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Salt Repository Project Office
505 King Avenue
Columbus, Ohio 43201-2693

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April 2, 1984

J. William Bennett, Associate Director (Acting)
Geological Repository Deployment
Office of Civilian Radioactive Waste Management, DOE
  Project Office

SUBJECT: SRP PARTICIPATION IN INTRACOIN

Reference: February 6, 1984 memo to J. Neff, et al. from J.W. Bennett,
             Decision Regarding INTRACOIN Participation

The Salt Repository Project will proceed to participate in the INTRACOIN
exercise by running by the end of calendar year 1984 the following:

    o Level II Porous Media Cases a and b
    o Level III Porous Media Case - effects of code dimensionality

We expect to be able to project a more accurate date and form of documentation
during Fall of 1984. Enclosed for your information is ONWI's letter
recommending this participation.

J. O. Neff
Program Manager
Salt Repository Project Office

SRPO:LAC:1884A   ST#405-84

Enclosure:
March 1, 1984 letter to R. Wunderlich from S. Goldsmith, INTRACOIN
Participation

cc: C. Cooley, DOE-RW-24, w/encl.
     D. Vieth, DOE-NV, w/encl.
     L. Olson, DOE-NV, w/encl.
     T. Verma, NRC, w/encl. and with referenced incoming letter
     S. Gupta, ONWI, w/o encl.
     G. Jansen, ONWI, w/o encl.
     T. Steinborn, ONWI, w/o encl.

March 1, 1984

R. C. Wunderlich, Chief
Engineering and Technology, SRPO

INTRACOIN PARTICIPATION

The Salt Repository Project can and should productively participate in
at least part of the problem sets of INTRACOIN Levels 2 and 3.

Although NRC came into Levels I and II after DOE discontinued its
INTRACOIN efforts, NRC through its contractor SANDIA is now a full
participant at all levels of INTRACOIN. Considerable insight into their
plans and technical awareness in verifying and validating codes could be
gained by observing their performance on INTRACOIN problem sets.

We did participate fully in Level I of INTRACOIN. ONWI ran the original
analytical GETOUT code for the few problems to which it was applicable
and ONWI's subcontractors also participated in an activity coordinated
by ONWI. UC Berkeley ran the analytical UCBNE codes, INTERA ran the
finite element SWENT code and PNL ran the stochastic MMT code. This
participation resulted in the UCBNE10.2 code being selected by ONWI (and
the world) as a standard analytical code with 80 benchmark cases, and in
the replacement of the original GETOUT code by the SCOPE code BAIRN
developed by PNL (basically a new GETOUT with a UCBNE10.2 kernel).

Our participation also resulted in the development at ONWI of the
analytical code LAYFLO (similar to the Swiss RANCH code) which is
essential for modelling transport through layered media directly from
the repository to the surface. A limited participation in Level 2
INTRACOIN was done using it. We see no further need to apply in
INTRACOIN new analytical codes, since the problems already worked can be
rerun with new codes that use the same principles.

The Salt Repository Project relies less heavily than the hard rock sites
on nuclide transport codes because salt has the limited availability of
water as an extra layer of safety and because we must use part of our
resources to deal with modelling of salt dissolution. However, we will
always need finite element nuclide migration codes as well as
analytically based codes to handle the entire problem of transport to
the accessible environment. Therefore, we should participate in the
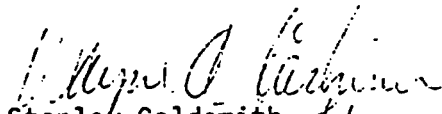INTRACOIN program.

ST# 291-84
WBS 1.3.1

NRC is using INTRACOIN Test Cases to benchmark GEOTRANS, and PNL is also using INTRACOIN Test Cases to model codes for ONWI. By the end of calendar year 1984, our personnel should be able to run the following cases from the INTRACOIN problem sets to benchmark codes under development:

- Level II Porous Media Cases a and b
- Level III Porous Media Case - effects of code dimensionality.

In particular, Sumant Gupta of PAD-ONWI is upgrading his code of coupled flow, energy and solute transport to include multidimensional radionuclide chain transport. The above INTRACOIN problem sets will provide a useful framework in which to compare his results with those of other codes. This comparison is a necessary part of code verification and does not present a commitment of additional resources.

If you have any questions or comments regarding this matter, please contact G. Jansen of my staff at extension 7317.

Stanley Goldsmith
Director

SG/GJ:rb

In triplicate

cc: JO Neff (3)

memorandum

DATE: FEB 6 1984

REPLY TO
ATTN OF: RW-20

SUBJECT: Decision Regarding INTRACOIN Participation

TO: J. Neff, NPO
S. Mann, CH
D. Vieth, NV
L. Olson, RL

Reference: "Decision Memorandum Regarding INTRACOIN and HYDROCOIN Participation," November 10, 1983

Background: The International Nuclide Transport Code Intercomparison (INTRACOIN) is an international radionuclide transport code benchmarking, verification, and validation effort sponsored by the Swedish Nuclear Power Inspectorate (SKI).

The structure of the INTRACOIN exercise consists of problem sets representing three levels. Each level has a primary objective:

- First level - comparison of numerical accuracy (benchmarking, verification)

- Second level - simulation of field situation for which data exists (validation)

- Third level - comparison of code abilities to handle idealized but difficult performance assessment problems (sensitivity of codes to parameter variabilities).

Decisions: As a result of indications of a general, but not unanimous project interest, the following has been decided regarding further INTRACOIN participation:

1. In the interest of time and efficiency, outstanding level 1 contributions will be completed by PNL and sent to DOE-HQ who will provide it to the INTRACOIN secretariat in Sweden.

2. Projects will participate in INTRACOIN by completing level 2 and level 3 exercises which they select.

3. Descriptions of the level 2 and level 3 cases of INTRACOIN are attached. Each project should consider each exercise described in the attached material, and make a judgment as to whether or not the given exercise is relevant to the benchmarking, verification, and validation of codes that may be used by that project. Field realism should not be as great a concern as whether or not these exercises can be used to verify or validate a code or a portion of a code. Decisions should be transmitted by letter to DOE-HQ no later than January 30, 1984. Decisions to solve a given problem should be accompanied by a target date for work completion. Submittals should be sent to DOE-HQ for review and forwarding to the INTRACOIN secretariat in Sweden as one, single U.S. DOE contribution.

Recommendations: The following recommendations as to which projects should consider a given problem reflect the opinions of DOE-HQ personnel and are included for your consideration and comment.

Problem (see attachments):	Project:
A. Level 2:	
1. Fractured media case a (Sr migration with preinterpreted geochemical and hydraulic properties) case b (Sr migration with preinterpreted hydraulics)	BWIP, OCRD
2. Porous media case a (idealized site with predetermined hydraulics and sorption)	NNWSI, ONWI
case b (Sr migration from dual tracer test data)	NNWSI, ONWI
B. Level 3:	
1. Fractured media case with sorption and congruent dissolution.	BWIP, OCRD
2. Porous media case, effects of code dimensionality, calculation of spatial concentration distribution with multidimensional codes	BWIP, NNWSI, OCRD, ONWI

Schedule: Please return your comments and decisions to Carl R. Cooley, RW-24, two weeks from memorandum date of receipt. Please include a schedule with your commitment to each problem. Your solutions should be forwarded to RW-24 on or about March 26, 1984.

J. William Bennett
Acting Associate Director
Office of Geologic Repository
   Deployment
Office of Civilian Radioactive
   Waste Management

Attachments: 1. INTRACOIN Level 2 Problems
              2. INTRACOIN Level 3 Problems

cc: R. Stein
     J. Fiore
     C. Cooley
     A. Metry
     E. Gilardi
     J. Strahl
     D. Siefken
     A. Van Luik
     B. Thompson