

DENSE MEDIA CYCLONE OPTIMIZATION

Report Type: Quarterly Technical Progress Report

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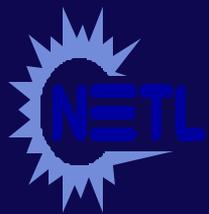
Partition Enterprises

Precision Testing Laboratories



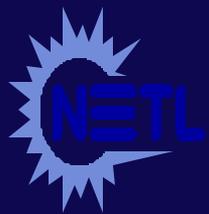
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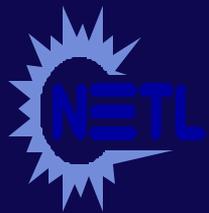
ABSTRACT

All technical project activities have been successfully completed. This effort included (i) completion of field testing using density tracers, (ii) development of a spreadsheet based HMC simulation program, and (iii) preparation of a menu-driven expert system for HMC trouble-shooting. The final project report is now being prepared for submission to DOE comment and review. The submission has been delayed due to difficulties in compiling the large base of technical information generated by the project. Technical personnel are now working to complete this report. Effort is being underway to finalize the financial documents necessary to demonstrate that the cost-sharing requirements for the project have been met.



Project Objective

- ❑ To develop engineering tools to improve HMC performance.
- ❑ These include:
 - Low cost density tracers to rapidly assess HMC efficiency (used by plant engineers)
 - Process models to predict influence of operating and design variables (used by plant designers)
 - Model-based expert system to provide a user-friendly interface for trouble-shooting HMC problems (used by equipment operators)



Project Cost Summary

Accrued Costs: \$153,583 (out of \$153,858 available)

Invoiced Costs: \$153,583

Source	First Year		Second Year		Third Year		Totals	
	Plan*	Actual	Plan*	Actual	Plan*	Actual	Plan	Actual
Participant	\$79K	\$79K	\$87K	\$87K	0	---	\$166K	\$166K
DOE	\$96K	\$96K	\$58K	\$58K	0	---	\$154K	\$154K
Total	\$175K	\$175K	\$145K	\$145K	0	---	\$320K	\$320K

**Budget after approved no-cost time extension*

KEY:

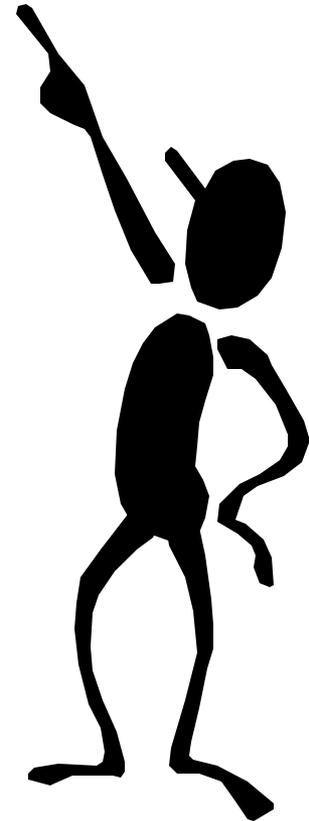
Plan = Planned costs for the full year.

Actual = Actual costs through the reporting period.



Milestones and Status

- Task 1: Baseline Assessment **completed** using density tracers and sampling campaigns.
- Task 2: Circuit Modifications **completed**, including plant upgrades and new O&M practices.
- Task 3: Follow-Up Assessments **completed** on a monthly basis to track process improvements.
- Task 4: Sample Analyses **completed** for all samples from monthly and detailed test programs.
- Task 5: Data Analysis/Simulation **completed** for all plant sites using spreadsheet simulator.
- Task 6: HMC Expert System **completed** for plant training and trouble-shooting.
- Task 7: Concept Assessment is **being finalized** (final report and cost-sharing documents).



Project Recognition



- Technical Publications/Presentations
 - Luttrell, G.H., Bomar, T.S., and Wood, C.J., 2002. "Optimization of Heavy Media Cyclone Circuits," Proceedings, **SME Annual Conference & Exhibit**, Phoenix, Arizona, February 25-27, 2002, Preprint No. 02-128, 7 pp.
 - Luttrell, G.H., Bomar*, T.S., Wood, C.J., and Bethell, P.J., 2002. "Operating Guidelines for Heavy Media Cyclone Circuits," Proceedings, **19th Annual Coal Preparation Exhibition & Conference**, Lexington, Kentucky, April 30-May 2, 2002, pp. 117-124.
 - Luttrell, G.H., Barbee, C.J., Wood, C.J., and Bethell, P.J., 2002. "An Industrial Evaluation of Heavy Medium Cyclone Circuits," Proceedings, **19th Annual International Pittsburgh Coal Conference**, Pittsburgh, Pennsylvania, September 23-27, 2002, Session 22 – Coal Production and Preparation I, Preprint No. 22-1, 10 pp.
 - Luttrell, G.H., Barbee, C.J., Wood, C.J., and Bethell, P.J., 2003. "Operating Guidelines for Heavy-Media Cyclone Circuits," **Coal Age Magazine**, Vol. 108, No. 4, April 2003, pp. 30-34.
 - Luttrell, G.H., Wood, C.W., and Bethell, P.J., 2004. "Simulation of Heavy Medium Cyclone Performance," Proceedings, **SME Annual Conference & Exhibit**, Denver, Colorado, February 24-25, 2004, 6 pp.
 - "Coal Preparation," **Annual Alabama Mining Institute Meeting**, Regional Chapter of SME, September 5-6, University of Alabama, Tuscaloosa, AL, (Presentation Only).



Project Recognition

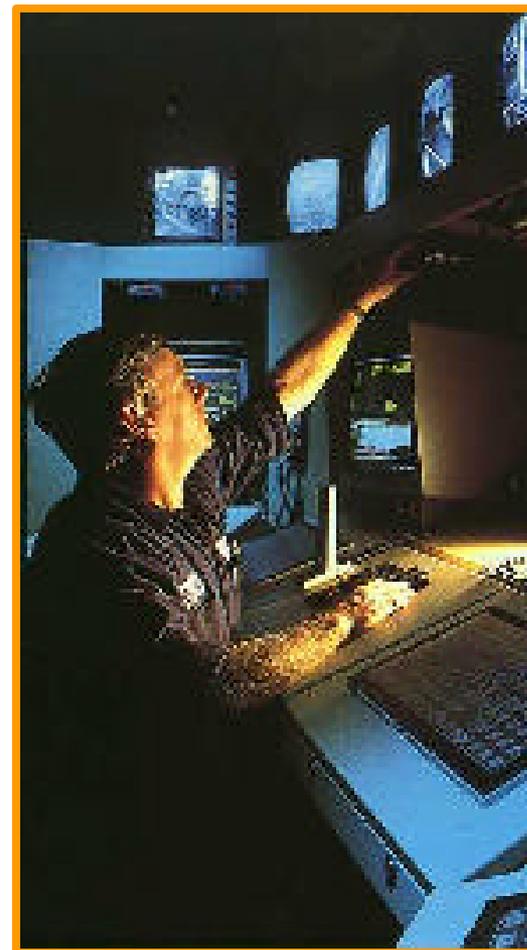


- Workshop/Training Sessions (**Provided to 219 Individuals**)
 - "O&M Standards for Heavy Media Cyclones," Half-Day Workshop, Massey Coal Services, Chapmanville, WV, February 9, 2001, 18 attendees.
 - "O&M Standards for Heavy Media Cyclones," Half-Day Workshop, Massey Coal Services, Chapmanville, WV, March 9, 2001, 11 attendees.
 - "Introduction to Coal Preparation," One-Day Short Course, Sponsored by Coal Prep 2001 Exhibition & Conference, Lexington, KY, April 30, 2001, 66 attendees.
 - "O&M Standards for Heavy Media Cyclones," Half-Day Workshop, TECO Coal Company, Dunbar, KY, June 12, 2001, 14 attendees.
 - "O&M Standards for Heavy Media Cyclones," Half-Day Workshop, Massey Coal Services, Chapmanville, WV, July 6, 2001, 10 attendees.
 - "O&M Standards for Heavy Media Cyclones," Half-Day Workshop, Massey Coal Services, Chapmanville, WV, August 17, 2001, 8 attendees.
 - "O&M Standards for Heavy Media Cyclones," Half-Day Workshop, Massey Coal Services, Charleston, WV, February 1, 2002, 7 attendees.
 - "O&M Standards for Heavy Media Cyclones," Half-Day Workshop, Massey Coal Services, Charleston, WV, February 15, 2002, 13 attendees.
 - "O&M Standards for Heavy Media Cyclones," Half-Day Workshop, Massey Coal Services, Charleston, WV, March 1, 2002, 14 attendees.
 - "O&M Standards for Heavy Media Cyclones," Half-Day Workshop, Massey Coal Services, Charleston, WV, March 22, 2002, 13 attendees.
 - "O&M Standards for Heavy Media Cyclones," Half-Day Workshop, Massey Coal Services, Chapmanville, WV, July 10, 2002, 14 attendees.
 - "Heavy Medium Cyclones," Half-Day Workshop, Coastal Coal Company, Kingwood, WV, planned for October 23, 2002, 12 attendees.
 - "O&M Guidelines for Heavy Medium Cyclone Circuits," Half-Day Workshop, Alpha Natural Resources, Abingdon, VA, December 10, 2003, 19 attendees.



Commercialization Outlook

- ❑ Tracer services now offered by Precision Testing Laboratories (PTL) of Beckley, WV.
- ❑ Tracers recently used by PTL at industrial sites:
 - Turris Coal
 - Sapphire Coal
 - Arch Coal
- ❑ Project data used to obtain spin-off project involving electronic tracers that can be remotely detected.



Project Status

- ❑ Technical activities successfully completed.
- ❑ Expenditures well within budget allocations.
- ❑ Project closeout underway.
 - Editing/Submission of Final Project Report
 - Securing Required Cost-Sharing Documentation

