The Gas Turbine Condition Monitor provides real-time compressor efficiencies, expected generator capacity, and expected efficiency based upon various ambient conditions. This information can be useful in determining loss of turbine efficiency or other problems. Curves are customizable and can be easily adjusted anytime afterward. Expected values calculations require the availability of appropriate curves (from the manufacturer or actual historical data). This tool makes it easy to identify problems with turbine performance early.

Using the ‘Element Relative Display’ feature, one master Process Book display file may be used to consistently display the key performance indicators of each turbine by simply selecting the turbine 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.

**Live Data Inputs Suggested for Best Results:**
- Fuel flow to turbine
- Fuel temperature to turbine
- Fuel pressure to turbine
- Fuel heating value or constituents necessary (chromatograph) to calculate heating value
- Exhaust gas temperature
- Air compressor inlet temperature
- Barometric pressure
- Air compressor filter outlet pressure or filter differential pressure
- Air compressor outlet temperature
- Air compressor outlet pressure
- All available bearing temperatures
- All available bearing vibration
- All available emissions data

**Optional Live Data Inputs (Recommended if corresponding performance curves are available):**
- Relative humidity (or wet bulb temperature)

**Recommended Technical Information:**
- All manufacturer design rating specifications
- All manufacturer performance curves

The following parameters are calculated, ISO-corrected, and key performance indicators (KPIs) are visually displayed in a real time comparison to manufacturer design curves or data, or to historical data trends:
- Air compressor isentropic (adiabatic) efficiency
- Air compressor polytropic efficiency
- Power from Fuel
- Turbine Work
- Gas Turbine Heat Rate

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

![Formula Configuration](Image)

Fundamental performance calculations exist as formulas within elements.
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.
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.
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.
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.
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