

Small Group Activities on Energy Efficiency Improvement in Thermal Power Plants



- An initiative of Central Electricity Authority and GTZ under IGEN Programme**

The Indo German Energy Programme (IGEN)-Background

- **The Ministry of Power, Government of India and GTZ (Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH) signed an 'implementation agreement' with respect to the Indo-German Energy Programme in 2006.**
- **The Indo German Energy Programme (IGEN) is performing research work and performance assessment in support of the implementation of Energy Conservation Act 2001 in cooperation with the Ministry of Power and its statutory bodies Bureau of Energy Efficiency (BEE), and Central Electricity Authority (CEA).**
- **Under the IGEN agreement, CEA has been entrusted with the task of ensuring performance optimization and efficiency of thermal power plants.**
- **The IGEN project is being executed under two main sub-components:**
 - 1. Mapping Studies of thermal power generating units**
 - 2. Performance Optimization of Thermal Power Stations**

Performance Optimisation of Thermal Power Stations under IGEN Programme (Sub Component II)

- **The overall aim of this measure is to support and prepare public and private power plant operators for performance reporting as well implementation of financially attractive and technically viable improvements of power plant net heat rate under the provisions of the Energy Conservation Act.**
- **This phase has been initiated with effect from 15th January, 2008 and is expected to be completed by 15th January, 2010. The following 5 outputs are planned:**

Performance Optimization of Thermal Power Stations under IGEN Programme

(Sub Component II) Contd...




- 1. Capacity building of thermal power stations personnel and Technical assistance for conduct of high quality energy audits**
- 2. Technical assistance in the establishment of energy management system in the power plants**
- 3. Annual statistics of validated impact of energy conservation in power plants**
- 4. Familiarization and interchange of best practices with power plant operators in Germany or Europe**
- 5. Development of electronic data base to analyze the findings of all energy audit reports carried out in power plants and assessment of impacts with respect to energy conservation and efficiency.**

Small Group Activities- Concept



Small group activities are activities carried out voluntarily and continuously by all members of small groups within the same work place aimed at improving the operation of the work place in line with company policy.

Basic idea behind small group activities

-  To develop work that is satisfying and fulfilling by raising workers' capabilities and making effective use of their ingenuity.
-  To create a lively and bright work place by respecting the human qualities of the workers.
-  To contribute to the improvement and development of the company.

The advantages of small-group activities:

- 1. Setting group objectives and working for their attainment strengthens the sense of teamwork.**
- 2. Group members share and coordinate their respective roles better.**
- 3. Communication between labor and management, as well as between workers of different ages, is improved.**
- 4. Morale is greatly improved.**
- 5. Workers acquire new skills and knowledge and develop more cooperative attitudes.**
- 6. The group is self-sustaining and solves problems that would otherwise be left to management.**
- 7. Labor-management relations are greatly improved**

Proposed Methodology on the "Small Group Activities"

- Power plant to request each of their departmental head to propose volunteers to participate in this "Small Group Activity". The batch size should be restricted to 4-5 volunteers from each department, which may include operators, supervisors, maintenance staff/engineer, production staff/engineer etc.;
- In the first workshop, these groups will be given technical input by GTZ on the methodology of identifying various energy conservation opportunities in the power generation system. The volunteers participating in the workshop are expected to interact with the faculty and also can present their view point during the workshop proceedings. The Small Groups can also present outline of their identified projects on the last day of Workshop.
- After the conduct of first workshop, the "Small Group" would further diagnose the energy conservation opportunities in their work place and will analyze and will prepare an action plan for its implementation.

Proposed Methodology on the “Small Group Activities- Contd.

- **After a gap of 3 months, a mid-term workshop to be held where the "Small Group" would present their findings. Other participants and experts would also be invited so as to strengthen the recommendations of the "Small Group". The power plant may also seek assistance in any other technical input which is required from the various agencies such as manufacturers, suppliers of equipment/process, experts ;**
- **In the next 2 months' period, the proposals framed by "Small Group" may be modified based on the feedback and extra information received;**
- **After this 2 months' period, the Workshop to be held and the presentations to be made by the "Small Groups". The power plant's management may also participate in this Workshop;**
- **The management would consider the proposals presented in these workshops for implementation and would give its approval after taking into account the techno-economic feasibility of such proposals;**
- **After the acceptance of proposals by the company's management , "Small Groups" would take the responsibility of implementation of such proposals;**
- **The final Workshop to be held after the implementation programme is over to present the findings. These Workshops may also be attended by power plant's top management.**

Small Group Activities

1. Problem and Barriers

- **Emphasis on plant load factor instead of 'efficient generation' by a thermal power station.**
- **Degradation of equipment resulting in loss of efficiency, but not monitored properly**
- **Lack of awareness on efficiency related issues, even energy saving potential through house keeping measures, requiring low investment, not tapped properly**

2. Importance

- **The Small Group Activity on Energy Conservation in thermal power stations would ensure the effective implementation of the EE projects and their sustainability**

3. Possible Partners

- **Private thermal power stations**
- **Centre and State owned Power Stations**
- **Central Electricity Authority (Ministry of Power)**
- **IGEN Project (GTZ)**
- **Energy efficient equipment suppliers/manufacturers**

4. Interest of each Partner

- Private thermal power stations- to improve efficiency and reduce cost of generation
- Centre and State owned Power Stations- to improve efficiency and reduce cost of generation
- Central Electricity Authority (Ministry of Power)- to improve efficiency, conserve fossil fuel reserves and mitigate GHG emissions
- IGEN Project (GTZ)- to effectively implement the project, ensure its sustainability and mitigate GHG emissions
- Energy efficient equipment suppliers/manufacturers- to increase the sales volume of EE technologies

5. Joint Objectives

- **improve thermal power station efficiency**
- **reduced cost of generation**
- **mitigate GHG emissions**
- **conserve fossil fuel reserves**
- **effective implementation of the IGEN project, and its sustainability**
- **increase the sales volume of EE technologies**

6. Possible Contribution

- **The support of GTZ may be limited to providing faculty support for workshops and meeting the travel and honorarium of experts participating as faculty.**
- **The participating plants have to bear related expenditure for the organisation of workshops and implementation of agreed projects as identified by the plant personnels/ small groups**

7. Next Steps

- **Activity included in IGEN Phase-II**
- **Identification of plants with the support of CEA**
- **Implementation**

8. Contact Person

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