



# Health Monitoring of Power Plants : Across India



Presented by

**Atul Kansal , UltraTech Cement Ltd.**



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OSIsoft.

# REGIONAL SEMINARS

The **Power** of **Data**

**I N D I A**

**THRIVING  
IN A  
WORLD OF  
CHANGE**

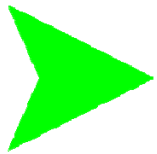
**August 22 - 23, 2013  
Mumbai, India**



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# AGENDA...



**Who we are**

**Solution Architecture**

**Health Monitoring**

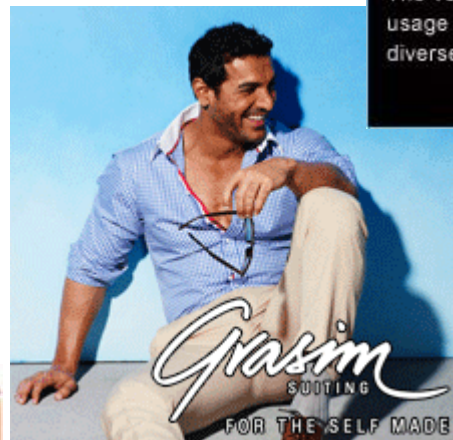
**Results and Benifits**

**Way Forward**



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And many **more.**





A US \$40 billion corporation, the Aditya Birla Group is in the League of Fortune 500. It is anchored by an extraordinary force of over 136,000 employees, belonging to 42 different nationalities.

- The world's largest aluminium rolling company
- No.1 in viscose staple fibre
- Biggest producer of primary aluminum in Asia
- Among the top 10 cement producers globally
- The No.1 producer of carbon black in the world
- Fourth-largest producer of insulators in the world
- Fifth-largest producer of acrylic fiber in the world
- Among the best energy efficient fertilizer plants



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ADITYA BIRLA



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# Unit Locations : Pan-India Presence

Allgarh  
 Dadri  
 Panipat  
 Bhatinda  
 Kotputli  
 Aditya Cement  
 Vikram Cement

Gujarat  
 Jafferabad

Magdalla BT  
 Magdalla

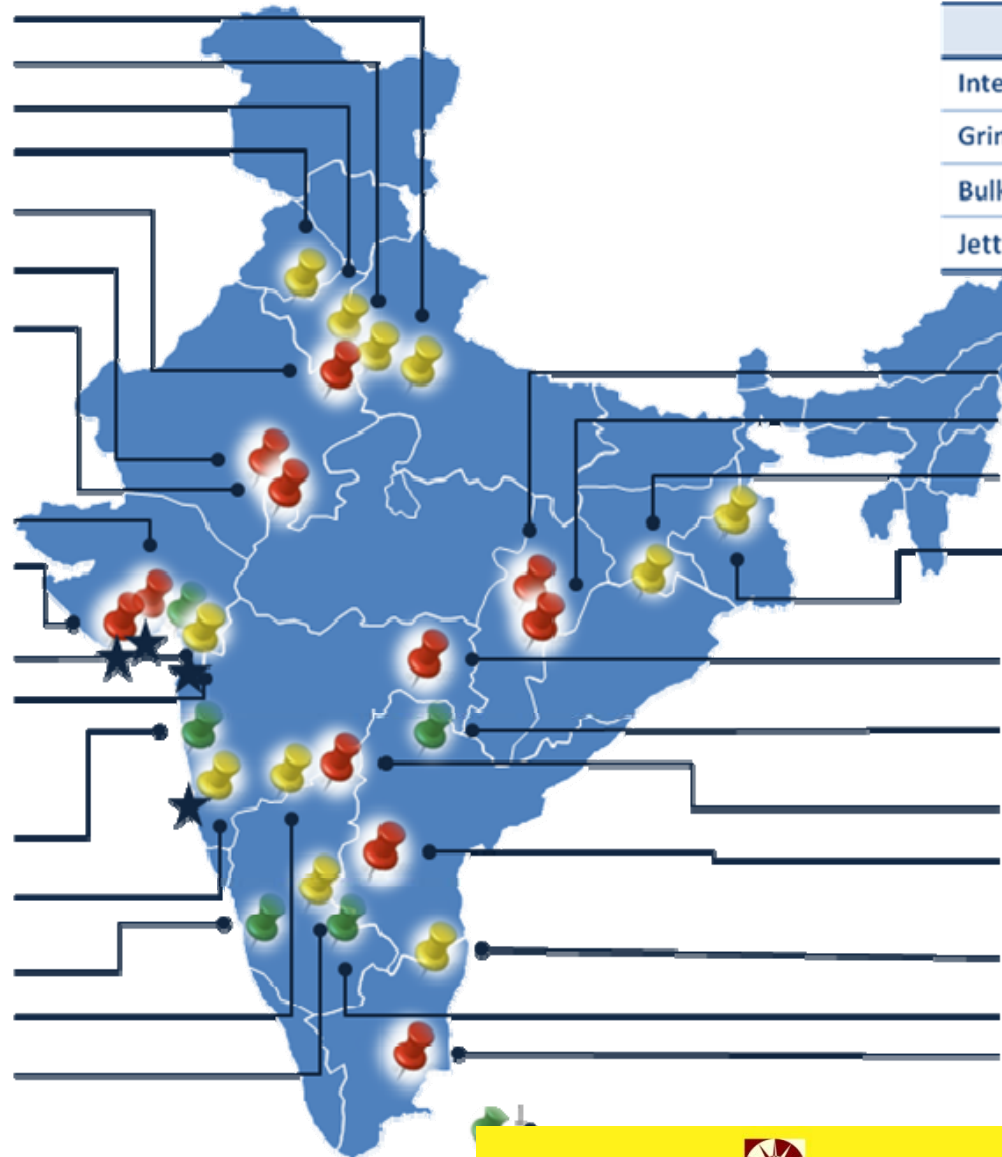
Navi Mumbai BT

Ratnagiri

Mangalore BT

Hotgi

Ginigera



Type of Unit	No.
Integrated Plants	11
Grinding Units	11
Bulk Terminals	6
Jetties	4

Hirni  
 Rawan  
 Jharsuguda  
 West Bengal

Awarpur  
 Hyderabad BT  
 Rajashree Cement  
 Andhra Pradesh

Arakkonam  
 Bangalore BT  
 South

Sri Lanka BT

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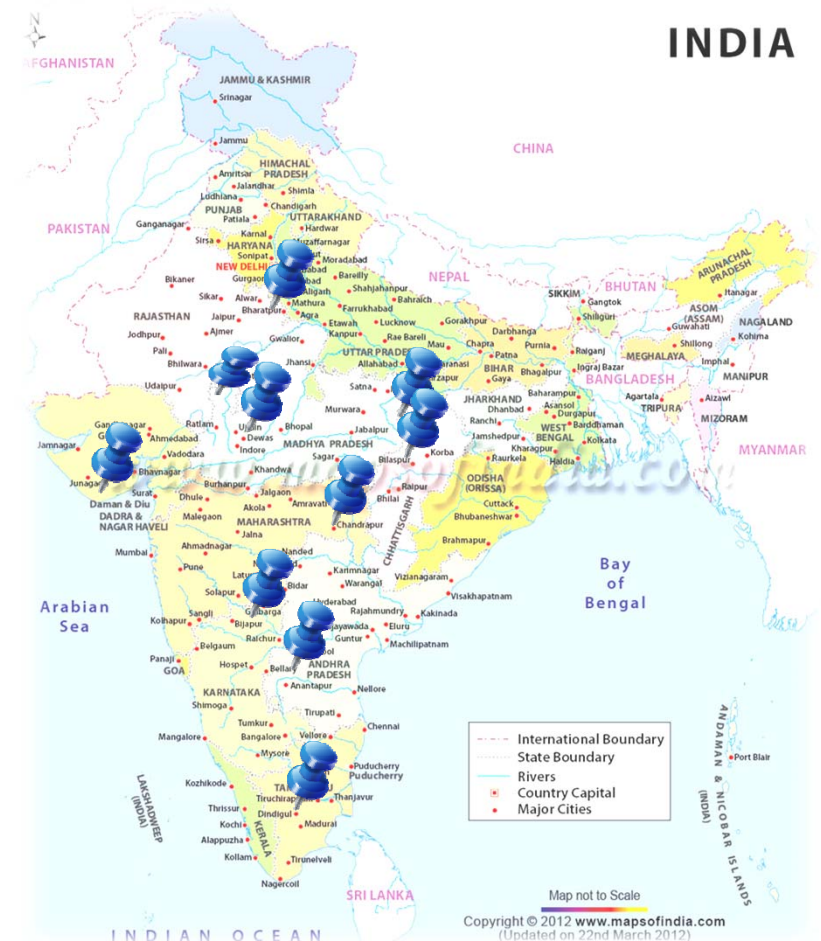
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# Business Challenge

- ✓ Different DCS at different sites
- ✓ Data from various locations across country
- ✓ Data Security and DCS Security
- ✓ Real time data at remote locations
- ✓ Reports



# PI ...as a Solution...



✓ Easy to SYNC with any system

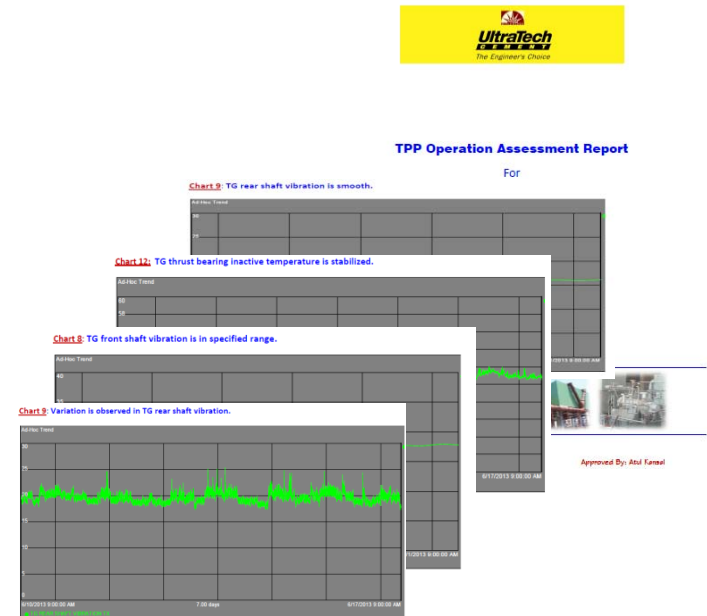
✓ Secure data transfer

✓ Real time data availability

✓ Data Analysis

✓ Technical Support from OSI Soft

✓ Custom built reports for internal use



# Structure of PI System



## Connect

Collect data from hundreds of sources.



## Manage

Gather and archive large volumes of data. Scale to meet your growing business needs.



## Analyze

Access real-time or historical role-based data for the entire enterprise at any time.



## Present

View data, identify problems, and take corrective action with familiar, easy-to-use graphical tools.

Servers

Analytics

Visuals

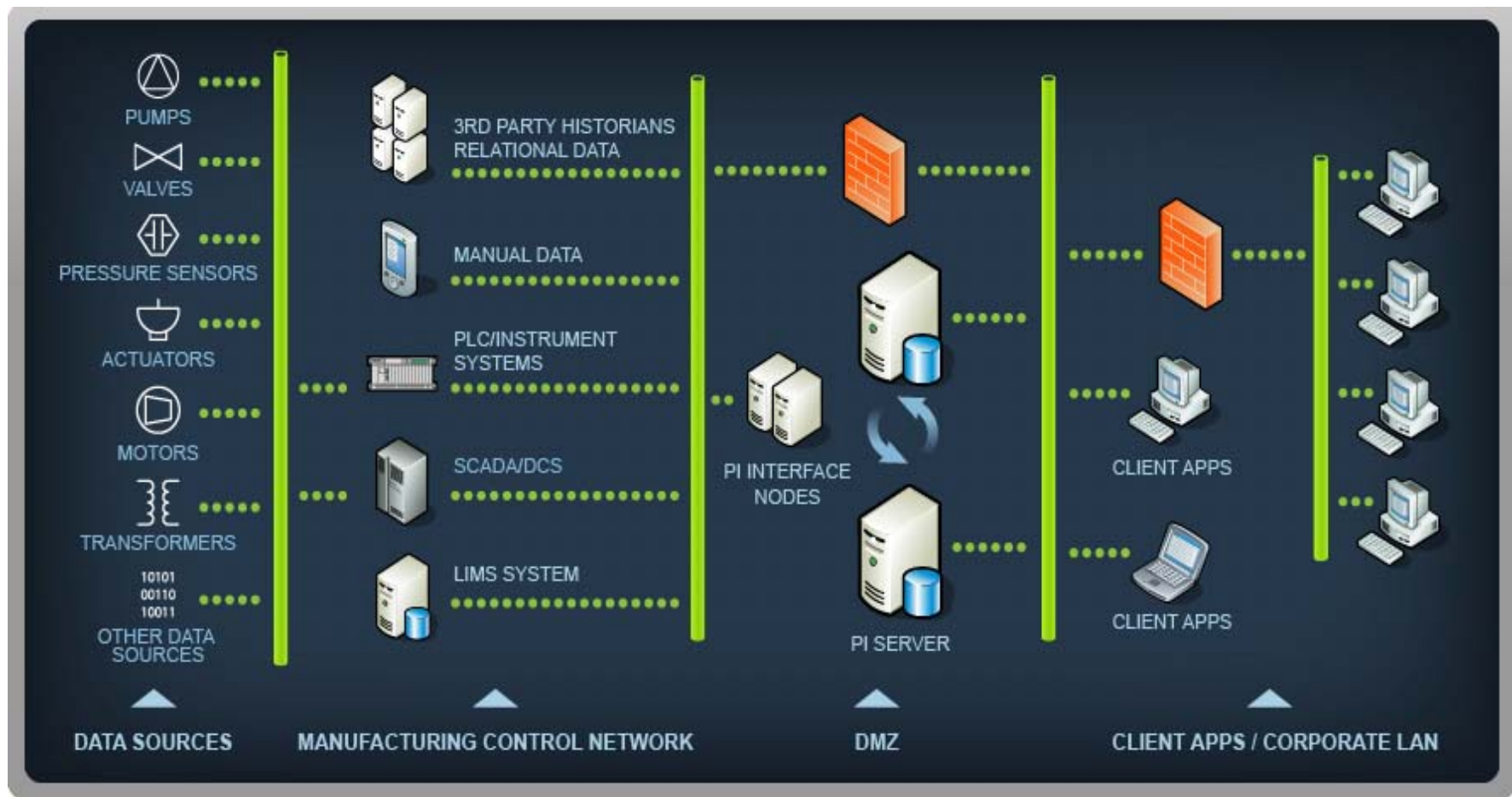
**PI System is highly scalable and reliable; it connects the right people with the right information at the right time, so that they can analyze, collaborate and act.**



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# PI System Architecture: Site



COLLECT



HISTORIZE



FIND



ANALYZE

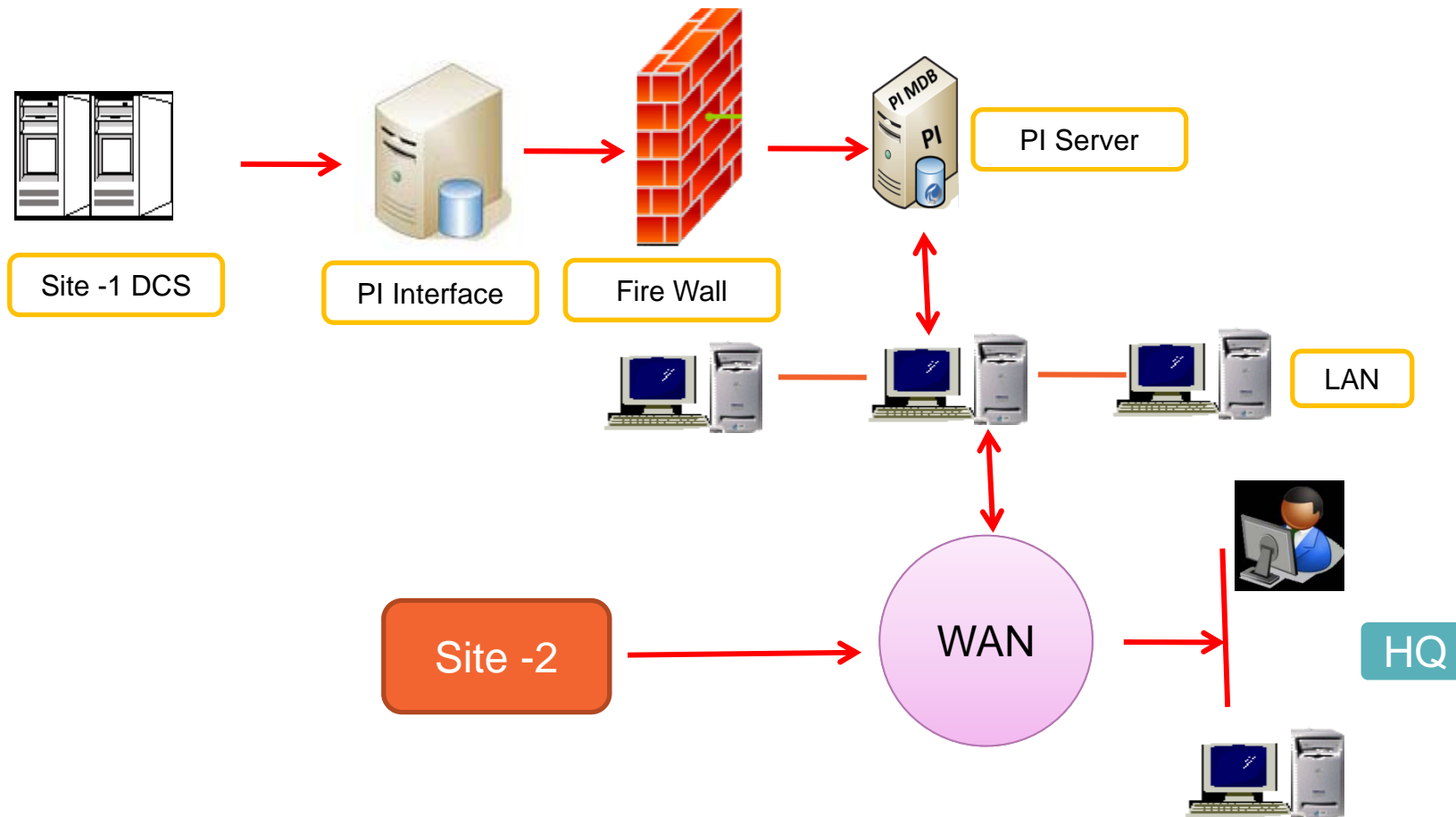


DELIVER



VISUALIZE

# PI System Architecture: UltraTech



# System Architecture in Ultratech

More than 100k tags configured at different site.

More than 3K concurrent users.

Connectivity with different plant system (SCADA or DCS)

PI OPC Interface, PI Modbus Interface,...

More than 5k calculated tags using PI Performance Equation,  
PI Totalizer and PI ACE

Power full use of PI Process Book and PI Data Link by users



# Key differentiators of PI System in Ultratech

- ❑ Is an infrastructure - it is not limited by the number of tags it can collect nor the tag resolution
- ❑ PI data is available in every form to ANY third party application
- ❑ PI data extraction tools (SDK, OLEDB, JDBC) allow for access to ANY PI data
- ❑ Can scale across multiple plants and the entire enterprise
- ❑ Resolves time zone differences
- ❑ Has over 450 interfaces and many are to specific cement analysis and control systems including
  - FLS Automation ECS and QCX , ABB 800 XA , RS Logix
  - X-ray devices
  - Laser and Infrared analysis tools



PI System



COLLECT



HISTORIZE



FIND



ANALYZE



DELIVER

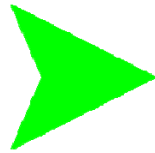


VISUALIZE

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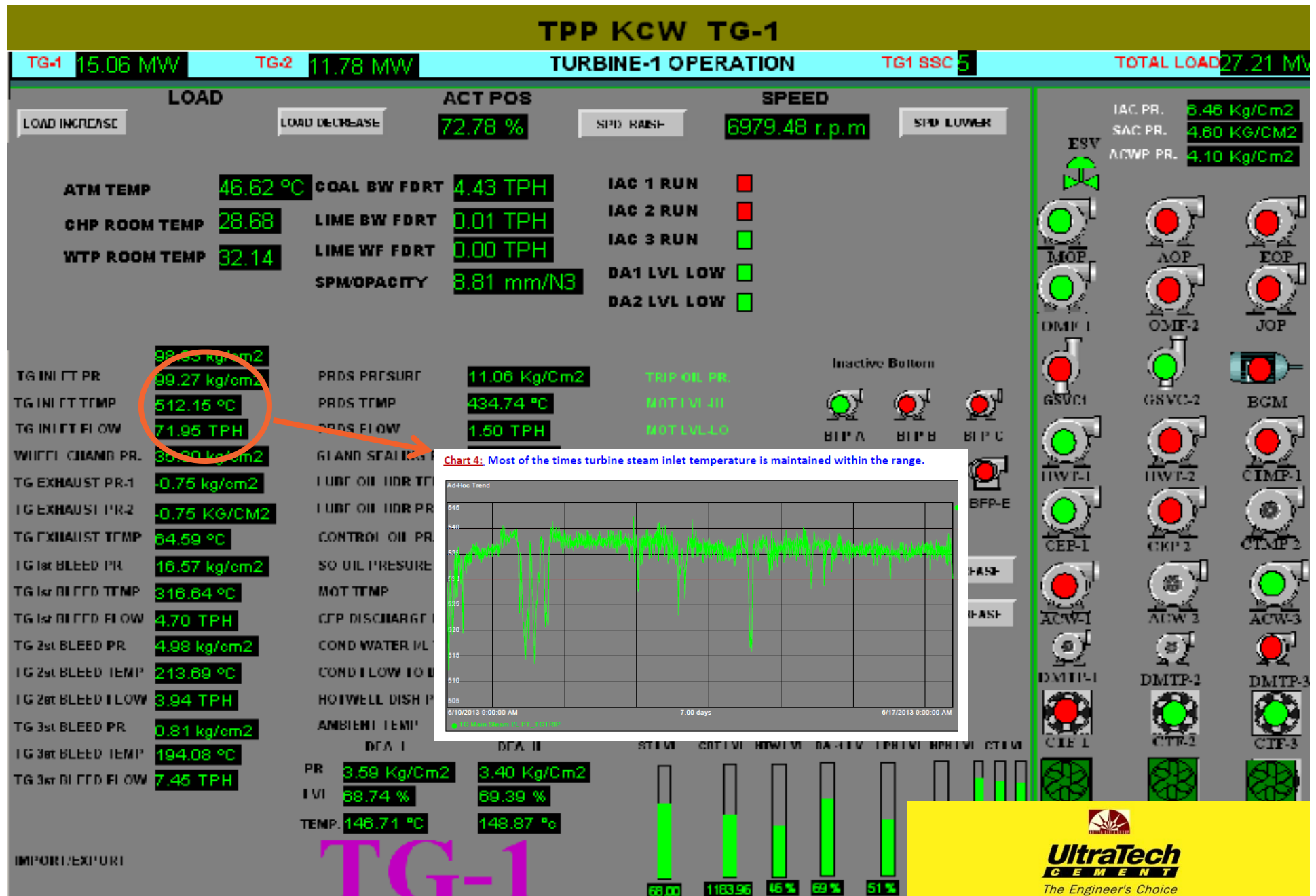
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# RM&D – REMOTE MONITORING AND DIAGNOSTIC

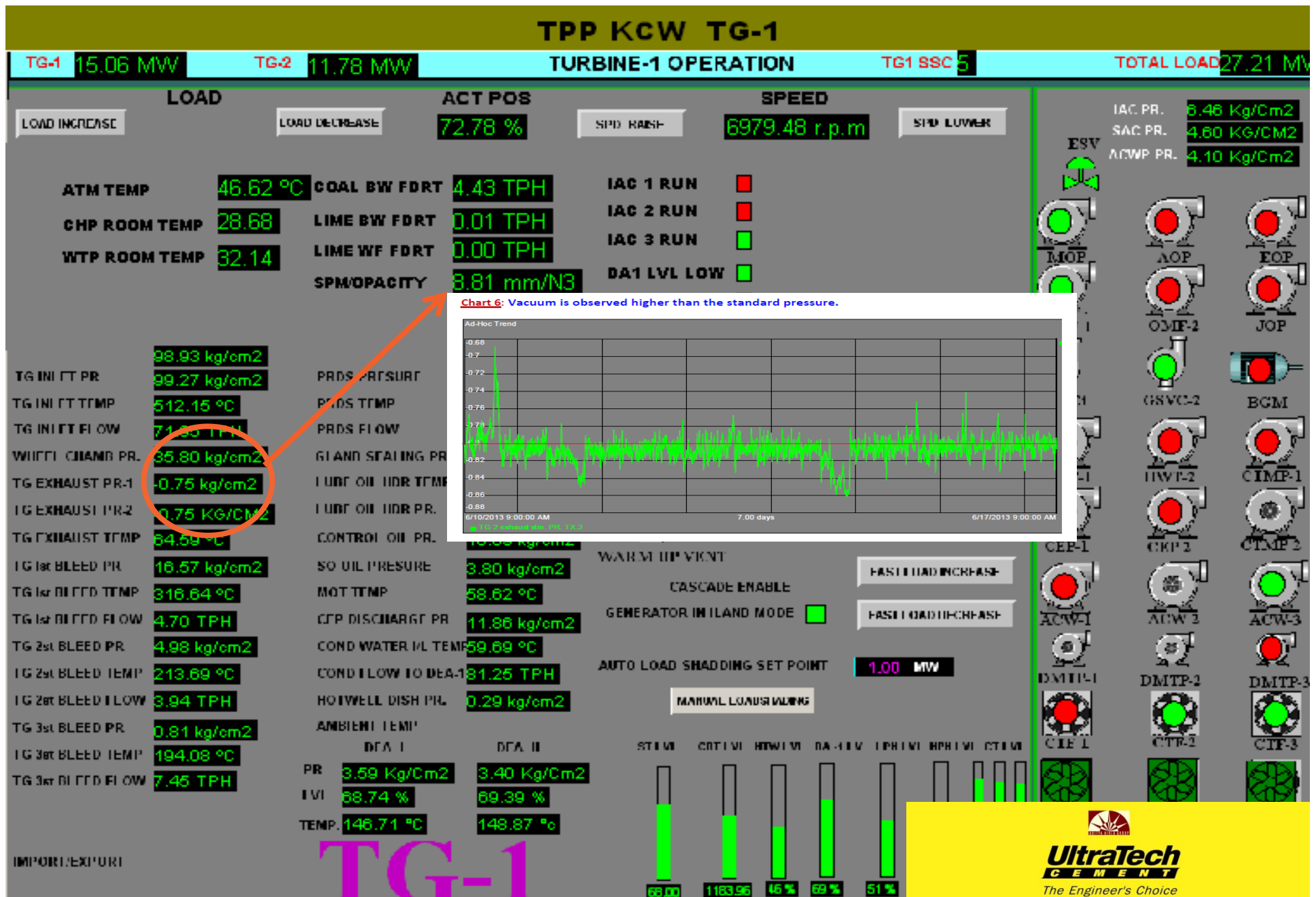


# Turbine Health Monitoring...

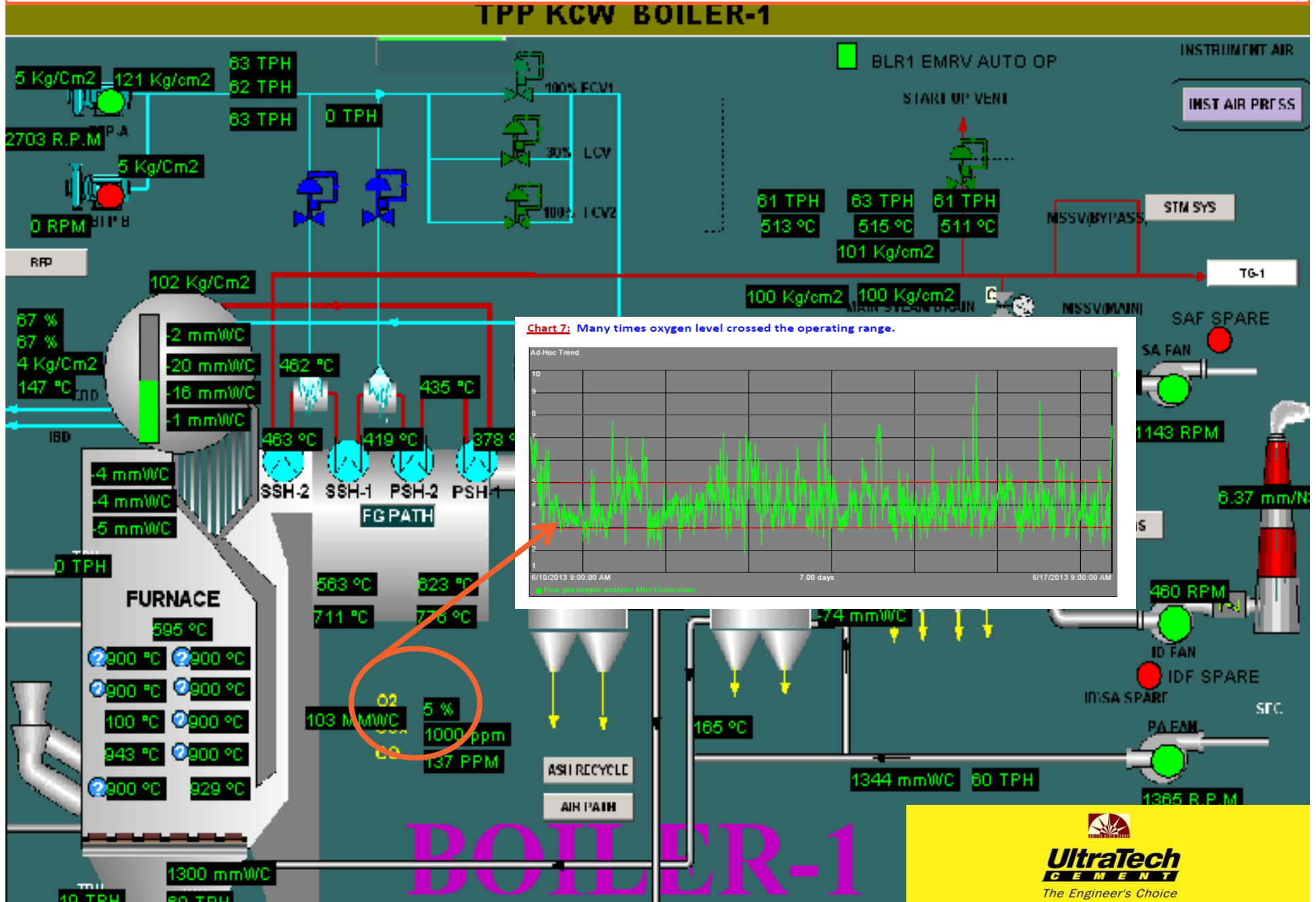




# Turbine Health Monitoring...



# Boiler process Monitoring...







## TPP Operation Assessment Report

For

**Aditya Cement Works**

24<sup>th</sup> June - 01<sup>st</sup> July 2013

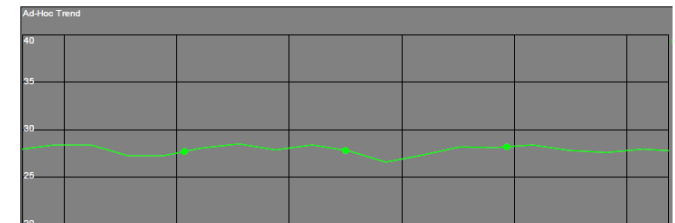
BY CPP Pr



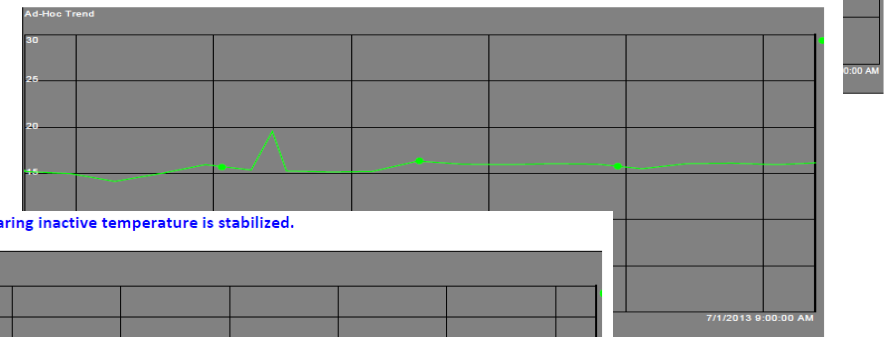
Created by: Jatin Dubey

Approved By: Atul Kansal

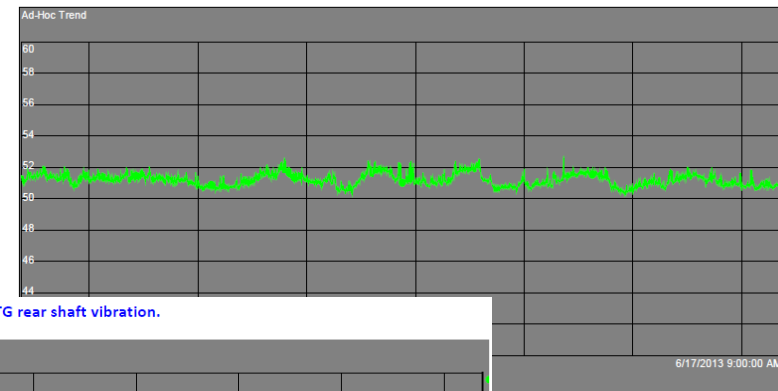
**Chart 8:** TG front shaft vibration is in specified range.



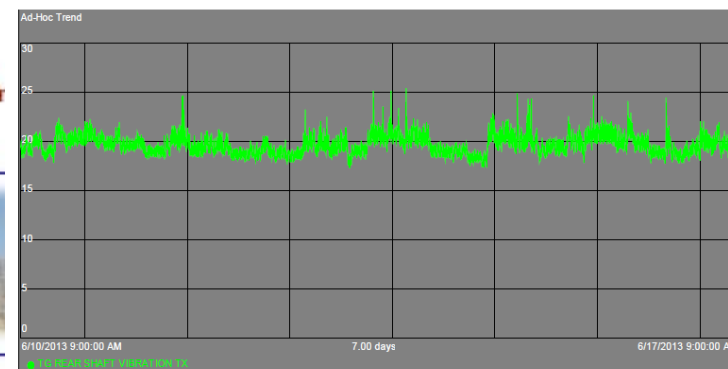
**Chart 9:** TG rear shaft vibration is smooth.



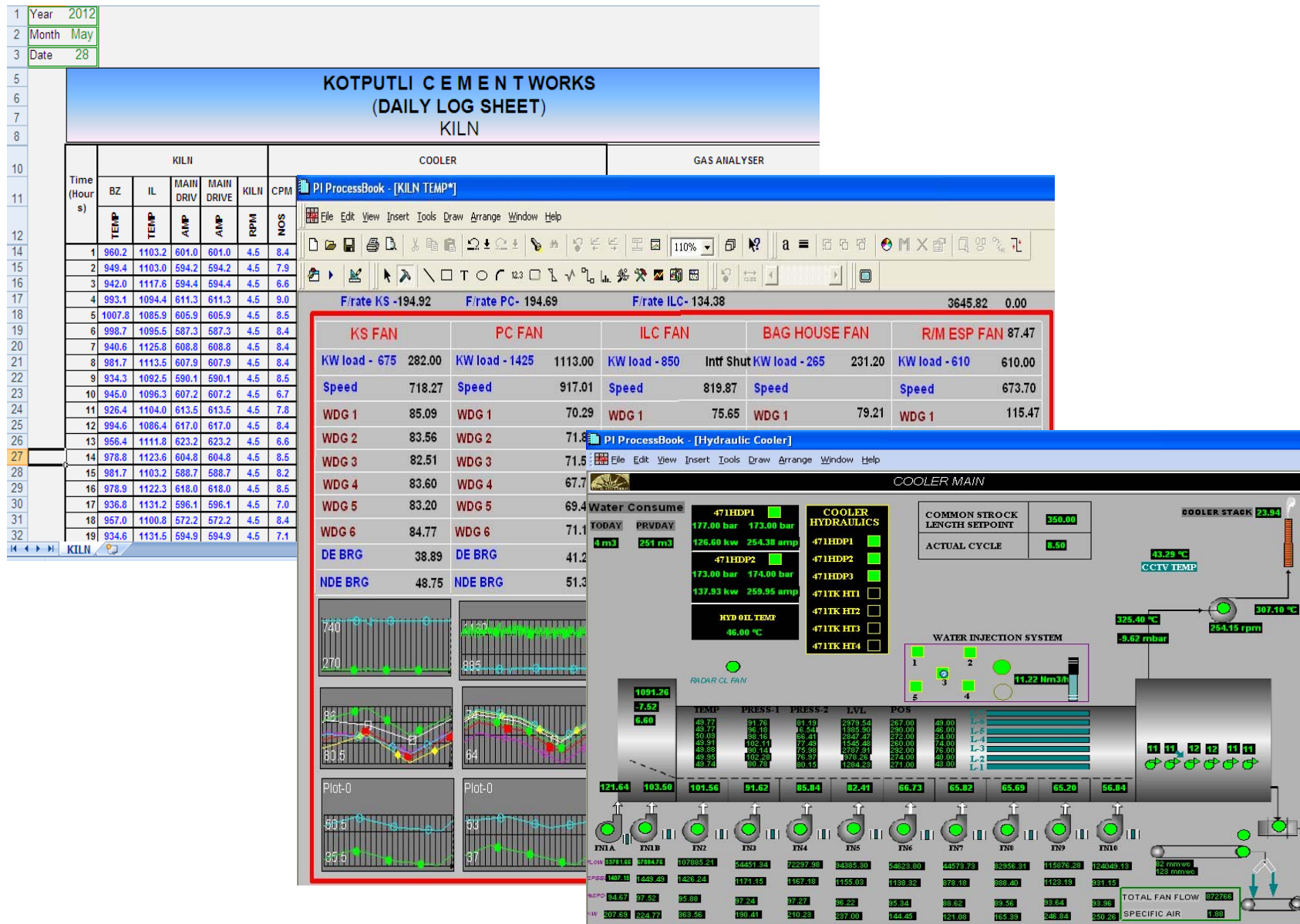
**Chart 12:** TG thrust bearing inactive temperature is stabilized.



**Chart 9:** Variation is observed in TG rear shaft vibration.



# Cement Plant MIS...Trend monitoring...process optimization

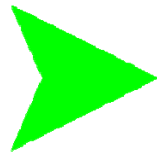


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# BENEFITS

Data availability across the units and at head office.

Real time data access , monitoring and corrective actions in time.

Quick decision making .

Automatically generated notifications on mail & mobile(SMS) to all maintenance People .

Internal MIS report automation and ease of availability

Use of online data to speed up the information flow of the organization and facilitate quick decision-making.

PI System has led to take better decisions and ongoing improvements in terms of Kaizens.

# Benefits of advanced technology System in Cement / Power

PI System is used as a framework or an infrastructure in cement. The most difficult part of data collection in a cement environment is to get all the sources of data connected and collecting data.

The quality information is also key information to the overall evaluation and usage. Batch framing of the cement type and raw mix can help make consistent product and is also instrumental in achieving overall value of the data.

Certain products can be used as framework for developing high value applications to solve key pain points.



# Benefits of advanced technology System in Cement / Power

## ☐ Cost Containment

- Event framing of cement type runs
- Totalization of raw material and variable costs across type runs
- Use of PSA to connect total costs by type up to ERP Systems

## ☐ Product Quality

- Interface to lab systems to collect lab data from sample points
- Use of PI AF to attach product specification tables to event framed types and kiln data
- Use of PI Profile to view kiln temperature profile data and particle size at the finish control





# Benefits of advanced technology System in Cement / Power

## ❑ Increased Asset Reliability

- Use of PI AF to build an asset model
- Use of totalizers to accumulate run times on pieces of equipment
- Use of PI ACE to build repeatable calculations for equipment anomalies
- Use of PI Notifications to send alerts to email or maintenance management systems

## ❑ Energy Management

- Use of PI ACE to build energy calculations
- Use of PI SharePoint to build a plant wide visualization



# Benefits of using OSIssoft PI System in cement

- ❑ Sustainability and Compliance
  - Use of PI ACE to build repeatable calculations
  - Use of PI DataLink and DLES for building environmental reports for EPA and CSI
  - Use of PI Audit Trail to satisfy compliance
- ❑ Knowledge Retention
  - Use of PI ProcessBook for building system diagrams



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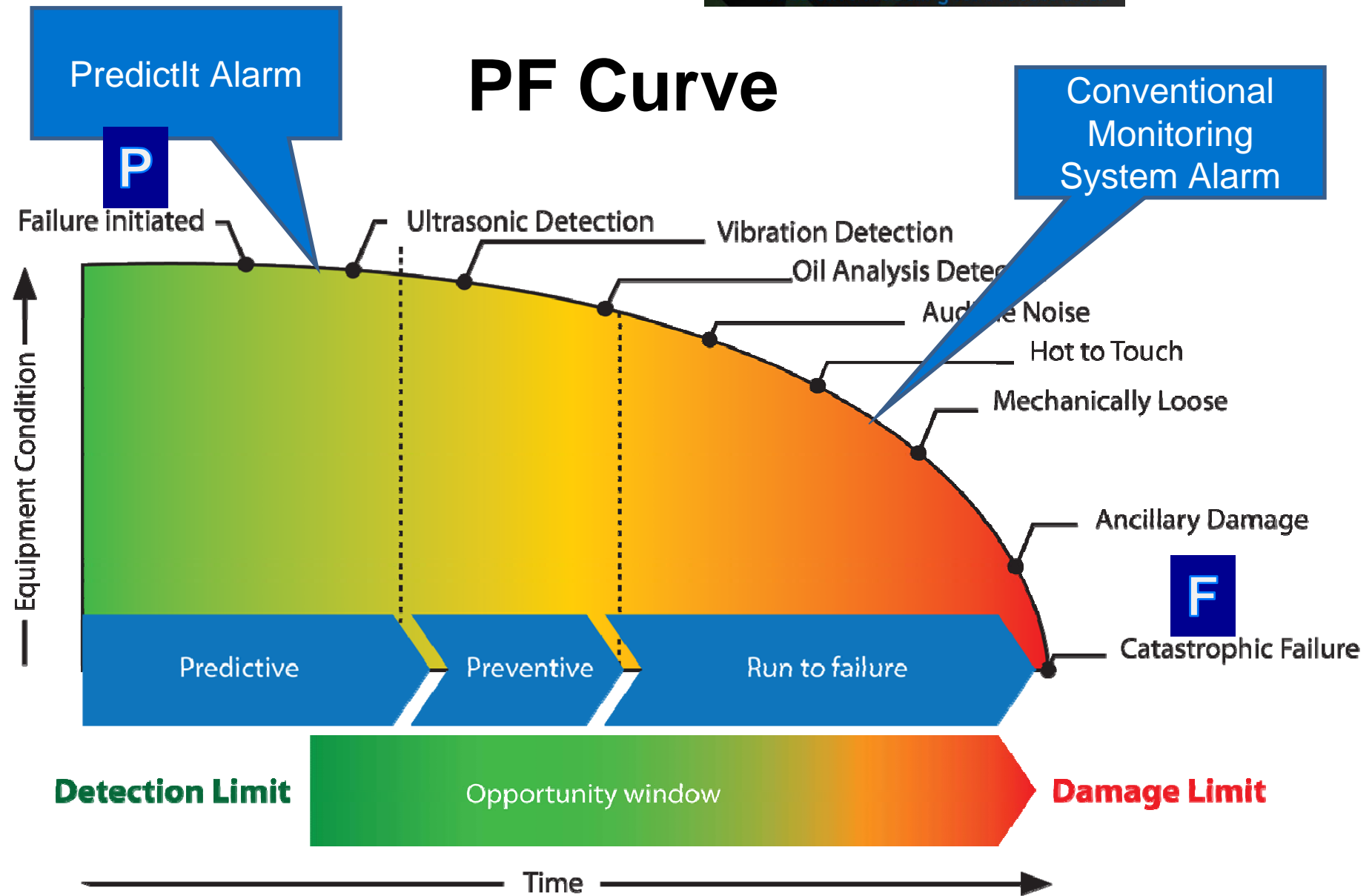
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# Way Forward...

- ✓ Link all PI Servers with Integrated SAP under installation.
- ✓ Extensive use of PI Process Book/PI DataLink for “Process optimization.”
- ✓ PI SQC in the On-Line Mode.
- ✓ **Data trending and implementation of prediction model**
- ✓ Strengthen Maintenance System in conjunction with PI.
- ✓ Understanding and Implementation of latest OSIsoft products.
- ✓ Ways to launch PI Coresight for ad hoc analysis.
- ✓ Connecting PI Server to Smart phones for display of trends/status.



# PF Curve





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YOU

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