Prescriptive engineering services

IMI Insyt

Stop the cracks before they start

IMI Critical Engineering

Breakthrough Engineering

Existing equipment- prescriptive solutions

The continuous cycling of spraywater systems in combined cycle power plants frequently leads to system-critical cracking.

The increased cycling puts stress on plant equipment. Cracks in pipes and valves are a familiar sight for those inspecting the equipment. When spraying cold water onto hot metal as part of the attemperation process, the development of cracks become inevitable.

The result is unexpected shutdowns, lost revenue, and unsafe working conditions.

Having to stop the plant to replace cracked or otherwise damaged equipment is not a simple task. It commonly requires cranes, or other heavy equipment, scaffolding, and significant downtime.

Insyt: the proactive approach to plant maintenance

With Insyt, you can:

- Identify data signatures that lead to structural integrity issues such as cracks and leaks
- Fix plant control logic issues that create massive thermal stresses
- Identify equipment concerns that impede system performance

Insyt is a digital, end-to-end prescriptive engineering service that identifies problems in your system, helping you stop failures before they happen.

Using data-driven analytics, it identifies misoperation, poor design, and inadequate maintenance, improving plant safety and performance.

The system-wide approach ensures peace of mind for you, increased safety for personnel, and big savings for your plant, with no unplanned shutdowns.

This system-wide, physics-based analysis, carried out by highly experienced IMI engineering experts, identifies improvements needed for desuperheating performance and system control, including thermal gradients, spraywater control, atomization, system synchronization, and more.

The benefits of using Insyt:

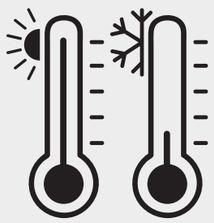
- A proactive approach to failure prevention through improved plant reliability
- Improved maintenance planning and scheduling
- Large data batch processing by industry experts
- Reduce workplace accidents and near misses
- Save time and money, and improve your ROI

Common plant issues that cause cracking

Most plants were built to run at baseload with few starts and stops. Renewable energy supplies require plants to start and stop every day.

Condensate accumulation can generate catastrophic failures in boiler piping and can impact the turbine.

If attemperators and desuperheaters are located too close to elbows, hot and cold streams can separate and cause large temperature gradients. This affects desuperheater performance and usage cycles.



Original plant control logic left over from commissioning can lead to significant problems with temperature control. This causes major thermal gradients and stresses.

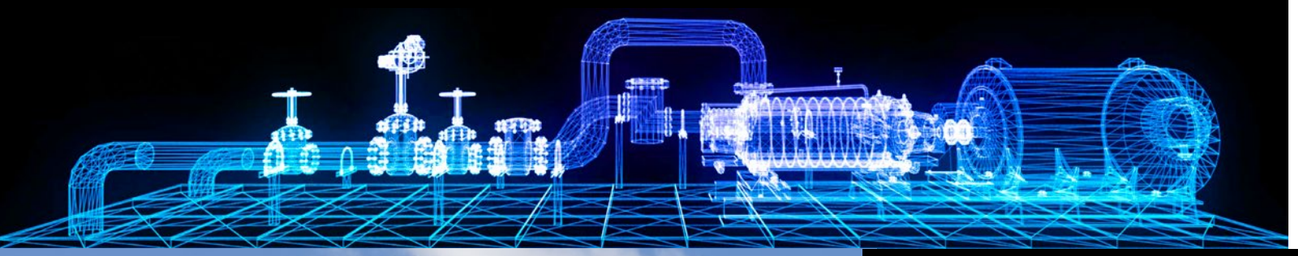
Insyt: How it works

Through Distributed Control System (DCS) data review, the IMI Insyt service analyzes desuperheater and turbine bypass system (TBS) performance to identify operational issues, poor control logic, and faults in hardware design.

Reviewing control system performance verifies stability. The normal measures of plant cycle life do not reliably indicate the condition of a desuperheating system, so Insyt reviews information about spray pattern, atomization, steam energy, superheat, and more.

Installations can also be reviewed remotely through P&IDs and isometric drawings, citing common problems with installations, and recommending fixes.

An Insyt review can prevent future problems that increase plant stresses, reduce equipment life, and increase the risk of future pipe failures. These events may lead to safety hazards and unplanned outages, potentially costing plants millions in downtime and repairs.



How we acquire data, and what we do with it

The distributed control system (DCS) is the brain of the plant, providing process control automation, and ensuring that the plant operates within the boundaries of performance through instrumentation and alarms.

Plant operators use the DCS to regulate the upper and lower limits on the system, with fail-safes to prevent large-scale failure.

As part of its operation, the DCS receives very large amounts of information from sensors and other instrumentation throughout the plant. This historical data is captured and can be reviewed for troubleshooting purposes.

Interpreting this amount of data can be an arduous task.

Plant operators may lack the time or expertise to use the data effectively and determine the root cause of developing issues.

Additionally, this data typically comes from high-level plant sensors that monitor pressures, temperatures, and flows.

Expertise is required to translate these parameters into critical values that can be used to make recommendations for specific hardware optimization and system control.

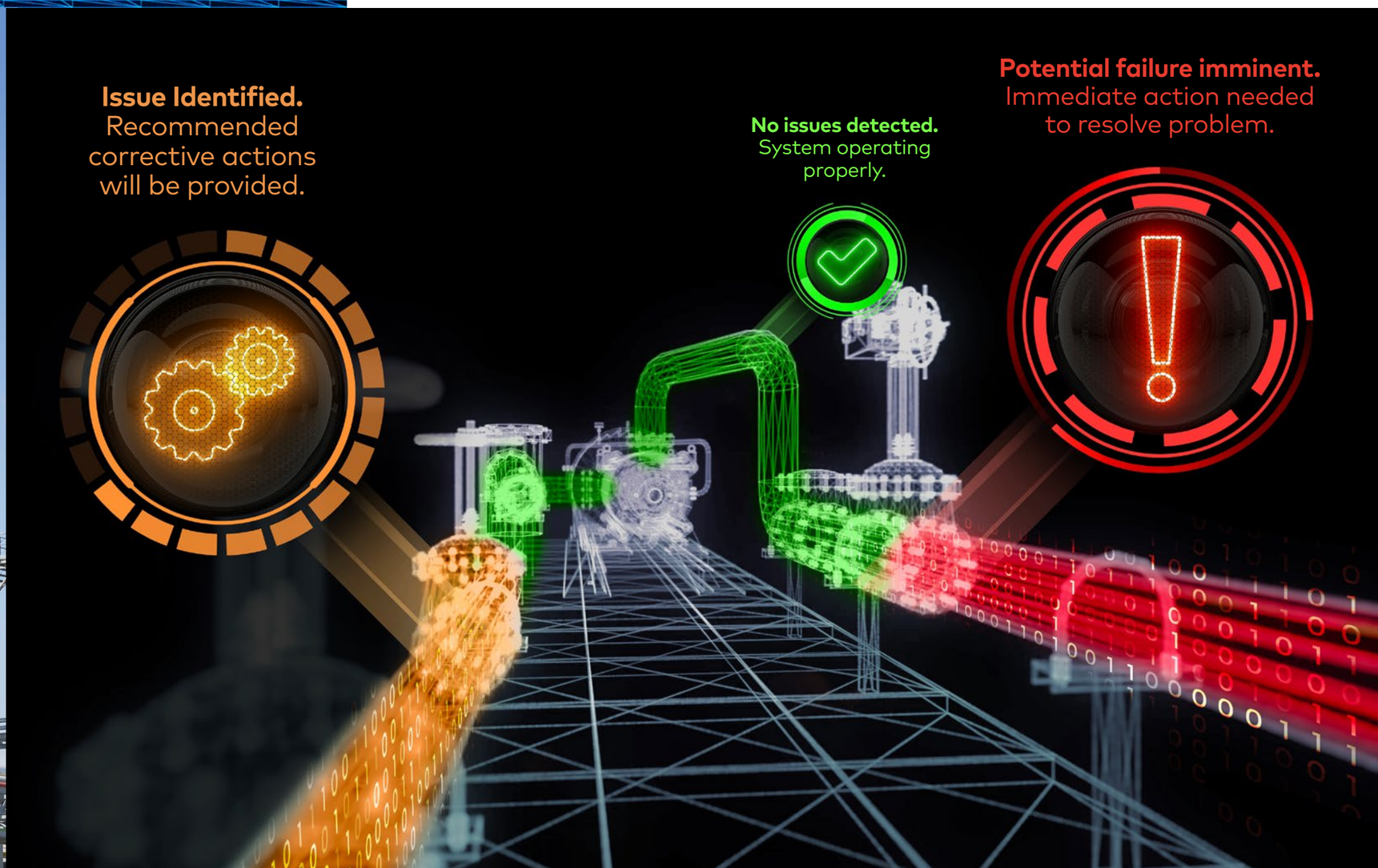
Common problem applications

- > Interstage attemperators
- > Turbine bypass systems
- > Auxiliary steam systems
- > Steam letdown stations
- > Turbine exhaust desuperheaters

Issue Identified.
Recommended corrective actions will be provided.

No issues detected.
System operating properly.

Potential failure imminent.
Immediate action needed to resolve problem.



Our journey together

A kick-off meeting is held between IMI and the client to discuss data points, any historical issues, and plant operation

The Insyt team will identify the necessary P&ID information and isometric drawings required and will take possession of the DCS historical data from the customer

Historical plant data is provided in raw form, processed by Insyt experts, and loaded into IMI's software, using proprietary algorithms developed across decades of industry experience

A virtual system walkdown takes place, with the optional addition of system photographs and video

Our team evaluates the data to make recommendations about maintenance requirements, control logic changes, and equipment issues

A report is produced detailing critical operational metrics. The report will also recommend any corrective actions that should be taken.

A close-out meeting is held to discuss the findings

This is the beginning of a continuous partnership, with regular monitoring and evaluation to detect any emerging problems and maintain plant operations at optimum efficiency

Critical operational metrics

The report will detail operational metrics, including but not limited to:

- > Thermal gradients
- > Spray valve cycling
- > Temperature cycling
- > Quenching events
- > Wet steam
- > Valve performance
- > Control system behavior

The report will also recommend any corrective actions that should be taken

IMI Critical Engineering

IMI Critical Engineering are global critical flow control specialists with decades of experience in research, development, and manufacturing of valves and other flow control systems and solutions. This expertise has been channelled into our new Insyt solution, providing prescriptive engineering services to identify, alert, and provide corrective actions to potential failures in your system.

Americas

imiccisales.americas@imi-critical.com

IMI CCI Brazil
Sorocaba
Brasil

Tel: +55 11 2645 6503

IMI CCI Houston
Texas
USA

Tel: +1 281 670-5357

IMI CCI RSM
California
USA

Tel: +1 949 858 1877

Asia-Pacific

imiccisales.apac@imi-critical.com

IMI Critical Australia
Melbourne
Australia

Tel: +61 3 9213 0800

IMI Critical Japan
Kobe
Japan

Tel: +81 78 277 1880

IMI Critical Korea
Paju-si
Korea

Tel: +82 31 980 9800

IMI Critical Malaysia
Kuala Lumpur
Malaysia

Tel: +60 3 6412 3500

IMI Critical Singapore
Singapore

Tel: +65 6653 7000

China

imiccisales.china@imi-critical.com

IMI Critical China
Shanghai
PR China

Tel: +86 21 3973 8008

Europe

imiccisales.europe@imi-critical.com

IMI CCI Austria
Wien
Austria

Tel: +43 1 869 27 40

IMI CCI Brno
Brno
Czech Republic

Tel: +420 511 188 111

IMI CCI Sweden
Säffle
Sweden

Tel: +46 533 689 600

IMI CCI Switzerland
Balterswil
Switzerland

Tel: +41 52 264 9500

IMI CCI United Kingdom
Manchester
UK

Tel: +44 (0)161 655 1680

India

imiccisales.india@imi-critical.com

IMI CCI Bangalore
Bangalore
India

Tel: +91 80 4030 3500

IMI CCI SriCity
Andhra Pradesh
India

Tel: +91 86 2371 8000

Middle East and Africa

imiccisales.mea@imi-critical.com

IMI CCI Dubai
Dubai
United Arab Emirates

Tel: +971 4 807 3111

IMI Saudi Industry LLC
Dammam
Saudi Arabia

Tel: +966 13 868 8119

IMI Critical Engineering
Lakeside, Solihull Parkway
Birmingham Business Park
Birmingham B37 7XZ
United Kingdom

Tel: +44 (0)121 717 3700
Fax: +44 (0)121 717 3701

www.imi-critical.com

IMI Critical Engineering

IMI Insyt

go.imi-critical.com/insyt

insyt@imi-critical.com

AB01018.01-22en