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Announcement

FISA-97 WorkshopEC-sponsored Research on Severe Accidents.

Nuclear Fission Safety Programme 1994–1998
17–19 November 1997, Luxembourg

The second international workshop on 'EU Research on Severe Accidents' will be held in Luxembourg from 17 to 19 November 1997. The workshop is being organized by the European Commission (EC) as a mid-term review of the cost-shared and concerted actions which were launched in 1996 and 1997 in the areas A.1 and B of the Nuclear Fission Safety programme 1994–1998. Area A covers innovative approaches such as passive decay heat removal systems (A.1), whereas Area B consists of five sections (areas B.1–B.5) covering phenomenological studies as well as prevention and mitigation measures relevant to severe beyond-design-basis accidents in light water reactors (LWR).

Nowadays in many countries of the European Union (EU) the ultimate goal of nuclear reactor safety experts is to render 'practically' unnecessary extensive evacuation precautions for populations in the site vicinity. This means essentially developing safety systems and procedures to respond to the challenge of the hypothetical severe accidents, which are beyond-design-basis events, assuming the very unlikely situation that the accident prevention measures have failed. At the FISA-97 workshop the strategy and the main achievements of the EC research programmes on severe accident analysis will be discussed together with some applications to plant assessments.

The subject of severe accidents in LWRs is usually just so complex to understand and the investigations are so expensive that international research efforts are needed to come to firm conclusions. At the EC, two research programmes were focusing on the understanding of the physics of beyond-design-basis accidents and on the development of accident management measures for LWRs of both the present and the future generation of reactors, namely: the Reinforced Concerted Action 1990–1994 which was concluded by the FISA-95 workshop (Luxembourg, 20–22 November 1995) and the current EURATOM Framework Programme 1994–1998 on Nuclear Fission Safety under its Areas A.1 and B.

Throughout the above-mentioned EC research programmes, many aspects of severe accident analysis are addressed, starting from early accident progression in the primary coolant system and going up to severe damage to the containment integrity, assuming that the safety systems are not working satisfactorily. Special emphasis is put on the applications of the findings to the development of measures for the mitigation of the consequences of severe accidents. The current EC research programme is organized in 51 multipartners contracts, each under the responsibility of a coordinator agreed amongst the contractors. A total of 35 contracting organizations (including the Joint Research Centre of the EC) are involved, coming from 11 EU member states and from some countries abroad.

At the FISA-97 workshop the main results of the 51 current EC research projects about Innovative Approaches and Reactor Safety will be presented by the coordinators of the multipartners contracts. In addition, results will be presented in relation with the supporting activities on reactor materials ageing. Besides those technical presentations by the projects coordinators, it is foreseen to have a series of invited lectures about generic issues of reactor safety for present and future LWRS.

The work programme is structured into seven clusters which are described in the following:

(1) In-vessel Core Degradation and Coolability ('INV' cluster/8 projects)
(2) Ex-vessel Corium Behaviour and Coolability ('EXV' cluster/4 projects)
(3) Radiological Source Term ('ST' cluster/10 projects)
(4) Containment Performance ('CONT' cluster/10 projects)
(5) Accident management measures ('AMM' cluster/5 projects)
(6) Ageing of structural components ('AGE' cluster/7 projects)
(7) Conceptual Reactor Safety Features ('INNO' cluster/7 projects).

Experiments about molten fuel/coolant interaction are conducted in the INV (IN-Vessel) cluster and will produce results of interest to the understanding of both early and late phase core degradation, as well as in-vessel debris coolability, including for example steam explosions. Measurements of molten corium/concrete interactions are performed in the EXV (EX-Vessel) cluster, with the aim to develop a databank for high-temperature materials properties and to contribute to the design of core-catchers. Experiments are conducted in the ST (radiological Source Term) cluster about fission products release from irradiated fuels at high temperatures and about aerosol re-entrainment in containment under various atmospheric conditions. This is done in close connection with the international PHEBUS-FP programme. In the CONT (CONTainment) cluster, tests about aerosol behaviour and high temperature loads are conducted and analyzed, with emphasis on containment thermo-hydraulics and deflagration-to-detonation criteria for hydrogen. Leakage of radionuclides through the containment is also examined.

Of interest to the present generation of reactors, especially those proposed for life extension, are the activities on ageing of reactor components, which are conducted in the AGE (AGEing) cluster. Of interest to the next generation of reactors is the development of innovative (passive) safety features for ensuring the main safety functions: this is the scope of the INNO (INNOvative) cluster, especially devoted to passive decay heat removal systems.

Ultimately, severe accident research aims at the confirmation of the safety margin, the quantification of the associated risk, and the evaluation of the effectiveness of the accident management measures of the nuclear power reactors, which is the aim of the AMM (Accident Management Measures) cluster.

Scientists wishing to attend the FISA-97 workshop should register their interest before 30 June 1997 by writing to the scientific secretariat to obtain the detailed conference programme and the appropriate registration forms, namely:

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