

Horizon Sensing (Proposal #51)

April-June 2001 Quarterly Report (2nd)

- **Principal Investigator:** Larry G. Stolarczyk, Sc.D., Stolar Research, Inc.
- **NETL Project Manager:** David M. Hyman
- **Partners:**
 - Los Alamos National Laboratory
 - CONSOL, Inc.
 - RAG American Coal
 - FMC Corporation
 - Lee Ranch Coal Company
- **Total Project Cost:** **\$1,860K**
 - DOE Share: \$ 900K (incl. \$40K to LANL)
 - Participant Share: \$ 960K
- **Project Period:** **36 months**
- **Project Start Date:** **20 December 2000**
- **Report Date:** **31 July 2001**
- **DOE Award No.:** **DE-FC26-01NT41050**



Project Objectives

- To demonstrate the feasibility of real-time stress measurement, bit loading, and horizon sensing on a longwall shearer, boring machine, continuous miner, and loading bucket.



Photo Library



HS-3 Installed on Joy CM-14



HS-3 Installed on Joy HM-31



HS-3 Power Generator



HS-3 Display on Joy HM-31



HS-3 Display Screen and Menu

Project Cost Summary

(Amount in Thousands of Dollars)

	First Year		Second Year		Third Year		Total	
	Plan+	Actual*	Plan+	Actual*	Plan+	Actual*	Plan	Actual
Participant	320	1,960	320	3,360	320	3,360	960	
DOE	303		298		298		900	
Total	623		618		618		1,860	

Key

+ Planned costs for the full year

* Actual costs through the reporting period. Based on full Stolar Horizon staff deployment of the Horizon Sensor Project at \$280K/month



Milestones and Status

Major Milestones Planned to Date/Status

Planned Milestone

Status

- | | |
|---------------------------------------|----------|
| – Shock and Vibration Testing | Mar. 02 |
| – Calibration Neural Network Software | Mar. 03 |
| – Integrate Boom Inclinometer | Apr. 04 |
| – S.A. In-mine CM Test (S. Africa) | Jul. 01 |
| – Anticipated U.S. MSHA Certification | Aug. 27 |
| – U.S. In-mine CM Test (Exxon) | Sept. 03 |
| – U.S. In-mine CM Test (Consol) | Sept. 10 |
| – U.S. In-mine Bore Miner Test (FMC) | Sept. 10 |
| – In-mine Longwall Drum | Oct. 01 |



Key Accomplishments

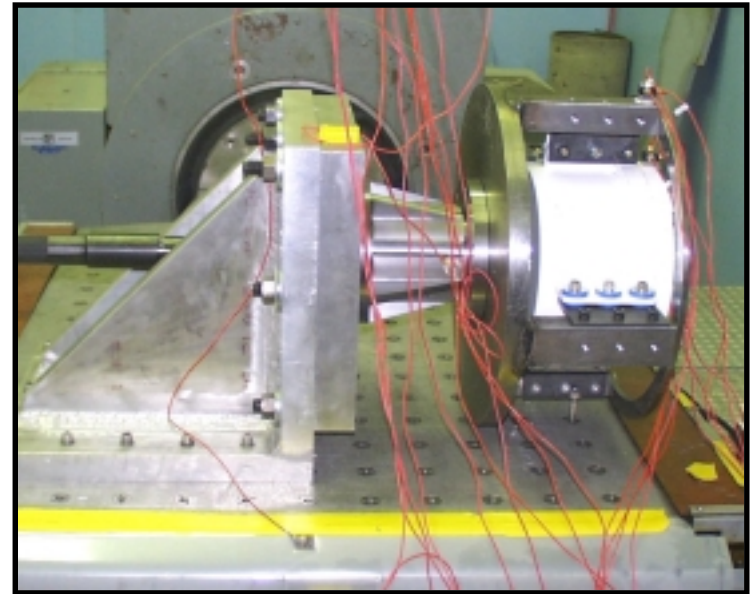
Progress to Date Highlights

- Completed HS-2 prototype drum CM test at Consol – February 2001
- Applied for MSHA certification for HS-3 system – February 2001; Anticipated certification – August 2001
- Drum CM shock and vibration measurements at Consol yield 80g shock expectations – March 2001
- Prototype Drum HS-3 designed to withstand 80g impacts –March 2001
- Integration of cutter boom inclinometer to measure mine height and sump depth – April 2001
- Sandia National Lab shock and vibration tests confirm HS-3 integrity under mine conditions – May 2001
- Eleven (11) HS-3 Systems (complete w/ spares) built for field test program – May/June/July 2001
- Negotiated field test contracts with mining companies



Good News!

- **Prototype Installation of HS-2 Horizon Sensor proved that uncut coal could be measured in Real-Time.**
- **Mining Companies believe that the Horizon Sensor is essential to the cleaner coal mining technologies.**
- **Senate and House members support Clean Coal Technologies.**
- **To increase the ‘science’ factor in the Art and Science of mechanical design for mining equipment, Sandia National Laboratories offered the services of its Centers of Excellence in areas of structural analysis and vibration testing of the HS-3 Horizon Sensor.**



Project Recognition

- Trade Show Booth Featuring HS-2 at Mine Expo 2000
- Trade Show Booth Featuring HS-2 at SME 2001 Annual Meeting
- Trade Show Booth Featuring HS-3 at 2001 Longwall USA
- Trade Show and Televised New Conference Featuring HS-2 in Albuquerque, 2001
- World Coal Magazine Feature Article May 2001
The World of Smart Mining



Project Assessment

(Internal DOE Use Only)

- **Open Issues and/or Problems**
 - None noted
- **Overall Assessment**
 - Off to a good start

