Dahanu Thermal Power Station
Contents

- Company Profile
- Energy Management System
- Monitoring & review
- Continual Improvement
- Performance based approach
- Energy Conservation Projects
- Awards & Recognition
Company Profile

Defence
Power
Transmission
Distribution
Cement
Airport
Mumbai Metro
Roads
## DTPS: Overview

### Plant performance for last 10 years

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average PLF (%)</td>
<td>99.27</td>
</tr>
<tr>
<td>Average Availability (%)</td>
<td>~96</td>
</tr>
<tr>
<td>Gross SHR (kCal/kWh)</td>
<td>2292</td>
</tr>
<tr>
<td>Aux Consumption (%)</td>
<td>7.61</td>
</tr>
</tbody>
</table>

### Key Specifications

- **Commissioning Year**: 1995
- **Capacity**: 500 MW
- **No. of units & Size (MW)**: 2 X 250
- **Height of Chimney (Mtrs)**: 275
- **Water from reservoir (Cu Mtr./day)**: 5000
- **Fuel (Domestic + Imported) MTPA**: 2.6

As on FY15
DTPS Journey towards Excellence

1998 ISO 9001
1999 ISO 14001
1999 QIP/SIP/EMP
2000 RAMCO ERP Package implémentation

2001 ISO Up gradation
2003 SAP & ESS implementation
2004 British Safety Council Audit

2005 Benchmarking CII
2005 Six Sigma drive I
2005 Mercer HR study
2006 OHSAS 18001

2007 SA 8000
2008 Integrated Management system

2008 ISO 27001
2009 SAP in place of RAMCO
2010 BS EN 16001

2011 ISO 50001:2011 (EMS)
2014 Integration of management system
System Approach – Guiding Aspects

Integrated Management System

- Vision
- Mission & Values
- Statutory & Legal Norms

Corporate Policy Guidelines

- Review by top Management

Documentation

- Implementation

Feedback

Deviation/Correction

Control

Monitoring & Analysis

Regulatory Norms

Monitoring & Analysis

Confidential
Slide 6
Energy Management System

- Heat rate
- APC
- Fuel
- Process Parameters

- Data Collection, Compilation & Record Keeping
- MIS

Identification & Review of deviation

Scope of Improvement

data

Déviation

TIME TO IMPROVE
ISO 50001:2011

- Energy Policy
- EMC
- AOP
- E-Lan system
- Data collection and MIS
- Daily Deviation report
- Daily Plant meeting
- Evaluate and analyze
- Rectification & Improvement plan
- Energy Audits as per CEA guidelines
- Innovative O&M approach
Online Energy Monitoring System

FGD
Process parameter

PCR-1
Process parameter
4-20 mA
24+16 channel

PCR-2
Process parameter
4-20 mA
24+16 channel

Compressor Room
Process parameter

FS485
24+16 channel

Continual Improvement
Total 250 meters installed
Monitoring Facilities At DTPS

100% digitalization

Energy Consumption from E LAN

Process Parameters Reports from DCS

Energy Consumption from E LAN

Process Parameters Reports from DCS

Digital Logbooks

SAP

Control

Auto Email for MIS

Daily Energy Deviation report for review
### Daily Energy Deviation Report

#### Maintenance Control:
This control includes:
- ✔️ Detail Analysis Of Problems
- ✔️ Solution In Terms Of New Alternative Technology
- ✔️ Repair or Replacement.

<table>
<thead>
<tr>
<th>HT Auxiliaries</th>
<th>Average as on Date (2011-12)</th>
<th>Base Value</th>
<th>Operating Value</th>
<th>Operation Control</th>
<th>Maintenance Control</th>
<th>Run Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT</td>
<td>Kw</td>
<td>kw</td>
<td>kw</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Average Power Consumption Rate As On Date**

- Base Value:
  - It is decided based on the average value of 1 year data.

- Operating Value:
  - It includes the effect of coal quality variation, condenser vacuum, and other seasonal effects. Operators have to run equipment in this standardized operating range.

- Operational Control:
  - It includes:
    - Un-optimized condition
    - Operation deviation
    - Valve/damper passing
    - Preventive maintenance due
    - Set points at various parameters

- Maintenance Control:
  - This control includes:
    - Detail analysis of problems
    - Solution in terms of new alternative technology
    - Repair or replacement.
All Buildings Of Plant Are Covered Under Monitoring

10 % reduction in Energy consumption achieved during last year
Performance Review System

- **Daily Departmental Meeting**
  - Departmental Meeting With All Team Members

- **Daily Plant Meeting**
  - Plant Performance, Energy deviation review with all Sectional Heads

- **Monthly Operation Review Team Meeting**
  - Monthly Review Of Overall Plant Performance & Energy deviation
Control system

Notification raised in SAP

Discussed in Daily plant meeting

Categorized Aux power / Heat rate

Running Defect

Planning done to attend

Opportunities for continual improvement

New Requirement / Modification

Equipment Shutdown

Short Shutdown

Major Overhaul
Continual Improvement

Performance Test
a) Monthly Efficiency Test
b) Air Ingress test
c) Insulation survey
d) Pre & Post outage survey

Energy Audits
a) Periodic External Audits
b) Internal Audits as per CEA guidelines

O&M Strategy
a) Performance Based maintenance
b) Process Optimization
O&M process at DTPS

Communication
100% Digitalization

Team Work
Environment

Standardisation
Systems

New Technology Innovations
O/M Approach

INNOVATION

Modular Maintenance concept

“PROMT” Priority on Managing Performance Trends maintenance

Approach

Process Optimisation

TECHNOLOGY

Energy Monitoring System
Modular Maintenance Concept

- A maintenance procedure that allows the replacement of major assemblies in a minimum amount of time and expenditure is called “module” (e.g. HP turbine module, CW debris filter, Primary & Secondary fans rotor, Boiler feed pump cartridge, vacuum pump, CW pump)
PROMT Maintenance Concept

- "PROMT"- Priority On Managing Performance Trends maintenance (e.g. wise Flue gas duct leakages, HP heaters performance)

Flue Gas duct leakages  HP Heaters parting plate leakages
Process optimization is the discipline of adjusting a process so as

- to optimize specified set of parameters
- without violating system constraint.

Process optimization is a continuous process it’s a “Journey not Destination”

“*The savings are recurring*”

- *Investment - NIL*
Approach for optimization

From EM MIS

Data Collection
Validation & conversion in reportable format
GAP Analysis
Probable solutions
Pilot testing
Monitor

Brainstorming
D-logbooks
Event analysis
MIS reports
Technical Validation

OEM data
Benchmarking
Other plant visit
Other site inputs

Once the optimisation process reached the desired results solutions are finalized through IMS Systems and controls are placed
Process Optimization

Rationalization

Optimization

Periodic Review of SOPs

In case of Stand by equipments Higher efficiency equipments are kept in service

0.19% Reduction in Aux power potential

1. Cooling water System
2. Soot blower operations etc

1. SOP for back down period prepared to minimize the losses.
Energy Conservation Projects
### Energy Conservation projects

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Description</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Installation OF VFD</td>
<td>5.2 Mus/annum</td>
</tr>
<tr>
<td>2</td>
<td>Refurbishment of HP turbine module</td>
<td>20 kcal/kwh</td>
</tr>
<tr>
<td>3</td>
<td>Installation of Vapor Absorption Machine</td>
<td>1.8 Mus/annum</td>
</tr>
<tr>
<td>4</td>
<td>Energy Efficient Lighting</td>
<td>0.624 Mus/annum</td>
</tr>
<tr>
<td>5</td>
<td>Optimization of Compressed air system</td>
<td>0.5 Mus /annum</td>
</tr>
<tr>
<td>6</td>
<td>Monitoring Computer Idle time</td>
<td>0.1 Mus/annum</td>
</tr>
</tbody>
</table>
# Energy Conservation projects

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<thead>
<tr>
<th>Sr. No.</th>
<th>Description</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>BFP Cartridge Replacement</td>
<td>2.6 Mus / annum</td>
</tr>
<tr>
<td>8</td>
<td>Replacement of Manganese Liner By Hi-Crome Liner In Coal Mill</td>
<td>6.72 Mus / annum</td>
</tr>
<tr>
<td>9</td>
<td>Replacement with Renewable Energy</td>
<td>0.3 Mus / annum</td>
</tr>
<tr>
<td>10</td>
<td>Rationalization of equipment running hours</td>
<td>0.1% of APC</td>
</tr>
<tr>
<td>11</td>
<td>Optimization of Cooling water pumps</td>
<td>0.1% of APC</td>
</tr>
</tbody>
</table>
Technology - Installation of VFD

Saving Achieved = 2 x 148 kwh

Total 12 Nos. Of VFD Are Installed for Different Application

Energy Saving 622 KW/Hr
# BFP Cartridge Replacement

<table>
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<tr>
<th>Boiler Feed Pump</th>
<th>Saving Achieved</th>
</tr>
</thead>
</table>
| Performance Based BFP cartridge Replacement (serviced cartridge) | BFP-1A = 461 kw  
|                                      | BFP-2A = 656 Kw                      
|                                      | BFP-1B = 347 Kw                      |
Replacement of Manganese Liner By Hi-Crome Liner

Before and after Mill Kw
Renewable Energy Projects

Saving achieved 3.6 kwh per ventilator

Solar street lighting

1056 Watts (Total 48 nos)

Solar Water Heater

2 HP Solar Water Pump
Awards & Recognitions

- National Meritorious Award by Ministry Of Power
- Rajiv Gandhi Award for Clean Technology
- Vasundhara Award by Maharashtra Pollution Control Board
- Ramkrishna Bajaj National Quality Award
Save Energy

DTPS “Journey Towards sustainable excellence”