Each InsightPak can be applied to specific machines within the System 1 platform to perform continuous real-time data analysis to detect early changes in machine behavior and identify targeted failure modes. It doesn’t just raise red flags. InsightPaks diagnose malfunctions by using machine configuration information, real-time data, and asset operating states.

Results can be visualized, trended, and annunciated within System 1. Alarm notifications are available via email and may be shared via open protocols such as OPC UA. InsightPak Analytics can aid root-cause diagnostics by correlating its results with high-resolution data within the System 1 database.

InsightPak Analytics cover a wide range of assets including rotating machines with fluid-film bearings, reciprocating machines, auxiliary systems, and common processes.

Over 60 years of proven Bently Nevada machine and process problem-solving is now embedded in powerful new software plug-ins which continuously perform analytics and diagnostics covering an extensive range of equipment.

Modern industrial operations have an overwhelming quantity of data, and it’s impossible for staff to continuously monitor and analyze machinery conditions. Unfortunately, generic analytics tools often provide insufficient diagnostics for specialized machines, and many analytic offerings do not allow experts to access and alter the algorithms to meet specific requirements. In addition, it is difficult to correlate diagnostic results with data in disparate historian platforms lacking high-resolution, time-synchronized data.

InsightPak™ Analytics changes all that.
InsightPak for rotating assets with fluid-film bearings

- Centrifugal compressors
- Speed increasing/decreasing gearboxes
- Integral gear compressors
- Industrial gas turbines
- Aeroderivative gas turbines
- Power turbines
- Axial compressors
- Electric motors
- Pumps
- Blowers
- Fans
- Generators
- Steam turbines

With appropriate instrumentation, diagnostics include:

- Radial preload
- Fluid-induced instability
- High synchronous vibration
- Rotor runout
- Sub and Super synchronous rubs
- Misalignment
- Rotor bow
- Surge
- Stall
- Gear mesh
- Blade pass
- Combustor rumble
- High exhaust/high differential exhaust temperatures
- Electric motor non-uniform airgap
- Pump cavitation

InsightPak for reciprocating assets

This InsightPak covers API type compressors in the services of hydrogen, flare gas, LDPE, or natural gas. With appropriate instrumentation, diagnostics include:

- Crosshead pin loading
- Frame loading
- Pressure packing leaks
- Suction/discharge valve leaks
- Leak—cylinder to low pressure
- Leak—high pressure to cylinder

Rules for auxiliary systems

InsightPak rules cover analytics and diagnostics for two types of dry gas seals used in centrifugal compressors: tandem, and tandem with intermediate labyrinth. Diagnostics include:

- Bearing oil migration
- Low seal gas DP
- Low seal gas temperature
- Low secondary seal gas temperature
- Low separation seal gas DP
- Primary seal failure
- Seal gas flow problem
- Secondary or separation seal failure
- Secondary seal failure
- Secondary seal gas flow problem
- Separation seal gas flow problem
- Seal gas booster fouled filter
- Seal gas fouled filter
- Secondary seal gas fouled filter
- Separation seal gas fouled filter

Stay tuned for more InsightPak diagnostics
## InsightPak methodology

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<tr>
<td>- Design speed/ lower and upper speed limits</td>
<td>- Speed</td>
<td>- Bearing level</td>
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<td>- Diagnostic results are identified via System 1 Event Manager, email notifications, or OPC UA alarm events</td>
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<td>- Bearing clearance</td>
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</tbody>
</table>

### Benefits
- Automatically detect failure modes
- Maximize your plant availability
- Support existing maintenance strategies
- Mitigate your operational risks
- Extend the life of your assets
- Reduce time spent for root-cause analysis
- Utilize existing sensor data
- Gain new insight into equipment and process behavior
- Leverage System 1’s core capabilities such as notifications and plotting

### Support
In addition to installation, we provide a full range of support services to ensure you get the most value from your InsightPak Analytics:
- Installation and configuration
- Training
- Optimization
- Customization to meet corporate best practices
- Supporting service agreements