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Cover Page

TRAINING COURSES FOR COGENERATION SYSTEM DESIGNERS  
AND  
SUGAR MILL MANAGEMENT

End-of-Tour Report

David A. Berkowitz  
December 8, 1994

Alternative Energy Development, Inc.  
8455 Colesville Road Suite 1225  
Silver Spring, MD 20910

Project Number 499-0015-3-40024

Contract Number 386-0015-C-00-4300-00

DATE: December 7, 1994  
TO: David W. Hess  
FROM: David A. Berkowitz  
SUBJECT: End-of-tour Report  
BAGASSE COGENERATION SEMINARS

COPIES TO: USAID/Washington (separate transmittal)

The purpose of this tour was to complete preliminary planning and arrangements for the Bagasse Cogeneration Seminars. This report summarizes the activities and accomplishments toward the goal of mounting the Seminars. Contacts and in-country travel are provided below.

#### General Comments

During the period of almost four weeks in-country, I made good contacts within the sugar industry, and identified resources to help arrange the Seminars. Referrals from USAID and MNES regarding potential support for the Seminars were very helpful to me in getting started, and through letters and conversations with CII, IDBI, NPC in Delhi, the contacts served to promote interest and coordination within the industrial community. However, it was clear that the Indian Sugar Mills Association (ISMA), National Federation of Co-operative Sugar Factories (NFCSF), and Sugar Technologists Association of India (STAI), had excellent connections to sugar mills, were quite interested and up-to-date on all aspects of bagasse cogeneration, and were well-suited and extremely willing to facilitate the Seminars. I chose to use ISMA for the support role, issued them a letter task statement (copy attached), which we worked out jointly, and things are underway.

MNES suggested holding the Management Seminar in Madras, and the Technical Seminar in Tiruchy. Poor access by air transport (only 3 flights a week to Tiruchy) made this seem too difficult to arrange on a short time schedule, and would unnecessarily extend the time schedule. So everything is going to happen in Madras.

ISMA suggested that I check out the Aruna Quality Inn in Madras, which is held by the same group that operates the Aruna sugar mill in Tamil Nadu, where a major small power and bagasse cogeneration project is underway. The hotel is small, modern, cheap, and with an excellent meeting room, media facilities and business center.

During four days in Madras, I contacted Avant Garde (consultant group), KCP (equipment supplier and sugar mill operator), and had discussions with Sajiv K. Menon, Asst. GM (Projects) of Aruna Sugars Ltd. Aruna is taking an innovative management approach in developing a 30 MW small power/bagasse cogeneration project, and I invited Sajiv K. Menon

to participate as a member of the Seminar faculty.

I spent a week in Pune visiting four sugar mills in Maharashtra, the Vasantdada Sugar Institute, and attending the International Society of Sugar Cane Technologists Workshop. It was a wonderful chance to learn about the Indian sugar industry, meet who's who, compare Indian sugar technology with other countries represented at the workshop, and promote the Bagasse Cogeneration Seminars. A major topic of the workshop was energy balance in the sugar mill, steam utilization, and cogeneration. Representatives of the Pakistan sugar industry where I had done previous cogeneration work were present, which was a nice connection. Hideo Idehara was also there, and we had several useful discussions about sugar mill training needs and the capability of engineering consulting firms in India to plan, specify, and install cogeneration systems, which he had written about in his Renewable Energy report.

The final week in Delhi was devoted to making firm arrangements for the Seminars, as summarized below.

### Progress and Status of the Seminars

The Seminars are scheduled, as follows:

Management Seminar	10-11 February 1995
Technical Seminar and Workshop	13-22 February 1995

Sessions will be held on Saturday; Sunday will be a day off. It will be possible to complete the final Technical Workshop on a Wednesday, minimizing the time necessary for sugar mill personnel to be away from their mills during crushing season. Dates have been reserved at the Aruna Quality Inn, and a block of rooms has been set aside for participants.

The preliminary daily schedule for both Seminars is attached. I will be in contact with all the consultant faculty members after returning home to assure their availability or find alternates, and finalize their topics, contributions, and work out any schedule glitches.

The Seminar will be opened in a culturally appropriate manner. Some additional local functionaries will be invited to attend the opening and welcome, who I am assured will then disappear. There will be a cocktail dinner on the first day of the Management Seminar which will be hosted by ISMA at their expense.

The list of invitees has been prepared, and is attached. There will be approximately 40 participants. ISMA chose the sugar mills using the criteria of active interest or progress in cogeneration, minimum 3500 TCD or 1 MW for export, and located in a State with an approved tariff. Currently, I expect about 20 to 25 representatives from 12 mills in Maharashtra, Uttar Pradesh, Karnataka, and Tamil Nadu. In addition, representatives are being invited from the major engineering firms and equipment suppliers, SEBs, IDBI, CII, and GOI (S&T, IREDA, NES, and Food). Invitation letters have been prepared for each group of participants, on USAID letterhead (and hopefully signed by David Hess before I leave India), and will be distributed by ISMA who will provide a cover letter and follow-up on acceptances, etc.

### Schedule of in-country travel

Nov 13	Arrival in India
Nov 14 - 21	in Delhi
Nov 22 - 25	in Madras
Nov 26 - Dec 1	in Pune
Dec 2 - 8	in Delhi
Dec 9	Departure for U.S.

### Organizations Visited and Contacts

### Location

MNES	New Delhi	Ajit K. Gupta, Director Sudhir Mohan Dr. J.R. Meshram Eng. Inder Kumar
Indian Sugar Mills Association	New Delhi	S.L. Jain, DG M.N. Rao, Secretary
Sugar Technologists Association of India	New Delhi	Vinay Kumar, Secretary
National Federation of Co-operative Sugar Factories	New Delhi	D.K. Goel, Technical Adviser
Aruna Sugars & Enterprises Ltd.	Madras	M. Sivaram, MD Sajiv K. Menon, AGM
The K.C.P. Limited	Madras	N. Radhakrishna Rao, GM (Engg)
Vasantdada Sugar Institute	Pune	Dr. G.N. Acharya, Hon. Dir. V.G. Chikhalikar, Chief Sugar Eng
Maharashtra Industrial and Technical Consultancy Organization Ltd.	Pune	S.C. Natu, Chief Consultant
Bharathidasan University (Trichy)	Pune	Dr. R. Vasudevan, Director
Sugar Technology Mission, S&T, GOI	Pune	J.J. Bhagat, Mission Director
Bajaj Hindustan Ltd.(Bombay)	Pune	Mangal Singh, Adviser
Electronics R and D Centre	Pune	Rominus Valsalam, Project Mgr
John H. Payne, Inc.	Pune	Hideo Idehara, President

Many other informal contacts with sugar mill personnel, in Maharashtra and at Pune meeting.

BAGASSE COGENERATION: MANAGEMENT SEMINAR

FRIDAY, 10 FEBRUARY 1995

0845 to 0930 Morning Tea and Registration

0930 to 0945 Saraswati Vandana

0945 to 1030 *Ajit K. Gupta (MNES), S.L. Jain (ISMA), Dick Goldman (USAID)*  
Welcoming Remarks  
Introductions

1030 to 1100 *David A. Berkowitz*  
Theme Address and Technical Overview  
Cogeneration Options in the Sugar Mill  
Interconnection; Export of Surplus Power

1100 to 1115 Mid-morning Tea

1115 to 1330 *George St. John*  
Coproduct of Energy and Sugar  
Multibusiness, Competition for Resources and Control  
Long-Term Sales  
Risks and Restrictions

1330 to 1430 Luncheon

1430 to 1545 *George St. John*  
Contracts to Buy Power: Power Purchase Agreements in Hawaii  
Demand and Supply: Expansion of Generating Capacity

1545 to 1600 Evening Tea

1600 to 1630 *Malik Abdul Qayyum*  
Case Study: PPA for Small Producers in Pakistan

1630 to 1730 *[to be determined]*  
Electricity Boards of India  
Policies in State1, State2, State3

1730 to 1745 Evening Tea

1930 to 2100 Cocktail Dinner, courtesy of ISMA

SATURDAY, 11 FEBRUARY 1995

0900 to 0930 Morning Tea

0930 to 1030 *George St. John*  
Alternate Power Sources and Fuels  
Environmental Issues

1030 to 1100 *Sajiv K. Menon*  
Case Study: India  
Development of a 30 MW Sugar Cogeneration Project

1100 to 1115 Mid-morning Tea

1115 to 1200 *D.K. Goel*  
Cogeneration in India: Current Status

1200 to 1330 *Julie Stewart*  
Financing Cogeneration  
Strategies: Donor and Domestic

1330 to 1430 Luncheon

1430 to 1545 *George St. John*  
Company and Project Timing  
Scope and Definition  
Reaching Commitment

1545 to 1600 Evening Tea

1600 to 1630 *S.K. Tripathi*  
Closing Remarks

BAGASSE COGENERATION: TECHNICAL SEMINAR AND WORKSHOP

MONDAY, 13 FEBRUARY 1995

0845 to 0930 Morning Tea and Registration

0930 to 1000 *[To be determined]*  
Welcoming Remarks  
Introductions

1000 to 1100 *David A. Berkowitz*  
Technical Overview  
Cogeneration Options in the Sugar Mill  
Interconnection; Export of Surplus Power

1100 to 1115 Mid-morning Tea

1115 to 1330 *George St. John*  
Management Overview  
Coproduct of Energy and Sugar: Multibusiness  
Alternate Power Sources and Fuels  
Environmental Issues  
Contracts to Buy Power: Power Purchase Agreements in Hawaii

1330 to 1430 Luncheon

1430 to 1545 *Jacques Albert-Thenet*  
General Principles in Managing a Sugar Factory  
Energy Conservation and System Efficiency  
Energy auditing: Insulation, Leaks, Steam Trap Losses  
Safety; Boiler, Pressure, and Electrical Codes  
Record Keeping; Maintenance of Instrumentation and Controls

1545 to 1600 Evening Tea

1600 to 1730 *Jacques Albert-Thenet*  
Milling Tandems  
Grinding Efficiency, Preventive Maintenance, Lubrication, Vibration  
Monitoring, New Bearing Materials, Alternative Types of Drives

1730 to 1745 Evening Tea

TUESDAY, 14 FEBRUARY 1995

0900 to 0930 Morning Tea

0930 to 1100 *Jacques Albert-Thenet*

Bagasse Moisture, Cane Maturity, Cane Preparation, Mills Adjustments and Drainage, Temperature of Imbibition Water

1100 to 1115 Mid-morning Tea

1115 to 1330 *Jacques Albert-Thenet*

Boiler and Steam System Efficiency, Excess Air, Bagasse Moisture, Combustion and Combustion Control, Heat Loss, Scaling, Insulation, Heat Recovery, Water Usage

1330 to 1430 Luncheon

1430 to 1545 *Jacques Albert-Thenet*

Steam Usage in the Factory, Boiler Pressure, Topping Cycle, Let-down Steam, Juice Heating, Multiple Effect Evaporation

1545 to 1600 Evening Tea

1600 to 1730 *Richard Palmer*

Electrical Consumption and Electrical Practice in the Factory  
Types and Sizing of Motors, Power Factor Improvement, Grounding, Load Balancing

1730 to 1745 Evening Tea

1930 to 2100 Reception

WEDNESDAY, 15 FEBRUARY 1995

0900 to 0930 Morning Tea

*Jacques Albert-Thenet*

The entire day will be devoted to discussion of power generation options using a Case Study approach, based on a nominal sugar mill size of 4000 TCD.

0930 to 1100 Case 1: Optimization of existing plant for maximum power export with minimum investment

1100 to 1115 Mid-morning Tea

1115 to 1330 Case 2: Replacement of old boilers with high pressure boilers, installation of topping cycle v. condensing turbine for generation

1330 to 1430 Luncheon

1430 to 1545 Case 3: Expansion of crushing capacity to 6000 TCD, addition of new high pressure boiler, installation of condensing/extraction turbine

1545 to 1600 Evening Tea

1600 to 1730 Completion of Case 3

1730 to 1745 Evening Tea

THURSDAY, 16 FEBRUARY 1995

0900 to 0930 Morning Tea

0930 to 1100 *Sajiv K. Menon*

Case Study: Development of a 30 MW Sugar Cogeneration Project in India

1100 to 1115 Mid-morning Tea

1115 to 1330 *Jacques Albert-Thenet*

Question period and discussion of Case Studies: options and approaches, relevance to participant factories and strategies.

1330 to 1430 Luncheon

1430 to 1545 *Richard Palmer*

Electrical Considerations:

Interconnection point with local grid, generation and distribution voltage, selection of governor, synchronization, effect of grid voltage and frequency fluctuations, effect of tripping and power outage, safety and protective devices, metering, do's and don'ts of factory power distribution and grounding.

1545 to 1600 Evening Tea

1600 to 1730 Continuation of Electrical Considerations

1730 to 1745 Evening Tea

FRIDAY, 17 FEBRUARY 1995

0900 to 0930 Morning Tea

0930 to 1100 *Jacques Albert-Thenet*

Factory Operations:

Personnel Requirements, Training Needs, Impact of Maintenance and Scheduling

1100 to 1115 Mid-morning Tea

1115 to 1330 Participant Evaluations

1330 to 1430 Luncheon

WORKSHOP PORTION OF TECHNICAL SEMINAR

1430 to 1545 Review of Sugar Mill Questionnaires

Discussion of preliminary design goals for individual cogeneration systems

1545 to 1600 Evening Tea

1600 to 1730 Setting schedule for Workshop design studies and analyses

**SATURDAY THROUGH WEDNESDAY, 18-22 FEBRUARY 1995**

[There will be no workshop session on Sunday, which will be a rest day.]

0900 to 1745 Daily workshop sessions

Tea breaks and luncheon will be provided on the customary schedule.

The Workshop portion of the Technical Seminar will be held in open format, and is designed to support separate teams of engineers in analyzing cogeneration potential of individual sugar mills, whether through efficiency improvement, equipment replacement, or expansion. The Workshop will be interactive, with the expectation that each of the teams would do most of the analysis independently. Computers will be available for the teams that require it, equipped with spreadsheet and word processing software. Teams are encouraged to bring their own files for heat and material balance, and process analysis.

The goal of the TECHNICAL WORKSHOP is to develop a methodology for estimating the cogeneration potential of a sugar mill, defining appropriate cogeneration development options, evaluating trade-offs and optimizing plans. The basis for each team's study effort will be a detailed questionnaire characterizing the performance of individual sugar mills. The participants will be expected to estimate development costs for various cogeneration options and potential income streams from power sales for various tariff scenarios. Finally, participants will be expected to start developing a strategy, implementation plan, and schedule for proceeding with a cogeneration project. The final day of the Workshop will be devoted to presentations by each team of the results of their cogeneration plans and analysis.

**Daily Schedule for the Workshop**

**Friday, Saturday, Monday**

Conceptual design, performance goals, analysis of individual cogen systems.

**Tuesday**

Estimation of installed and operating costs  
Income from electricity sales  
Development of implementation plan

**Wednesday**

Team presentations of cogeneration plans and analysis

LIST OF INVITEES

SUGAR MILLS

Shri V.K. Goel  
Dhampur Sugar Mills Ltd.  
506-507, Kushal Bazar  
32-33, Nehru Place  
New Delhi 110 019

Shri Satwant Singh  
Simbhaoli Sugar Mills  
Simbhaoli 245 207  
Distt. Ghaziabad (U.P.)

Shri D.M. Sawhney  
Triveni Engineering Works Ltd.  
Kailash, 2nd floor  
26, Kasturba Gandhi Marg  
New Delhi 110 001

Shri R.V. Tyagarajan  
Thiru Arooran Sugars Ltd.  
Eldorado Building  
112, Uthamar Gandhi Salai  
Madras 600 034

Shri B.H. Kothari  
Kothari Sugars & Chemicals Ltd.  
Kothari Building  
115, Nungambakkan High Road  
Madras 600 034

Shri C.V. Krishnan  
E.I.D. Parry Ltd.  
Dare House  
P.B.No. 12  
Madras 600 001

Shri R.V. Shirgaokar  
Ugar Sugar Works Ltd.  
Ugarkhurd 591 316  
Distt. Belgaum (Karnataka)

5 additional factories to be selected from Cooperative Sector by NFCSF Ltd.

## SEBs

Shri T. Muthuswamy, Chairman  
Tamil Nadu Electricity Board  
Electricity Avenue, Anna Salai  
800 NKPR Ramasamy Maligai, 10th floor  
Madras 600 002

Shri G.P. Singh, Chairman  
Uttar Pradesh State Electricity Board  
Shakti Bhavan 14 Ashoka Road  
Lucknow 226 001

Shri K.V. Iriniraya, Chairman  
Karnataka Electricity Board  
Shakti Bhavan, Race Course Road  
Bangalore 560 001

Shri A.M. Nimbalkar, Chairman  
Maharashtra State Electricity Board  
Prakashgud, 4th floor  
Bandra (East)  
Bombay 400 051

Shri B.K.Bhat, Chairman  
Gujarat Electricity Board  
Vidyut Bhavan, Race Course  
Baroda 390 007

## CONSULTANTS

Mr. D.D. Puri, Chairman  
Indian Sugar and General Engineering Corp.  
Paras Cinema Building  
Nehru Place  
New Delhi 110 019

Mr. N. Radhakrishna Rao, General Manager (Engineering)  
The K.C.P. Limited  
Tiruvottiyur  
Madras 600 019

Mr. G.V. Raman, President  
Avant-Garde Engineers & Consultants (P) Ltd.  
58, Fourth Avenue  
Ashok Nagar  
Madras 600 083

Mr. R.R. Gopinath, Director  
Tata Consulting Engineers  
73/1 St. Mark's Road  
Bangalore 560 001

Shri A. Srinivasulu, Director (ERD)  
Bharat Heavy Electricals Limited  
BHEL House, Siri Fort  
New Delhi 110 049

Dr. R. Vasudevan, Director  
School of Energy  
Bharathidasan University  
Tiruchirappalli 620 023

Mr. Mangal Singh, Adviser  
Bajaj Bhavan, 2nd Floor, Jamnalal Bajaj Marg  
226, Nariman Point  
Bombay 400 021

GOI, BANKS, etc

Mr. Ajit K. Gupta  
Director (Power)  
Ministry of Non-Conventional Energy Sources  
Block No. 14, C.G.O. Complex, Lodhi Road  
New Delhi 110 003

Mr. Subhir Mohan  
Director (Biomass Cogeneration)  
Ministry of Non-Conventional Energy Sources  
Block No. 14, C.G.O. Complex, Lodhi Road  
New Delhi 110 003

Mr. U.N. Panjiar, Joint Secretary  
Ministry of Non-Conventional Energy Sources  
Energy Sources  
Block No. 14, C.G.O. Complex, Lodhi Road  
New Delhi 110 003

Mr. J.J. Bhagat, Mission Director  
Sugar Technology Mission  
Department of Science and Technology  
Government of India  
D-5, Qutab Hotel  
New Mehrauli Road  
New Delhi 110 016

Mr. V.J.B. Andrews, General Manager  
Industrial Development Bank of India  
IDBI Tower  
Cuffe Parade  
Bombay 400 005

Mr. V. Bhakthavatsalam  
Managing Director  
Indian Renewable Energy Development Agency  
3, Ring Road (FF)  
Kilokri, opp. Maharani Bagh  
New Delhi 110 014

Mr. Rajat Nandi, Senior Director  
Confederation of Indian Industry  
23, 26, Institutional Area  
Lodhi Road  
New Delhi 110 003

Shri S.K. Tripathi  
Joint Secretary (Sugar)

Ministry of Food  
Krishi Bhawan  
New Delhi 110 001

Shri B. Pandian  
Chief Engineer  
Non-conventional Energy Sources  
State Government of Tamil Nadu  
800, Annasalai  
Madras 600 002

# D R A F T

invite.001

December 4, 1994

Managing Director  
XYZ Sugar Mills Ltd.  
State of India

Dear :

USAID is sponsoring two seminars on the subject of Bagasse Cogeneration, with the support of the Indian Sugar Mills Association. The seminars will be held in Madras at the Aruna Quality Inn, as follows:

Management Seminar	10-11 February 1995
Technical Seminar and Workshop	13-22 February 1995

The Management Seminar is intended for top-level managers, and will focus on planning and decision-making issues (technical, financial, and contractual) associated with producing electricity for sale to the grid.

The Technical Seminar and Workshop is for senior technical personnel who manage and direct sugar factories, and will focus on technical and design options for cogeneration systems, including: steam conditions and process efficiency, energy balance, equipment selection, power generation, electrical interconnection and safety. The Workshop is optional for those who wish to proceed with design and specification of a cogeneration system.

The Seminar faculty includes sugar technologists from the Hawaiian sugar industry, and others with extensive experience in cogeneration. They will be joined by several experts from the Indian sugar industry. The program is being organized for USAID by Dr. David Berkowitz, a cogeneration expert. A preliminary program for both Seminars is attached.

We invite you to send two participants to the Management Seminar and two participants to the Technical Seminar and Workshop.

There will be no charge for the seminars or training materials. However, participants must pay for their own travel arrangements and hotel accommodations. A block of rooms is set aside at the Aruna Quality Inn.

Sincerely,

David W. Hess  
Office of Environment, Energy and Enterprise  
USAID/India

# D R A F T

invite.002

December 4, 1994

Managing Director  
ABC State Electricity Board  
India

Dear

USAID is sponsoring two seminars on the subject of Bagasse Cogeneration, with the support of the Indian Sugar Mills Association. The seminars will be held in Madras at the Aruna Quality Inn, as follows:

Management Seminar	10-11 February 1995
Technical Seminar and Workshop	13-22 February 1995

The Management Seminar will focus on planning and decision-making issues associated with producing electricity for sale to the grid. The Technical Seminar will focus on technical aspects and design options for cogeneration systems, and will include specific discussion of power generation, interconnection with the grid, protection and safety.

In addition to sugar technologists from the Hawaiian sugar industry, the faculty will include experts in transmission and distribution, and cogeneration contracts and tariffs. The program is being organized for USAID by Dr. David Berkowitz, a cogeneration expert. A preliminary program for both Seminars is attached.

We invite you to send one participant to the Management Seminar and one participant to the Technical Seminar. There will be no charge for the seminars or training materials. However, participants must pay for their own travel arrangements and hotel accommodations. A block of rooms is set aside at the Aruna Quality Inn.

Sincerely,

David W. Hess  
Office of Environment, Energy and Enterprise  
USAID/India

# D R A F T

invite.003

December 4, 1994

Managing Director  
PQR Engineers and Consultants  
India

Dear

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Technical Seminar and Workshop	13-22 February 1995

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The Seminar faculty includes sugar technologists from the Hawaiian sugar industry, and others with extensive electric utility and private sector experience in cogeneration. They will be joined by several experts from the Indian sugar industry. The program is being organized for USAID by Dr. David Berkowitz, a cogeneration expert. A preliminary program for both Seminars is attached.

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Sincerely,

David W. Hess  
Office of Environment, Energy and Enterprise  
USAID/India

# D R A F T

invite.004

December 4, 1994

General Manager  
IDBI, IREDA, CII  
India

Dear

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Sincerely,

David W. Hess  
Office of Environment, Energy and Enterprise  
USAID/India

**PROPOSED TASK LIST FOR ISMA SUPPORT OF  
USAID SEMINARS ON BAGASSE COGENERATION**

**1. Invitation of Sugar Mill Participants**

D.A. Berkowitz will provide letters of invitation on behalf of USAID to be sent to the sugar mills. The letters will include the preliminary seminar schedule, and a brief sugar mill questionnaire. The mills may send participants to either or both seminars: top-level executives and financial managers for the Management Seminar, and senior mill and technical managers for the Technical Seminars.

ISMA will identify enough sugar mills to assure attendance of at least 20, but not more than 25, participants at each seminar, representing at least ten mills. There will be good geographic distribution, with mills from both private and co-op sectors. Mills will be selected with cogeneration projects already underway, or under serious consideration. Other criteria include an estimated surplus capacity of at least 1 MW, or crushing capacity (existing or planned) of at least 3500 TCD.

**2. Invitation of Electricity Board Participants**

For the Management Seminar, the electricity board representatives must speak with authority on policy matters, including: tariffs; arrangements and agreements for purchase, wheeling, and banking; and demand and capacity projections. For the Technical Seminar, the electricity board participants will discuss: local distribution characteristics and equipment; grid reliability; interconnection safety and protection equipment; metering and calibration.

ISMA will identify at least 3, but not more than 6, electricity board representatives, as above, from Andhra Pradesh, Bihar, Karnataka, Maharashtra, Tamil Nadu, or Uttar Pradesh, and preferably from those states which have the most active interest in cogeneration.

ISMA will invite short policy presentations from the electricity boards for the Management Seminar, to fill a total schedule time of one hour.

ISMA will invite short technical presentations from the electricity boards for the Technical Seminar, to fill a total schedule time of one and one-half hours.

**3. Administrative Arrangements**

ISMA will provide a Seminar Coordinator who will be available full-time for seminar activities starting on 16 January 1995. The Coordinator will: assist D.A. Berkowitz in final preparation of seminar materials and arrangements; arrange access to secretary, copier, computer, and telecommunication facilities; maintain a participant master list; coordinate with the Quality Inn Aruna for final arrangements and room requirements; and be a focal point for queries and communications.

Two additional Assistants will be provided by ISMA on the first day of each Seminar to help with registration and distribution of participant materials.

The participant master list will be updated as required, and will include every invitee, every acceptance, and all other participants, including faculty, MNES, electricity boards, USAID, industrial organizations, etc. The lists will include complete name, title, affiliation, address, telephone and fax numbers.

4. Miscellaneous

ISMA and D.A. Berkowitz will jointly review and finalize the proposed arrangements at Aruna Quality Inn with respect to number of blocked rooms, schedule, conference package of meals and refreshments, and other requirements, etc.

ISMA will keep accurate records of time and expenses incurred, and submit all charges to D.A. Berkowitz in a manner to be agreed by both parties. Payment will be made by US\$ check.

ISMA will prepare individual folders for each participant, in both Management and Technical Seminars. D.A. Berkowitz will provide certain technical papers which must be copied and included in the folders. The complete folders will be prepared in advance and be available to each participant at the time of registration.

Such additional matters as may come up in connection with the Seminars will be dealt with jointly in a timely manner.

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