WP 07-EU1303

Revision 3

Geomechanical Instrument Data Processing

Technical Procedure

EFFECTIVE DATE: 06/18/08

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APPROVED FOR USE

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INTRODUCTION[1]

This procedure describes the methods used for processing manually and remotely acquired geomechanical instrument data from the Waste Isolation Pilot Plant (WIPP) repository. The general procedure described in this document involves the computer-oriented data entry and reporting system that allows the user to output reading and calculate values and plots from the geomechanical instrumentation data. The geomechanical instruments used are convergence meters, extensometers, piezometers, embedment strain gages, spot welded strain gages, earth pressure cells, rock bolt load cells, convergence points, and stressmeters. The instruments are read to monitor the changes to the underground openings and shafts and changes in the lithostatic and hydrostatic pressures within the rock around the underground openings.

Performance of this procedure may generate one or more of the following records:

- Instrument Data Database
- Attachment 1, GIS Initial Data Sheet

REFERENCES

BASELINE DOCUMENTS

- WP 07-1, WIPP Geotechnical Engineering Program Plan

REFERENCED DOCUMENTS

- WP 07-EU1301, Manually Acquired Geomechanical Instrument Data
- GIS Data Processing System Users Manual, Rev. 1, April 1987

EQUIPMENT

- The Data Processing System includes the Geomechanical Instrumentation System (GIS) Datalogging System computer.

PERFORMANCE

1.0 PROCESSING MANUAL DATA

NOTE

This procedure is followed for all manually entered data and for initial data records made for all instruments when first installed.

An engineer or qualified individual will complete Steps 1.1 through 1.5.

1.1 Take manual readings of the following instruments according to approved WIPP procedures or work instructions and **GO TO** WP 07-EU1301, and record information on appropriate GIS Field Data Sheet(s):

- Piezometers
- Resistance strain gages
- Vibrating wire strain gages
- Rock bolt load cells
- Earth pressure cells
- Stressmeters
- Convergence points
- Extensometers
- Wire convergence meters
- Thermocouples

1.2 Record initial readings on Attachment 1.

1.3 Calculate adjusted readings and record on Attachment 1.

1.4 Date and initial the sheet(s).

1.5 When adjusted readings have been calculated and entered onto the data sheet, supply the checker with the original data sheet and a copy.

1.6 Checker, review the data sheet(s) for accuracy and proper format.

1.7 Checker, checkprint the copy by indicating (highlighting) items approved in yellow and circling all items disapproved in red.

1.8 If items are not approved, return checkprints and originals to the qualified individual for review and changes.

NOTE

Differences are to be resolved through conferences.

1.9 Engineer or qualified individual, add comments to checkprints using a third color.

1.10 Checker, verify that all agreed-to corrections are made.

1.11 Checker, initial and date the originals and checkprints and return them to the qualified individual.

NOTE

The Engineer or qualified individual will perform Steps 1.12 through 1.19.
Rock bolt load cells, strain gages, piezometers, and pressure cells require a pre-installation reading. In the case of a load cell, piezometer, or pressure cell, this would be the unloaded reading; for a strain gage, it would be the installed, pre-stressed reading, etc,

1.12 Input approved data into appropriate database file.

1.13 Generate a hard copy of entered data and compare to approved checkprints for entry errors.

1.14 Mark all correct entries by highlighting in yellow and circling unapproved entries in red.

NOTE

Any errors found should be totaled and entered on the hard copy with the individual's initials, the date, and the checkprint number.

1.15 If entry errors are found, return to database file and make necessary changes.

1.16 Make a hard copy of corrections entered into the database.

1.17 Compare the hard copy to approved checkprints marking the approved corrections by highlighting in yellow and circling errors in red.

1.18 Repeat Steps 1.15 and 1.16 until hard copy matches approved checkprints.

1.19 Transfer data to master database.

NOTE

The Engineer or qualified individual will perform the steps in Section 2.0.

2.0 PROCESSING REMOTE DATA

NOTE

In Step 2.1, the instruments can be connected to networked dataloggers and may be remotely polled.

2.1 Qualified individual, remotely poll the following instruments:

- Resistance strain gages
- Vibrating wire strain gages
- Piezometers
- Earth pressure cells
- Stressmeters
- Convergence meters
- Extensometers
- Wire convergence meters
- Rock bolt load cells

2.2 Qualified individual, generate a report of remote data for editing.

2.3 Engineer or qualified individual, redline the hard copy to indicate inaccurate readings to be deleted.

NOTE

An Engineer or qualified individual must recognize accurate and inaccurate readings through comparison or instrument knowledge.

2.4 Engineer or qualified individual, delete marked records from pollings data base using the redlined hard copy.

2.5 Generate a report of the edited changes and compare to the copy generated in Step 2.3 to verify all marked records have been deleted.

2.6 Repeat Step 2.5, if necessary.

2.7 Process polled data and transfer to appropriate master database.

Attachment 1 - GIS Initial Data Sheet

GIS INITIAL DATA SHEET

GIS ID _____

FIELD TAG _____

DATE ___/___/___ TIME ____:____

INITIAL READING _____

FOR CVPT'S: CHORD _____

FOR EXTN'S: ANCHOR _____ DEPTH _____

V_{in} _____ V_{out} _____ V_{ex} _____

GAGE FACTOR _____

INITIAL READING = [(V_{out} + V_{in} - V_{ex}) / (2V_{in} - V_{ex})] * Gage Factor

LOCATION _____

SKETCH OF INSTALLATION

INSTRUMENT TYPE _____

READING DEVICE _____

SERIAL NUMBER _____

CALIBRATION DUE DATE _____

READING: ☐ MANUAL ☐ REMOTE

COMMENTS _____

VIEW LOOKING _____

DATA REDUCTION BY _____ DATE __/__/__

CHECKED BY _____ DATE __/__/__