RELAP5 Version 4.0.3

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Outline

- RELAP5-3D Changes Since Version 2.4.2

- Performed Testing

- Version 4.0.3 Update

RELAP5-3D Changes
Since Version 2.4.2

- *FORTRAN 95*

- *Restructuring with FOR_STRUCT*

- *Developmental Assessment*

- *Improved Time Step Control*

- *Improved Nodal Kinetics*

- *Institutionalized Card 1, Option 3 (Consistent Sound Speed Calculation between Volumes and Junctions when Noncondensables are Present)*

- *Allow Efficiency Multiplier (for Type-3 Turbine) using a Control Variable and Turbine Inlet Junction Form Loss Multiplier using a Control Variable*

RELAP5-3D Changes
Since Version 2.4.2 (cont.)

- *Allow PVM Coupled Restart from Uncoupled Runs*

- *Modified PVM Coupling to send any RELAP5-3D Nodal Kinetics Variable instead of the Restricted List of Power, Zone, Heat Structure Average Temperature, etc.*

- *Added Card 1 Option 27 to set Theta Velocity in Outermost Ring of Rigid Body Rotation and R-theta Symmetric Problems to 1.0 m/s*

- *Added Card 1 Option 29 to allow more Accurate Solution to Momentum Equations for Low Flows*

- *Allow Input Options NEW and NEWATH to use all Working Fluids*

- *ANS 2005 Decay Heat Standard*

RELAP5-3D Changes
Since Version 2.4.2 (cont.)

- *Pump Head and Torque Multiplier as a Function of Pressure and Void Fraction*

- *CO_2 Properties Improvement for Running near and through the Critical Point*

- *Improved Compressor Model (Allow Input Negative Flows on Speed Tables, Allow Compressors to Run with Noncondensable Gases)*

- *Added Command Line Argument '-stat' for Run Statistics for Developmental Assessment*

- *2D Heat Conduction Model without Reflood*

- *Alternate Heat Structure – Fluid Coupling Model*

RELAP5-3D Changes
Since Version 2.4.2 (cont.)

- *Linux SUSE Platform Capability*

- *PVM Coupling Junction*

- *Fluids DOWTHERM A, Pb, Vertrel and R134a (SUVA)*

- *Added Card 1 Option 71 to allow Improved Metastable Extrapolation into Superheated Liquid*

- *Added Additional Mass Error Edits*

- *AptPlot Capability*

- *Capability of modeling heat flux boundary condition with a control variable*

- *Correction of the Godunov boron tracking model*

RELAP5-3D Changes
Since Version 2.4.2 (cont.)

- *Increased size of 3D component*
- *Added alternate steam tables – now default*
- *Mass error logging*
- *Transport properties added to all tpf-files*
- *Property files in XDR format*
- *Updates to allow coupling of RELAP5 and STAR-CCM*
- *BPLU error corrections*
- *Fixes for Windows 7 compilation*
- *PHISICS neutron kinetics package coupled to RELAP5*

Performed Testing

32-bit	64-bit	32-bit with PVM	64-bit with PVM
Installation test set DA cases DOE test set	Installation test set DA cases DOE test set	Installation test set DA cases DOE test set PVM Test Matrix TestDT cases	Installation test set DA cases DOE test set PVM Test Matrix TestDT cases

Version 4.0.3 Update

- Version 4.0.3 was completed and released in July.

- This version of RELAP5-3D has been sent to a number of different user communities and is available to all IRUG members upon request.

Questions?