

Technical Assistance Requirements

1. GENERAL

To attain the Project's objectives, technical assistance is required in two main areas:

- (i) familiarisation and training of key RSPCL personnel, and
- (ii) execution of measures related to the replication objective of the project (see Annex 12).

The need for these measures arises out of the fact that there is no experience available in India with the ISCC technology. The associated costs are therefore considered incremental costs, i.e. incremental due to the inclusion of a solar thermal component.

2. TRAINING OF KEY RSPCL PERSONNEL

2.1 Result

At the end of the familiarisation and training programme, key RSPCL personnel should be able to properly monitor and control the activities of the EPC/O&M contractor during the design, implementation and operation of the project. The emphasis of the training will be on developing the skills required by RSPCL during the operational phase, as it is then that RSPCL will have to take on a continuing, long term core responsibility. During the design and implementation phase, RSPCL personnel will be supported by an Implementation Consultant, who will be able to assist RSPCL in resolving the specific, often non-recurring problems occurring during that time.

2.2 Training needs and target groups

The professional personnel to be employed by RSPCL will have to possess basic professional qualifications. Depending on the hierarchical position, substantial or a basic degree of experience in their respective fields will be required. At least some of the technical staff should have experience with steam and gasturbine and preferably even with combined cycle power stations.

None of the professional Indian staff, however, will have any experience with the ISCC technology used in the Mathania Project. It is therefore necessary to provide

- (i) induction training, i.e. familiarisation with the general technical, financial and economic aspects of the ISCC concept to all professionals, including members of the Board of Directors;
- (ii) technical training and practical experience on the design, operations and maintenance of the ISCC technology to RSPCL's engineers, and
- (iii) financial training on the financial and economic aspects of ISCC power generation for the finance personnel.

According to these needs, five different target groups can be distinguished:

- (i) members of the Board of Directors
- (ii) higher management (Managing Director and Executive Directors)
- (iii) key technical staff
- (iv) key finance staff
- (v) other staff

For other fields, such as general management, accounting, personnel and administration, it is assumed that RSPCL will recruit sufficiently qualified personnel who will be able to set up the required systems. This may involve limited local consultancy inputs, but not any substantial technical assistance which needs to be planned for at this point in time.

2.3 Measures

To attain project objectives, three types of training measures are required, i.e. the induction, the technical and the financial training.

2.3.1 Induction training

Three approaches towards providing a basic understanding of the characteristics of the Mathania project are proposed:

- (i) a seminar-type presentation with a strong audio-visual orientation, which can, at least partially, also be used for the outside public;
- (ii) after project implementation, a guided site visit through the plant, which would supplement the seminar, and
- (iii) overseas information and study visits to solar thermal, combined cycle and ISCC plants (once the other ISCC reference projects have been completed).

The first two approaches would be suitable for all target groups. The third, i.e. the visits to other sites, would have to be restricted to selected Board members and key RSPCL staff.

As induction training will also be required for the public relations activities within the replication effort, this training module should be prepared by the Replication Consultant and included in his terms of reference.

2.3.2 Technical training

The key technical staff of RSPCL consisting of the Executive Director of the Mathania Project and probably of one senior and one junior engineer each in the fields of process engineering, instrumentation and data acquisition, and operations and maintenance will need

- (i) a theoretical understanding of the basis of ISCC technology. This can be obtained by self-study of the relevant literature, by being involved in the control work of the Implementation Consultant and by working with the Replication Consultant in developing and running the technical and financial/economic models of the plant;
- (ii) practical exposure to the actual design and building of the Mathania plant. This can be achieved by integrating 2-3 of the RSPCL engineers into the team of the Implementation Consultant, and
- (iii) practical exposure to the actual operation and maintenance of an ISCC plant. This can be obtained by practical internships at solar thermal power plants (Cramer Junction) and combined cycle power plants. Organisation of the practical internships should be in the hands of the EPC/O&M Contractor, who will have to arrange for similar sessions for his own people.

Because of the relatively small target group (maximum of seven engineers) and the diverse and special nature of the subjects which need to be mastered by RSPCL personnel, the instructional approach should mainly be one of on-the-job training over a longer period of time.

2.3.3 Financial training

A basic understanding of the financial and economic implications of the ISCC technology will be provided by the induction training. In addition, the Executive Director Finance and his deputy will require in-depth understanding of the complex interrelationships between the main factors impacting the monetary efficiency of the Project. This can best be provided by close cooperation with the Replication Consultant, who will develop a financial/economic model of the Project. Involvement in the design, calibration and repeated actual running of the model will enable financial specialists to build this knowledge base.

It will therefore be a task of the Replication Consultant to actively involve the key financial personnel of RSPCL in the financial/economic modelling of the Project.

3. IMPLEMENTATION ARRANGEMENTS

3.1 Training of RSPCL personnel

On-the-job training over a longer period of time combined with exposure training at solar and combined cycle plants that are already operational will constitute the focus of the technical assistance programme for RSPCL. Training will be mainly provided by the Implementation Consultant, and to a lesser extent by the Replication Consultant, the EPC/O&M Contractor and others. It is the responsibility of the Implementation Consultant to ensure that the different activities are carried out in a coordinated manner. Following the commissioning of the plant, the Implementation Consultant should be available for assistance in dealing with special problems and for carrying out additional training measures essential for RSPCL personnel, if the need arises.

The terms of reference for the different parties will therefore have to include the following:

- Implementation Consultant:
 - On behalf and in close cooperation with RSPCL management, overall responsibility for planning the Mathania-specific training of RSPCL personnel and for ensuring that it is carried out in a coordinated and efficient manner.
 - Coordination of training activities with the EPC/O&M Contractor, the Replication Consultant and others.
 - Inclusion of RSPCL's technical key RSPCL personnel in their team and provision of on-the-job training concerning all design, operational and maintenance aspects.

EPC/O&M Contractor:

- Arrangement of practical internships for RSPCL's technical key personnel at operating solar thermal and combined cycle plants.

Replication Consultant:

- Involvement of RSPCL personnel in the technical and financial/economic modelling of the Mathania plant.
- Development and provision of Induction Training to new RSPCL personnel at the site.
- Arrangement of overseas study and information visits to solar thermal and ISCC plants.

3.2 Replication (see Annex 12)

This will be the task of the Replication Consultant. Because of the diverse nature of the overall task, a number of international and local firms are likely to form a consortium for replication activities.

4. TIME SCHEDULE

The technical assistance required for the training of RSPCL personnel as well as for the replication activities have to start in tandem with the commencement of the project implementation phase and continue well into the operating period. The timetable for the training modules is included in the implementation schedule for the Project (Annex 2).

5. COST ESTIMATE

Cost estimate for the technical assistance programme is included in Appendix 1 to this Annex 11.