

SARNET NEWS N°

April 2006

COMMUNICATION OUTSIDE THE NETWORK, LINKS WITH OTHER STRUCTURES

The announcement of the second European Review-Meeting on Severe-Accident Research and management, **ERMSAR 2007** is under preparation, it will be **hosted by FZK in Karlsruhe during the week of May 14th, 2007** (it should last 3 days, the precise dates will be defined in the coming weeks).

The SARNET project was presented at the FISA-2006 meeting held in Luxembourg on March 13th-16th 2006, and SARNET material was presented at the post-FISA workshop on PSA level 2, as detailed below.

ASTE C

The latest version V1.2 Rev1 has been released to the partners in dec.05. It is characterized by the feedback of 5 months of maintenance on models, mainly for in-vessel late-phase degradation and MCCI.

In order to improve the exchange of information between code users and the development team, a new version of MARCUS tool, more user-friendly, is being implemented in early April on the SARNET WEB site.

Needs of code evolution as expressed by the users have been synthesised (models, documentation, users' tools). They will be taken into account for IRSN-GRS specifications of the future series of versions V2. An action plan for model adaptation to BWR , involving 5 partners, has been set up.

PSA2 (level 2 Probabilistic Safety Assessment) ACTIVITIES

The members of the group have actively contributed to the preparation of the post FISA workshop devoted to PSA2 activities. It gave the opportunity to meet several end-users organisations (beyond the SARNET partners). The minutes of the workshop will be written by young scientists granted by SARNET for attending the seminar.

A synthesis of end-users requests and recommendations will be prepared by a representative of Swedish utilities.

A majority of partners will participate to the benchmark exercise on the assessment of the risk of containment failure due to hydrogen combustion which aim is to compare dynamic reliability methods with classical ones. The final version of the specification is available and the benchmark will be organized in two steps: risk assessment without considering uncertainties then taking into account uncertainties.

RESEARCH PRIORITIES

Following the methodology defined in 2005 the SARP¹ group has reviewed (February 2006), 7 new or re-oriented research issues proposed by topical coordinators, several recommendations were made, in particular:

- Perform calculations about the **additional source of volatile FPs** that might results from the **decomposition and recombination of aerosols and FPs in hydrogen Passive Autocatalytic Recombiners (PARs)** and perform small scale tests under typical reactor accident conditions;
- Review the existing database to estimate the **amount of volatile Ru in the containment** under consideration of specific accident sequences and conditions and perform separate effect tests to complete the database for the release and transport of volatile Ruthenium.

CORIUM, CONTAINMENT and SOURCE TERM

Progress review seminars have been hosted by PSI in Villigen (30 January – 3 February, 2006) for all three jointly executed research activities (CORIUM, CONTAINMENT and SOURCE TERM). A schedule for uploading the experimental data into DATANET (databank) and a timetable for producing new and improved models for ASTEC have been established. A forward programme has been developed for the third year, similar in nature to that of the second year, with some adjustments based on the second year's experience; a significant effort has been done to promote joint actions with a significant increase of benchmarking activities devoted to the estimation of remaining uncertainties and to the assessment of their acceptability.

Illustrations of progress or major events

In the Corium domain, one may mention:

- Cladding oxidation by air : recent MOZART results show a better behaviour for M5 compared to Zry-4 up to 850°C. Nevertheless, after 900°C the behaviour are the same. ICARE/CATHARE comparison with MOZART kinetic results shows the necessity to introduce the modelling of post-breakaway regime in code. This point is confirmed by oxygen consumption underestimation in ATHLET CD during air-ingress phase in QUENCH-10 experiment.
- In-vessel corium pool behaviour : the LIVE I1 commissioning test has been successfully performed by FZK in February to check the overall facility performance. After a second test where subsequent melt pour will be tested, the first LIVE test L1 in the frame of LACOMERA with TUS (Sofia) will be conducted with binary salt mixture to investigate 3D corium pool behaviour for VVER reactor conditions.
- Vessel thermo mechanical behaviour : the first step of joint exercise have been launched. All the necessary data for OLHF test interpretation have been transmitted to the participants. The next step will be the interpretation of a FOREVER test.
- Corium concrete interaction : COMET-L2 and L3 benchmark. The input data and experimental results concerning COMET-L2 test (MCCI in a stratified configuration) are now ready and they will be sent to the participants by mid of April. At the present time, 7 institutes have announced their participation. Probably 3 other will join the group.

¹ Severe Accident Research Priorities

In the Containment domain, one may mention:

- that CEA and FZK plans to pursue a closer collaboration programme, including the mobility of a CEA researcher to FZK, from July 2006 to June 2007, on the topic of « Modelling of H2 Combustion ». The work would deal with the improvement of the CREBCOM combustion model implemented both in the CEA/IRSN TONUS code and in the FZK COM3D code.
- Following the WP12-2 CAM Workshop, March 2-3, 2006, four working groups have been constituted concerning the spray benchmark exercise, for the development and assessment of models clustering around four experiments.
- SARNET partners in SERENA Phase 1 have actively participated in the elaboration of the Phase 2 proposal. The SARNET technical meeting discussing SARNET related FCI work on April 5, 2006, at IRSN, Fontenay-aux-Roses, was held in conjunction with the SERENA-2 experts meeting, held on April 6-7, 2006, at NEA headquarters in Paris, where the proposal was discussed by potential OECD partners.
- The task leader of WP13-1 (FCI) H. Jacobs (FZK) will retire next July. D. Magallon (CEA) will take over the duty of leading the task.
- A connection between WP13-2 (DCH) to WP12-1 (HC) will be established by the planned investigation of the combustion of hydrogen jets in a prototypic containment atmosphere, which is important for DCH. FZK will perform experiments and make data available to partners in WP13-2 and WP12-1.

In the Source Term domain, one may mention:

- Following discussions at the annual review meeting mentioned above, two proposals for new issues were raised at the Severe Accident Research Priorities concerning ruthenium behaviour in the containment, and interactions of fission products with PARs. Both these proposals were accepted, along with a realignment of the aerosol retention issue to consider resuspension. The proposed work programme for JPA3 reflects these matters.
- The paper "SARNET: Integrating Severe Accident Safety Research in Europe: Safety Issues in the Source Term area", has been accepted for the ICAPP-06 meeting, Reno, 4th-8th June 2006.
- The ISTC EVAN proposal was reviewed at the request of CEG-SAM, and comments provided to its meeting in March.
- Detailed discussions were held with new SARNET members Newcastle University and AECL prior to their admission, regarding their technical contributions in JPA3 and beyond. Significant contributions from them are expected in the Source Term area.

DATANET

The deployment of DATANET (SARNET experimental database system) is still in progress with the opening of two new STRESA nodes one at AEKI and one at CEA. Five STRESA nodes (at AEKI, CEA, FZK, IRSN and JRC-Ispra) may now be accessed by the partners; three ones are close to be open (at CIEMAT, FORTUM and KTH).

EXCELLENCE SPREADING

The CD ROM containing the full text of SARNET first course (held in Cadarache in January 2006, see SARNET News N°5) has been distributed to the participants.

A specific page has been open on ACT to collect the delegation proposals and applications in order to facilitate the contacts between candidates for a mobility and host organisations.

MANAGEMENT

The fifth meeting of the Management Team has been held in Ispra (JRC-ISPRA) on March 2nd ; during this meeting several proposals were defined, in particular:

- The activity programme for the “April 2006-September 2007” period (JPA3),
- The grant distribution for SARNET third year,
- The types of courses to be organized within the coming months (one on PSA2 methodologies, one on modelling and one on SAM).

These proposals have been approved during the 3rd meeting of SARNET Governing Board held at PSI, Villigen, on March 24th. During this Governing Board meeting four important decisions were taken:

- Creation of a **working group that will define the structure of the post-FP6 SARNET**, on the base of a project elaborated by the Coordinator after analysis of the answers to the “SARNET follow up” questionnaire; a preliminary version should be prepared for the end of this year;
- Creation of an ad-hoc scientific committee that will organize the **peer review of ASTEC in 2007**;
- Integration in the SARNET Consortium of **3 new members: AECL (Canada), BNRA (Bulgarian Safety Authority) and the University of Newcastle, UK**;
- Establishment of **links with IAEA** via the nomination of Mamdouh El-Shanawany to the SARNET Advisory Committee.

FUTURE EVENTS:

- Project review by an expert panel nominated by the EC (J. Royen, M. Khatib-Rahbar, G. Löwenhielm): June 27th, 2006 (Brussels, Belgium).
- Management Team meeting N°6: September 7th, 2006 (Aix en Provence or Cadarache, France).
- Advisory Committee Meeting N°2: October 13th, 2006 (Chatou, France).
- Governing Board meeting N°4: March 23rd, 2007 (Budapest, Hungary)
- ERMSAR 2007: May 2007 (Karlsruhe, Germany).