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U.S.-Russian Cooperation Powerplant Efficiency and Reliability Enhancement Project Status Report

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US – Russian Cooperat on Thermal Power Plant Efficiency a ıd Reliability Enhancement

Meet with Energy Ministry and RAO/UES

- December 2002
- Agree on concept & scope
- Identify candidate power plant, Primorskaya GRES
- Obtain initial data set
- Go/No-go decision to proceed

Preliminary Scoping Mission

- Summer 2003
- Data analysis underway
- Small team of US experts review mine/fuel supply, plant operation, and performs needs assessment
- Team report and recommendations
- Go/No-go decision to proceed

Finalize US & Russian Analysis/ Diagnostic Teams

- Late Summer '03
- Russian team includes ministries, national utility, coal and boiler companies, and engineering institutes
- US team includes counterpart organizations plus financial expertise

On-Site Analysis and Diagnostics

- ı all 2003
- ı efine specific n easures for improvements at candidate plant
- Study tour by Russians to US facilities similar to candidate plant
- Go/No-go decision to proceed

Feasibility Study & Implementation

- Begin Winter 2003
- Conduct feasibility study; "bankable" document to attract investment
- Implement measures to improve performance
- Document process and replicate in other Russian plants

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WHERE ARE WE?

- Technical information received
- Russian Contacts Identified
- US Team Defined
- Phased Approach Implemented

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RUSSIAN TECHNICAL ISSUES (1)

- Primorskaya GRES (Gosudarstvennaya Rayonnaya Electrostantsiye – Regional, state-owned electric generation power plant)
- Total Design Capacity 2,570 MWt, consisting of:
  - Unit 1: 1,280 MWt (4 x 110 MWt plus 4 x 210 MWt) – Commissioned
  - Unit 2: 645 MWt (of 3 x 215 MWt) – One Commissioned
  - Unit 3: 645 MWt (of 3 x 215 MWt) – Under Construction
  - Installed Capacity: 1,495 MWt – Actual Capacity: 1,467 MWt
  - Fuel Source: Bikinskiy Coal from the Luchegorsk Mine
  - Almost 30% of Coal is Imported (from other Russian mines)

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RUSSIAN TECHNICAL ISSUES (2)

- Fuel supply about 1750 kcal/kg vs. design 2000 kcal/kg
- Lack of conveyor belts, poor bulldozer maintenance
- High wear and tear rate on railway deliveries
- No quality control system for coal received
- Heating and flushing system for black oil in winter doesn't exist
- Excessive ash cover of convection heating surfaces of boilers
- Only one boiler working in Unit 2 – construction terminated

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RUSSIAN TECHNICAL ISSUES (2) cont.

- No heat load automation at boilers
- Need to replace worn compressors
- Obsolete control and measurement instrumentation
- Unavailability of automated process management systems
- High-voltage breakers don't meet appropriate standards
- Need a new oxygen-nitrogen station
- Inadequate ash dumping space
- Deteriorating water quality in cooling pond (summer) due to algae

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RUSSIAN CONTACTS:

- Viktor Vladimirovich Milush, Team Leader
  Director of Primorskaya GRES and Coordinator for Luchegorsk Mine

- Alexey Mikhailovich Bychkov, Director
  Department of New Techniques and Technologies
  RAO EES Rossii

- Oleg Borisovich Pluzhnikov, Deputy Director
  Ecological Department
  Ministry of Energy of the Russian Federation

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U.S. TEAM:

- Robert Gentile, Team Leader, President, LTI/Atlantic Partners. Extensive engineering experience; chief regulator for surface mining, reclamation and enforcement for the U.S.; Assistant Secretary for Fossil Energy.
- Robert Dolence, Mining Engineer, President, Robert C. Dolence Associates. Senior positions in U.S. Department of Interior and Energy, Deputy Secretary for Environment and Natural Resources, State of Pennsylvania.

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U.S. TEAM cont.

- Steve Denton, General Manager, Usibelli Coal Mine, Inc., Alaska. Expert in coal mining and mine reclamation operations under severe and arctic conditions.

- Vladimir Vaysman, Mechanical Engineer, Parsons Energy & Chemicals Group, Inc. Specialist in utility and industrial boiler plant modification and emission reduction projects. Extensive experience in Eastern Europe. Fluent in Russian.

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SCHEDULE AND NEXT STEPS:

- Data analysis underway. Team will work with V.V. Milush toward a Summer assessment; timing, on-site logistics, other technical issues
- Join U.S.-Russian Go-No-Go decision to be made following preliminary assessment report
- "Go" decision will identify full analytical/diagnostics required; Russian team to include ministries, national utility, coal and boiler companies, engineering institutes. U.S. team represents counterparts plus financial expertise.