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NOTE TO: John T. Greeves, Chief
Engineering Branch
Division of Waste Management

WM Record File

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WM Project 1

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THRU: Mysore S. Nataraja, Section Leader
Rock Mechanics Section
Engineering Branch
Division of Waste Management

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(Return to WM, 623-SS)

FROM: John T. Buckley
Engineering Branch
Division of Waste Management

SUBJECT: COMPUTER MODELING CAPABILITY AND STRATEGY

Currently, WMEG has a very limited computer modeling capability in the areas of rock mechanics, underground opening stability and geostatistics. With the recent acquisition of the ADINA and ADINAT models our capability to model the thermal, mechanical and thermomechanical processes is slowly expanding. Furthermore, the addition of the IBM PC will significantly increase our ability to perform geostatistical analyses in the near future.

At this time, ADINAT is on line at Brookhaven and on the NRC's Data General Computer. CorSTAR Research is using the Brookhaven System to run sample problems and validation problems as requested under NRC Contract NRC-02-81-026. John Voglewede has made the necessary modifications to the ADINAT Code so that it is now available for use by NRC staff members on the Data General.

The ADINA Code is currently being used by CorSTAR on Brookhaven to run sample problems and validation problems. It has not yet been successfully transferred over to the NRC's Data General computer. Format differences between the CDC computers and the Data General computer are slowing up the transfer process. John Voglewede said he could probably have the transfer completed by the end of September, 1985 if it became a high priority.

Dr. Y. C. Kim from the University of Arizona has offered to send me a copy of the basic geostatistics programs at no charge. These programs will be compatible with the IBM-PC and should require very little lead time before analyses can be run. Its just a matter of receiving the programs from Dr. Kim.

ADINA and ADINAT will most likely be the major codes used in our thermal and mechanical modeling efforts. However it would be desirable to obtain and become familiar with other models being used by DOE at various sites. CorSTAR

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has been requested by the NRC to study those codes being used by DOE and recommend several codes which they feel would be valuable modeling tools for the NRC staff. CorSTAR has recommended that the following Codes be transferred to the NRC for use in the Engineering Branch:

- HEATING6 - 3D, steady state or transient heat conduction
- STEALTH - 3D, thermomechanical structural analysis
- ADINA/ADINAT - 3D, structural mechanics and heat transfer
- DOT - 2D, steady state & transient heat conduction
- MATLOC - 2D, finite element, stress analysis
- VISCOT - 2D, finite element, mechanical or thermal stress
- COYOTE - 2D, finite element heat conduction
- SALT 4 - 2D, stress analysis & heat transfer, creep

These codes will enable the NRC to independently evaluate DOE's modeling analyses. The current schedule indicates that the above codes will be transferred to the NRC for use by September, 1986. Included in the code transfer will be an updated users manual and sample problems.

Currently, not enough WMEG staff time is devoted to the development of an independent modeling capability. In order to develop and maintain a modeling program, at least one FTE, and preferably two, must be assigned to this project. I would recommend that at least two staff members become involved in the modeling efforts. The WMEG Branch could acquire the desired modeling capability by early 1987 if adequate time is allocated to at least two staff members. However, a geostatistical analysis capability can be developed by January 1986 with no changes to staff priorities.

Original Signed By

John T. Buckley
Engineering Branch
Division of Waste Management

cc: WM Branch Chiefs
WMEG staff

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