ProcessPlugins Generator Capability Monitor

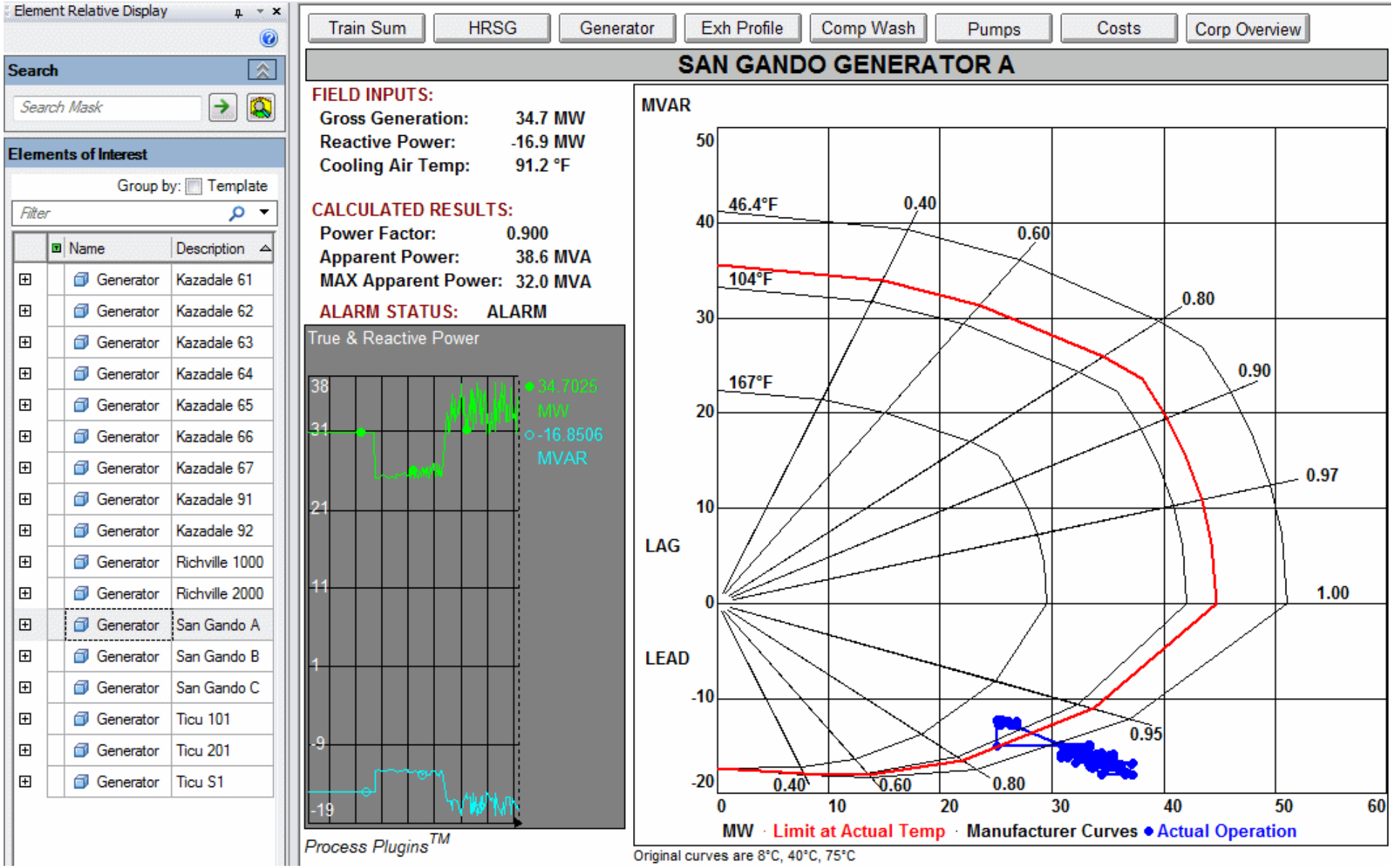
Partner Organizations:

Process Innovations Inc.

OSIsoft.

PROCESS PLUGINS™ GENERATOR CAPABILITY MONITOR

The Generator Capability Monitor provides real-time Power Factor, Apparent Power, Maximum Apparent Power, and Alarm Status. This tool provides a handy visualization making it easy to compare actual conditions with the real-time dynamic limitation. Note that this plot does not use an image, but plots the black curves from a table, interpolates the red limit curve real-time, and plots the blue operating condition all within the same plot. The result is highly accurate.



The generator reactive capability curve is displayed in a dynamic real time display. This display is unique in that the cooling gas parameter (or voltage where applicable) "D-curve" accurately moves real-time and reactive/real power is plotted within. The D-curve is plotted with extreme accuracy using true polar coordinates so that the entire limit curve is displayed dynamically around the entire 180 degree plot. This tool provides a very handy visualization of real time operation compared to the limitations.

PI Notifications are triggered with this alarm to notify the appropriate personnel.

Using the 'Element Relative Display' feature, one master Process Book display file may be used to consistently display the key performance indicators of each Generator by simply selecting the asset in the Element Relative pane (left side of display). With the 'Element Relative Display' feature, one master display file may be used for an unlimited number of similar assets. Corporate level summary "drill down" screens make navigation easy via PI Process Book, or Internet Explorer using PI Web Parts.

Flexibility of the OSIsoft AF structure allows for value substitution whenever certain instrumentation may be unavailable. This substitution can take a number of forms including real-time calculation of the expected value based upon surrounding instrumentation, manual input via AF, manual input to a PI tag based on operator rounds, or any combination of manual and calculated inputs.

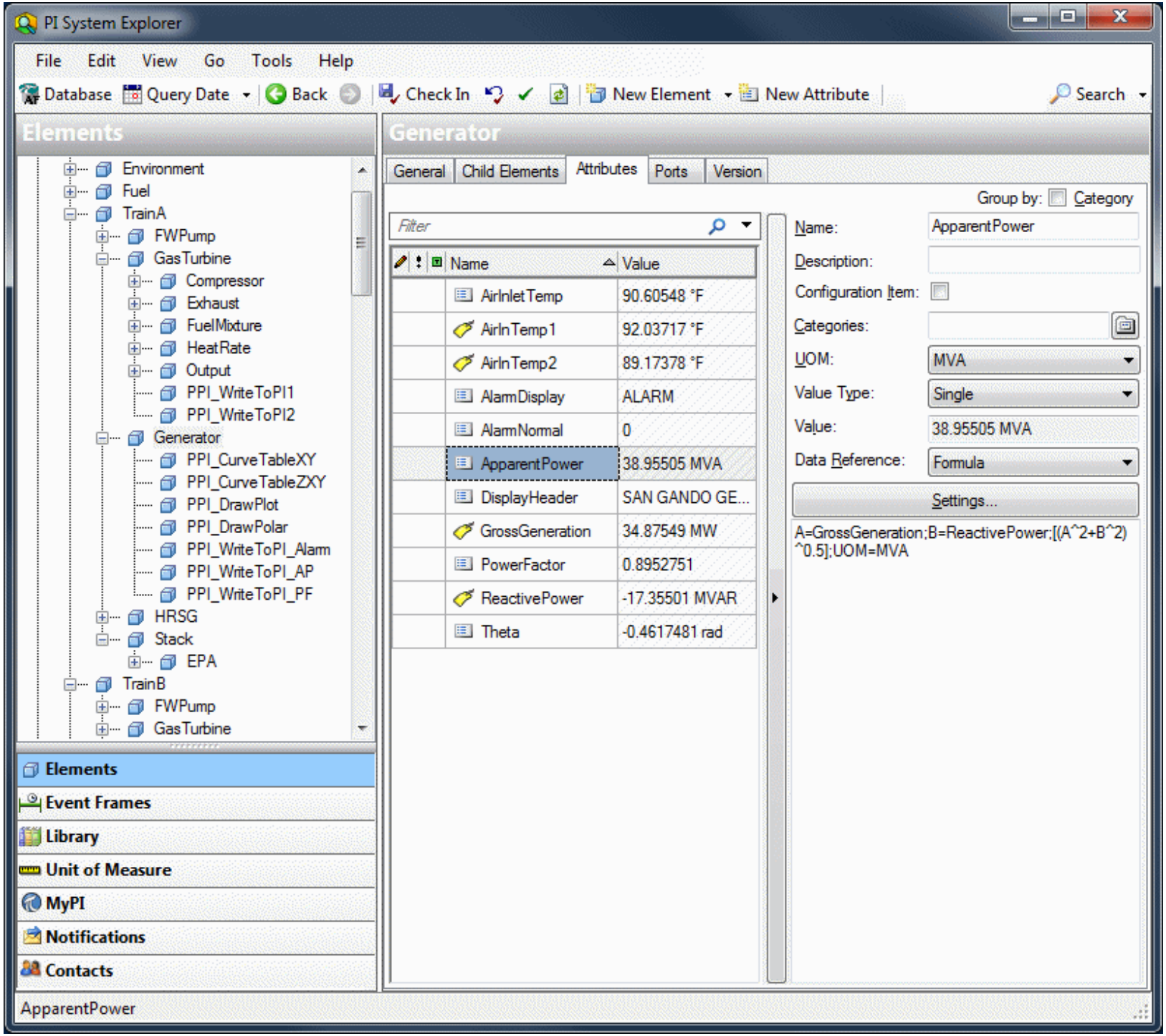
The Process Plugins™ solution has the capability of monitoring an unlimited number of assets, which could be added by the end user at any time in the future.

MORE ABOUT PROCESS PLUGINS™

OSIsoft's PI System continues to be the industry standard in data historians, which has been the core of its 21st century real-time infrastructure platform. And now this platform comes fully loaded with every feature necessary to support all of your needs for monitoring, modeling, diagnostics, or forecasting without the need for any 3rd party software. That's where the Process Plugins™ package comes in.

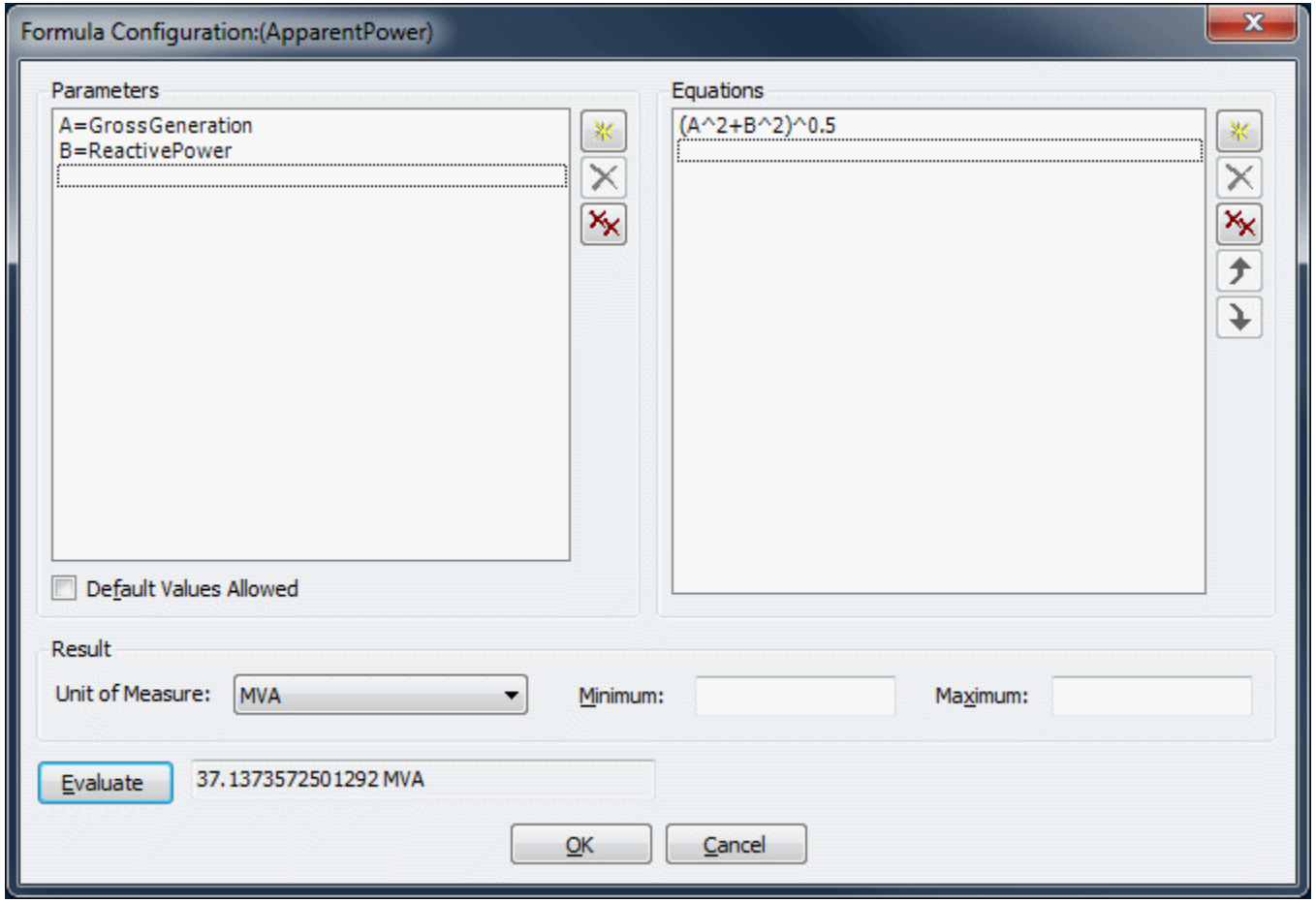
Process Plugins™ is not 3rd party software. The Process Plugins™ package customizes your OSIsoft platform for your plant. This is the only existing solution if you want:

1. No unnecessarily redundant PI tags
2. No 3rd party software
3. One Microsoft certified package with seamless integration of calculations and models
4. Web browser interface capability
5. Ability to drill down into calculations to see (or edit) exactly what they're doing


PI System Explorer
File Edit View Go Tools Help
Database Query Date Back Check In New Element New Attribute Search
Elements
Environment
Fuel
TrainA
FWPump
GasTurbine
Compressor
Exhaust
FuelMixture
HeatRate
Output
PPI_WriteToPI1
PPI_WriteToPI2
Generator
PPI_CurveTableXY
PPI_CurveTableZXY
PPI_DrawPlot
PPI_DrawPolar
PPI_WriteToPI_Alarm
PPI_WriteToPI_AP
PPI_WriteToPI_PF
HRSG
Stack
EPA
TrainB
FWPump
GasTurbine
Elements
Event Frames
Library
Unit of Measure
MyPI
Notifications
Contacts
Generator
General Child Elements Attributes Ports Version
Group by: Category
Filter
Name Value
AirInletTemp 90.60548 °F
AirInTemp1 92.03717 °F
AirInTemp2 89.17378 °F
AlarmDisplay ALARM
AlarmNormal 0
ApparentPower 38.95505 MVA
DisplayHeader SAN GANDO GE...
GrossGeneration 34.87549 MW
PowerFactor 0.8952751
ReactivePower -17.35501 MVAR
Theta -0.4617481 rad
Name: ApparentPower
Description:
Configuration Item:
Categories:
UOM: MVA
Value Type: Single
Value: 38.95505 MVA
Data Reference: Formula
Settings...
A=GrossGeneration;B=ReactivePower;[(A^2+B^2)^0.5];UOM=MVA
ApparentPower

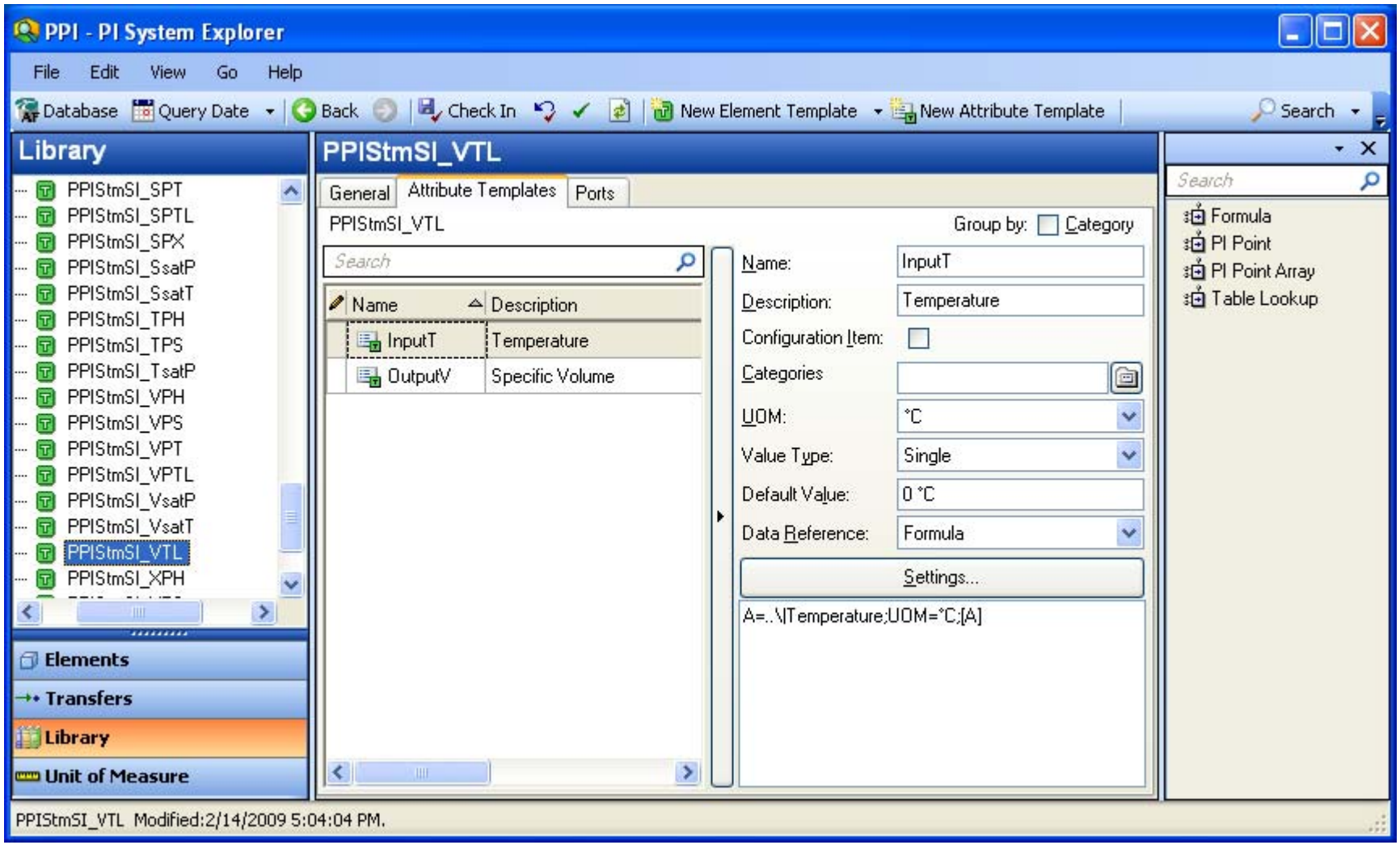
The Process Plugins™ package resides primarily within OSIsoft's PI Asset Framework (PI-AF). Your plant customization exists in the form of *elements* which handle most of your basic performance calculations. Using PI System Explorer, system administrators can view, modify, or enhance elements as desired.

Element Formulas



Fundamental performance calculations exist as formulas within elements.

Element Templates



The Process Plugins™ package comes with a complete set of "Drag & Drop" Element Templates for use in PI-AF. Some routines utilize the Process Plugins™ Windows service, which delivers results back to an element.

Lookup Tables

GasProperties

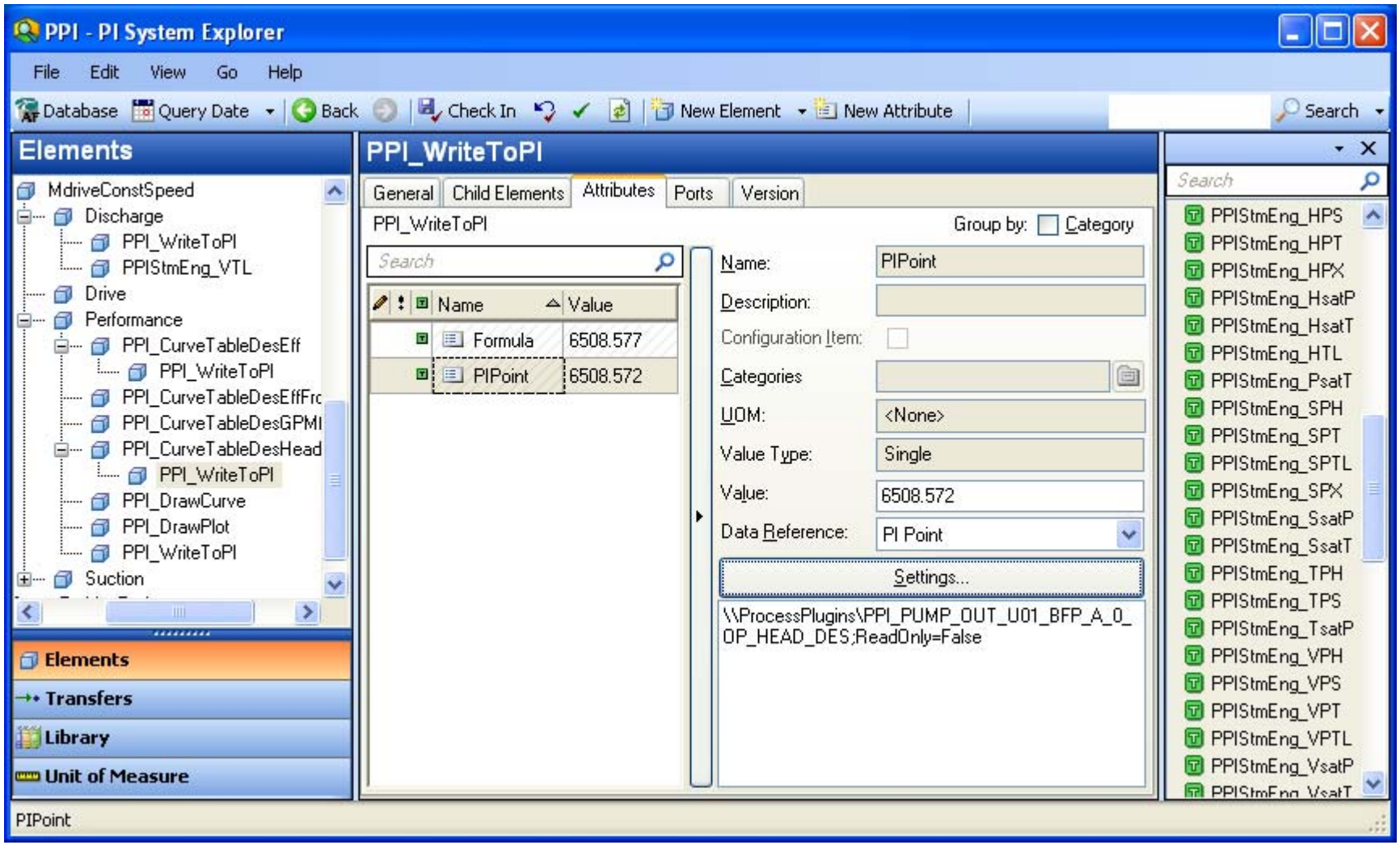
General | Table | Define Table | Version

GasProperties

Name	Molecule	MolWeight	HHVdry	LHVdry	SpecHeatRati	SpecHeatCp
Acetylene	C2H2	26.03728	1488	0	1.232	1.69
Air	AIR	28.963	0	0	1.4	1.01
Ammonia	NH4	18.03846	0	0	1.31	2.19
Argon	Ar	39.948	0	0	1.667	0.52
n-Butane	C4H10	58.123	3392	3131	1.094	1.67
i-butane	C4H10	58.123	3392	3131	1.094	1.67
Carbon Dioxide	CO2	44.01	0	0	1.289	0.844
Carbon Monoxide	CO	28.01	321	321	1.4	1.02
Chlorine	Cl2	70.906	0	0	1.34	0.48
Ethane	C2H6	30.07	1789	1636	1.187	1.75
Ethylene	C2H4	28.05316	1614	1485	1.24	1.53
Helium	He	4.002602	0	0	1.667	5.19
Heptanes	C7H16	100.204	5502.5	5100	1.05	0
Hexanes	C6H14	86.177	4755.9	4403.8	1.06	0
Hydrogen	H2	2.016	325	273.8	1.405	14.32
Hydrochloric Acid	HCl	36.46094	0	0	1.41	0.8
Hydrogen Sulfide	H2S	34.08	647	596	1.32	1.017
Hydroxyl	OH	17.00734	0	0	1.384	1.76
Methane	CH4	16.043	1014	913	1.304	2.22
Methyl Chloride	CH2Cl	49.47958	0	0	1.2	1.005
Nitric Oxide	NO	30.0061	0	0	1.386	0.995
Nitrogen	N2	28.013	0	0	1.4	1.04
Nitrous Oxide	N2O	44.0128	0	0	1.27	0.88
Oxygen	O2	31.999	0	0	1.395	0.919
n-Pentane	C5H12	72.15	4200	3884	1.07	0
i-pentane	C5H12	72.15	4200	3884	1.07	0
Propane	C3H8	44.097	2573	2367	1.127	1.67
Propylene	C3H6	42.07974	2383	2192	1.15	1.5
Sulphur Dioxide	SO2	64.0638	0	0	1.29	0.64

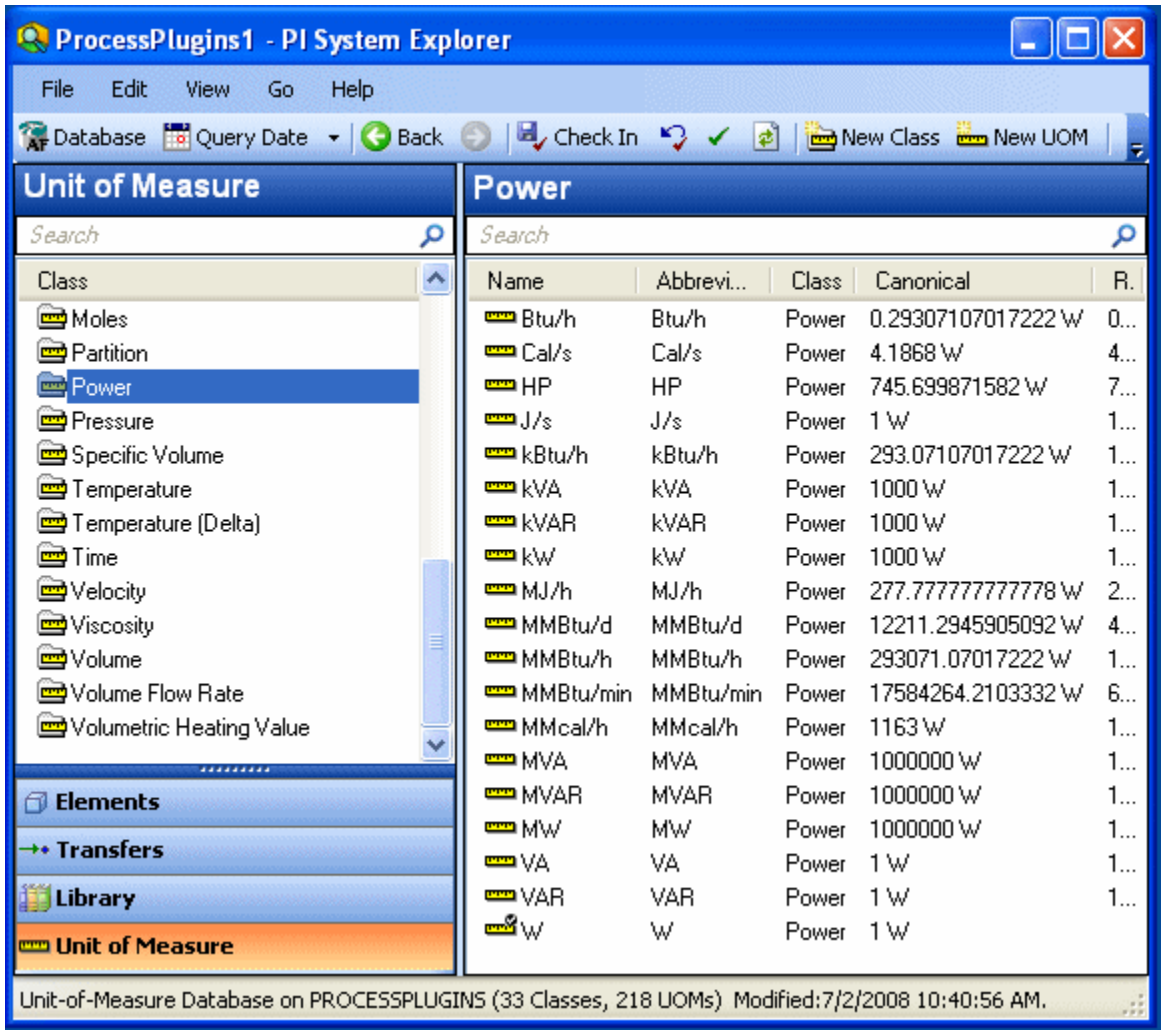
The Process Plugins™ package comes with both industry standard and site specific tables which are used by elements for lookup functions as well as interpolation.

Data Storage



Key resultant data generated by Process Plugins™ modules are stored in the OSIsoft PI historian. Process Plugins™ modules do not store redundant or unnecessary data, but only a handful of PI tags for key results.

Units of Measure



The Process Plugins™ package includes a complete set of engineering units utilized by the utility industry for use with the PI AF Unit of Measure (UOM) system. PI-AF automatically performs unit conversions on demand and delivers results in either the U.S. English or S.I. engineering unit systems.

ProcessPlugins

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