Paulin Research Group R2018 New Features Summary

(PRELIMINARY – SUBJECT TO CHANGE ON FINAL RELEASE)

(Updated 8-22-2017)

NozzlePRO™

Updates and new features that will be present in version V12.0 of NozzlePRO™

- Support for ASME VIII-2 Part 5 Nonlinear Analysis Features
    - PRG has invested upwards of 8 person-years of software development, software testing, laboratory testing for results validation and correlation, and QA/QC for this new capability to be available in NozzlePRO™ and FEPipe™. This marks a MAJOR new capability for all PRG FEA-based applications.
    - Automatic Twice Elastic Slope Calculation
    - Automatic Collapse Calculation Load Stepping
    - Large Rotation, MultiLinear Elastic Plastic Material, Arc Length Solution with First Order Large Strain
    - Nonlinear Ratcheting Determination using Reinhardt Method
    - Branch and Run Side Sustained Stress Index Calculation
    - Ratcheting for various load combinations
    - Plastic Unloading to determine permenant deformed shapes
    - Substructure analysis of piping system to determine primary or secondary characteristic of nozzle loading.
- Directives for EN13445 Local Stress Analysis
- Non-integral reinforcement pads for pipe shoes and saddles
- Clamp-Type pipe shoes
- Updated allowable load algorithm for pipe shoes and saddles
- Piping Technology and Products Pipe Shoe Library
- Shell Automated Saddle Model
- Bend SIFs Included in PRGiK Calculator – includes expanded h values, attached pipe lengths, circumferential thickness variation, etc.
- Steady State and Transient Thermal Analysis of Pipe Shoes and Saddles
- Update to Latest Version of API-579/FFS-1 and Enhanced Local Thickness Modeling
- Automatic Modeling of Rings Around Shell Geometries
- **Addition of drawing tools to allow the graphical, "CAD-like", modification of shell model details and addition of model components. (See more details below.)**
- **MultiCore SuperNode Solver (4-to-8 times faster)**
- Normal updates and bug fixes since the last major release
- Point Cloud Capability Added to 3D Output Processor in NozzlePRO
    - allows the end user to validate their "as built" or operating systems in the field, by comparing them to the "as designed" piping models and PV models. This program combines plant scan data (point cloud data) processing capabilities and 3D modeling utilities to allow any plant staff member the ability to quickly and accurately see if what is actually in the field matches the computer models of what is in the field.

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FEPipe™

Updates and new features that will be present in version 10.0 of FEPipe™

- All new NozzlePRO™ features listed on the previous page, including **non-linear analysis** are also included in FEPipe.
    - Please read comments above for this new functionality. This marks a MAJOR new capability for all PRG FEA-based applications.
- The point cloud (scanning) software allows users to take measurements of FEA models of pipe or vessels, or to compare FEA models to the actual scan model images. Provides high and low resolution editing.
- **BOSB31 – fluid-structure interaction using frequency domain analysis of piping system to comply with B31.3 loading requirements in Para. 301.5. (See separate product announcement.)**
- MultiCore SuperNode Solver (4 to 8 times faster)
- New Postprocessing Graphic Module Available for NozzlePRO or FEPipe. Multiple models can be reviewed simultaneously on a region-by-region basis. Stresses for all models are presented in colorized tables. All reports can be sent to Word or Excell.
- Single Bolt Unloading analysis in AxiPRO.
- For those that are not aware, PCLGold™ is included with your FEPipe™ License and can be used as long as your License is on support. PCLGold™ is a complete Pipe Stress Analysis Program with FEA capabilities.
- Frequency Cutoff added to PCL (piping) to support high mode extraction
- Updated CAESAR II Interface – supporting CAESAR Version 10
- ALL SHELL TEMPLATES CAN BE analyzed using the VIII-2 Part 5 Nonlinear Solver
- Normal updates and bug fixes since the last major release
- Guidelines for Multiple Olet Model Types for Pipe Stress
- SIFs and k-factors for Structural Steel Supports on Bends
- STP-PT-074 Nozzle Stress Calculations
- Updated PCL Eigensolver. Computes more modes (eigenpairs) for beam models.
- SIFs and k-Factors for Bends with Steel Supports + pressure stiffening
- Automated Skirt Added to Nozzles-Plates and Shells Vessel Head Templates
- **Addition of drawing tools to allow the graphical, "CAD-like", modification of model details and addition of shell model components.** Add/delete elements; Extract curves and put elements in between two curves; Add restraints graphically. Change thicknesses.