

KORTE WEERGAVE VAN DE INHOUD VAN DE LEZINGEN

G. Van Goethem

Since the Three Mile Island accident in the United States in 1979, regulatory authorities and electricity utilities have embarked on a wide-ranging review of nuclear plant performance and safety requirements. With an experience of approximately 10000 reactor-years - the operating history of nuclear fission plants worldwide - scientists and engineers have learned much about how to run them safely. If the nuclear option is to continue to grow, though, the public, interest groups, governments and financial authorities have to be convinced that they are safer than before.

The European Union has played its role in this international safety improvement effort by organising a series of nuclear safety projects under the Euratom research framework programmes. Each of the main actors of this Community research programme has obviously its own priorities, for example: safety for the regulatory bodies and the associated technical safety organisations; safety and performance for the electrical utilities and the associated engineering companies; safety, performance and innovation for the manufacturing industry and the associated services.

The "indirect" actions administered and cosponsored by DG Research during Euratom FP-5 (1998-2002) are focussing on the following issues:

- plant life extension and management (PLEM cluster): irradiation damage prediction, irradiation ageing and corrosion effects, monitoring, structural integrity and flow problems; research infrastructures, risk assessment, concrete ageing, computer based systems
- severe accident management (SAM cluster): primary loop integrity (in-vessel corium behaviour and source term), containment integrity (ex-vessel corium behaviour and hydrogen risk) - both from a phenomenological and an accident management point of view
- evolutionary concepts (EVOL cluster): knowledge management and numerical simulation, advanced experimental and numerical tools, education and training, advanced thermo-hydraulics modelling for plant applications, advanced nuclear fuel (high burn-up and MOX fuel).

Research on plant modernisation (PLEM) is contributing to improvements and a better harmonisation of safety practices throughout the EU Member States and the candidate CEECs. It shown that severe accident research (SAM) results in a better evaluation of these very unlikely events: the uncertainties are better quantified and subsequently the risks related to corium behaviour, hydrogen explosions and/or radiological releases are reduced. Some interesting evolutionary safety concepts and innovative numerical tools (EVOL) are discussed. Further exploitation of the results of this innovative research will help the nuclear industry achieve the scope of reducing even further the risks of both design basis and severe accidents.

Besides technological requirements, socio-economic aspects are becoming increasingly important due to the level of public and political acceptance and to the economic pressure of deregulated electricity markets. It has been shown that research conducted in the Euratom framework could contribute to meet these requirements. These challenges and others linked to EU policies and end-user needs are tackled in the 6th framework programme - see <http://www.cordis.lu/fp6-euratom/>.

A recent overview article is available at www.kerntechnik.nl

D. M. Taylor

Mr. Taylor will describe the Commission's nuclear package and, in particular, the two proposals for Directives - the "Safety" Directive and the "Waste" Directive. The focus of the talk would be on the objectives of the proposals, their specific requirements on the Member States and the present status of the proposals (now being discussed with and within the European Council and the European Parliament).

Additional info can be found:

- http://europa.eu.int/comm/energy/nuclear/index_en.html

- A recent article in Nuclear Engineer is available at www.kerntechnik.nl

H.A. Weisshaeupl

An overview will be given regarding the outlines of the nuclear safety research performed at JRC. Special attention will then be given to the activities of the Institute for Energy, located at Petten, dealing with structural integrity assessment, analysis of accidents, probabilistic and risk assessment, safety of innovative reactor designs, support to the TACIS/PHARE program.

Additional information can be found:

- <http://www.jrc.cec.eu.int>
- <http://www.ie.jrc.cec.eu.int>

R.P.C. Schram

The talk will focus on the Dutch project participation to 5th FWP fission programme. The projects address many different topics such as radioactive waste incineration, reactor safety, computational methods and irradiation experiments. Some highlights of the "physics" and "irradiation experiment" projects will be given. Examples of the 5th FWP projects are NACUSP, IRTMBA, HTR-N/N1, MUSE, ENEN, ADOPT, Thorium Cycle, MICROMOX, etc.

Additional info can be found:

- Fuels, Actinides and Isotopes group <http://www.nrg-nl.com/product/fuel/index.html>
- Recycling of waste (in Dutch) <http://www.nrg-nl.com/public/ras/pagina01.html>
- About The 5th FWP Thorium project <http://www.nrg-nl.com/extranet/thorium/index.html>
- About the 5th FWP ADOPT project <http://www.sck.be/adopt/projectssummary.html>