# NTPC Limited

*(A Government of India Enterprise)*

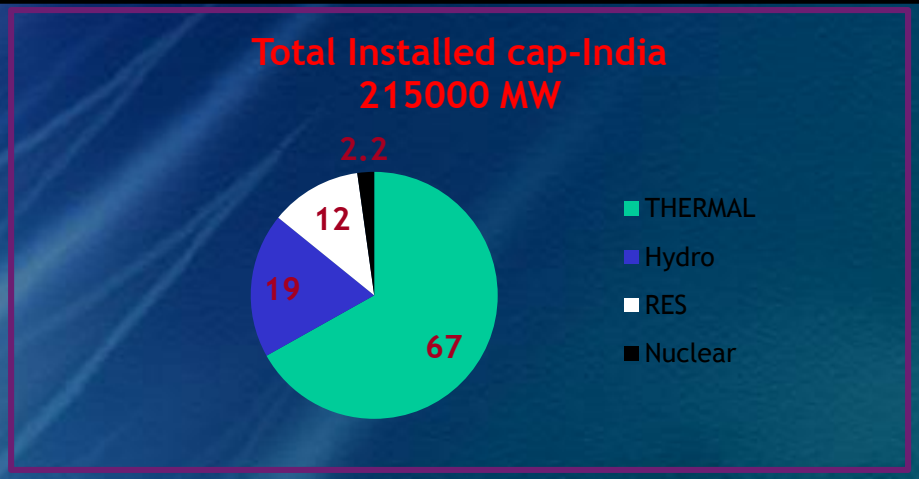
**"A Maharatna Company"**

**ANIL KUMAR-AGM**

एनटीपीसी NTPC

*Transforming lives*

# INSTALLED CAPACITY




| | No of plants | Capacity MW |
|---|---|---|
| NTPC Owned | | |
| Coal | 16 | 31855 |
| Gas/Liquid fuel | 7 | 3955 |
| Renewable | 2 | 10 |
| Total | 23 | 35820 |
| Owned by JVs | | |
| Coal & Gas | 7 | 5364 |
| Total | 30 | 41184 |

# Size and Rankings

## OWNERSHIP

- GOVERNMENT OWNS 84.5% (Recently reduced to 75%)
- FOREIGN INSTITUTIONAL INVESTORS (FIIs) OWN 2.55 % AND 12.95 % OWNED BY DOMESTIC INSTITUTIONS & PUBLIC

## SOUND FINANCIALS

Total revenue > 64000 crores

Net Profit >12000 crores

Ranked 5th amongst the listed company in terms of PAT 2011-12

## STATURE

- INDIA'S LARGEST POWER GENERATING COMPANY WITH 25% SHARE
- 337th LARGEST COMPANY IN THE WORLD (FORBES RANKING – 2012
- RANKED 1st IN THE WORLD IN CAPACITY UTILISATION
- RANKED 10th LARGEST ELECTRICITY PRODUCER IN THE WORLD

एनटीपीसी NTPC

# Energy Conservation in NTPC

एनटीपीसी NTPC

# MAJOR TECHNOLOGICAL INITIATIVES

## BY

## NTPC

# Technology Initiatives

- ADOPTION OF IMPROVED SUB-CRITICAL PARAMETERS OF 150 KSC/ 537$^0$C / 565$^0$C FOR 500 MW UNITS.
- 660 MW UNITS WITH SUPER CRITICAL PARAMETERS OF 247 KSC / 537$^0$C/ 565$^0$C INTRODUCED AND ALREADY UNDER CONSTRUCTION.
- PLANS TO INTRODUCE HIGHER SIZE UNITS OF 800 MW.
- DEVELOPMENT OF INTEGRATED COAL GASSIFICATION COMBINED CYCLE (IGCC) TECHNOLOGY SUITABLE TO INDIAN COAL

एनटीपीसी NTPC

# Technology Initiatives

- 765 KV TRANSMISSION, ADVANCED CLASS GTS ARE SOME OF THE TECHNOLOGIES BEING INTRODUCED.
- THE COMPANY SETS ASIDE UPTO 1 % OF THE PROFITS FOR R&D
- NTPC ENERGY TECHNOLOGY RESEARCH ALLIANCE (NETRA) IS WORKING IN BOTH FUNDAMENTAL AND APPLIED FIELDS AND HAS A WELL-DEFINED MANDATE TO DEVELOP VARIOUS TECHNOLOGIES WHICH WILL ENHANCE PLANT RELIABILITY, EFFICIENCY ETC.

# CEETEM - Centre for Energy Efficient Technology & Energy Management

- - This group has been established in Corporate Centre with mandate
- -to oversee and coordinate in totality, different energy saving efforts in the power plants including energy audits.
- - To comply with all requirements of E C Act – 2001
- CEETEM works with **Energy Efficiency & Management Group (EEMG)** of all stations
- - EEMG groups are dedicated to monitor different energy efficiency parameters of power plant including implementation of different energy conservation measures in the power plant
- NTPC formulated and adopted the **Energy Management Policy** in the year 2004.

# Energy Conservation system in NTPC

- Energy Audit System
- Meeting statutory requirements
- Installation of On Line Energy Monitoring System
- Study and application of innovative energy efficient technologies
- Organizing mass awareness programs in NTPC townships

# Energy Audits System

**Energy Audit System includes**

- Energy Audit Procedures
- Energy Audit Schedule
- Conduct of Energy Audits
- Energy Audit Reports indicating recommendations, saving potential and action plan
- Follow up of action plan

***Power plant is divided into different systems, For conducting detailed energy audits***

- **Boiler**

  **Boiler efficiency**
  **Draft system**
  **Milling System**
  **Thermal Insulation**

- **Turbine**

  **Turbine efficiency**
  **Regenerative system**

- Electro Static Precipitator
- Coal Handling Plant
- Ash Handling Plant
- CW system and Cooling Tower

- Compressed Air System
- Air Conditioning and Ventilation System
- Water Balance
- Lubricating Oil

# Thrust Areas for Energy Conservation

1. On Line Energy Management System

2. Coating of internals of large water pumps (CW pumps, Ash water pumps etc.)

3. Minimizing Feed Regulating Station DP, preferably to zero

4. Using Variable Frequency Drives for HT drives ( wherever flow control is achieved by Inlet guide vane / inlet damper / valve)

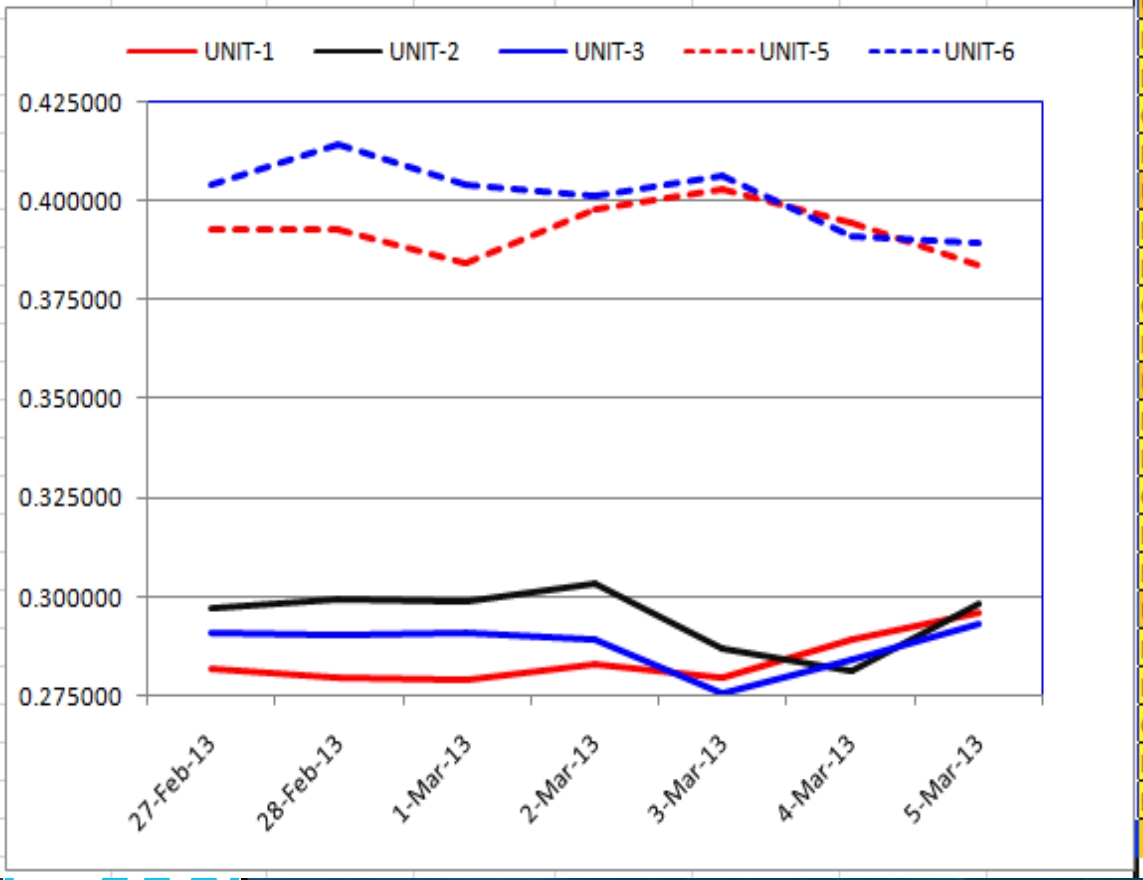
# Energy Conservation – New Initiatives

- **On Line Energy Management System**

- To control and closely monitor electrical power consumption of different subsystems of the power plants including trending and history. It has been installed / being installed in all NTPC stations.

# On Line Energy Management System

| MU | 5-Mar-13 | 4-Mar-13 | 3-Mar-13 | 2-Mar-13 | 1-Mar-13 | 28-Feb-13 | 27-Feb-13 |
|---|---|---|---|---|---|---|---|
| UNIT-1 | 0.295789 | 0.289053 | 0.279484 | 0.282833 | 0.278929 | 0.279327 | 0.281827 |
| UNIT-2 | 0.298045 | 0.281036 | 0.287181 | 0.303549 | 0.298896 | 0.299433 | 0.296935 |
| UNIT-3 | 0.293073 | 0.283843 | 0.275646 | 0.289140 | 0.290721 | 0.290449 | 0.290723 |
| UNIT-5 | 0.383691 | 0.394498 | 0.403113 | 0.398053 | 0.384582 | 0.392781 | 0.392882 |
| UNIT-6 | 0.389218 | 0.391440 | 0.406462 | 0.401286 | 0.404386 | 0.414176 | 0.404178 |



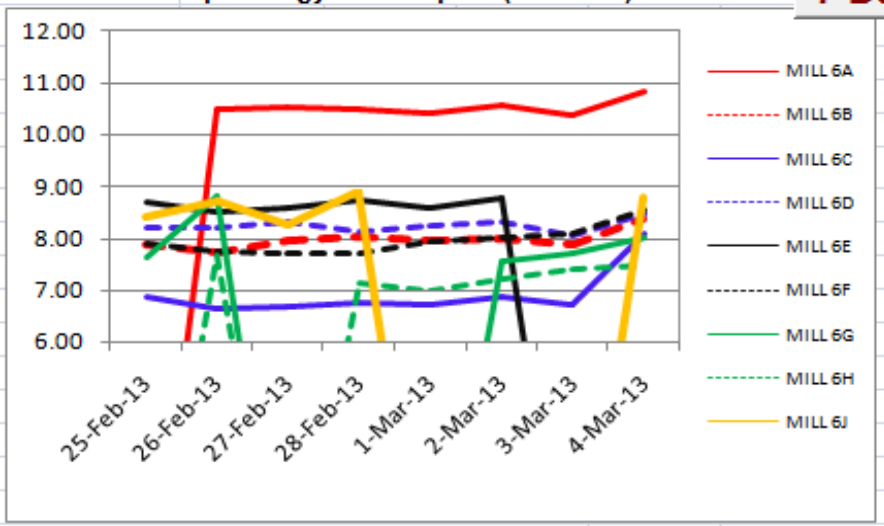

| GEN & APC | 5-Mar-13 | 4-Mar-13 | 3-Mar-13 | 2-Mar-13 | 1-Mar-13 | 28 |
|---|---|---|---|---|---|---|
| **UNIT-1 GEN** | **4.92** | **4.88** | **4.98** | **4.91** | **4.86** | |
| Milling | 81150 | 82272 | 82004 | 81300 | 81105 | |
| Draught | 56875 | 56192 | 54186 | 55773 | 53183 | |
| Condensate | 10178 | 5742 | 0 | 0 | 0 | |
| Feed water | 144288 | 141576 | 140017 | 142635 | 141720 | 1 |
| **UNIT-2 GEN** | **4.40** | **4.48** | **4.91** | **4.89** | **4.81** | |
| Milling | 89602 | 90552 | 90910 | 89942 | 88582 | |
| Draught | 58994 | 50894 | 54445 | 62333 | 59511 | |
| Condensate | 9819 | 9602 | 9729 | 10093 | 10090 | |
| Feed water | 136709 | 127075 | 129157 | 138269 | 137773 | 1 |
| **UNIT-3 GEN** | **4.75** | **4.61** | **4.99** | **4.85** | **4.93** | |
| Milling | 85060 | 86342 | 86184 | 85867 | 85423 | |
| Draught | 55804 | 51973 | 47405 | 52278 | 57323 | |
| Condensate | 10110 | 9886 | 9797 | 10113 | 10047 | |
| Feed water | 139097 | 132640 | 129249 | 137934 | 135023 | 1 |
| **UNIT-5 GEN** | **11.33** | **11.91** | **11.73** | **11.42** | **12.11** | |
| Milling | 150411 | 154716 | 153537 | 149619 | 147469 | 1 |
| Draught | 153165 | 159497 | 168096 | 169747 | 164219 | 1 |
| Condensate | 41026 | 41457 | 42479 | 42150 | 41858 | |
| Feed water | 0 | 0 | 0 | 0 | 0 | |
| ECW-ARCW | 22004 | 21982 | 22111 | 19163 | 14335 | |
| **UNIT-6 GEN** | **8.24** | **11.93** | **11.79** | **11.50** | **11.48** | |
| Milling | 146144 | 124958 | 154045 | 152864 | 153968 | 1 |
| Draught | 165980 | 131981 | 175350 | 169565 | 168793 | 1 |
| Condensate | 41944 | 39153 | 41977 | 41549 | 42005 | |
| Feed water | 0 | 0 | 0 | 0 | 0 | |
| ECW-ARCW | 17159 | 16910 | 17251 | 19408 | 21641 | |

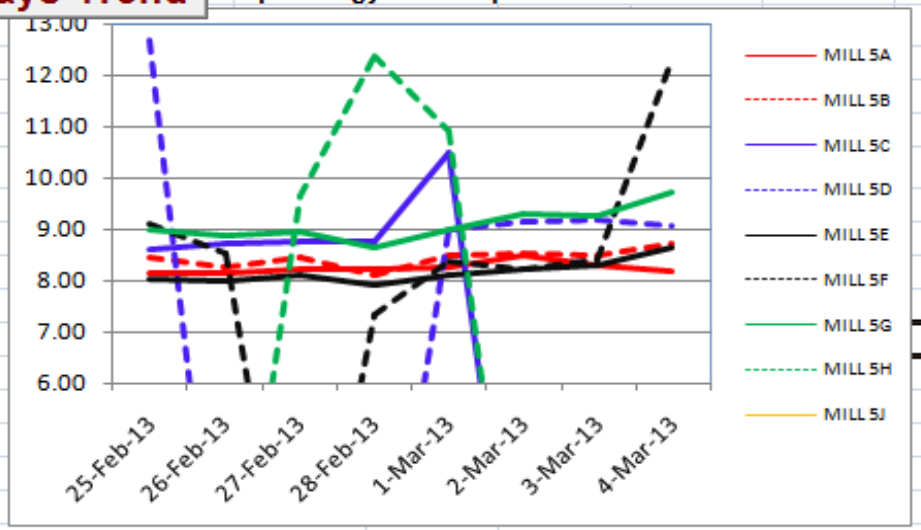
**SYSTEM WISE APC BREAKUP FOR ALL UNITS IN 7 DAYS**

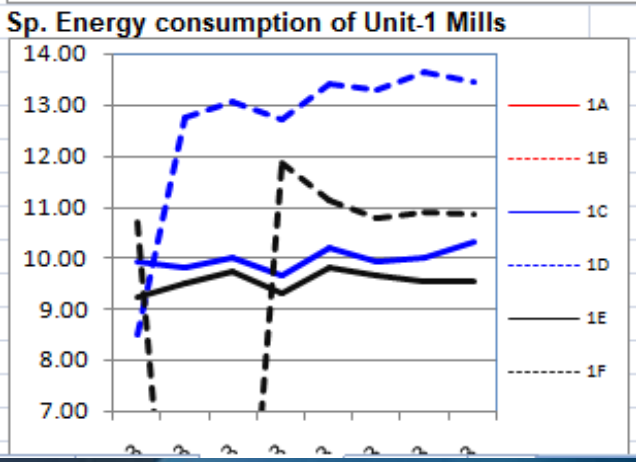
एनटीपीसी NTPC

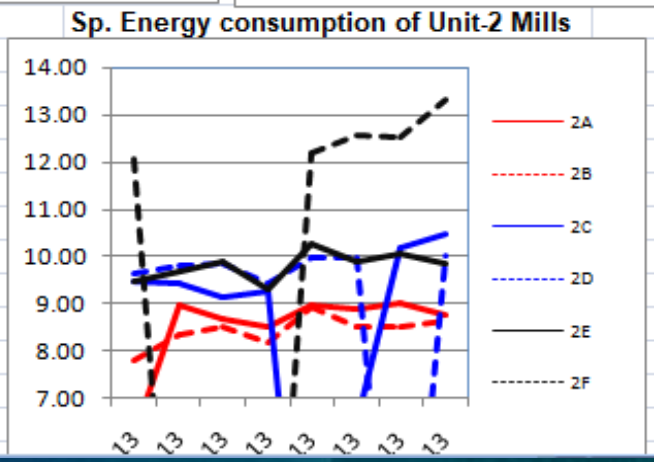
# On Line Energy Management System

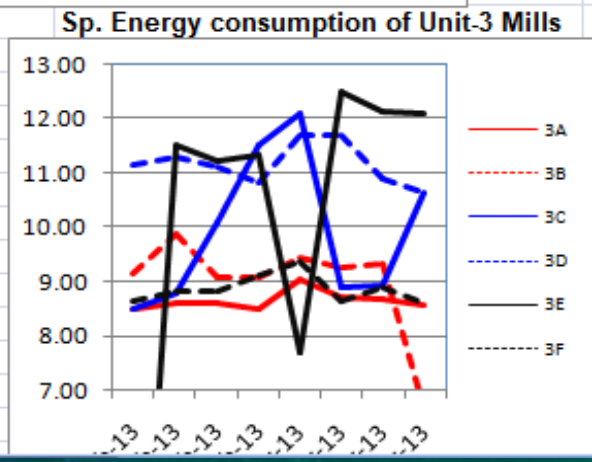
## 7 Days Trend



# Polymer coating of Pumps

- Generally gives an efficiency improvement of >4%
- Old worn out pumps - a fit case for coating
- CW pumps, Ash water pumps etc. are considered for coating

# *Energy Conservation – New Initiatives*

- Minimizing FRS DP to minimum ( preferable zero ) is one of the thrust area to reduce power consumption of BFPs.

- Efforts are also being made to introduce many other technological advance systems like *Variable Frequency Drives (VFD)* in the existing medium voltage drives using IGBT technology in the operating stations to further tap the energy saving potentials available.

# ENERGY MANAGEMENT POLICY

- NTPC, a premier electric power utility in the country, in its endeavor towards being one of the world's most energy efficient power utilities, is committed to produce electric power in the most efficient manner, keeping in view environmental sustainability as also quality power production at optimum cost.
- To meet the above goal we will strive for: -
  - Managing efficiently the utilization of input energy resources like coal, natural gas, naphtha, oil, water etc. by proven operational practices and deploying cleaner and more efficient technology as appropriate and feasible.
  - Nurturing energy efficient design and technology for new buildings, wherever practical.
  - Enhancing utilization of renewable energy resources, wherever feasible.
  - Conduct regular internal and external energy audits to identify areas of improvement so as to ensure efficient energy consumption comparable to the best in the world.

एनटीपीसी NTPC

# ENERGY MANAGEMENT POLICY

- Exploring the possibility of replacing non energy efficient technology/equipment with the energy efficient state-of-the-art technology/equipment, wherever feasible.
- Maximize recovery of waste energy, wherever feasible.
- Sustaining energy efficiency gains by establishing and maintaining a management information system designed to support managerial decision making.
- Ensuring energy conservation awareness programmes on enterprise basis and also disseminate knowledge gained to others through energy audits and workshops.
- Enrichment of experience on energy conservation by exchange of ideas with other organizations.
- Explore the possibility of promotion of research and establishing demonstration projects in the areas of energy conservation in power plants

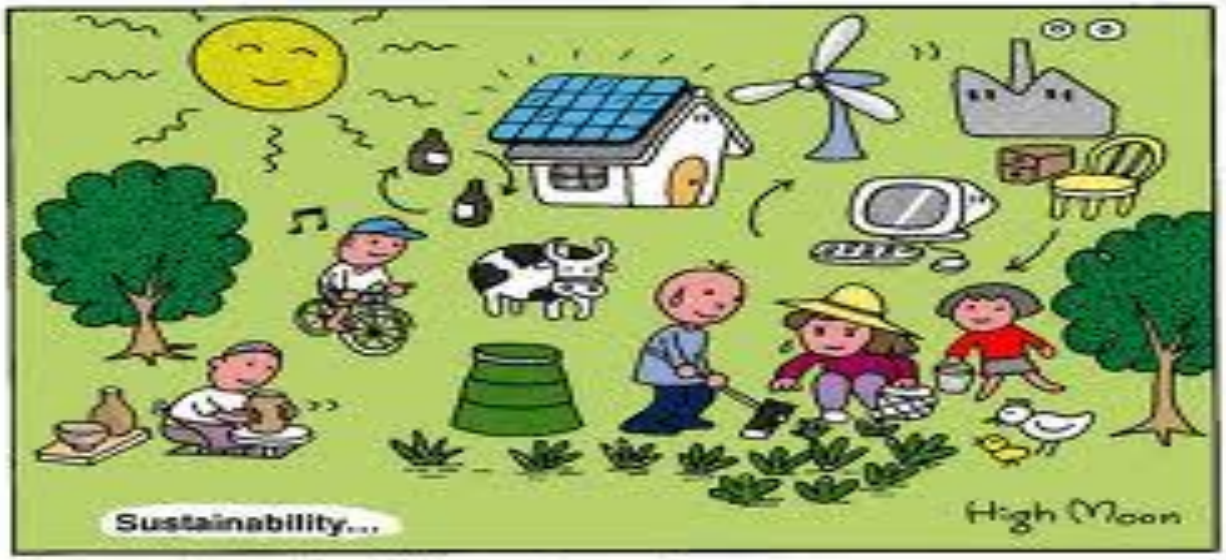
एनटीपीसी NTPC

# Conclusion

- As per Energy Conservation Act – 2001, carrying out periodic energy audit is now a statutory requirement for all energy intensive industries incl. power utilities and NTPC is fully geared to meet this requirement

- NTPC is adopting latest energy efficient technologies in its new plants as well as introducing the same in old operating plants

# Thank you




Note: Working together for a harmonious existence.