RELAP5-3D Dedicated Journal Issue

George Mesina

March, 2014

INL intends to publish an <u>issue</u> of a <u>journal</u> totally <u>dedicated to RELAP5-3D</u>. A call for papers is out.

Background

In the past few years, there have been many new developments and applications of RELAP5-3D. Some of these have not yet been published. The INL will sponsor an issue of an ANS journal dedicated to RELAP5-3D. The call for papers has gone out and is reproduced below. If the number of articles grows too large for a single issue, the INL may sponsor two dedicated issues. Interested parties should contact George.Mesina@inl.gov.

The abstracts are due April 29. Also in the call for papers, an "email of intent" to write on a particular topic or title is requested prior to writing an abstract. Several authors have sent emails of intent for 12 papers. Although much more information was supplied by several authors, authors who have committed to write papers, their submissions are reduced to a single sentence here.

1. Supporting Qualified Database for V&V and Uncertainty Evaluation of Best-Estimate System Codes for Licensing Applications
2. RELAP5 applications at GRNSPG-UNIPI: thirty years of Activities.
3. The BEPU Evaluation Model with RELAP5-3D for the Licensing of Atucha-2 NPP.
4. Insights on the ill-posedness of the governing equations
5. A description of the RELAP5-3D/PHISICS coupling methodology and theory coupled with some basic verification test examples.
6. Application of RELAP5-3D/PHISICS code to the MHTGR-350 benchmark showing some of the results and timings for Phase I and II.
7. An article of the implementation and the assessment of the Moody HEM critical flow model for RELAP5-3D with comparison against test data from Marviken blowdown experiments 15, 22 and 24 and against the Ransom-Trapp and Henry-Fausky critical flow models.
8. Recently modernized RELAP5-3D tools and peripherals.
9. The theory and application of variable gravity in RELAP5-3D
10. The improved verification capability built into RELAP5-3D
11. Closure relationships for new fluid fields in RELAP
12. Nodal Kinetics Improvements in RELAP5-3D

In addition to these, approximately half of a dozen more have been offered verbally. Because there is still room, the call for papers is reproduced below.

Call For Papers

You have expertise, experience and recent involvement with RELAP5-3D either with development, application, or both. Idaho National Laboratory is planning to create one or two issues of an American Nuclear Society Journal dedicated to RELAP5-3D. Both Nuclear Technology (NT) and Nuclear Science and Engineering (NS&E) have expressed interest. In fact, and if we obtain enough articles (more than ten articles), we may publish in both. The INL may pay the page charges for any/all papers submitted within reason (see below).

We are soliciting articles on recent developments and applications of RELAP5-3D in a variety of areas. Some potential topics are listed below, however there are many more possibilities of interest. Please submit your abstract and your paper to the INL (George.Mesina@inl.gov) by the following schedule:

- **Abstract Submission to INL: April 28, 2014**
- **Full Paper submission to INL: Sep 22, 2014**

If you are interested in submitting an abstract, please email a short note of interest to me. Also, if you know of a colleague who may be interested, please forward this and let me know.

Sample Development Article Topics:

- Variable gravity for moving problems
- Built-in highly accurate verification
- NESTLE neutronics developments
- Coupling with the new PHISICS neutronics package
- New Coupling of Star-CCM+ with RELAP5-3D
- Time-stepping improvements
- RELAP5-3D user tools
- Uncertainty and sensitivity analysis

Sample Applications:

- Using RELAP5-3D to analyze Small Modular Reactors
- Using RELAP5-3D to analyze gas-cooled reactor systems.
- Using RELAP5-3D to analyze aircraft engine cooling

- Parallel Virtual Machine (PVM) coupling with CFD and containment codes to better model a PWR.
- Statistical validation of PIRTs with RELAP5-3D
- Using RELAP5-3D to satisfy Nuclear Power Plant (NPP) licensing requirements.
- Creating the validation envelope for RELAP5-3D applications on NPP systems
- Applying RELAP5-3D in concert with the NRC Regulatory Guide 1.203 recommendations

Page charges are $30/page black and white and $525 in color. So please collect your color figures, try to put all of them on one page. Otherwise, INL may not cover your page charges.

Thank you,
Dr. George Mesina
Idaho National Laboratory