

ORDNANCE FACTORY BHANDARA

Bhandara (Maharashtra)

Unit Profile

Ordnance Factory Bhandara, an important and major unit of Ammunition and Explosive group of Ordnance Factory Board, is engaged in production of variety of products such as

- (i) Single base propellants
- (ii) Double Base Propellants (Ballastite and Rocket)
- (iii) Explosives, their compounds and products (RDX, PETN, CORD, CLCs, FLSCs) and
- (iv) Intermediate products(Nitrocellulose, Concentration of Weak Sulphuric and Nitric acid)

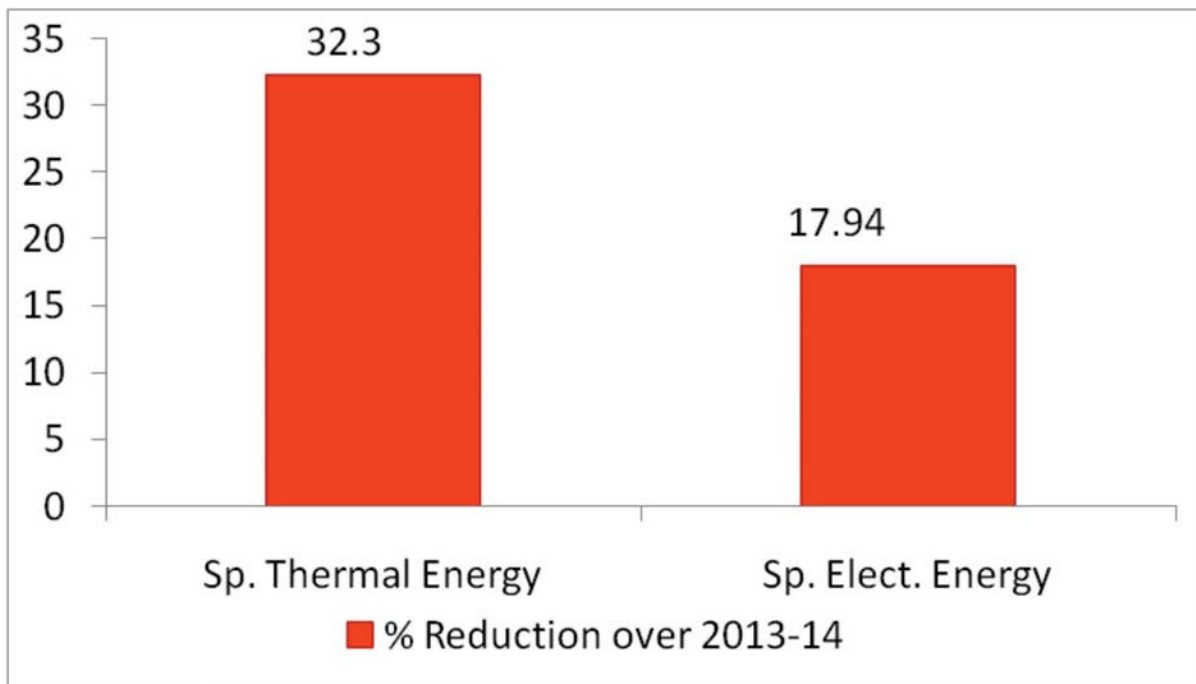
Being chemical explosive production, buildings are located at far distances from each as safety requirement. Hence, total area of land inside Factory is very wide to the tune of 1425 Acres. Also, due to safety reasons indirect heating is required for production and drying operations. Hence, there exists huge capacity and network (23 Km) of steam. For the same reasons consumption of water is also very high to the tune of 5 Million Gallons per Day. All above factors make the factory very energy intensive. Total expenditure of OFBa in energy per year is to the tune of 100 Cr per year



In view of above, it was prudent that energy conservation measures are undertaken with utmost sincerity and vigorously at OFBa. Hence, major constituents like Furnace fuel Oil, Electricity, Water, Freon etc were selected to conserve.

Specific Energy Consumption

Ordnance Factory Bhandara despite many constraints has achieved the objectives of reduction in energy consumption as well as reduction in specific energy consumption. Saving in specific Electrical Energy Consumption has been achieved by 17.94 % and saving in specific Thermal Energy Consumption is achieved by 32.30 %.



Energy Conservation

1. Use of Automatic Blow-down in Steam Boilers
2. Use of Online Efficiency Monitoring System in Boiler Houses.
3. Use of New Energy saver Steam Traps in steam network.
4. Use of Lagging-cladding for insulation in steam network..
5. Centralization and shutting down of inefficient boilers..
6. Condensate recovery from every possible end.
7. Optimization of high pressure boilers.
8. Implementing Solar Industrial Heating system for production drying buildings.
9. Replacement of conventional geysers with solar geysers.
10. Use of electronic kWh meter in place of conventional kWh meters.
11. Use of energy saver for pumps, AC circuits & lighting circuits.
12. Use of energy efficient inverter AC's in Admin Buildings.

13. Use of Heat Exchangers (Economizer) in boilers.
14. Use of Bio-energy in Industrial Canteen.
15. Proposal of 100MW Ground mounted grid connected Solar Plant.
16. Use of LED lights in street lighting and other areas of production & residential buildings
17. Use of VFD's in motors & improvement in Load Management system.
18. Replacement of old fans by energy efficient fans.

Major Energy Conservation Projects Implemented at Ordnance Factory Bhandara

Furnace Fuel Oil

Administrative measures:

- (i) Stringent monitoring of Quality and Quantity of F.F. Oil received was started and action taken to lock the tanker through IOCL and HPCL
- (ii) Calorific Value Testing is started as the same was not a practice in vogue earlier because the clause of Calorific Value was not available in the specification of Furnace Fuel Oil.

Technical measures:



Condensate Heat Recovery



New SteamTraps



Flue gas heat utilization



Improving Insulation Cladding

- (i) Mixing of special emulsifier in the F.F. tank has been started which converts old sludge in to useful Furnace fuel oil.
- (ii) Diverting spent steam in to feed water tank to increase the temperature of feed water to the boiler
- (iii) Using Economisers which utilizes the heat of Flue Gas and increases the temperature of the feed water to the boiler
- (iv) Changed the design of nozzles used in boiler & maintaining proper air-fuel ratio.
- (v) Using special type of energy efficient steam traps
- (vi) Improved Lagging & Cladding of Steam Line
- (vii) Maintaining optimum pressure at boilers and avoiding blow-downs etc.

Electricity



Shut down of 660 TR Chilling Unit



Installation of LED Street Lighting

Technical measures:

- (i) Shut down of underutilized 660 TR Chilling unit of old RX plant
- (ii) Installation of LED street lightening in the factory & estate area.
- (iii) Installation of VFD as a replacement to old and worn out variable gear boxes & motors.
- (iv) Implementing LED fittings in Factory Bldgs. and Estate residential qtrs.
- (v) Shut down of under utilized Transformers
- (vi) Replacing Aluminium blades with F.R.P blades of cooling tower
- (vii) Replacement of energy efficient fans in Estate and Factory Area
- (viii) Replacement of all geysers from Guest houses and hospital by Solar Heaters

Water

Extensive survey of leakages in water pipe line circuit (around 25 Kms) were carried out. 60 leakages of different sizes were identified and arrested. Special float valves were installed in the static tanks. Recirculation system installed at feasible location. The above resulted in reduction of pumping hours from 30 hrs to 20 hrs and clear water pumping from 28 hrs to 18 hours at Pumping Station.

Annual saving of water = **15 MCum**

Annual saving in electrical units = 970900 KWh

Annual Savings achieved = Rs 82,52,650.

The production activities of OFBa is energy intensive. All heating is taking place through steam. The area is very wide and there is steam net work of 23 Km. in the factory. Similarly, the water consumption is to the tune of 5 million gallons per day. In view of this, number of measures have been taken to reduce steam, water and electricity consumption. The results have been very encouraging. The energy consumption after initiation of conservation measures have brought down the energy requirement per ton of production almost by 50%. It has translate in annual saving of **Rs. 20 crores** to the factory during 2014-15.

Factory Integrated Management System (IMPS) Policy

"We at Ordnance Factory Bhandara manufacturing intermediates, propellants and explosives, are committed to deliver quality products & services in time by following and developing sound processes, reducing/preventing pollution and continually

improving quality environmental and OH & S performance, complying all applicable statutory and regulatory requirements.

We are also committed to comply with requirements and continually improve the effectiveness of quality, environmental and occupational health & safety management system by establishing and reviewing respective objective & targets.

This policy is documented for implementation and is communicated to employees working for, as well as on behalf of Ordnance Factory Bhandara and also made available to public''.

Energy and environment policy of Ordnance Factory Bhandara is in line with the following commitments.

- (i) Saving up to 15 % of energy through improved energy efficiency in both Furnace Fuel Oil and Electricity.
- (ii) Sourcing at least 70% of energy used from Renewable Energy sources such as Solar Power.
- (iii) Energy audits to improve energy efficiency on its sections and offices.
- (iv) Complete replacement of incandescent lamps, CFL's with energy efficient LED lights.
- (v) Large scale plantation in open land both inside as well as in estate area.