CONDELL 2000
SHAFT GUIDE ALIGNMENT MEASUREMENT SYSTEM

APPLICATION

The EMS Technik CONDELL 2000 Shaft Guide Alignment Measurement system is a state-of-the-art instrumentation system which is used to check and test shaft guide alignment on inclined and vertical mine shafts. Test results are processed and displayed on a standard personal computer.

The quantitative evaluation of the trueness of the guides in a shaft has always presented a formidable technological challenge. The recording of the deceleration in the X-X, Y-Y and Z-Z planes, while the conveyance is in motion, has proved to be the most reliable method of measuring the true alignment of the guides. Traditional measurement recorders are capable of accurately measuring these excursions but has never been able to pin-point the exact position of a guide misalignment in the shaft.

EMS Technik has addressed these problems and believes that the EMS Technik CONDELL 2000 system provides not only an elegant solution to these traditional problems but also becomes a cost-effective way in which most mines can regularly evaluate the condition of their shafts and thereby possibly preventing the crippling costs that could be incurred through shaft guide rail failures.

The CONDELL 2000 system is also capable of measuring the distance between the shaft guides with the aid of laser distance measuring sensors. These measurements provide accurate guide width versus position information.

EQUIPMENT SUMMARY

The CONDELL 2000 system comprises of the following equipment:

1. Conveyance Logger complete with an XYZ Decelerometer and optional laser distance sensors,

2. A winder unit complete with a 500-pulse/revolution shaft encoder,

3. Personal Computer with the CONDELL 2000 Software programme suite.

SUMMARY OF OPERATIONAL PROCEDURES

Before a test is commenced the battery powered Conveyance Logger is time synchronised with the Winder Unit and the personal computer. The Conveyance logger is then simply placed in the conveyance who*s guide alignment is to be checked and connected to the X,Y,Z decelerometer which has been clamped to the conveyance. The recording process is started and the Conveyance equipment proceeds to record up to 8 analogue channels (On-board Battery voltage, X-Axis deceleration, Y-Axis deceleration, Z-Axis deceleration, Left Guide Laser sensor(Optional), Right Guide laser sensor(Optional) and 1 spare) onto it*s on-board solid state memory. Each analogue input is sampled 100 times a second.

The inspector then starts the data acquisition process in the Winder Unit and the unit commences it*s sampling of the winder*s rotational position, against time. The winder*s rotational position is captured from the rotary encoder fitted to the winder*s shaft.

Upon completion of a test the Conveyance equipment is connected to the PC on the surface who then copies the contents of the Conveyance equipment*s memory onto the PC*s disc where the rotational measurements of the Surface unit has previously been written to so that the two sets of samples are captured against a common time base. The PC is now able through it*s program to process and display or print the captured analogue channels of the conveyance against time and position.

Program on the PC allows for the detailed analysis of the captured information against pre-defined maximum X, Y and/or Z excursions etc. By comparing these printouts the ability now exist whereby the most recent test results can be compared against the results of previous test thus enabling the user to detect developing trends which may signify the gradual deterioration of the guide rails in a shaft.

SPECIFICATION SUMMARY

Conveyance Logger	
Memory capacity	16 Mbyte
Recording Time	40 Minutes
Recording Channels	8 x 0-2.5VDC
D/A Resolution	8 Bit
Acquisition rate	100 Samples /second
Data Communication to PC	Ethernet
Winder Unit	
Memory capacity	64 kByte
Recording Time	40 Minutes
Recording Channels	1 Quadrature Pulse Rotary encoder
Acquisition rate	input
Data communications tp PC	5 samples/second
	RS232 19200Baud
XYZ Deceleration head	
Number of axis	3
X-Axis range	± 1g
Y-Axis range	± 1g
Z-Axis range	± 2g

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