Löwenhielm) has reviewed SARNET progress on June 13th, 2005 (prior to the meeting the expert panel had reviewed all the project deliverables). They have concluded that SARNET is a good project that has achieved most of its objectives and technical goals for the first year period with relatively minor deviations. However, several recommendations were made; the most important are:

- No fundamental change of the Joint Programme of Activity is recommended, however it should be more clearly demonstrated that the present research elements of the programme are indeed cohesive and achieved in an integrated, collaborative and sustainable manner.
- Regarding ASTEC model assessment, a standard of acceptability should be defined and a higher priority should be given to application of ASTEC to BWR.
- Scientific peer-review process should be put in place, as part of efforts to establish the excellence of the SARNET network.
- More emphasis should be put on "Spreading of Excellence" (education and training, preparation of courses, writing of textbooks, public communication).
- Additional efforts should be devoted to the definition of "Severe Accident Research Priorities" (SARP) Work Package. Work in this area needs to receive urgent attention and high priority. Utilities and regulatory authorities should be associated with the definition of priorities.

Finally the Consortium has been encouraged to initiate in the coming months the discussion on the follow-up of the NoE beyond the current contract (that is to say after March 2008).

COMMUNICATION INSIDE AND OUTSIDE THE NETWORK

Within the Advanced Communication Tool (ACT), a survey has been conducted on the usability of the ACT. The feedback from users to this survey has been a valuable indication on extensions of the ACT, and has led to the installation of a Frequently Asked Question – Site, where the most common questions are answered. A link to a discussion group is also provided.

The final programme of the first European Review-Meeting on Severe-Accident Research and management, **ERMSAR 2005** (to be held on 14th –16th November 2005 in Aix-en-Provence, France) has been delivered. It may be found on the public web site: www.sar-net.org. A direct registration is possible: click [here for Online Registration](#).

ASTEC

IRSN and GRS are finishing the preparation of the version V1.2 of ASTEC (last tests and finalisation of the documentation). This version will be delivered on a CD-ROM to all ASTEC partners in the second week of July 05. It will benefit from the work performed since 1 year on numerical consolidation.

Specifications of model adaptation/extension to VVER-440, VVER-1000, CANDU, RBMK and BWR are under preparation. First reports (sometimes only preliminary ones, e.g. for RBMK and BWR since some exploratory studies will be necessary on these reactors in 2006) should be available in September 05.

All partners are currently writing technical reports on their validation work performed with ASTEC V1.1 during the first 15 months. Complementary calculations have been done since the February 05 ASTEC Users' Club, for instance on PACTEL T2.1. The synthesis report on the application to more than 20 different experiments (analytical or integral ones) will be delivered during the summer 05.

The situation is the same for the benchmarking calculations on plant calculations. Complementary calculations have been done on Konvoi 1300 MWe and on TMI2. The synthesis report on the 17 different plant applications will be delivered during the summer 05.

After V1.2 release, the partners will apply this version to the same calculations they performed to check either progress or at least non-regression of results. The ASTEC topical coordinator will discuss more precisely with all partners during the summer 05 the next stage of work to be done until March 06.

PSA2 (level 2 Probabilistic Safety Assessment) ACTIVITIES

The PSA 2 group met recently and for the third time in June 28th and 29th. The meeting, hosted by TUS in Varna – Bulgaria, was the opportunity to discuss the progress made:

- Comparison of Dukovany and Paks plants (both VVER 440) level 2 PSA,
- Finalization of the comparison of the partners' general methods for level 2 PSA development,

- Progress made in the comparison of methods used so far to assess uncertainties and in the identification of complementary possible methods.

Besides, the content of the three PSA2 deliverables due in September 2005 were précised and tasks were defined to achieve the new objectives of the group which are now to propose recommendations of best estimated methods to assess, in a level 2 PSA, hydrogen distribution and combustion, immediate consequences of the vessel rupture, melt corium concrete interaction and iodine releases and also uncertainties on those phenomena.

Concerning the two dynamic reliability methods already selected, the comparison, on an example, of results obtained with classical method and MCDET (Monte Carlo Dynamic Event Tree) one has been up dated and first ideas about the application of Stimuli Driven Theory of Probabilistic Dynamics on the example of hydrogen combustion phenomena have been developed

CORIUM, CONTAINMENT and SOURCE TERM

Work has continued in the three areas following the lines set out in JPA2. Several technical seminars have been organized and several joint papers for ERMSAR conference are under preparation.

In the Corium domain, one may mention:

- The test QUENCH-11 (LACOMERA-Q2) is under preparation and will be conducted in two phases in August/October under participation of Bulgarian Academy of Science, IBRAE (Ru), PSI and of course FZK.
- Several SARNET partners attended April MCCI-OECD meeting. CCI-2 benchmark exercise was presented and discussed and after presentation of unsuccessful melt ejection test, decision was taken to conduct an other 2D ablation test with siliceous concrete by the end of summer 2005.
- CEA Cadarache is preparing with FZK a COMET test in VULCANO, scheduled in October. This test, funded by the FP5 PLINIUS Transnational Access to Research Infrastructure project, is aimed at demonstrating with prototypic corium the COMET core catcher concept. Within SARNET, IKE is making some pre-calculations of this test with WABE, taking into account corium physical properties. Posttest calculations are also planned in a second stage.

In the **Containment domain**, one may mention:

- A two-day workshop on recombiners, spray and condensation has been organised end of June at the CEA Headquarters in Paris. Several organisations have participated to the fruitful discussions such as University of Pisa, Framatome, VEIKI, University of Madrid, UJV, FZJ, FZK, LEI, NRG, IRSN and CEA. Presentations have also covered the different subjects including NPP applications, current status of modelling and model validation. For the three selected topics, it has been agreed to produce for the end of the year a report regarding the details of models, validation and also identified gaps. Some integration work has also been proposed: Implementation of recombiner models in partner's containment code; a simple benchmark dealing with interaction of two recombiners in a closed volume (CEA will provide benchmark specifications), benchmarks for Spray using TOSQAN and

MISTRA facilities. CEA will coordinate the work on recombiners, University of Pisa the one on Condensation and IRSN the one on Spray.

- End of June, phase 1 of the OECD Research Programme SERENA on fuel-coolant interaction was concluded after three years of operation. IRSN/CEA and KAERI had prepared a proposal for a possible phase 2 that has been supported by all SARNET partners within SERENA. This proposal includes experiments with KROTOS/Cadarache and TROI (KAERI). All SERENA partners accepted the proposal. The agreed formulation will become available in July

In the **Source Term domain**, one may mention:

- Cooperation has been reinforced in the area of aerosol retention in cracks; at a circle meeting held in Milan on 27 May, conditions for future experiments and bases for model development were set.
- The attachment of a CIEMAT researcher to PSI has been successfully concluded and a step forward in the methodology to understand the SGTR project results has been set. Repetition of such a detachment next year is recommendable.
- Cooperation has started actively on mass transfer matters, concerning results from SISYPHE.
- The RUSSET experimental programme at AEKI is being reviewed by UCL Belgium, in relation with previous research at UCL.

DATANET

Following a progress meeting held end of May in ISPRA, two new organisations have joined the DATANET activities (development of Database network for preserving experimental data): VTT and CIEMAT.

SARP

The working scope is

- Observe progress of JPA and SAP in cooperation with Management Team
- Check if any Needed Research Issue, based on PIRT Implication of EURSAFE, is resolved due to reduction of uncertainties or gain of scientific insights (risk potential, lack of knowledge)
 - High frequency, every year
- Check if any new Issue has to be added to the PIRT Implication list of Needed Research
 - Medium frequency, every two years
- Check if any new process or phenomena have to be included in the general PIRT list and evaluate Safety Relevance and Lack of Knowledge following the methodology applied in EUROSAFE
 - Low frequency, every three or four years

The first meeting of the organisation involved in this work package has been held in FzK on April 25th, 2005. The methodology of work has been defined. The preliminary

conclusions have confirmed the priorities that have been defined by the EUROSAFE project.

EXCELLENCE SPREADING

A meeting was held on May 23 and 24, 2005 in Stockholm at the campus of the Royal Institute of Technology (KTH) on the subjects of :

- holding a course on Severe Accident Phenomenology (SAP),
- writing a book on Severe Accident (SA) Safety.

The structure of the course and of the book has been defined. Lecturers for the various topics in the course and also some of the authors for the topics in the book have been identified.

- The meeting discussed the contents of the SAP course. The course is scheduled for January 9 to 13, 2006. It will be held at the INSTN site in Cadarache, which is located just outside of the CEA Cadarache Nuclear Center. A brochure of the course will be issued in July, it will be distributed at the upcoming meetings and sent to various institutions and Universities in the next 2 months, so that we have sufficient and timely advertising of the course for people to apply by first November 2005. The course is planned for both for students (150 €) and researchers (500 €) and will start from the basics.
- The book will be a Text Book of reasonable length (300 to 400 pages) with treatment of severe accidents as an integral part of reactor safety. It will be a premier product of SARNET, since it should incorporate all the knowledge that we have gained so far in Severe Accident Safety. Before delivery experts will evaluate it.

The mobility programme is developing; 4 new delegations of researchers have or will be initiated.

FUTURE EVENTS:

Management Team meeting N°4 : September 22nd, 2005 in Garching.

ERMSAR 2005, 14-16 November 2005, Aix-en-Provence.

Education course on severe accident (for students and young researchers), January 9 to 13, 2006, in Cadarache.

Governing Board meeting N°3: March 24th, 2006, Zürich.