

CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES

TRIP REPORT

SUBJECT: FLAC Training Course
AI 06002.01.011.041

DATE AND PLACE: April 3-5, 2006
Itasca Consulting Group, Inc.
Minneapolis, Minnesota

AUTHOR: S. Gonzalez, CNWRA

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SENSITIVITY: Non-Sensitive

PERSONS PRESENT:

The training course was attended by six engineers and geoscientists.

BACKGROUND AND PURPOSE:

The purpose of the course was to provide training in the use of the explicit finite difference program FLAC (Fast Lagrangian Analysis of Continua). FLAC is a two-dimensional continuum program for modeling soil, rock, and structural behavior.

The course instructor was Dr. Zorica Radakovic-Guzina of Itasca Consulting Group, Inc.

SUMMARY OF ACTIVITIES AND PERTINENT POINTS:

The training course was held over three days. The course consisted of both lectures and computer exercises using the latest version of FLAC (Version 5.0). A brief summary of the main topics covered each day is provided below.

Day 1:

Lecture topics included an introduction to FLAC 5.0, including an overview of potential applications and capabilities in geo-engineering analysis and design, FLAC theoretical background, grid generation, and basic material models. Practical computer exercises involved modeling a strip footing to determine bearing capacity, as well as modeling surface subsidence due to underground excavations.

Day 2:

Lecture topics included an introduction to FISH, the programming language of FLAC. FISH may be used to apply a user-written constitutive model that may not be available in FLAC. Lecture topics also included an introduction to groundwater analysis, soil/rock structure interaction in

FLAC, and slope stability analysis using the program FLAC/SLOPE. Several computer exercises related to the above topics were also conducted.

Day 3:

The final day of the training course was devoted to FLAC dynamic analyses. Lectures addressed dynamic loading, material models, damping, and liquefaction modeling principles. A computer exercise involved setting up a seismic analysis.

CONCLUSIONS:

The training course was very comprehensive. The lectures and associated computer exercises introduced a wide range of FLAC applications.

PROBLEMS ENCOUNTERED:

None.

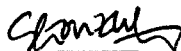
PENDING ACTIONS:

None.

RECOMMENDATIONS:

I found the training course to be extremely beneficial. The course provided a good overview of the main features of FLAC, as well as the general procedures used to conduct various types of analyses. I found the material related to dynamic analyses, which focused on seismic applications, to be particularly relevant to Yucca Mountain work related to site response and soil/rock structure interaction.

SIGNATURES:




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04/25/06

Date


CONCURRENCE:



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