ONLINE DAMAGE TRACKING
ATTEMPERATOR EQUIPMENT
Advanced Monitoring

Structural Integrity Associates, Inc.®

SIIQ™
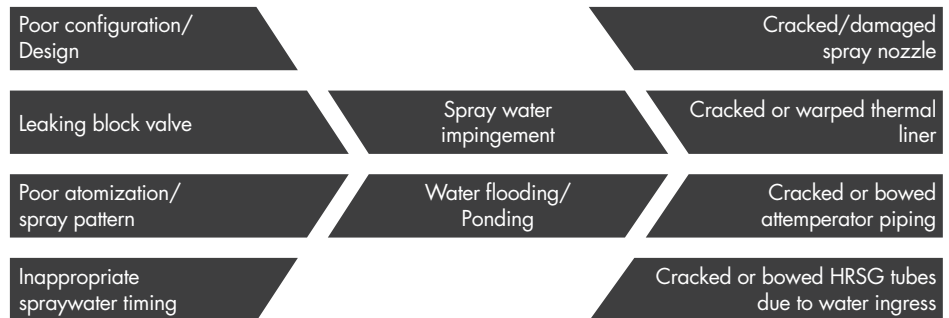Connecting **Intelligence** to Assets

Avoid costly damage and unnecessary inspections using SI's intelligence – SIIQ™ – to determine if, where, and when attemperator damage is occurring – all in real-time. Inform your long term asset management strategy, extending inspection intervals and optimizing asset life though intelligence – SIIQ.

Spraywater

Hot Steam

Cooled Steam
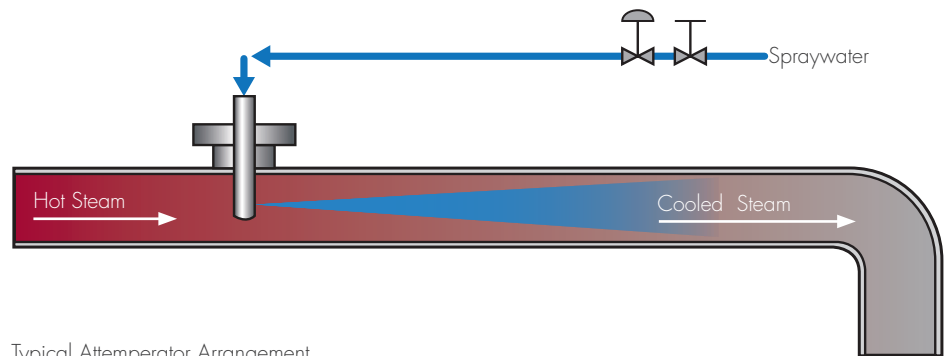
Typical Attemperator Arrangement

THE PROBLEM

Attemperators or desuperheaters reduce steam temperature using a water spray and are one of the most problematic components in combined cycle plants. There are many attemperator designs and configurations, but all are vulnerable to damage. If the causes of damage are not addressed early, then cracking and steam leaks occur leading to costly repairs and replacements. Unfortunately, damaging temperature transients are not detected by standard plant control instrumentation until it is too late.

Causes		Effects
Poor configuration/ Design		Cracked/damaged spray nozzle
Leaking block valve	Spray water impingement	Cracked or warped thermal liner
Poor atomization/ spray pattern	Water flooding/ Ponding	Cracked or bowed attemperator piping
Inappropriate spraywater timing		Cracked or bowed HRSG tubes due to water ingress

Possible causes and damaging effects of malfunctioning attemperators

Damaged Nozzle   Cracked Liner   Failed downstream Weld/Elbow

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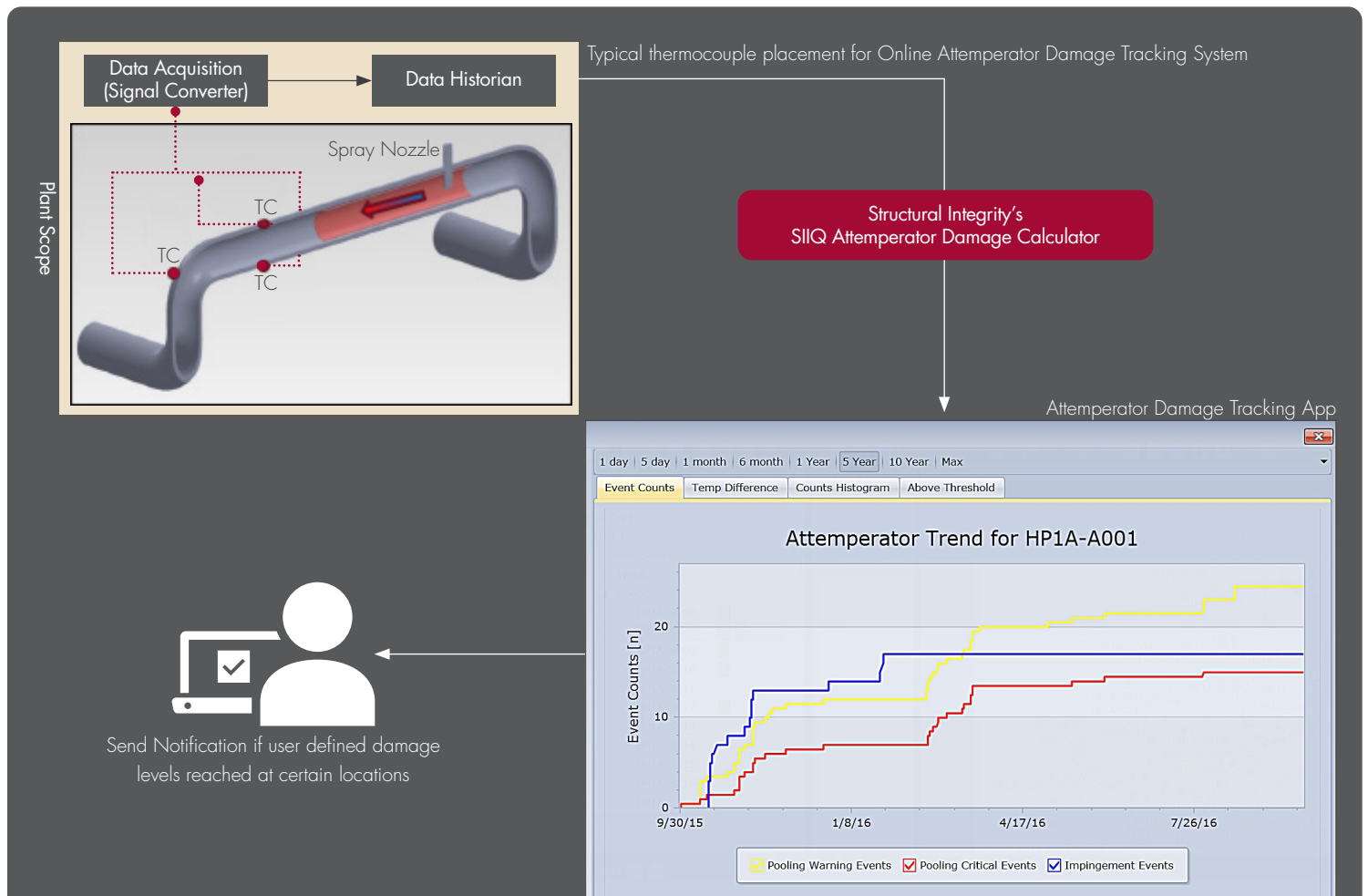Huntersville, NC 28078

THE SOLUTION

The SIIQ solution provides alerts based on intelligent assessment of temperature or damage trends in real time allowing mitigations to be performed prior to the need for costly repairs.

SIIQ works by tracking damaging temperature differentials with strategically placed thermocouples with intelligent algorithms that provide direct feedback on the magnitude of damage incurred from each water impingement, flooding or ponding event. Email alerts are sent providing early detection allowing mitigation such as operation changes, maintenance, or logic updates.

SIIQ implementation takes advantage of a scalable and modular approach. This approach allows flexibility to use a fully turn key solution using all SI components or a custom solution mixing elements from various sources. The intelligent algorithms and notifications are provided through PlantTrack™, our lifecycle management software. PlantTrak can receive data either through SI provided wireless transmitters or through a web interface to your plant historian.

To get started, contact us now and SI experts will begin with a review the design of the attemperator system and guidance on appropriate thermocouple location and work with plant personnel to determine the optimum system architecture.

Typical thermocouple placement for Online Attemperator Damage Tracking System

Plant Scope

Data Acquisition (Signal Converter) → Data Historian

Spray Nozzle

TC · TC · TC

Structural Integrity's SIIQ Attemperator Damage Calculator

Attemperator Damage Tracking App

1 day | 5 day | 1 month | 6 month | 1 Year | 5 Year | 10 Year | Max

Event Counts | Temp Difference | Counts Histogram | Above Threshold

Attemperator Trend for HP1A-A001

Event Counts [n]

9/30/15 — 1/8/16 — 4/17/16 — 7/26/16

☑ Pooling Warning Events ☑ Pooling Critical Events ☑ Impingement Events

Send Notification if user defined damage levels reached at certain locations

SIIQ

SIIQ uses the PlantTrack Lifecycle Management along with SI's proprietary sensors, transmitters, and wireless network to provide a suite of real-time damage tracking applications for common plant components: piping, headers, tubing, attemperators, etc. It is modular in nature, enabling a complete system from SI or integrated with various other hardware & software applications.

PlantTrack

Is SI's web-based graphical data management of design, configuration, inspections, failures, repairs, etc. It can be used to manage off-line data by itself, but when used in an SIIQ implementation, it provides the intelligent algorithms to predict damage and the interface for expert diagnosis.

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