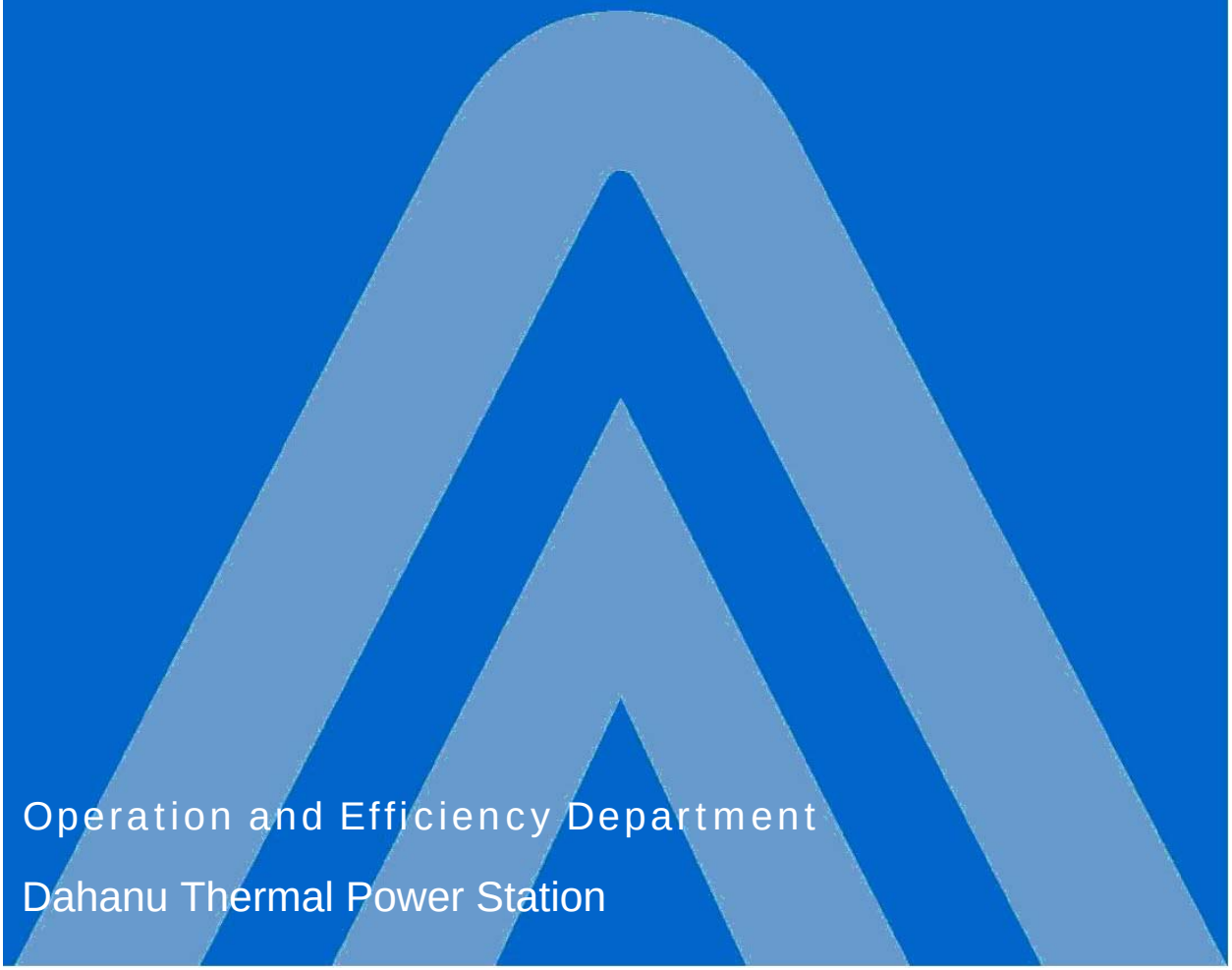
RELIANCE Energy
Anil Dhirubhai Ambani Group

DTPS TG Roof Wind Ventilator Installation Report - 2008

Dec. 17, 2008



Operation and Efficiency Department

Dahanu Thermal Power Station

TG Roof Wind Ventilator - eCO600

By considering the today's scenario of conservation of energy, DTPS have installed and commissioned the TG roof Wind Ventilators, the analysis of effectiveness of Hybrid type Wind ventilators (eCO600) carried out, and found out the benefits of this new technology against existing electrical exhauster.

Submitted for review and comments

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1: Objective

Our main objective is the "**Conservation of Energy**" by replacing the existing electric roof exhauster in TG hall by Hybrid type Wind ventilators (eCO600) and also reduce the auxiliary power consumption. To increase the reliability of the operation of exhauster and reduced the maintenance, we have installed the hybrid wind ventilator which can work consistently for a long time with power supply or without power supply.

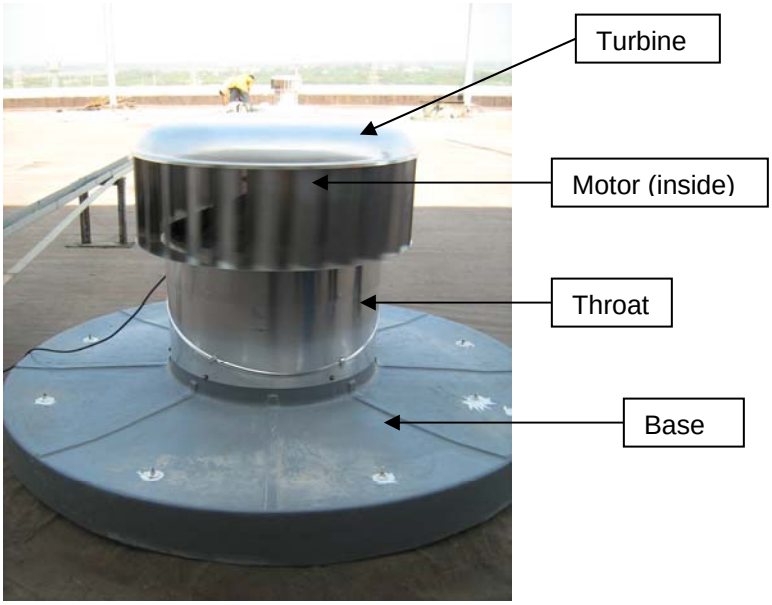
2: Specifications

Old-Electric Exhauster	New-Hybrid Wind Ventilator(eCO600)
Design Data Motor Watts: 3700 Watts / 5 HP Flow: 6000 M^3/hr Make: DOCTAIRE	**Design Data** Motor Watts: 116 Watts Current : 0.47 Amp Voltage : 200 – 277 Volts Flow: 2000 to 3000 M^3/hr (Motor not in service) Flow: 4000 M^3/hr (Motor is in service) Make: M/s Sudha Ventilating Systems Pvt. Ltd, Ahamadnagar
Actual test data Motor Watts: 3700 Watts Current : 6.1 amp Voltage : 410 volt Flow: 6000 M^3/hr	**Actual test data** Motor: Watts: 93 Watts Current : 0.47 amp Voltage : 210 volt Flow: **3324** M^3/hr (Motor not in service) Flow: **6183** M^3/hr (Motor is in service)

3: Constructional Details

ecopower® – TRUE HYBRID VENTILATION

ecopower utilises an electronic commutating (EC) motor installed in the head of the ventilator to enable motorised boost during periods of low wind speed or special ventilation needs. The motor can be activated by any digital measure, such as temperature, humidity gas concentration level etc. The standard product is controlled manually by a switch (not included). Unlike previous attempts to produce a hybrid mechanical/wind vent, ***ecopower*** has **no motor and fan blade in the throat** of the vent. This is **extremely** important. Research using AS4740:2000 (Performance of Natural Ventilators) has shown clearly that any obstruction in the throat of a wind ventilator will greatly decrease vent performance under wind load. The level of flow reduction can be 40% or greater. Also, axial fans located in the throat of wind vents can produce significant noise levels. ***ecopower*** is one large direct drive centrifugal fan. The bearing system of the motor becomes the bearing system of the ventilator. This means that the vent can be free spinning under wind load or power activated as conditions require. The use of an EC motor ensures that the best energy efficiency features available are factored into the product design.



4: Installation and Testing

On 16/12/2008 installation and commissioning done and testing carried out on 17/12/2008. Voltage, current, power consumption, flow and velocity of exhaust air measured for both the system

Team Members	Supporting Team Members
1. P. S. Jalkote	1. Kailash Nerkar
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Old-Electric Exhauster	New- Hybrid Wind Ventilator(eCO600)
	
	
	

Old- Electric Exhauster	New-Hybrid Wind Ventilator (eCO600)
	
	
	

5: Power Saving and Cost analysis

Total nos. of ventilator = 20

Recently installed = 02

1) Power consumption of old electrical exhauster = 3700 watt / exhauster

Total power consumption by 20 exhauster = 20 * 3700

= **74000** watt ---------- (A)

2) Power consumption by Turbo wind ventilator = 93 watt / ventilator

Total power consumption by 20 ventilator = 20 * 93

= 1860 watt ---------- (B)

3) Expected saving for 20 ventilator = A - B

= 74000 - 1860

= 72140 watt

= 72.14 kWh

4) Expected saving per day = 72.14 * 24

= 1731 kw / day

5) Financial saving per day (Rs.) = 1731 * 3.5

= 6059 /Day

= 1, 81,770 /month ----------(C)
= **21.81** Lacs/Year

6) Cost of one ventilator = 74,700 Rs/ventilator

7) Total cost of all 20 ventilators = 74700 * 20
= 14, 94,000 Rs ---------- (D)

8) Pay back period = D/C
= 1494000/181770
= 8.22 months
~ **9** months

6: Benefits

1. 97% saving in electricity consumption.
2. Noise free operation
3. Maintenance free
4. Light weight.
5. Easy to install and handle.
6. Hybrid operation i.e. with and without power.
7. Payback period in 09 months.
8. Lesser cost in comparison with electric operated TG roof ventilators.
9. No separate installation cost implication.
10. Easy to assemble and dismantle.
11. Eco-friendly.
12. Existing exhausters motor can be used as spare for electrical maintenance.

7: Forward Path

1. Balance 18 No. TG roof exhausters to be replaced in phase manner.