



Generation Division Smart Power Plant System: A Centralized Plant Information System

Presented by Tayeb Taher Al Khaja
Vice President



هيئة كهرباء ومياه دبي
Dubai Electricity & Water Authority

Generation Division

Smart Power Plant System

(A Centralized Plant Information System)

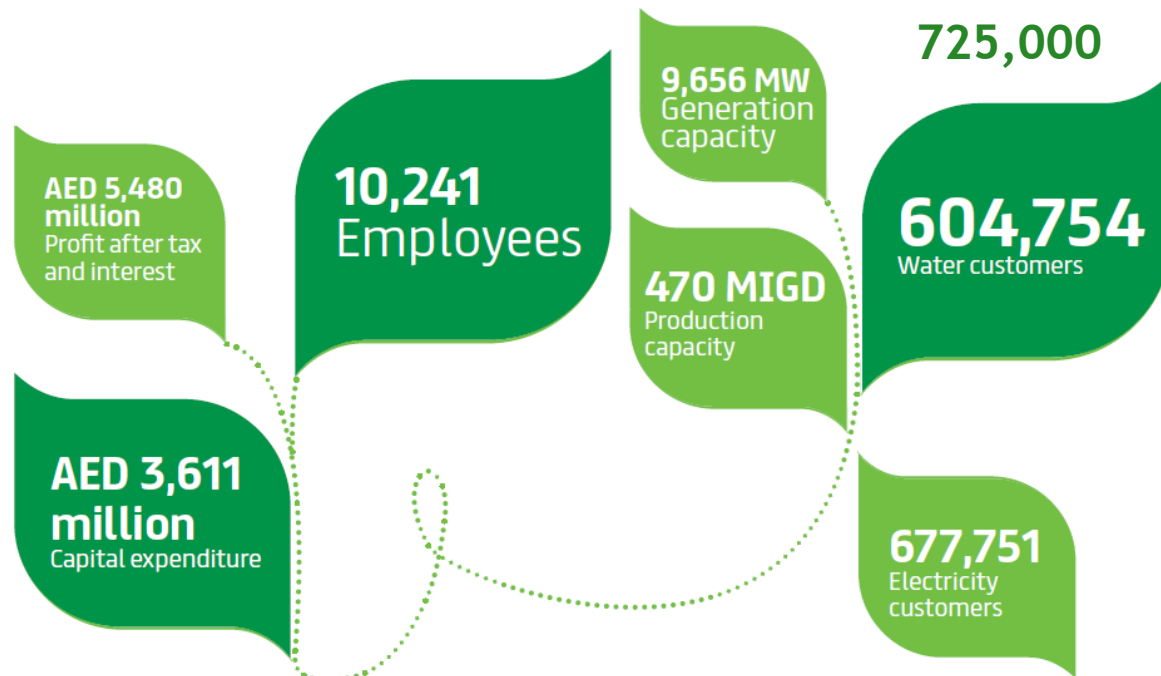


هيئة كهرباء ومياه دبي
Dubai Electricity & Water Authority

Tayeb Taher Al Khaja
Vice President - Plant-2 (DEWA)

ABOUT DEWA

- Established in **1959** as Dubai Electricity Company - DEC and Dubai Water Department - DWD in **1961**
- Merged into one company as Dubai Electricity & Water Authority in **1992**
- Leading contributor to Dubai's economic, social and environmental development



KEY FACTS ABOUT OUR ORGANISATION IN 2014





“In the race for excellence, there is no finish line...”

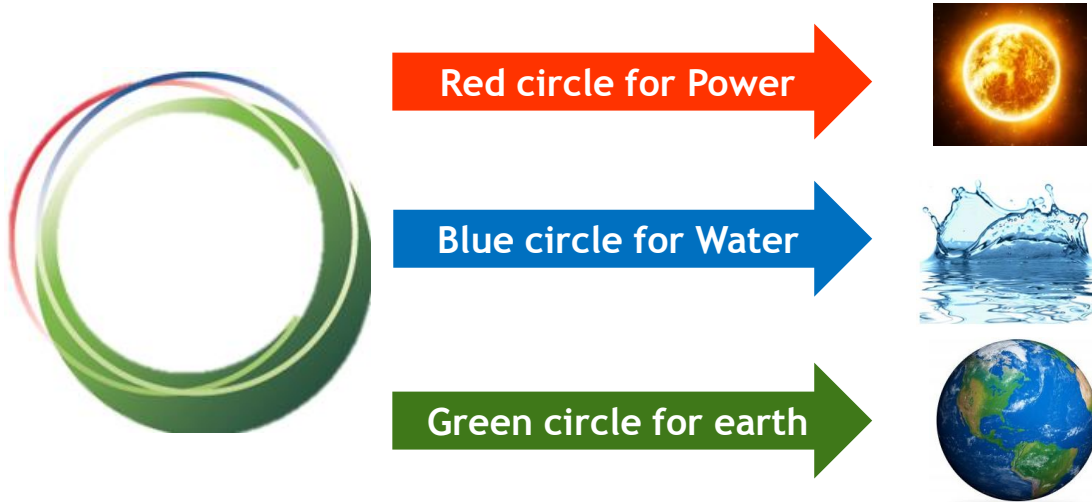
HH Sheikh Mohammed bin Rashid Al Maktoum
Vice President and Prime Minister of the UAE and Ruler of Dubai

Our Vision:
A Sustainable Innovative World-Class Utility

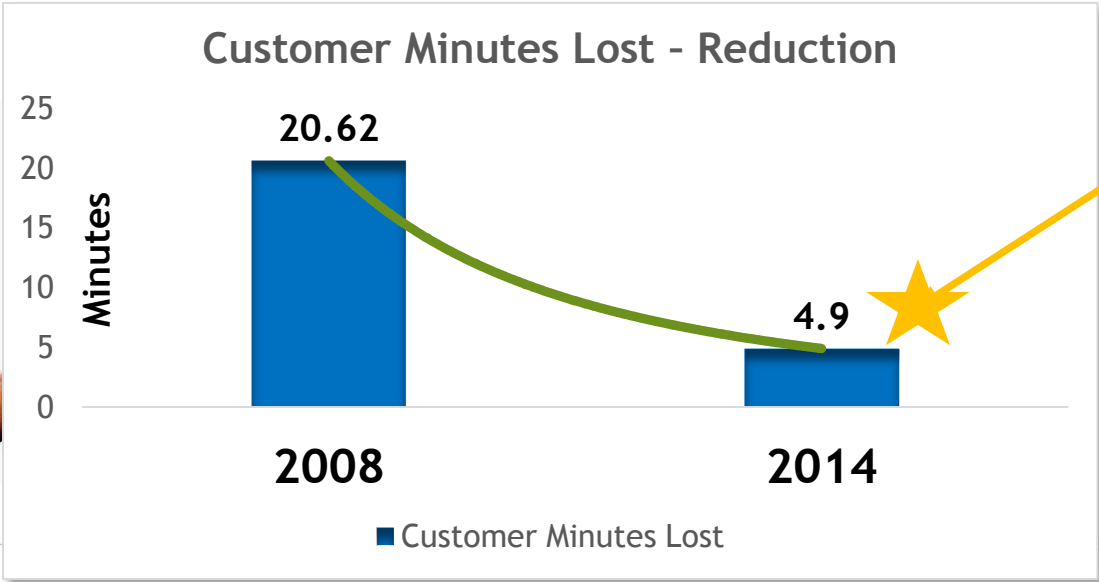
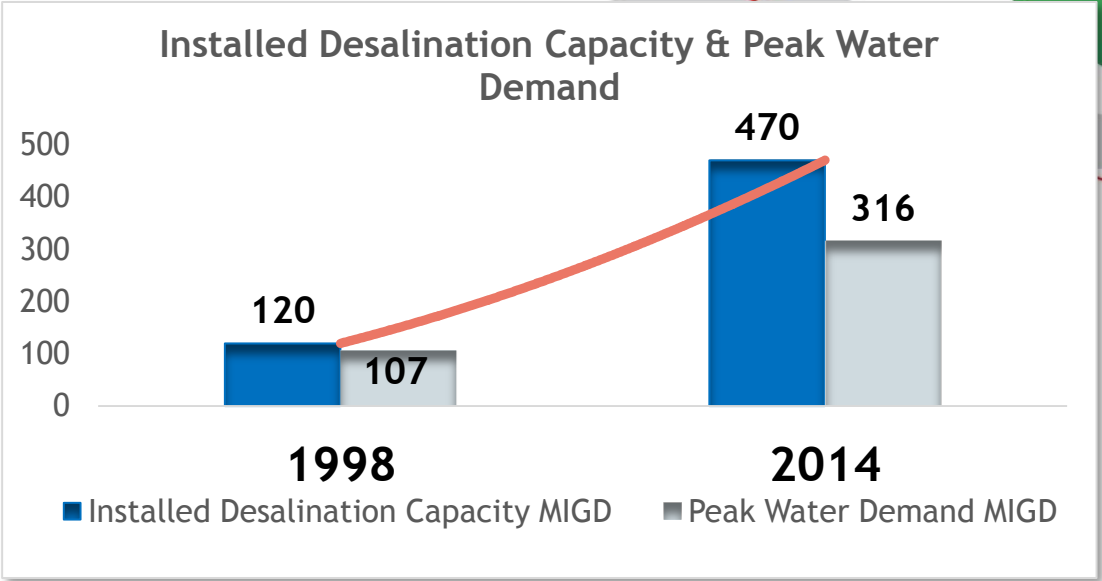
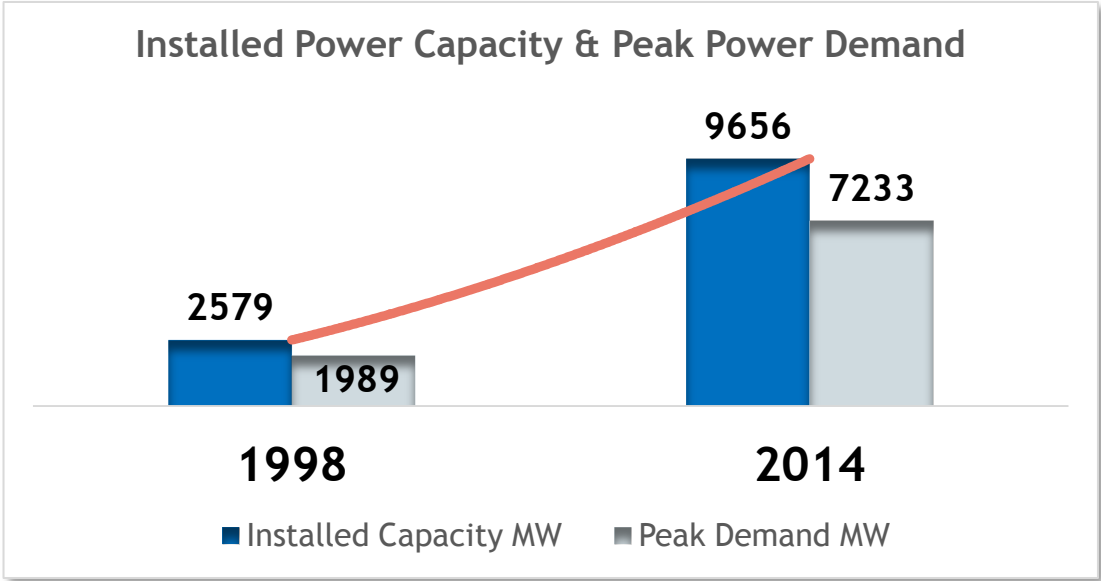
Our Motto:
For Generations to Come

DEWA Roadmap towards Success and Excellence

Pondering DEWA Branding = Energy of Life



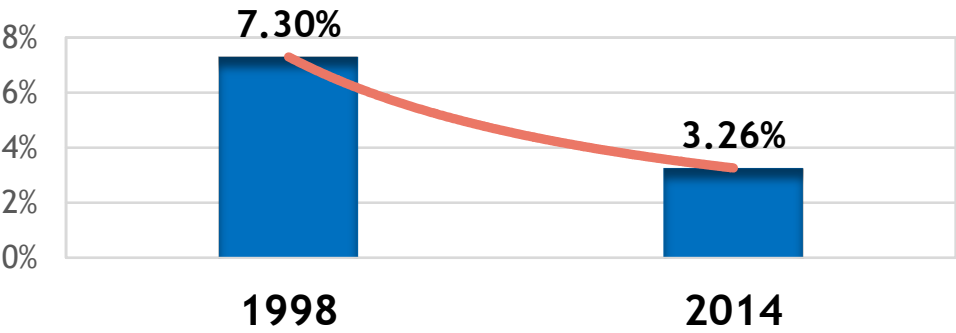
Achievements



4.9 Minutes compared to the global standard of 16.4 minutes

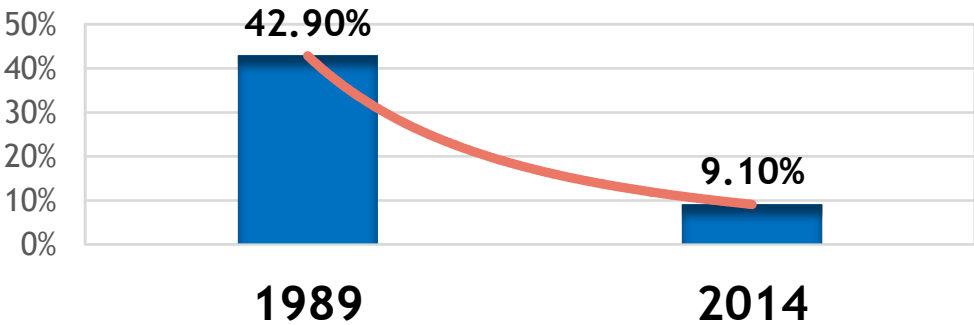
Achievements

Electricity Network Line Loss



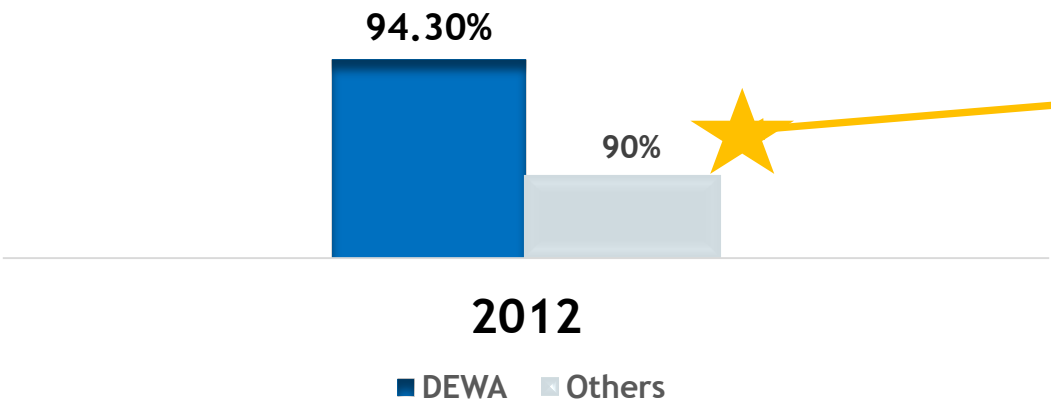
Germany	- 5.1%	Japan/Italy	- 7.0%
France	- 6.1%	Norway	- 7.5%
USA	- 6.28%	UK	- 7.7%

Water Network Line Loss



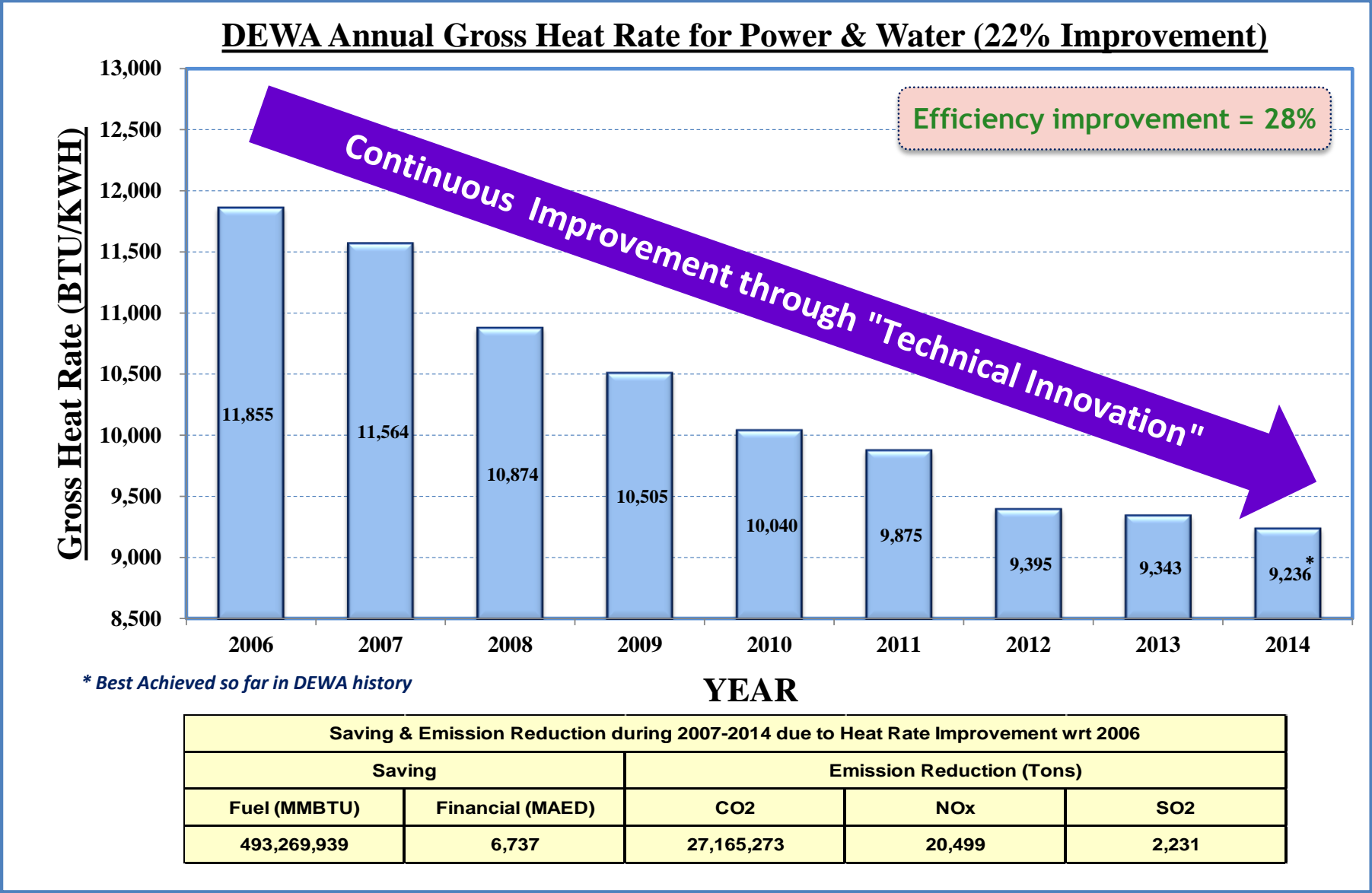
North America	- 15%
Latin America/Caribbean	- 42%
Asia	- 42%

Customer Satisfaction Index



90% is a record high on the global level, as major international companies achieved 90% only

Achievements



Awards & Certifications

BSC Sword of Honor in Health and Safety for the 7th consecutive year



BSC Globe of Honor in Environment for the 3rd consecutive year



Ranked No.1 in MENA and No.4 in World for Getting Electricity in 2014 World Bank report



eGovernment Award
Best Government e-Portal and Best Smart Phone Application awards 2013



investors in
Excellence
Since 2013



Best Program Administration Award 2013



6 different Awards 2010-2014



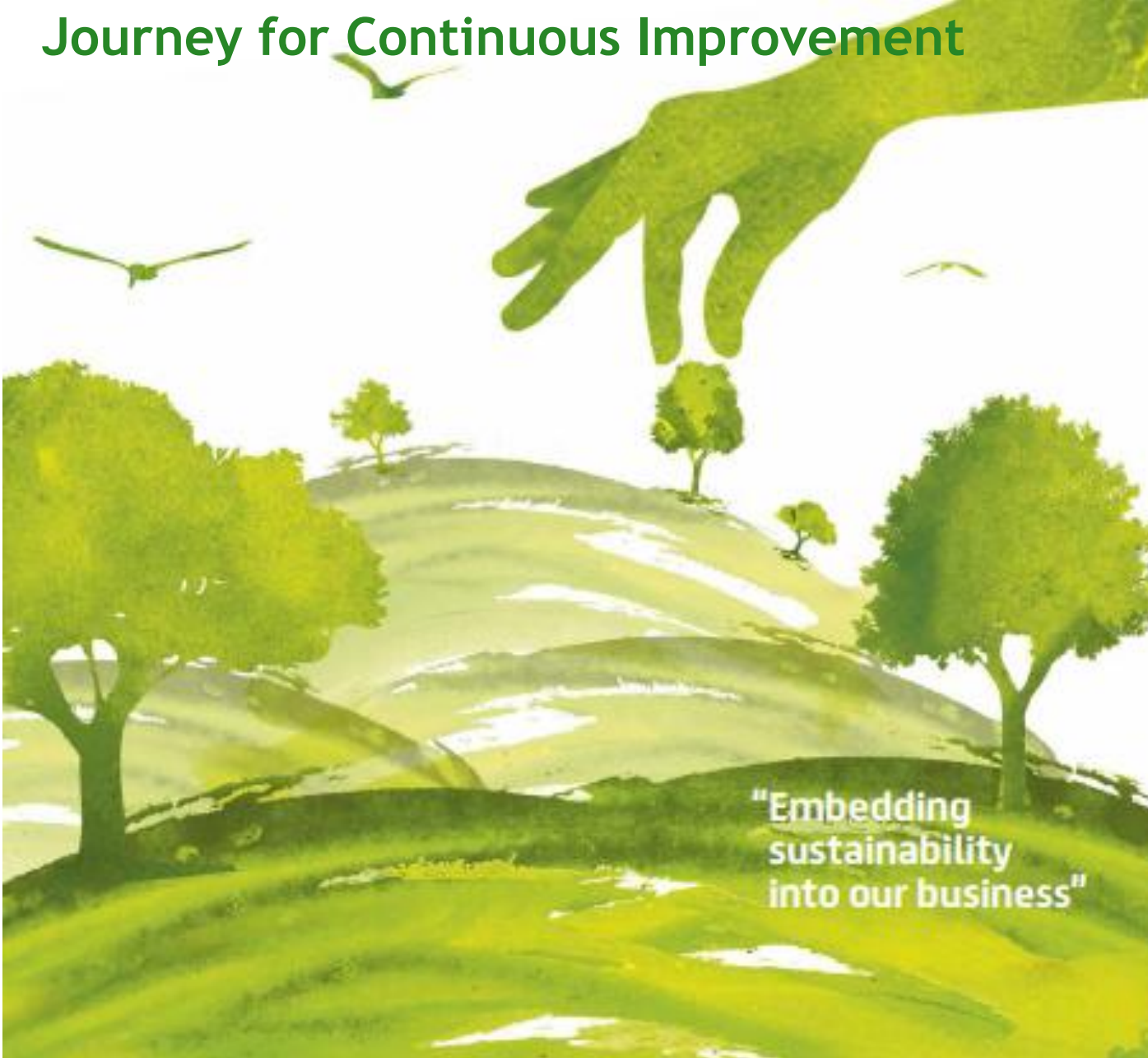
Promoting e-Government Award 2014



Best Idea Award 2013 & 2015



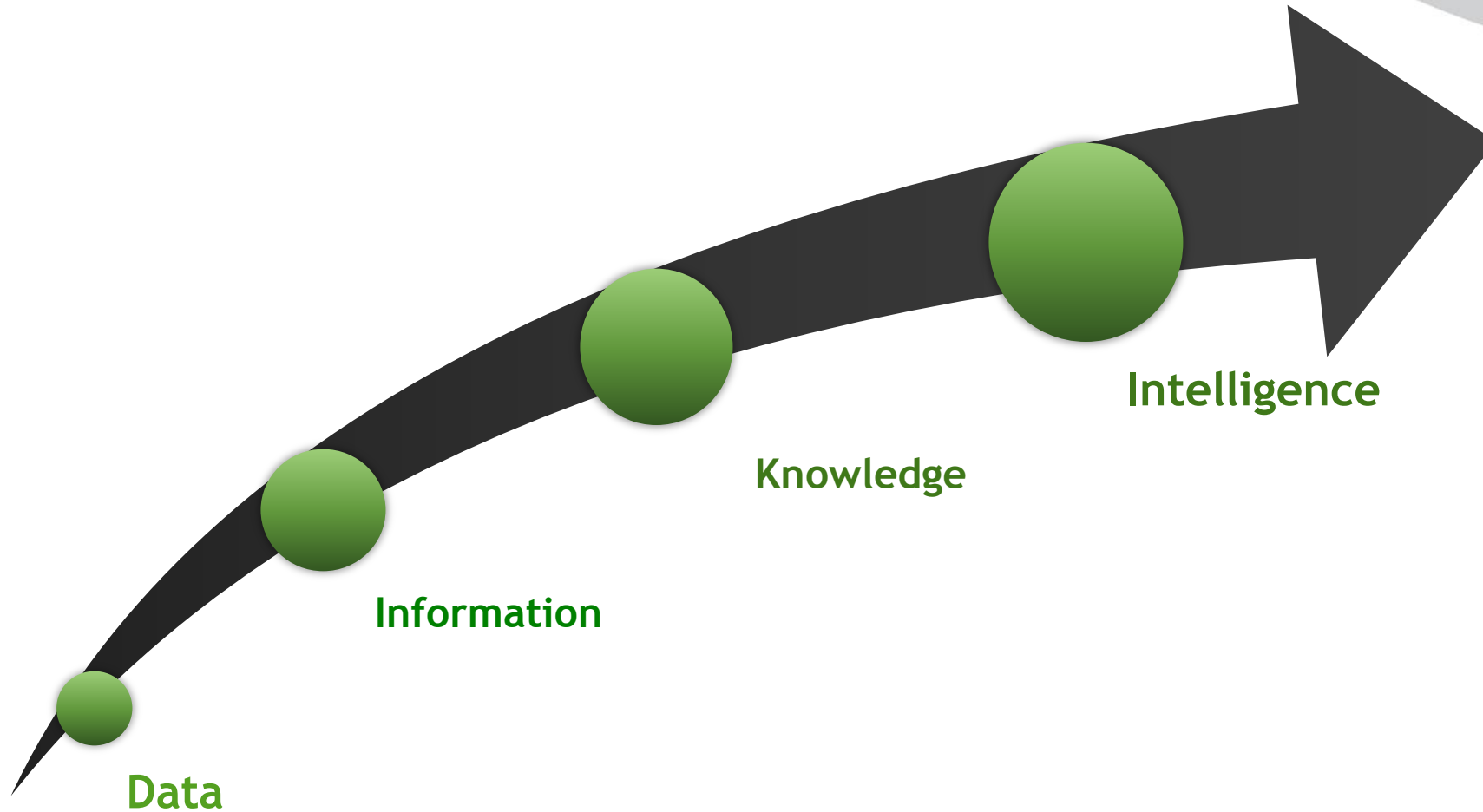
Journey for Continuous Improvement



Smart Power Plant System “SPP”

A Centralized Plant Information System

SPP VISION



Challenges

❖ 8 Fossil Power & Desalination Stations - Physically separated

❖ One Solar Park

❖ Different OEMs

❖ Different Proprietary Systems

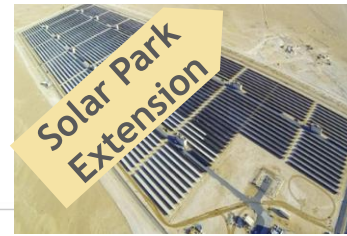
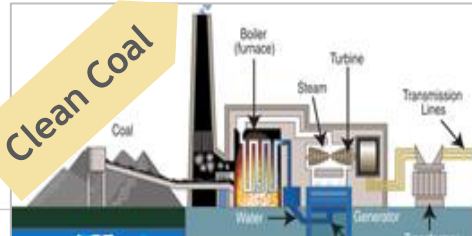
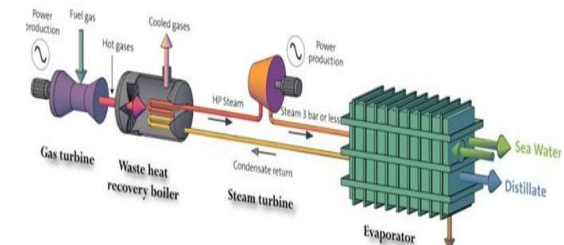
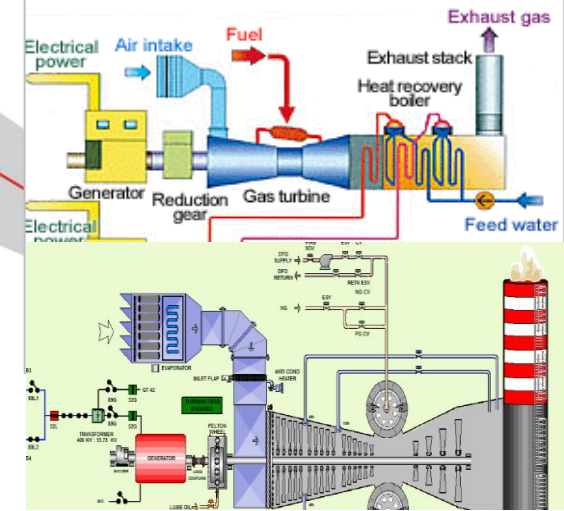
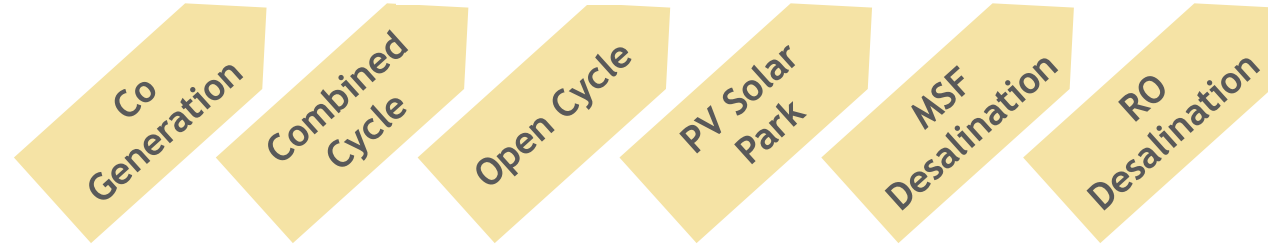
❖ Different configurations

❖ Independent Control Room for each station

❖ Real-time data available in CCRs only

❖ Reports are based on data collected by operators from HMIs and data historians

❖ New Projects



Road Map to Successful Smart Power Plant

2011

Up gradation of Old Plant Information Systems

2014

- Build the Centralized Information System by OSIsoft PI System
- Corporate Network Hookup
- OSIsoft PI System in DEWA Network

Dec 2015

- Dashboards for KPIs Monitoring
- Event & Alarm Notifications

2013

- OPC Gateway Building
- One Way Data Diode Development
- Safe Data Export to PI System

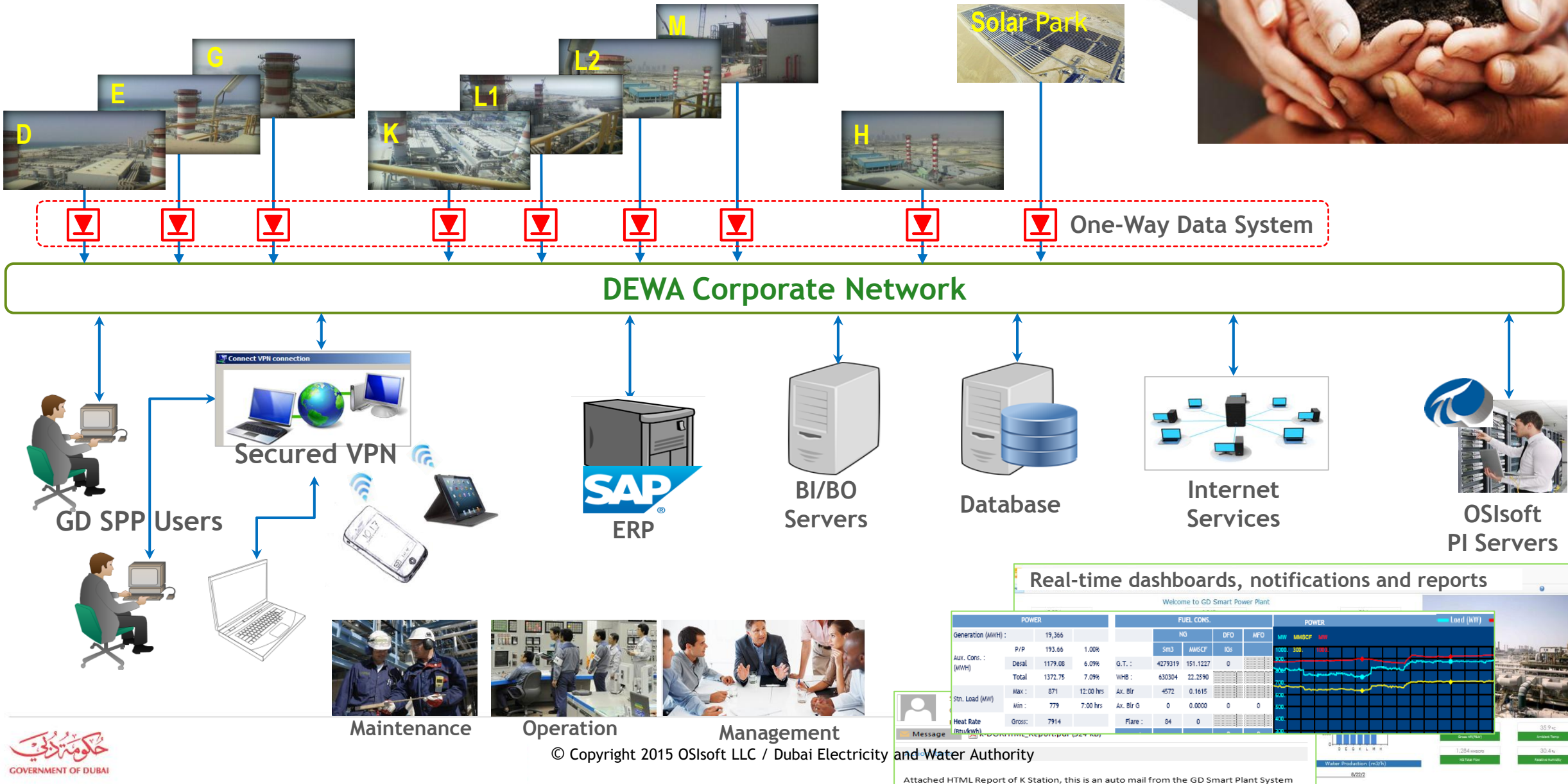
Jun'2015

- Embedding the Smartness into OSIsoft PI System to introduce Smart Power Plant System
- Dashboard Developments

2016

- Value Realization of OSIsoft PI System
- SAP Integration
- Maintenance Benefits
- Technical & Economic Condition Monitoring

Solution



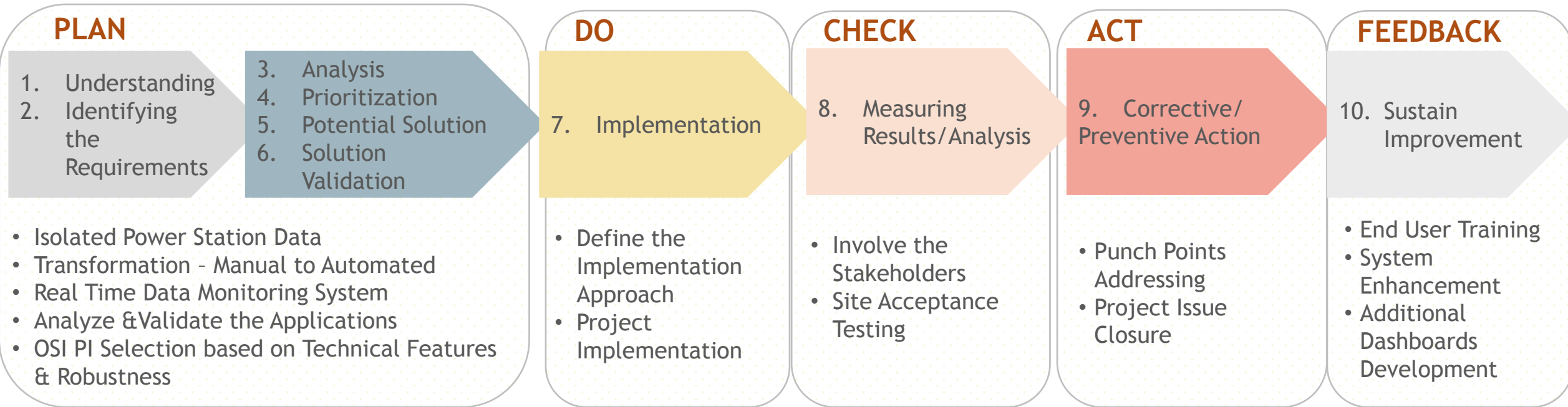
Smart Power Plant Project - Success Story

Project Objective

Establishment of the Real-time Data Center with Real-time & Historical Data from All stations Plant DCS systems at DEWA Corporate Network

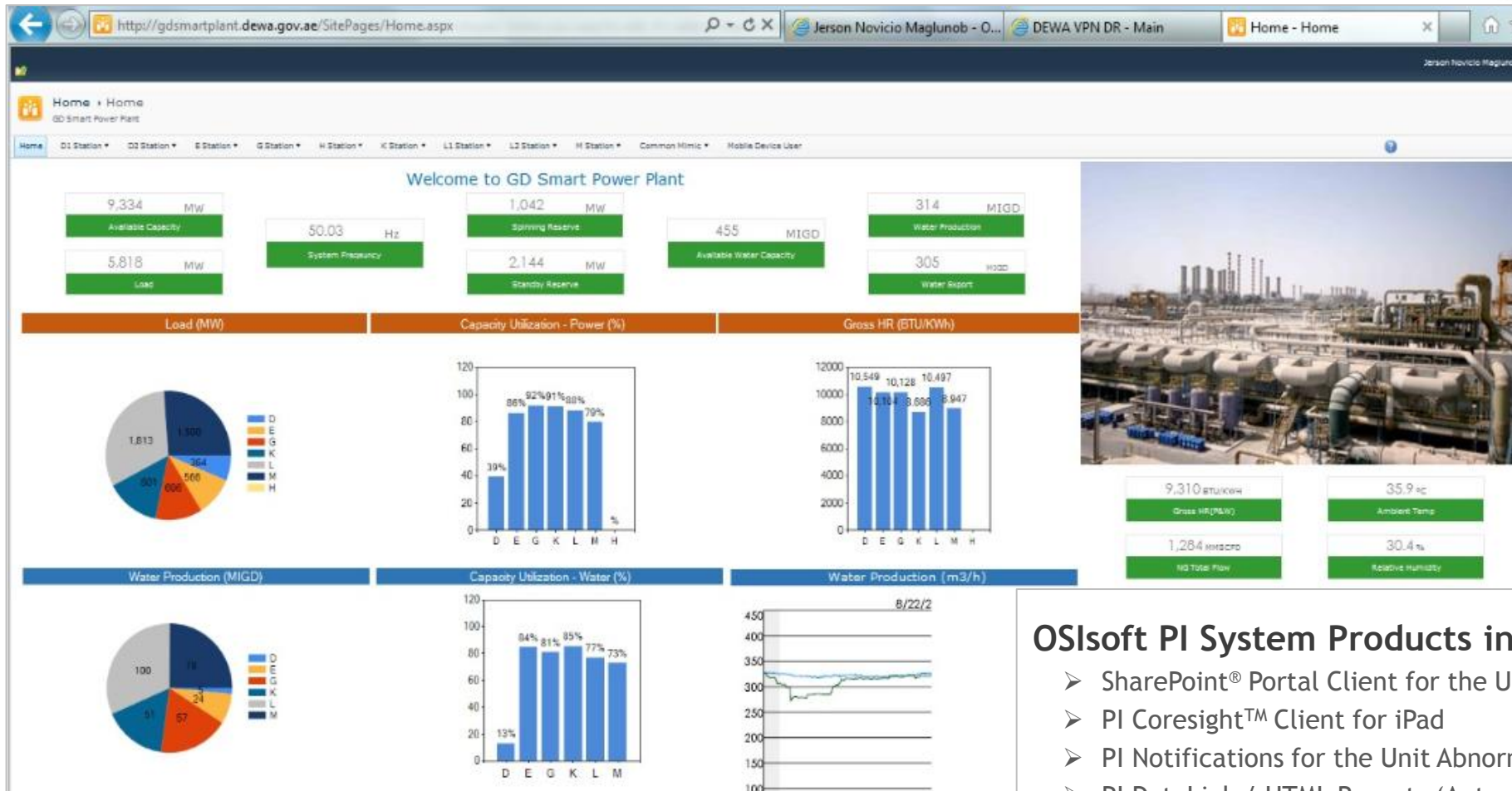
Project Approach

10 Steps Continuous Improvement Cycle approach has been adopted for the GD SPP Project Implementation



Smart Power Plant Portal

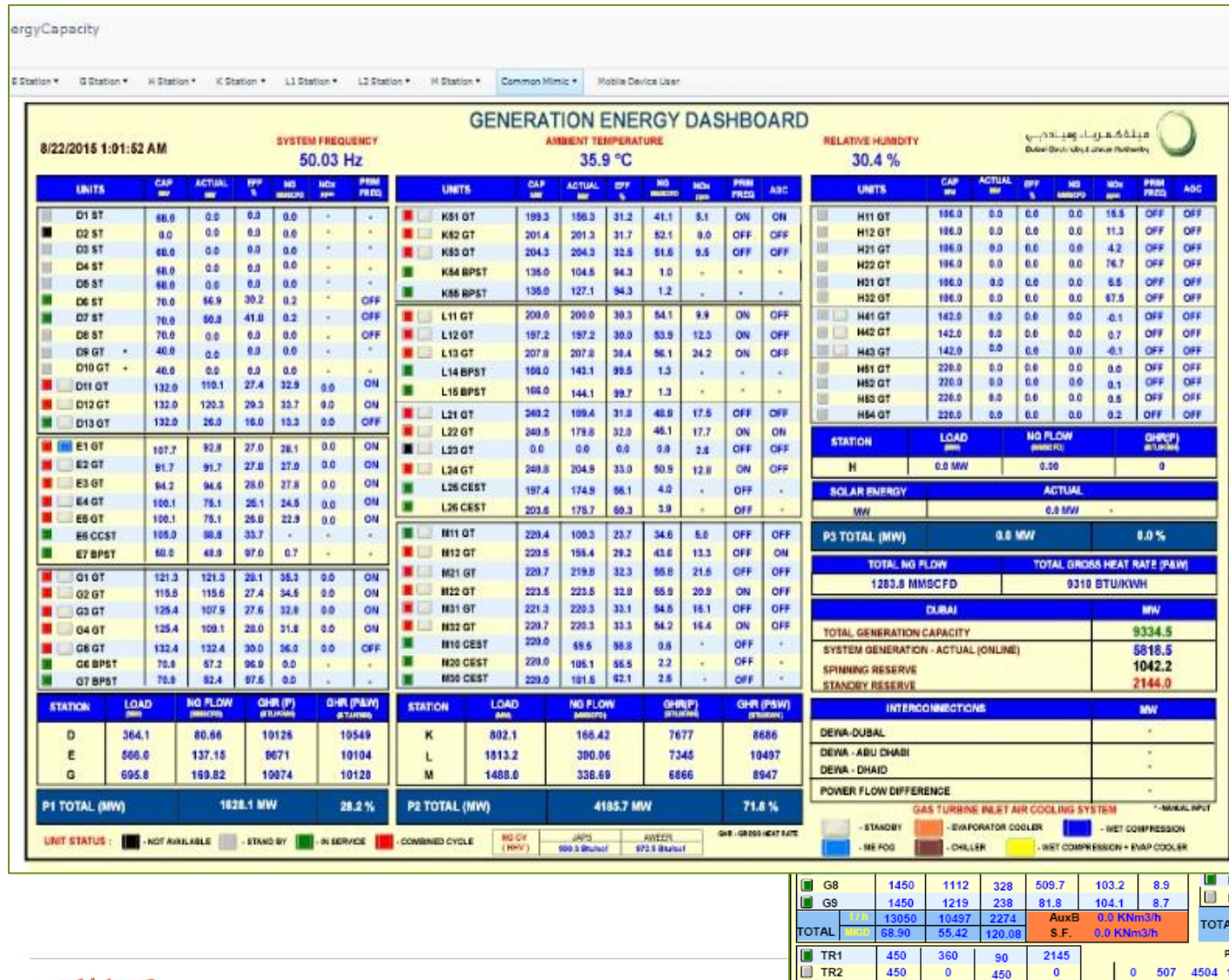
GD SPP Portal with Real Time Data from all Power Stations



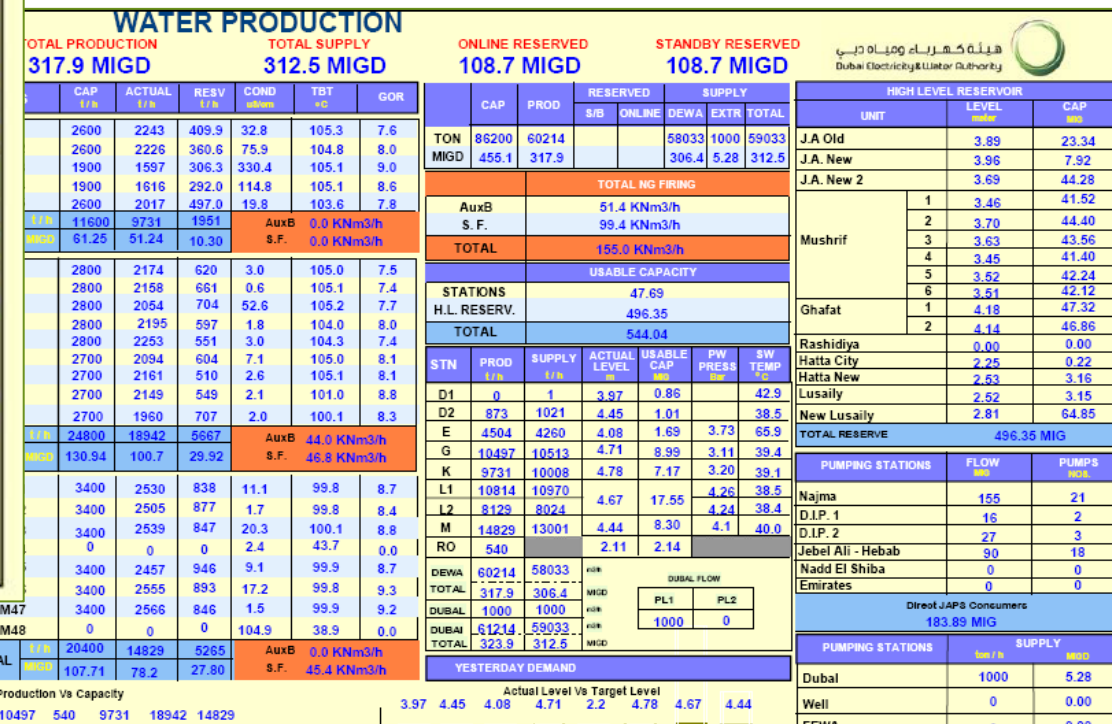
OSIsoft PI System Products in DEWA

- SharePoint® Portal Client for the Users (Desktops/Laptops)
- PI Coresight™ Client for iPad
- PI Notifications for the Unit Abnormality to the Key Users
- PI DataLink / HTML Reports (Automatic Generation & Sending) to Key Users
- PI ProcessBook/Asset Framework for Development
- Performance Equations/PI ACE for Formula Building & PI SQL for Database Archiving

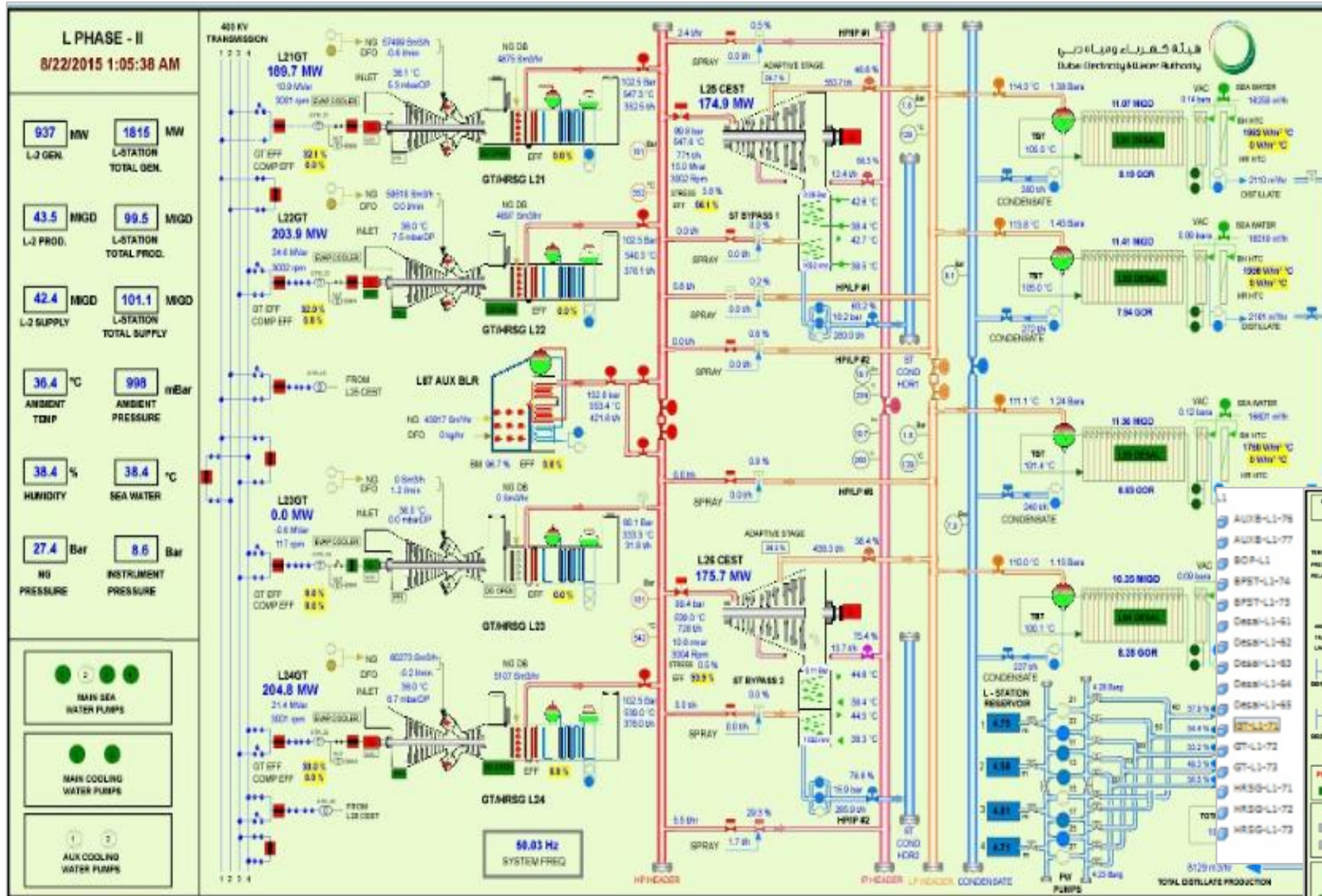
Dashboards



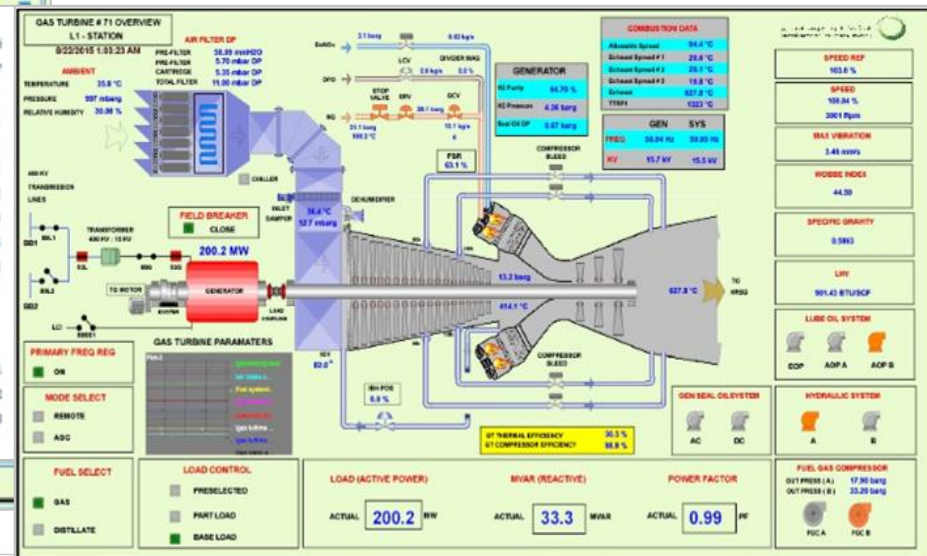
- ❖ Developed in-house
- ❖ Dynamic Statistics and KPIs Monitoring
- ❖ Best Hand Tool for the Management, Operation & Maintenance Staff
- ❖ Accessible on the go, Laptop/Desktop/Big Screen / iPad



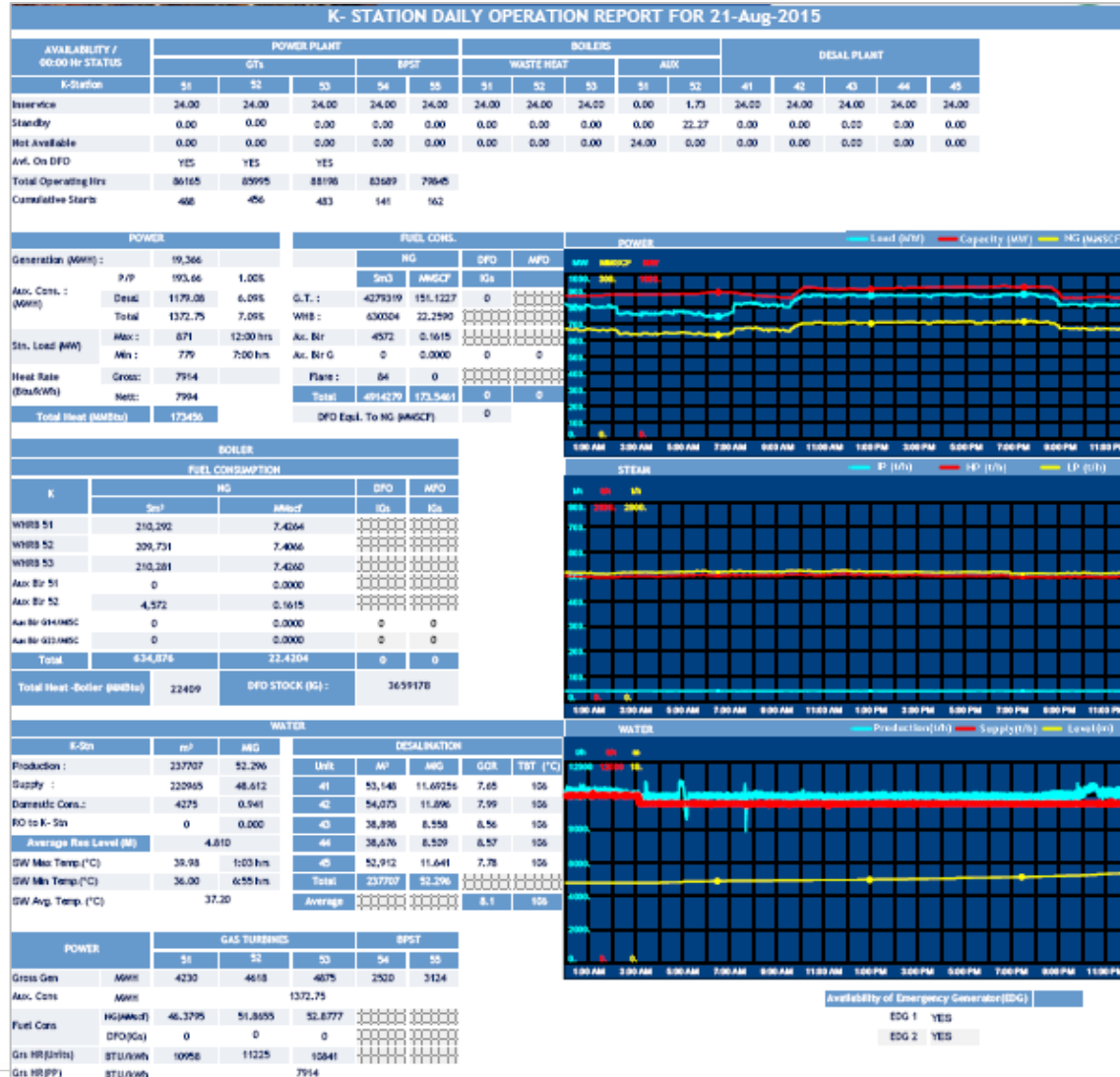
Overview Mimics



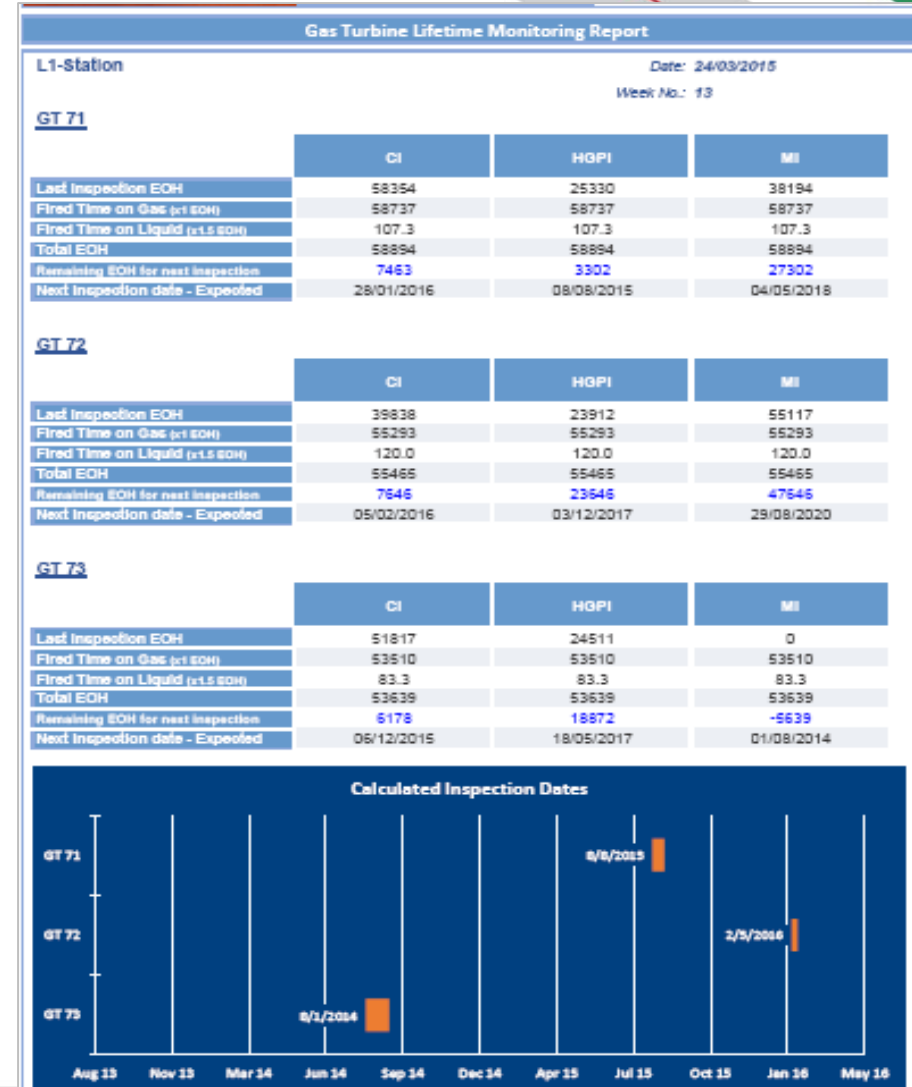
- ❖ Developed in-house
- ❖ Created our own library
- ❖ Extensive use of animated objects (like boiler flames, circuit breakers ...)
- ❖ Offers wider view of the process than DCS HMI mimics
- ❖ Online performance monitoring of main equipment



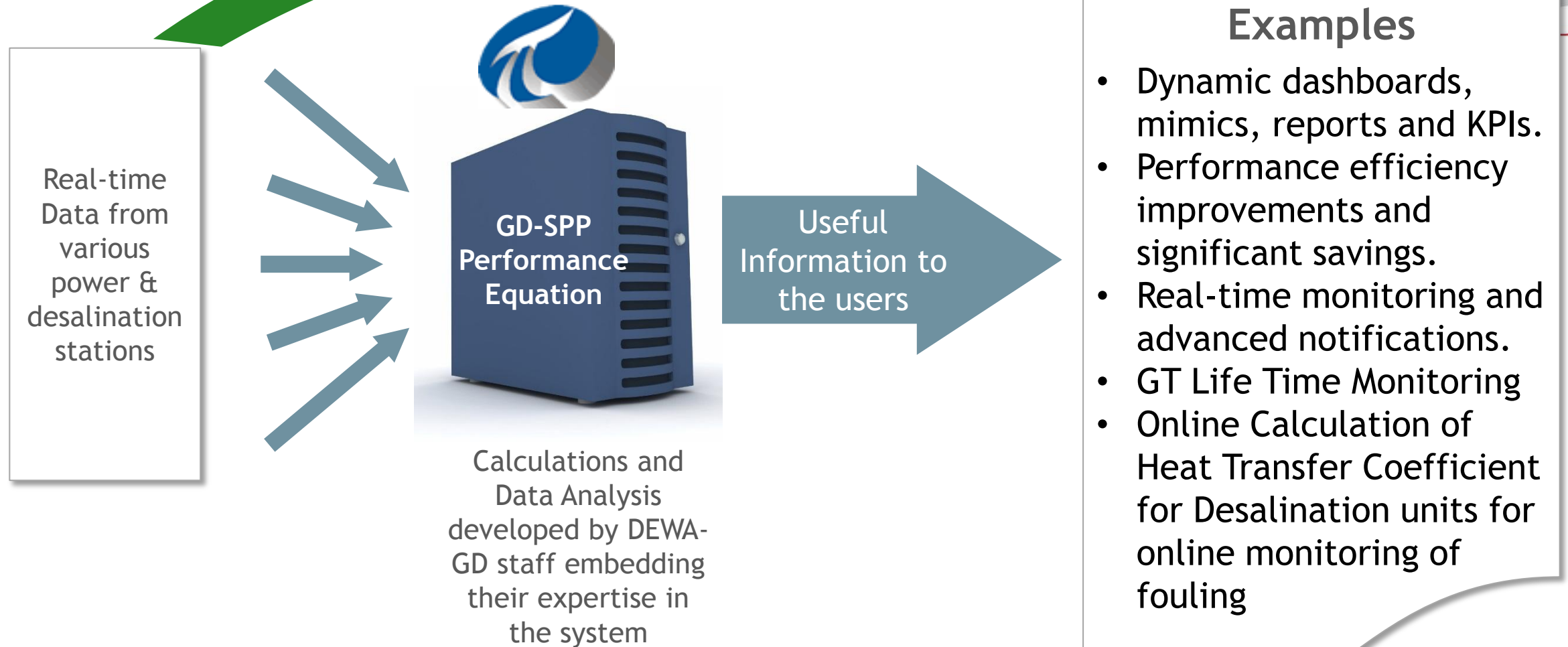
Daily Operation Report



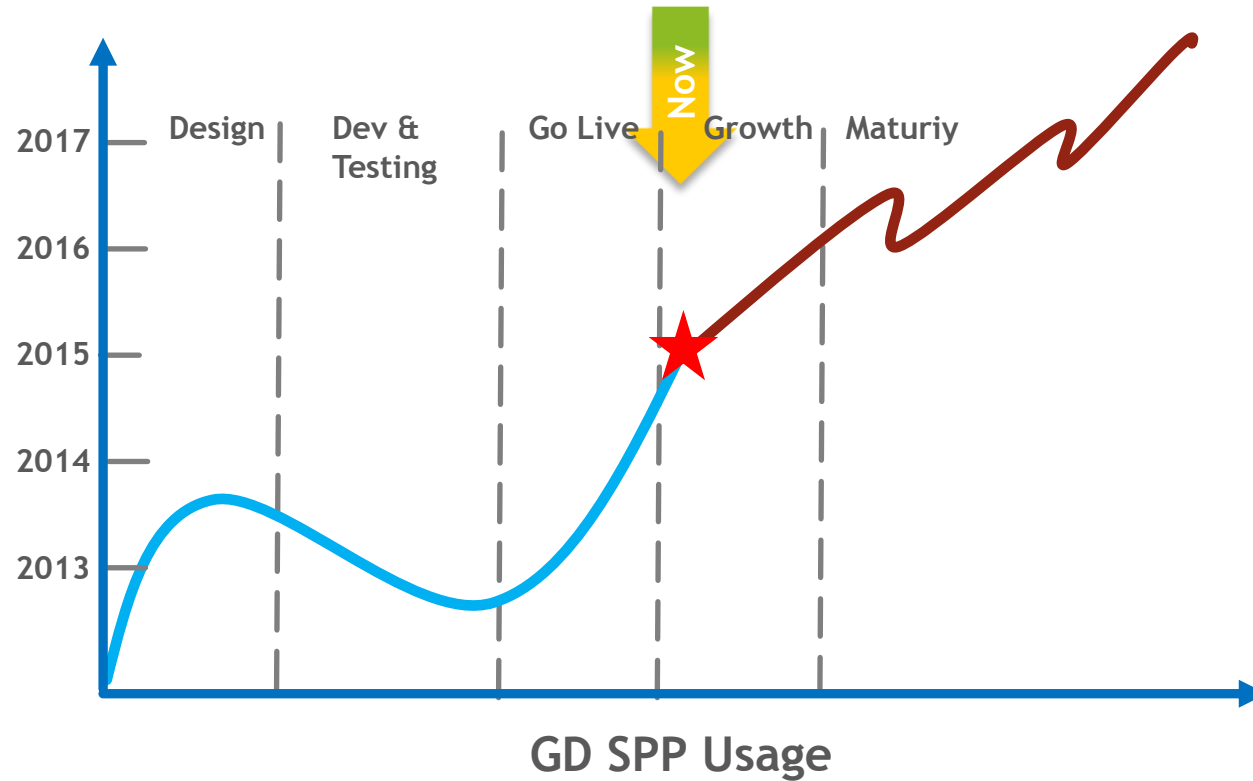
Maintenance Scheduling Report



GD-SPP Added Values



Where we stand now



Next Milestones to achieve

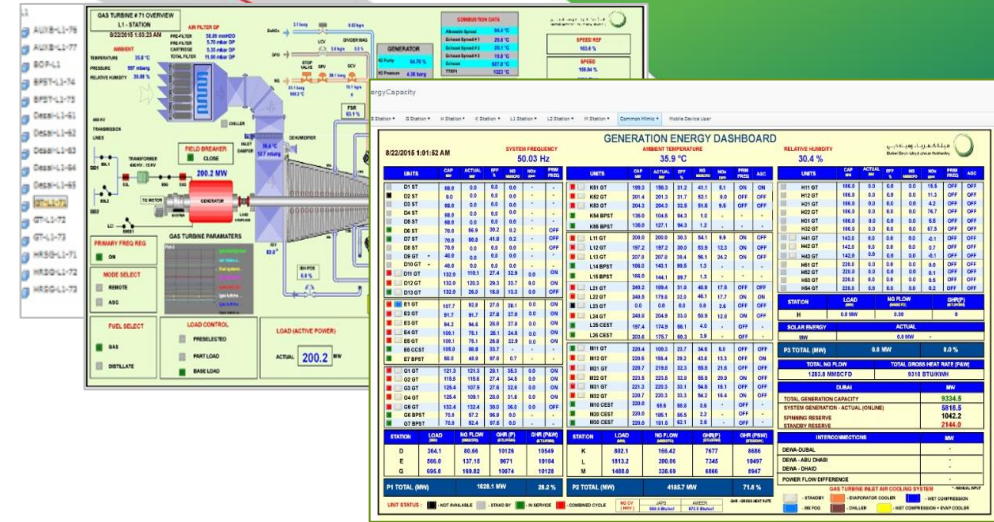
- ✓ Dashboard Development for KPIs
- ✓ Determine the Value Realization by OSIsoft PI System
- ✓ Increase the PI System Usage by 150%
- ✓ Implement the Users suggestion into the PI System
- ✓ Complete the PI Alarms and SMS Notification
- ✓ Integrate with SAP
- ✓ Utilizing for the Maintenance Scheduling
- ✓ Automating all the Manual Reports

Our Message to the audience...

"When you want to achieve something, you should be the change, however one should carry the courage till destiny arrives"

Summary

“The PI System has exceeded our users’ expectations. They were very much amazed and happy to have it because it made their life easy. Even just a few months in, we have reached a new level of intelligence through continuous improvement.”



BUSINESS CHALLENGES

- Proprietary and isolated station-wise Industrial Control System (ICS) and information systems require specialized engineers
- Power plant data was available only at the power station Control Room. Data was transferred manually between stakeholders
- Manual data collection and interpretation which was based on snapshots
- Non availability of holistic / big picture view

SOLUTION

- PI System installed on DEWA Corporate Network to collect data from 9 Power Stations
- Real-time data is being collected from each station and archived into the PI Server, users have access to data through corporate network
- The PI System analytical and visualization tools provide detailed real-time process monitoring
- Big picture dashboards, mimics, reports and KPIs developed taking advantage of data availability on one platform

RESULTS AND BENEFITS

- Management team, operation teams, maintenance teams, result engineers, planners have real-time access to the data
- Real-time monitoring and advanced notifications produced efficiency improvements and significant savings.
- Data-driven processes with enterprise wide visibility for better business intelligence
- Holistic and big picture view supported high level informed decision making

Contact Information

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Questions

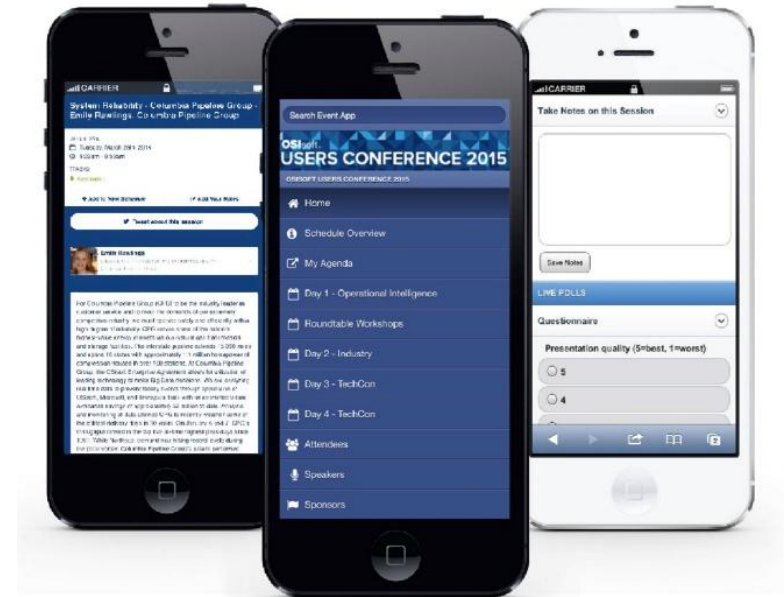
Please wait for the **microphone** before asking your questions

State your
name & company



Please don't forget to...

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감사합니다

谢谢

Danke

Merci

Gracias

Thank You

ありがとう

Спасибо

Obrigado

شُكراً

Thank you