International Training Program: 3D S.Un.Cop - Scaling, Uncertainty and 3D Thermal-Hydraulics/Neutron-Kinetics Coupled Codes Seminar

A. Petruzzi, F. D'Auria
University of Pisa, DIMNP
Via Diotisalvi 2, 56100 Pisa, Italy
a.petruzzi@ing.unipi.it,
f.dauria@ing.unipi.it

Tomislav Bajs
University of Zagreb, FER
Unska 3, 10000 Zagreb, Croatia
tomislav.bajs@fer.hr

F. Reventós
School of Industrial Engineering
Av. Diagonal 647,
08028 Barcelona, Spain
francesc@reventos@upc.es

Thermal-hydraulic system computer codes are extensively used worldwide for analysis of nuclear facilities by utilities, regulatory bodies, nuclear power plant designers and vendors, nuclear fuel companies, research organizations, consulting companies, and technical support organizations.

The computer code user represents a source of uncertainty that can influence the results of system code calculations. This influence is commonly known as the 'user effect' and stems from the limitations embedded in the codes as well as from the limited capability of the analysts to use the codes. Code user training and qualification is an effective means for reducing the variation of results caused by the application of the codes by different users. This paper describes a systematic approach to training code users who, upon completion of the training, should be able to perform calculations making the best possible use of the capabilities of best estimate codes. In other words, the program aims at contributing towards solving the problem of user effect.

The 3D S.UN.COP (Scaling, Uncertainty and 3D COuPled code calculations) seminars have been organized as follow-up of the proposal to IAEA for the Permanent Training Course for System Code Users (D'Auria, 1998). Four seminars have been held at University of Pisa (2003, 2004), at The Pennsylvania State University (2004) and at University of Zagreb (2005). It was recognized that such courses represented both a source of continuing education for current code users and a mean for current code users to enter the formal training structure of a proposed 'permanent' stepwise approach to user training. The 3D S.UN.COP 2005 was successfully held with the participation of 19 persons coming from 9 countries and 14 different institutions (universities, vendors, national laboratories and regulatory bodies). More than 15 scientists were involved in the organization of the seminar, presenting theoretical aspects of the proposed methodologies and holding the training and the final examination. A certificate (LA Code User grade) was released to participants that successfully solved the assigned problems. A fifth seminar will be organized in 2006 at the School of Industrial Engineering of Barcelona involving more than 30 scientists.

Keywords: 3D SUNCOP, uncertainty, user effect, training