IDEAS™ v5.0.0

IDEAS Release Notes

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Contact: ANDRITZ AUTOMATION Inc.
Division: Automation Solutions
125 Clairemont Avenue, Suite 570
Decatur, GA 30030, USA
Phone: +1 (404) 370 1350
Fax: +1 (404) 378 3813
www.andritz.com

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Table of Contents

Updates in IDEAS Version 5.0.0 1

New Objects and Product Enhancements 1

Section 1. IDEAS Platform Upgrades 2

1.1 New Version of Extend 2
1.2 Worksheet Upgrade Procedure 2
1.3 Developers Kit Object Upgrade Procedure 2
1.4 New Version of VMG Software 2

Section 2. Enhanced Global Worksheet Options 3

2.1 Use of Rotating Icons 3
2.2 Unlimited Number of PSD-Carrying Components 4
2.3 S-Click and D-Click Displays 4
2.4 Stream Colors 5
2.5 Stream Numbers 5
2.6 Object Navigator 6

Section 3. New Objects 7

3.1 Heat Exchangers Library 7
3.2 Macro Primitives Library 8
3.3 Size Reduction-S Library 9
3.4 Tanks Dynamic 10

Section 4. Enhanced Objects 11

4.1 Analog Controls Library 11
4.2 Chemical Recovery Library 11
4.3 Dynamic Data Exchange Library 11
4.4 Executives Library 14
4.5 Macro Primitives Library 17
4.6 Macro Unit Ops Library 19
4.7 Material Properties Library 20
4.8 Plotters Library 21
4.9 Pumps&Compressors Library 22
4.10 Separation-G Library 24
4.11 Tools Library 25
4.12 Tools Utilities Library 25

Section 5. Objects Being Phased Out 26

Section 6. Known Software Bugs at Time of Release 27

6.1 Use of MP Assembler on European Computers 27

Updates in IDEAS Version 5.0.0

New Objects and Product Enhancements

ANDRITZ AUTOMATION Inc. has released IDEAS version 5.0.0. This version introduces a major change to the platform and offers numerous new objects, features and improvements to the existing objects.

All software updates until April 2010 are included in this release document.

The release notes are divided into the following sections:

Section 1. IDEAS Platform Upgrades

Section 2. Enhanced Global Worksheet Options

Section 3. New Objects

Section 4. Enhanced Objects

Section 5. Objects Being Phased Out

Section 6. Known Software Bugs at Time of Release

Section 1. IDEAS Platform Upgrades

1.1 New Version of Extend

- IDEAS 5.0.0 uses Extend v7.0.6. This new application brings a dramatic improvement in the look-and-feel of IDEAS. The user will be able to very quickly be acquainted with the improvements once he/she starts using the new version.

1.2 Worksheet Upgrade Procedure

- Worksheets saved with previous versions of IDEAS can be opened in IDEAS v5.0.0. If upgrading v4.x.x worksheets, the user will have to follow the enclosed upgrade procedure "*IDEAS v500 Worksheet Upgrade Manual.pdf*". Snapshots from v4.x.x will not be supported in v500 and will have to be retaken.

1.3 Developers Kit Object Upgrade Procedure

- v4.5.5 Boundary Developers Kit objects and PF Developers Kit objects can be used or recompiled in v5.0.0. An upgrade procedure is detailed in the file "IDEAS v500 Developer Kit Upgrade Manual.pdf".

1.4 New Version of VMG Software

- In v5.0.0, Material Properties VMG incorporates the thermodynamic engine from VMG version 5.0 B71005.

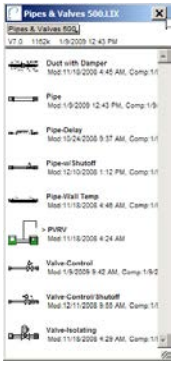
Section 2. Enhanced Global Worksheet Options

2.1 Use of Rotating Icons

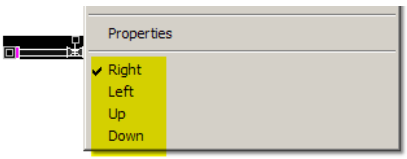
- The new IDEAS feature, rotating icons, has been introduced in the following libraries:

  - Heat Exchangers
  - Pipes & Valves
  - Pumps & Compressors
  - Nodes
  - Tanks Dynamic

- Instead of two or four instances of the same object with differently oriented icons (up, down, left, right) these libraries now have a single instance of the object that can be "flipped" to the desired orientation after it has been placed on the worksheet. For example, the Pipes &Valves library now has only 9 objects.



Once an object is placed on a worksheet, a right-click on the icon will produce a list of possible icon orientations.



A special file called "substitutionList.txt" was created to facilitate the upgrading of worksheets created in prior versions of IDEAS where there were individual objects such as Pipe-Right and Pipe-Left. This file resides in the Libraries folder and is part of the automatic search-and-replace procedure for upgrading worksheets.

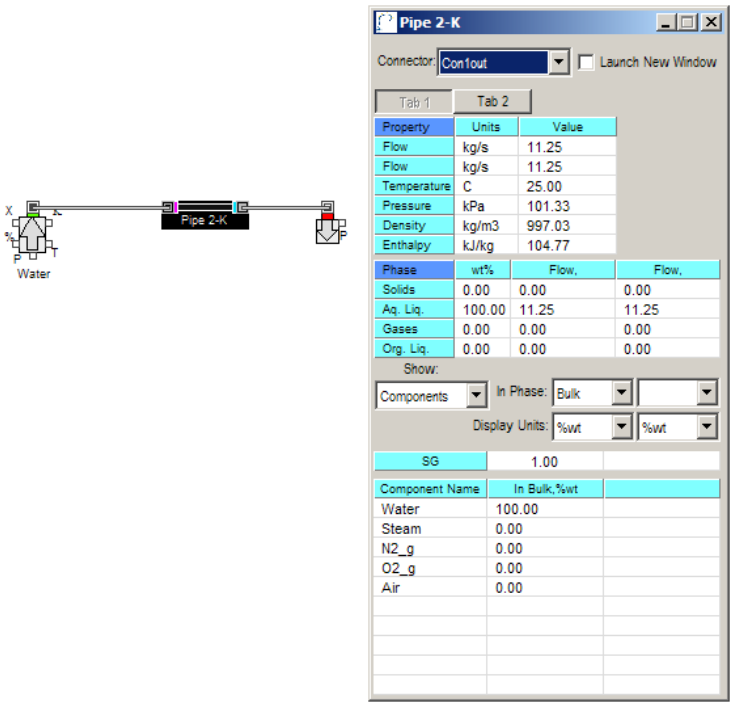
2.2 Unlimited Number of PSD-Carrying Components

- The Particle Size Distribution (PSD) capability has been expanded in v5.0.0 such that every component in the stream (up to 150 components) can have PSD assigned to it. The previous versions of IDEAS allowed assigning PSD data to a maximum of only 5 components.
- **Old Snapshots:** Every effort was made to assure backward compatibility with the existing IDEAS worksheets, however, due to the different PSD data structure, any existing snapshots are invalid. Existing worksheets can only be run from defaults the first time they are opened with IDEAS v5.0.0.

2.3 S-Click and D-Click Displays

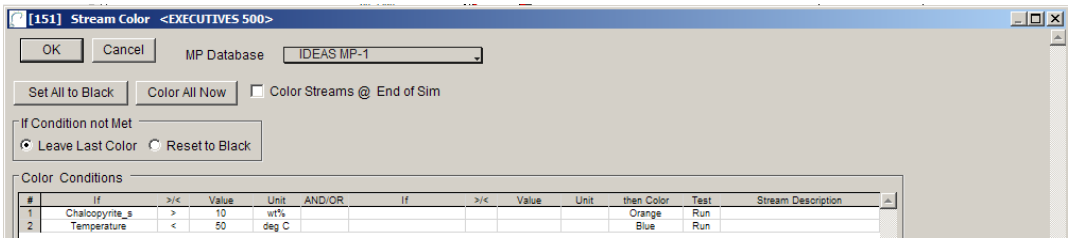
- Data for any IDEAS stream can be now displayed using either an S-click (simplified) or a D-click (detailed) windows. The displays pop up if the user presses “S/s” or “D/d” letters on the keyboard and then left-clicks the mouse on the desired stream line. The user must drop the Display Manager object from the Executives library on the worksheet in order to activate the D-click functionality.

D-Click Display



2.4 Stream Colors

- The Stream Coloring object from Executives library is used to automatically change the color of stream lines based on the stream conditions (temperature, pressure, composition) meeting user defined criteria.

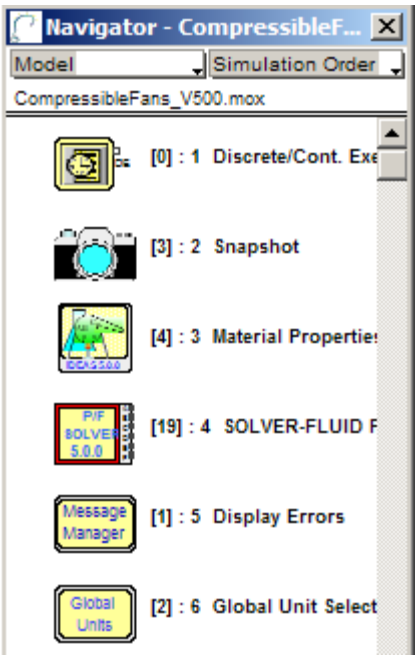


2.5 Stream Numbers

- In IDEAS v5.0, the placing of Stream Number objects is done via an “N-click” operation, i.e., the user has to press the letter “N/n” on the keyboard and then left-click the mouse on the line that needs to be marked. A new Stream Number object will then be placed at the mouse-click location.

2.6 Object Navigator

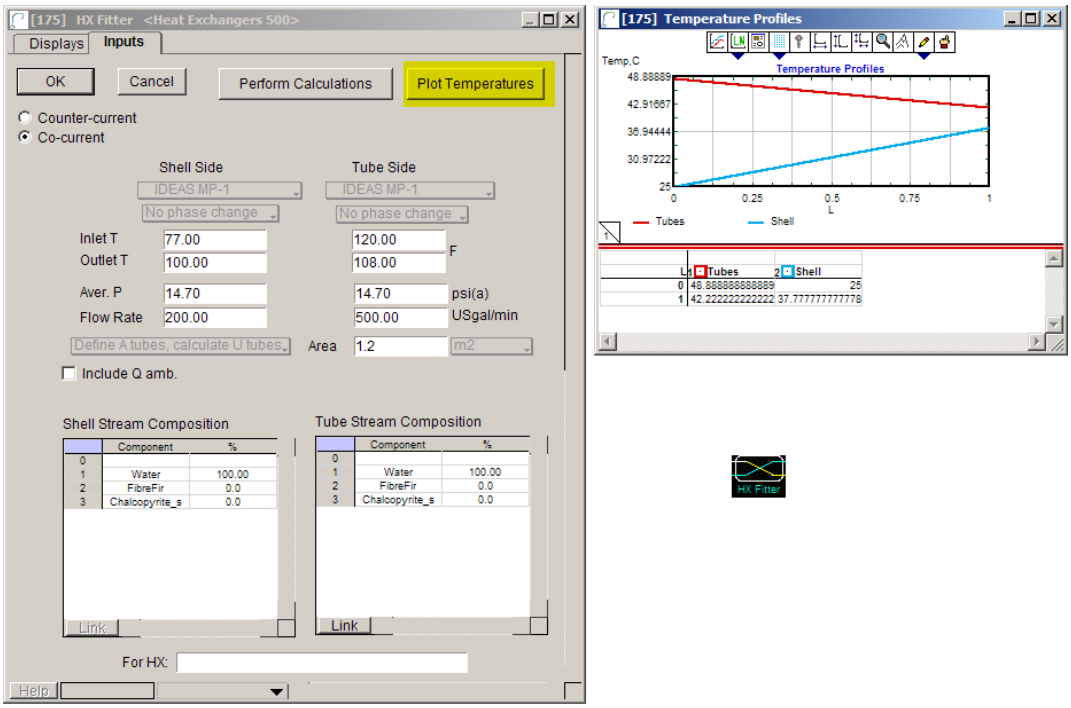
- One of the new features of IDEAS 5.0.0 is the Object Navigator, where a list of all the objects in the model, along with their block numbers will be listed on the worksheet. Clicking on this button in the toolbar, launches the Object Navigator window. In the picture below, the numbers in the square brackets are the block numbers. The blocks can be listed in order of Simulation order, block name, block number, block label and depth (levels of Hblocks).



Section 3. New Objects

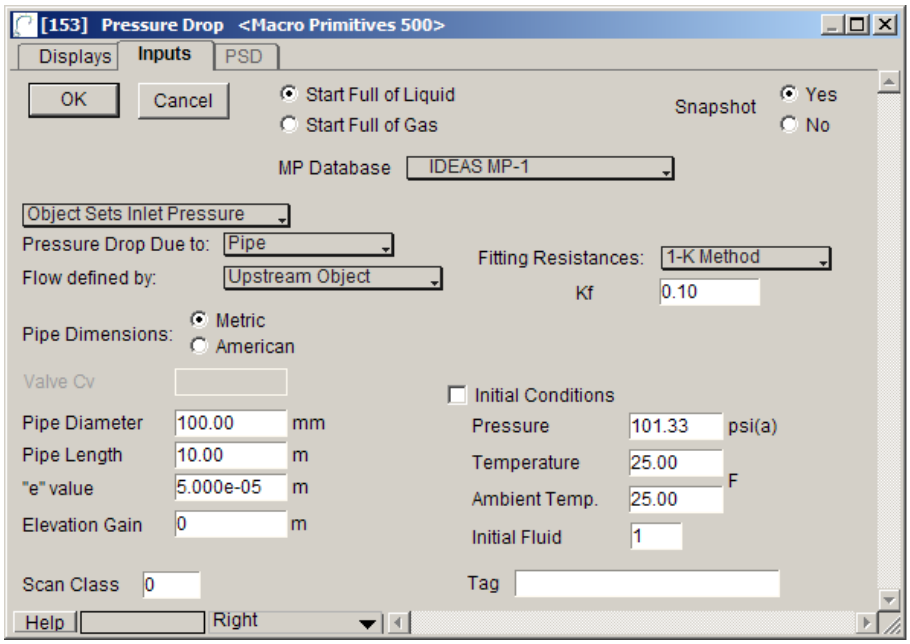
3.1 Heat Exchangers Library

- **HX Fitter** – The HX Fitter object can be used to verify heat exchanger specifications and to compute the LMTD, Area or Overall heat transfer coefficient, and heat losses. The user can also plot the shell and tube inlet and outlet temperatures to see if there is temperature crossover.



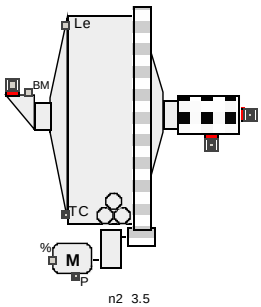
3.2 Macro Primitives Library

- **Pressure Drop** – This new object calculates pressure drop in steady-state (IDEAS Bronze-level) models. The object computes pressure drop based on either pipe dimensions and friction factors, or valve CV or a user specification.

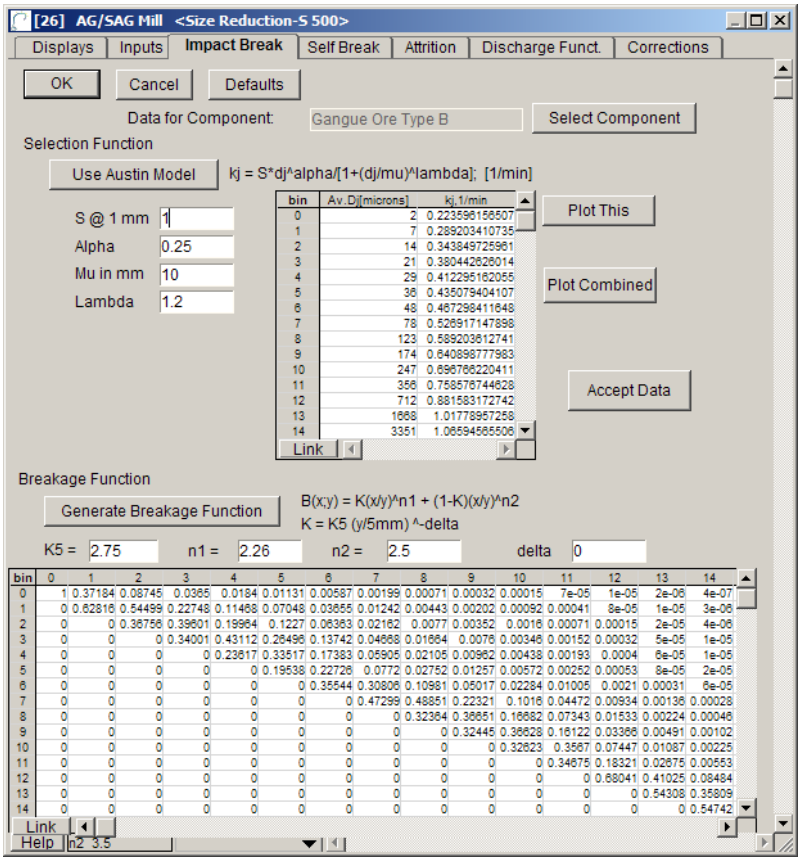


3.3 Size Reduction-S Library

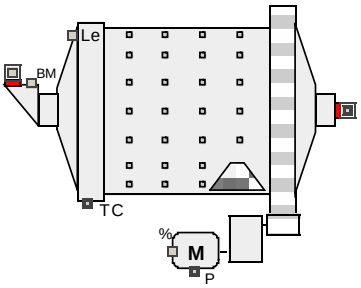
- **AG/SAG Mill**



- The AG/SAG mill object in IDEAS is designed to model size reduction caused by three phenomena: impact breakage, self breakage and attrition. The Population Balance model is used to represent the size reduction phenomena. The object can calculate the power consumption of the mill using the Austin-Morrell, JKRMC and Bond Work Index models.

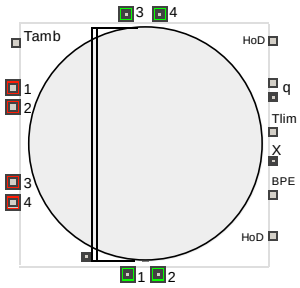


- **Rod Mill** – This object is similar to the Ball Mill object in that it assumes a perfect mixing in the mill. Rod Mill specific power equation is used.



3.4 Tanks Dynamic

- **Tank Multiphase Sphere** – A new multiphase tank object with the spherical shape has been developed. The user can specify the elevations of the different inputs and outputs and the object can also calculate heat loss due to surroundings.



Section 4. Enhanced Objects

4.1 Analog Controls Library

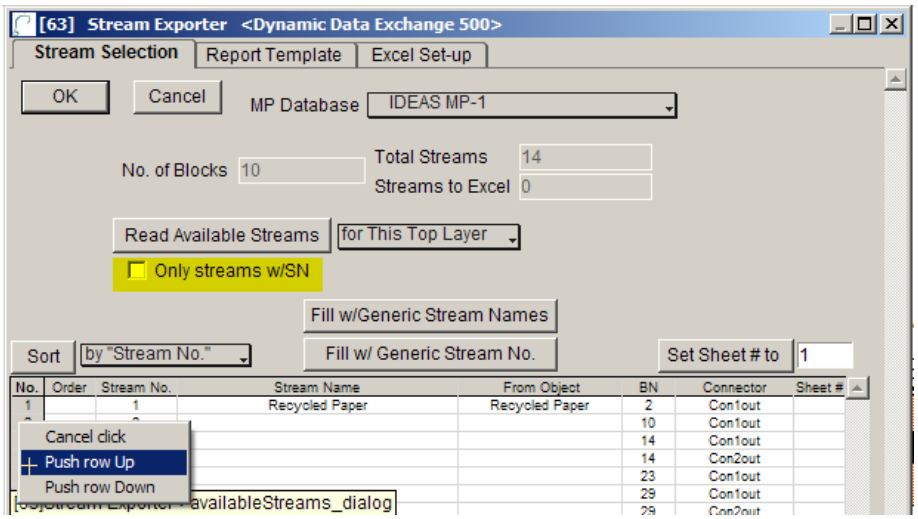
- **PID Controller** – Added an option to enter tuning parameters in ABB format.

4.2 Chemical Recovery Library

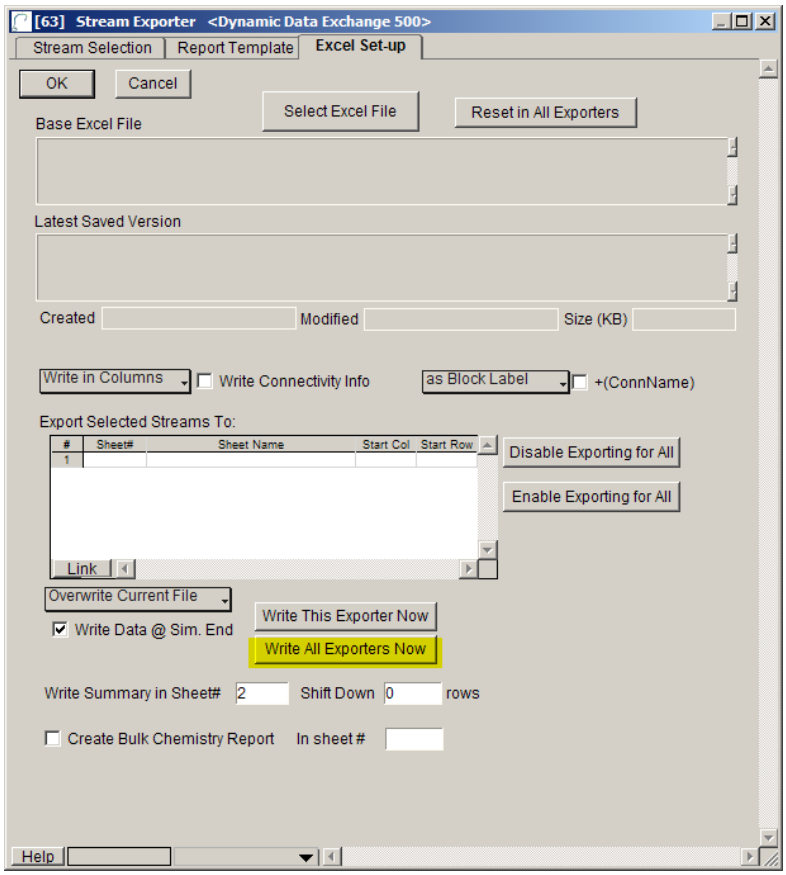
- **Lime Kiln** – This object now allows an unlimited number of zones.

4.3 Dynamic Data Exchange Library

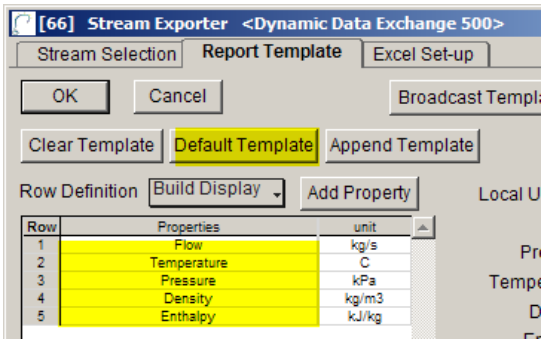
- **Stream Exporter**
  - The Stream Exporter has a checkbox that will only read in streams with Stream Numbers assigned to them.
  - The order of streams in the Stream Number table can be rearranged manually by right-clicking on the No. column and selecting to either “Push row Up” or “Push row Down.”



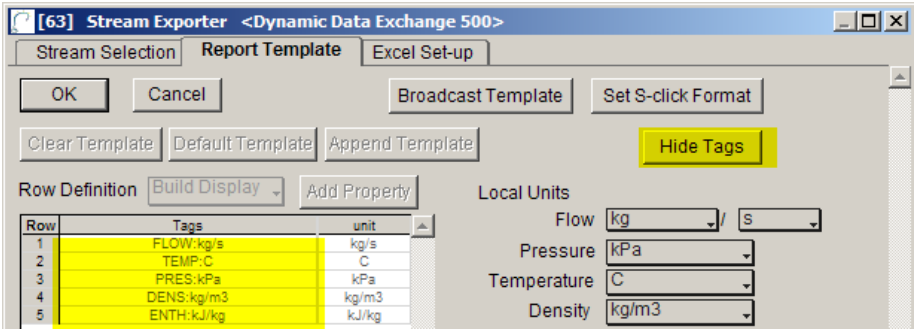
- A new button has been added to export data from ALL Stream Exporters on the worksheet, on demand.



- A new button, “Default Template” has been added to the Report Template Tab. Pressing that button will clear the table and replace it with the fields shown below: Flow, Temperature, Pressure, Density and Enthalpy.

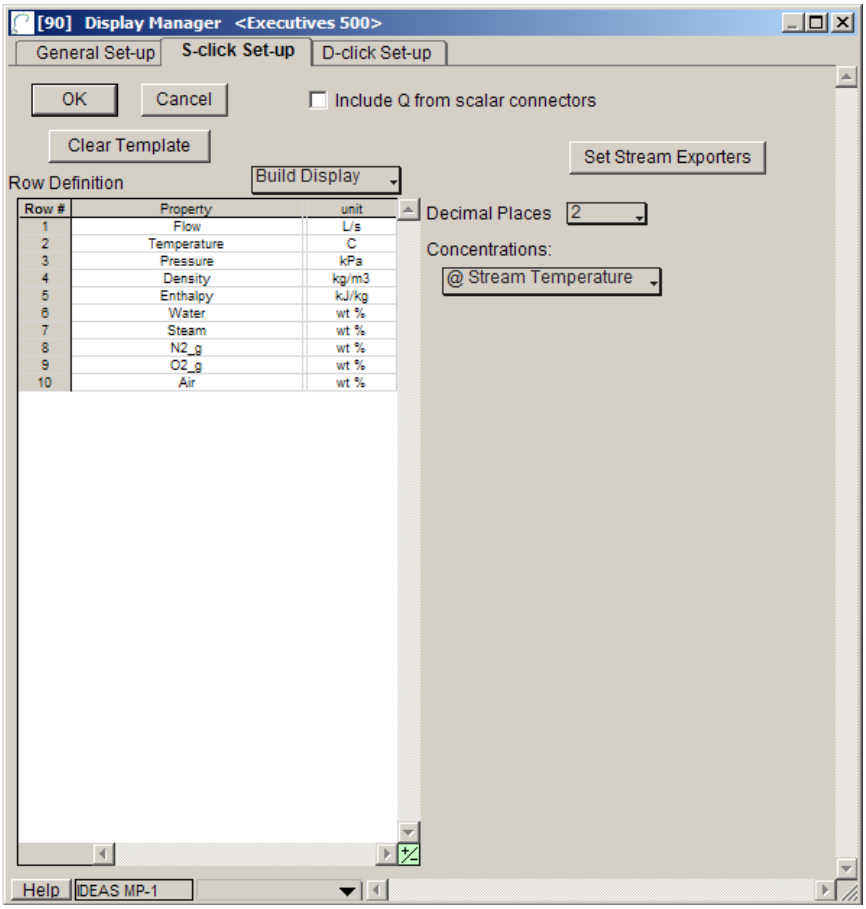


- A new button, “Show Tags” has been added to the Report Template Tab. Pressing this button will display the variable tag names instead of the variable names in the table. As shown in the picture below, instead of Flow, the table will display the variable tag: FLOW: kg/s.

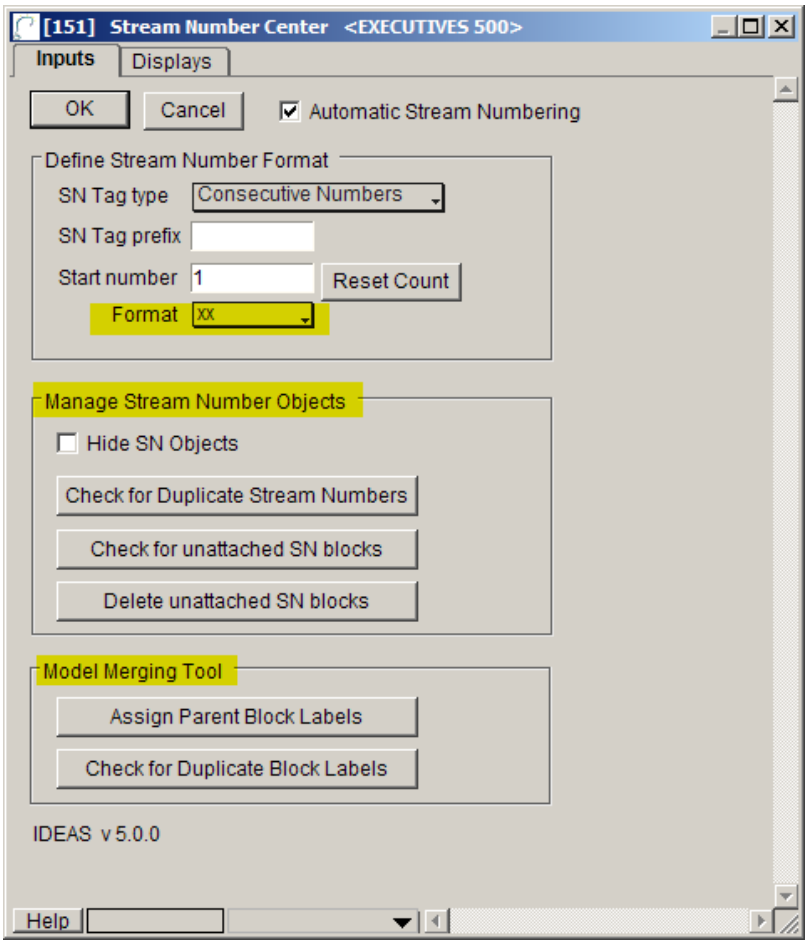


4.4 Executives Library

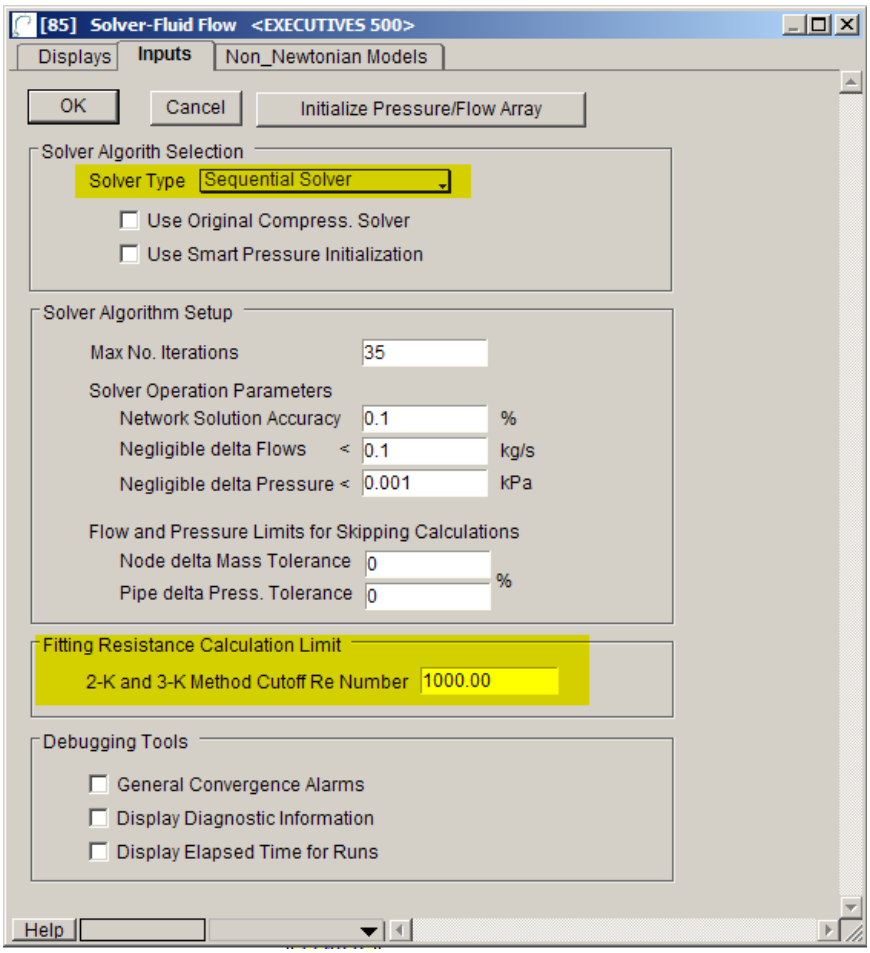
- **Display Manager**
  - This object was called **Click Master** in v490. When upgrading worksheets created in older versions of IDEAS, if the user is asked to find the object Click Master, the user must point to the Display Manager object in the Executives library.
  - The Display Manager object allows the user to set up the S-click and D-click windows. This object gives the user the flexibility to customize the windows to display the information most relevant to their process.
  - A new checkbox option has been added to allow external heat sources/sinks (via scalar connectors) in S-click energy balances.



- **Stream Number Center**
  - The Stream Number Center has new functionalities that allow the user to better manage SN objects and also merge models while preserving Stream Numbers.
  - The SN Center now allows the user to define the number format (xx, xxx, xxxx) so that the user does not have to type the leading zeros.
  - The SN Center has new options to manage stream numbers on the worksheet. The user can better track the SN objects by checking for duplicate Stream Numbers, or unattached Stream Numbers.
  - The user can also assign block labels to the parent blocks of SN objects prior to doing a copy-paste operation, which would preserve the SN objects and their connections. This feature is useful for users wishing to model large processes by breaking them up into smaller sections and eventually combining all the sub models into one master model.

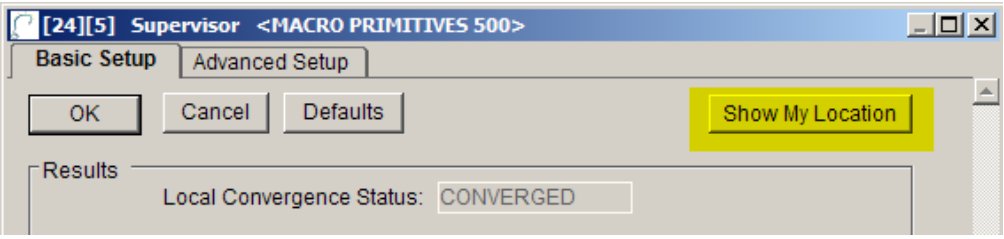


- **PF Solver**
  - The IDEAS Original Solver has been phased out, so the user will not be able to select that option in the Solver Type dropdown menu.
  - The PF Solver object has a new field that allows the user to set the lower limit on Reynolds number for friction factor calculations. This field expands the capability of IDEAS to model flows in the low-Reynolds number flow regime (Re << 1). For users dealing with flows that are mostly in the low-Reynolds number regime, the cutoff Re number should be set to 1 or lower. For users dealing primarily with flows in turbulent regime, it is advisable to use a higher cutoff Re number of 1000 in order to avoid instabilities and achieve faster convergence in pressure-flow calculations.

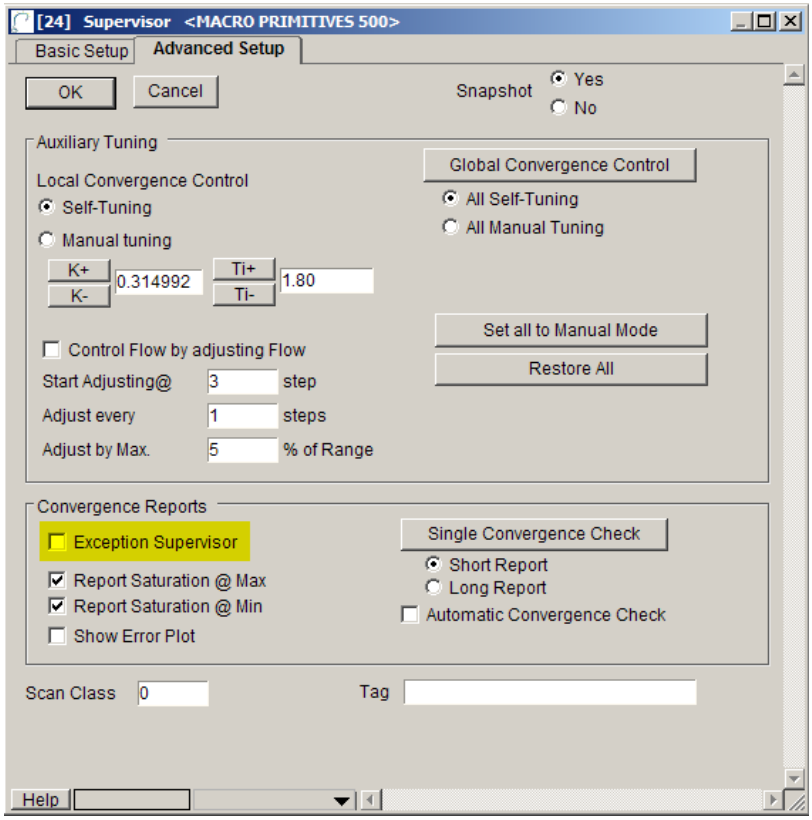


4.5 Macro Primitives Library

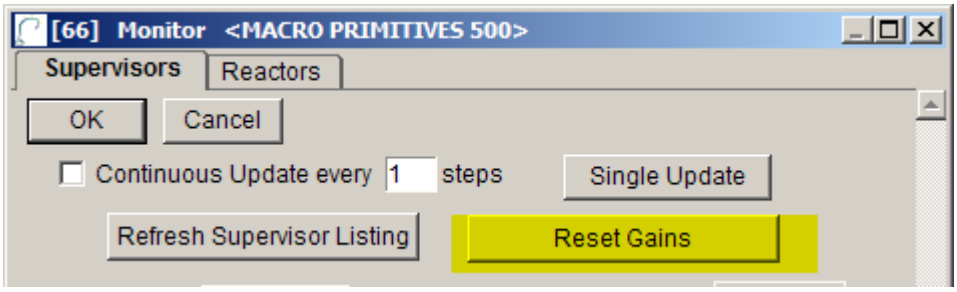
- **Supervisor**
  - New algorithm has been implemented to enhance convergence.
  - Added button “Show my Location”, which will open the enclosing Hblock if the supervisor was inside one.



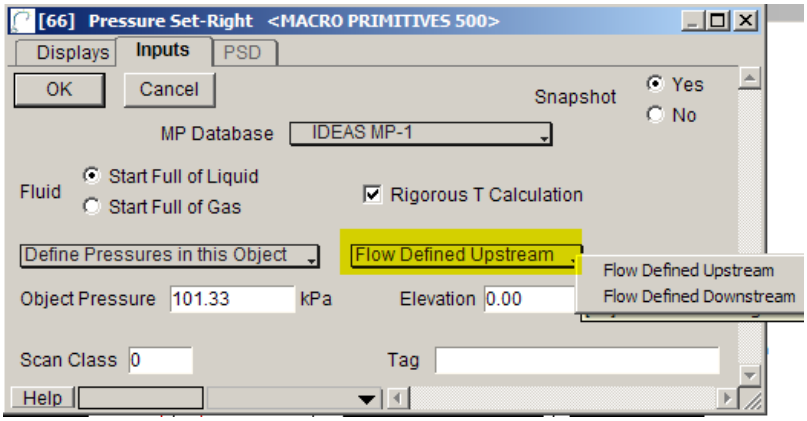
  - Added checkbox for “Exception Supervisor”, which will exempt that particular supervisor when reporting convergence.



- **Monitor** – Added button to reset Gains in all supervisors to 0.5. One application of this feature is when a user is starting a new scenario while running the simulation.

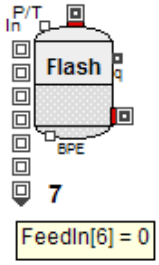


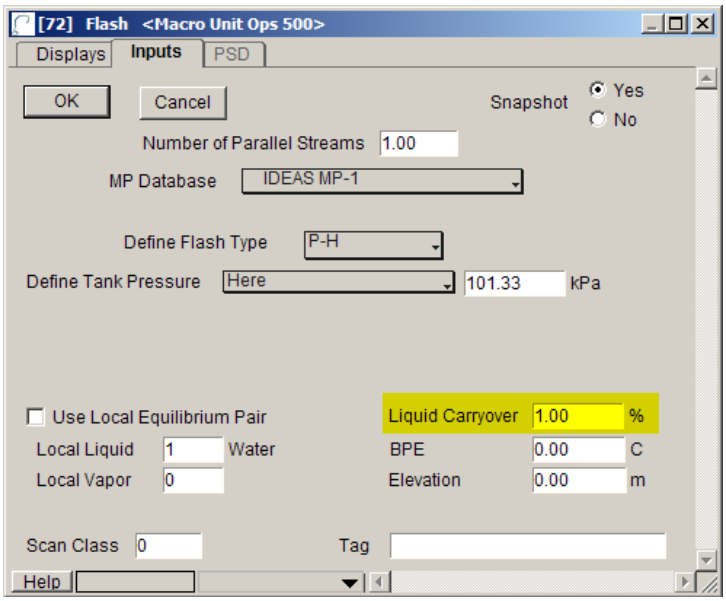
- **Pressure Set** – Added option to define flow upstream or downstream.



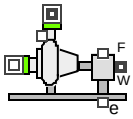
4.6 Macro Unit Ops Library

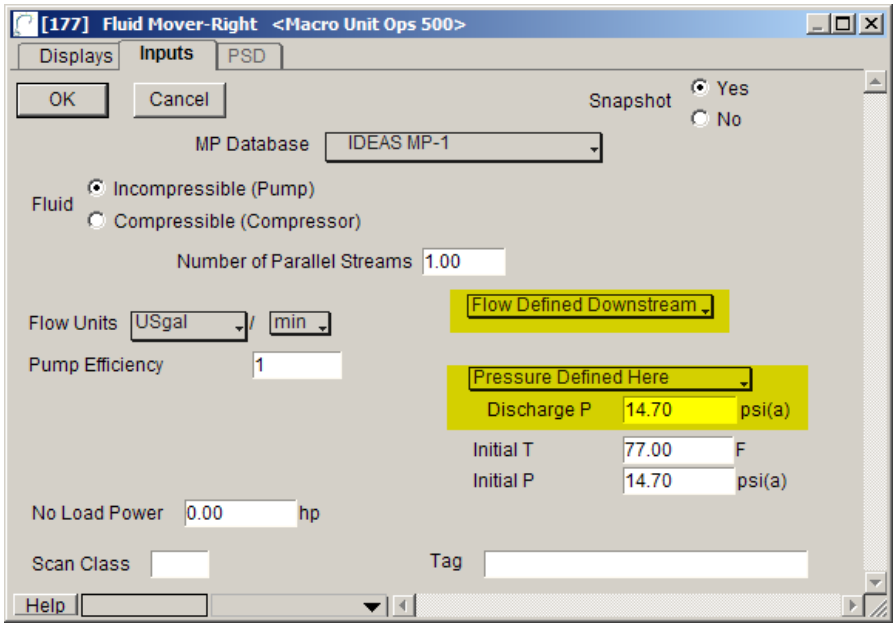
- **Flash Tank**
  - Modified the object to allow the user to specify up to 10 inlet connectors via a click-and-drag operation on the object icon connector.
  - Added option for user to define liquid entrapment in vapor phase.





- **Fluid Mover**
  - Added options for user to specify the Discharge Pressure and allow flow to be defined by downstream object.
  - Added scalar connector for user to specify efficiency.



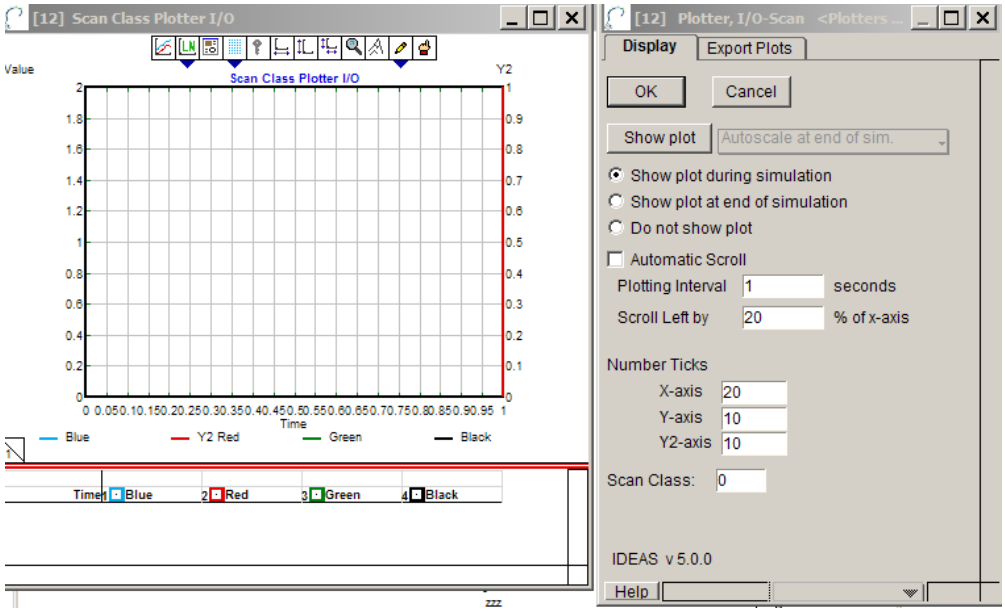


4.7 Material Properties Library

- **Sink, Source** – If the terminator or recreator options are chosen, the dialog box variables for flow, pressure, temperature, and elevation are greyed out. These values are set from the upstream or downstream objects.

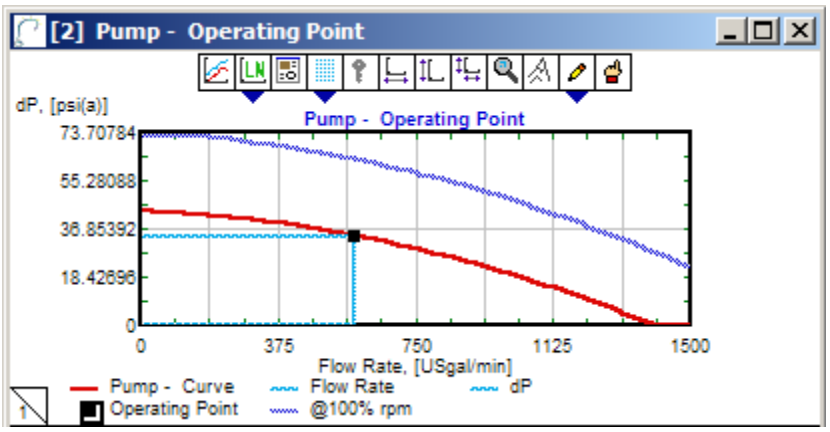
4.8 Plotters Library

- Added option allowing user to define number of ticks in the axes.

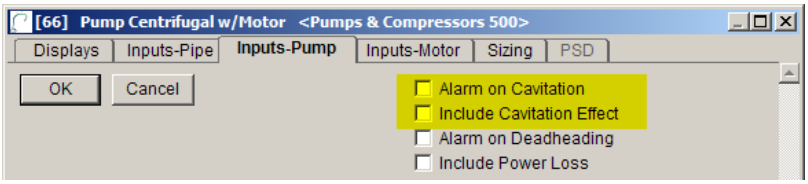


4.9 Pumps&Compressors Library

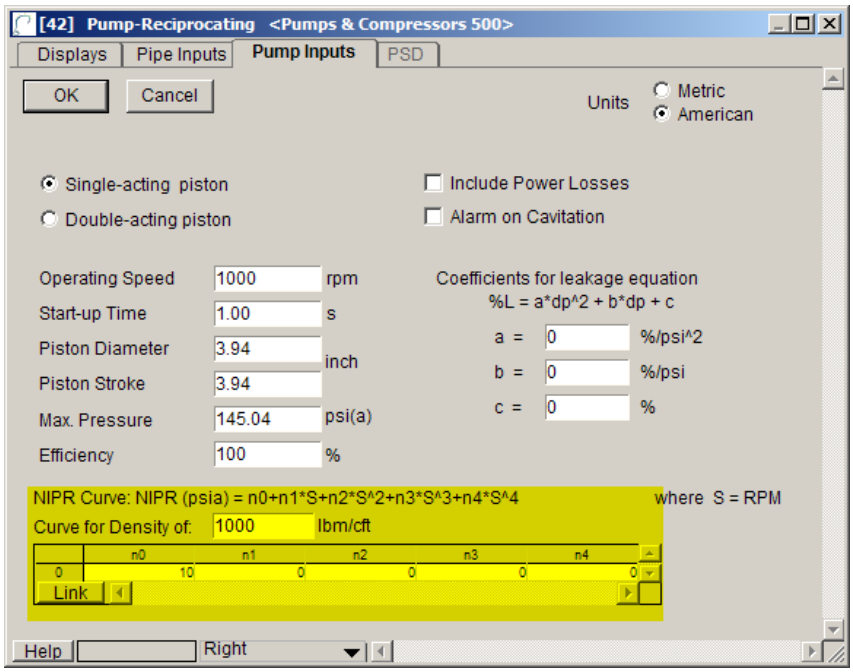
- **Pump Centrifugal w/Motor**
  - Added plot of pump curve at 100% RPM.



  - Added new checkboxes for cavitation effect calculations: 1) Alarm on Cavitation, and 2) Include Cavitation Effect

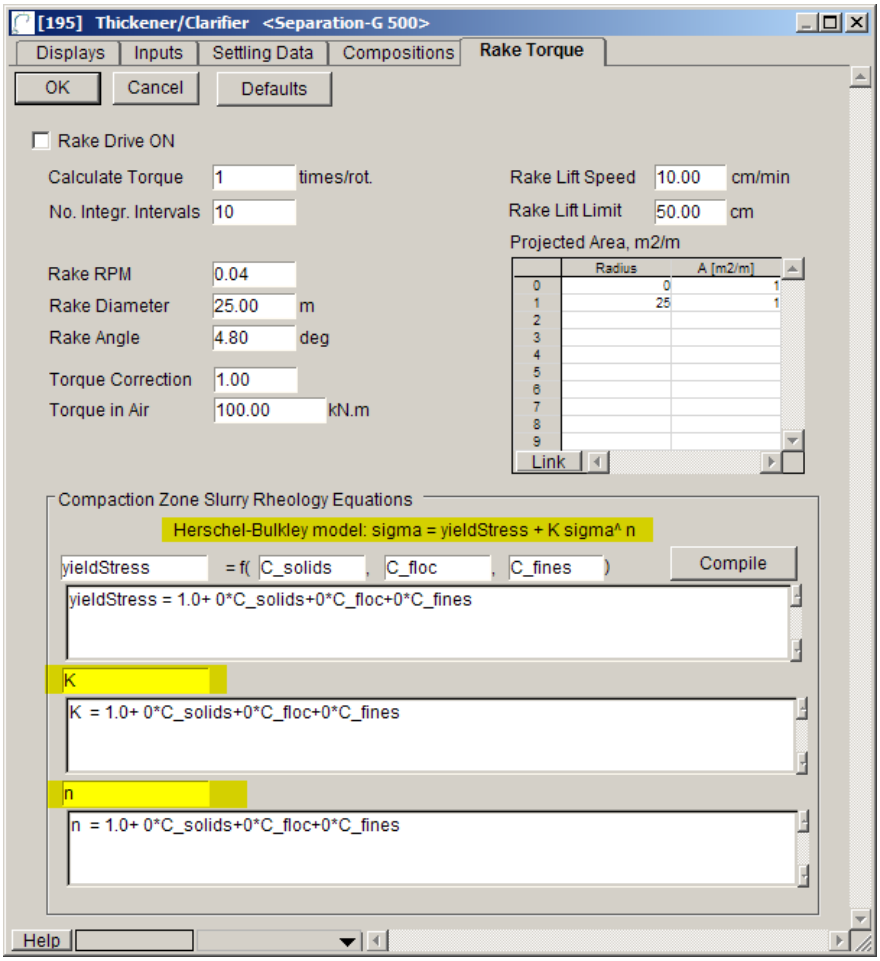


- **Pump-Rotary and Pump-Reciprocating**
  - Added cavitation calculations and fields for user to enter NIPR (Net Inlet Pressure Required) curve.



4.10 Separation-G Library

- **Thickener/Settler**
  - This object was called Thickener/Clarifier in IDEAS v490. When upgrading worksheets, the user must select this new object when prompted.
  - The Thickener/Settler has been enhanced to include Herschel-Bulkley non-Newtonian rheology parameters for the Compaction Zone calculations.

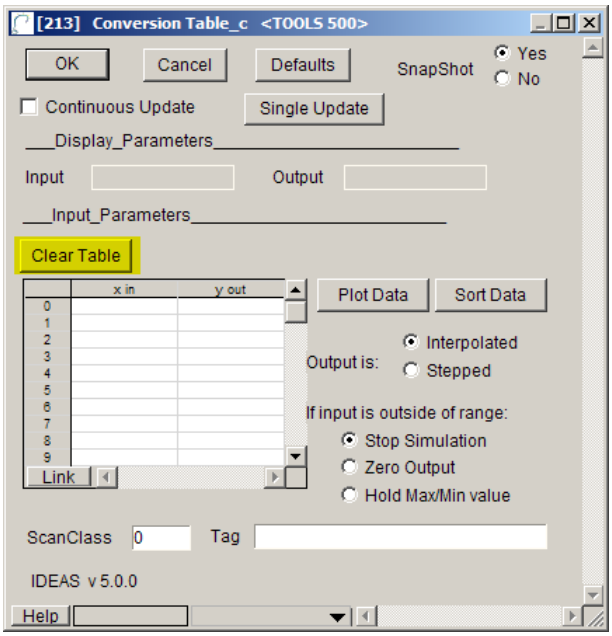


4.11 Tools Library

- **Global Mass Balance**
  - Object checks for negative flows and element misbalance.

4.12 Tools Utilities Library

- **Conversion Table -** Added button to Clear table



Section 5. Objects Being Phased Out

The following objects are being phased out in V5.0.0. Worksheets created in older versions of IDEAS will still work and run; however, users will not be able to drop new objects onto the worksheet.

- Stream Marker
- Stream Marker TR
- Stream Reference
  - The Stream Number, Stream Number Center and Stream Exporter are three objects that are alternatives to the Stream Marker objects. Going forward, users need to modify their models to use the Stream Number objects.
- Pump-Selectable Impeller
- Pump-Variable Speed

Section 6. Known Software Bugs at Time of Release

6.1 Use of MP Assembler on European Computers

When saving/creating a component record (using MP Assembler), IDEAS expects the decimal to be the math delimiter. If the MP Assembler object is used on a computer where all decimals are displayed as commas (typically European language mode), while saving/creating a component, all the decimal delimiters will vanish (turn to commas) and the component material properties will be drastically altered.

The work around is as follows. Before modifying a component using the MP Assembler, first shut down IDEAS. Next, go to the Control Panel and the Regional and Language Options. Choose English (United States). Next, open IDEAS and the MP Assembler. You will observe that the delimiter is now a decimal. Go ahead and make your change using the decimal as a delimiter. Save your file. All of your values should stay intact. At this point, you can switch back to your original language option.

For more information, contact ANDRITZ AUTOMATION Inc.:

Product Sales: Bob Harris
+1 (800) 567 IDEA (4332) (US & Canada only)
+1 (360) 714 0795 (Outside US & Canada)
bob.harris@andritz.com

Software Training & Support: Brett Schug
+1 (404) 370 1350 extension 225
as-simulation-support@andritz.com
www.andritz.com