



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

AUG 19 1982

Science Applications, Inc.
ATTN: Mr. Roger Markl
5 Palo Alto Square
Suite 200
Palo Alto, CA 94304

Gentlemen:

Subject: Contract No. NRC-04-80-178, Task Order No. 5

Pursuant to the pertinent provisions of this contract, I hereby (i) authorize the expenditure of \$65,000.00 of the funds currently obligated under this contract and (ii) direct you to perform the work set forth in the attached Task Order No. 5.

If you estimate that the total cost ceiling price is inadequate to complete the assigned work under this Task Order No. 5, you must so notify me within ten (10) business days after receipt. Said notification shall contain your estimate of the required total ceiling price. Notwithstanding said notification, you shall commence performance of the Statement of Work as indicated herein. Within ten (10) business days after receipt of such notification, the Contracting Officer shall either ratify the total ceiling price or adopt the proposed revised estimate or some combination of the two and revise or conform the Task Order accordingly. In the event you reaffirm your belief that the revised ceiling price is still inadequate to complete the assigned Task Order, you may upon submission of a written request to the Contracting Officer, within ten (10) business days after your receipt of the Contracting Officer's confirmation or amendment of this Task Order, be excused from further performance of such task. In such event, you shall be paid for the work performed to that date in accordance with the provisions of ARTICLE IV, COMPENSATION FOR SERVICES.

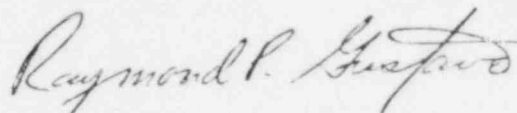
This letter executed on behalf of the Commission, is forwarded to you in quadruplicate. Please acknowledge receipt on three copies hereof and return them to me as soon as possible. The fourth copy should be retained for your file.

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PDR CONTR
NRC-04-80-178 PDR

AUG 19 1982

Four signed copies of Modification No. 5 to the basic contract, which increases the total contract funds by \$65,000.00, is also attached for your execution and return of three copies to the NRC along with the three copies of the subject document.

Sincerely,



Raymond Gustave
Contracting Off
Research Contracts Branch
Division of Contracts
Office of Administration

Attachments:

1. Task Order No. 5
2. Modification No. 5 (For Execution and Return to NRC)

RECEIVED:

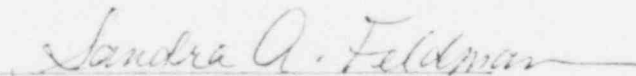
SCIENCE APPLICATIONS, INC.

Agree

Disagree

Notification will be submitted by _____
(Date)

BY:



Sandra A. Feldman

TITLE:

Sr. Contract Representative

DATE:

September 1, 1982

Objective

Perform an independent multidisciplinary review and technical critique of the products from the project "Risk Assessment Methodology Development for Waste Isolation in Geologic Media," an ongoing study by Sandia Laboratories for the Transportation and Materials Risk Branch of the Division of Risk Analysis, Office of Nuclear Regulatory Research (RES) of the Nuclear Regulatory Commission (NRC).

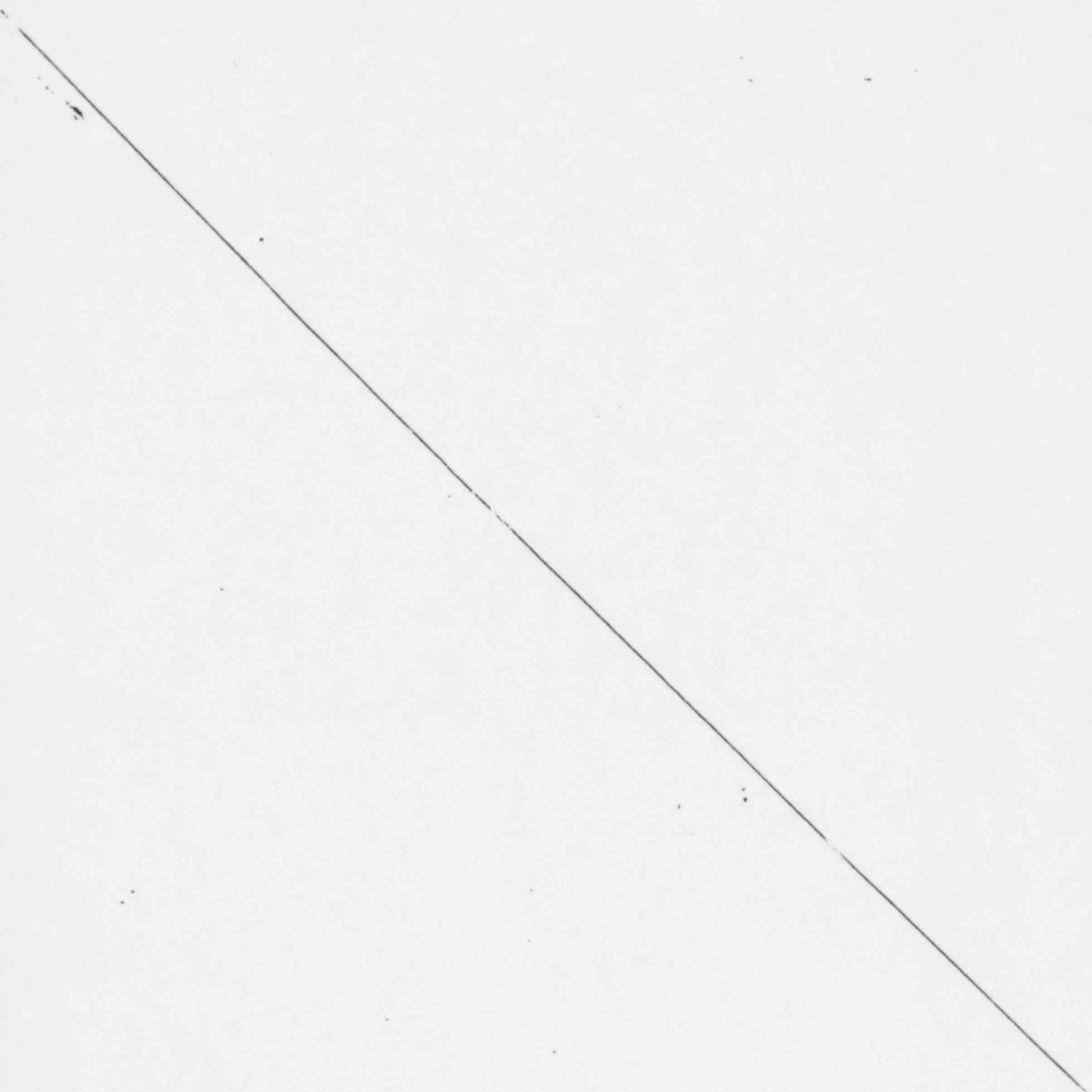
Scope of Work

This Task Order No. 5 contains two tasks. Task 1 is the review of the last two Sandia reports from the Risk Assessment Methodology Development for Waste Isolation in Geologic Media (bedded salt) program. The reports are as follows.

1. NUREG/CR-2452, entitled Risk Methodology for Geologic Disposal of Radioactive Waste: Final Bedded Salt Report, by Robert M. Cranwell, July 1982.
2. NUREG/CR-1667, entitled Risk Methodology for Geologic Disposal of Radioactive Waste: Scenario Formulation and Development, by Robert M. Cranwell, July 1982.

The review of the reports shall be approached from the perspective of how the work in any given report stands on its own and how it supports the overall Risk Methodology for Waste Isolation.

Task 2 is the preparation of an executive summary report from the review of the sixteen Sandia reports performed under Task Order Numbers 1-5. The review under Task 1 and the documentation of the executive summary shall address the questions listed under the Statement of Work section as well as any additional questions that SAI feel warranted.



Science Applications, Inc. (SAI) shall provide technical personnel, materials, facilities, and services including clerical support personnel to perform the work in this task order. SAI shall conduct a coordinated multidisciplinary review of the aforementioned Sandia products. SAI shall address and propose recommendations in the areas below, using only the data in each of the reports and supporting documents. NOTE: NOT ALL OF THESE QUESTIONS WILL BE APPLICABLE TO ALL STAGES OF THE PROJECT. ALL APPLICABLE QUESTIONS SHOULD BE ADDRESSED AT EACH STAGE.

1. Are the models realistic?
 - a. Are the assumptions valid?
 - b. What would be the impact on the analysis results of any incorrect assumptions?
 - c. What are some alternative techniques for correcting/improving any identified weaknesses in the models.
2. Is the risk methodology valid?
3. Are the data valid?
 - a. What uncertainty in the data would render the model results unrealistic?
 - b. Was each datum uncertainty and its contribution to the uncertainty in the results assessed appropriately?
4. Is the time period examined or used in calculations appropriate?
5. Do the event sequences chosen for calculation cover a reasonably complete range?
 - a. Is the treatment of completeness of Sandia adequate?
 - b. Were any important potential risk contributors omitted? If so, identify.

- c. Were the quantitative or qualitative criteria for choice of sequences valid?
6. Was an effort made to identify (i.e., rank according to importance to risk) key parameters, processes and events?
 - a. If so, was the effort adequate?
 - b. Evaluate the methods used to achieve the ranking.
7. Were the uncertainties in the results considered?
 - a. Were the uncertainties propagated and quantified?
 - b. Were acceptable numerical methods used?
 - c. Were the contributing uncertainties correctly assessed?
8. Which of the models and which parts of the methodology could be used to resolve discrete questions (e.g., for a licensing review) or would they only be useful as supporting information to discrete questions?
 - a. What types of questions could be resolved by use of a given model or the methodology?

9. Conclusions

10. Recommendations

NOTE: Any recommendation shall be accompanied by an estimate for the contribution to error in the results of a specific suggestion for improving the analysis.

For each task, the review shall include all of the following disciplines:

Earth Sciences:

- Hydrology with particular emphasis on mathematical modeling of regional flow systems and on the determination of hydrologic parameters.
- structural geology with particular emphasis on the dynamic interpretation of structural geologic features.
- aqueous geochemistry with particular emphasis on evaluation of system parameters that influence solubility, exchange and transport.
- geophysics with particular emphasis on measurements of physical parameters and their correlation with material and environmental characteristics.

Applied Mathematics:

- applied statistics with particular emphasis on sampling techniques, multivariate analysis, and sensitivity analysis.
- systems analysis with particular emphasis on solutions of systems equations and numerical (computer) solution techniques, especially those representing physical systems.
- probability analysis with particular emphasis on analysis systems reliability and the assessment of probabilities.

Applied Chemistry and Physics:

- with particular emphasis on transport processes, hydraulics and nuclear processes.

Environmental Biology:

- with particular emphasis on the mathematics of biology, biostatistics and radionuclide transport through the environment to humans.

A management coordinator and a technical coordinator shall provide focus to the following aspects of the contracted work:

- The technical coordinator shall assume final responsibility for the technical content of the final report.
- The management coordinator shall assume final responsibility for the technical editing of the final report.
- Both the Technical coordinator and the management coordinator shall conduct a briefing at the NRC Headquarters at the conclusion of the review.

NRC does not want a major thrust of the review under this Task Order to involve computer verification. Therefore, Task Order No. 5 does not allow for computer use in this review stage. Review involving limited computer use may be appropriate near the completion of the Sandia project. Therefore, as the review of Task Order No. 5 is conducted, identify areas, if any, of the risk methodology development that would profit from use of the computer for review at a more complete stage.

The review shall not involve communication with Sandia. Any questions that SAI as reviewers has are the same problems that a user of the methodology would have. SAI should point them out in their final report thereby making them known while the project is ongoing so they can have an impact on the final Sandia product.

Any disagreement or difference of opinion of reviewers should also be documented in the final report from SAI for this task order. SAI should not make open-ended criticisms, i.e., just saying something is bad. Make constructive criticism by first stating why something is inappropriate and subsequently adding statements of how to correct or improve the work and statements which delineate the impact of significance of recommendations to or errors in the methodology on the final result.

It is important that a consistent group of people review the entire risk methodology project. That is, all reviewers shall read all the products and supporting documents covered under all the task orders issued as part of this contract. Any changes in the reviewers, e.g., by attrition, must be approved by NRC. Award of additional task orders will depend upon satisfactory performance of this task order.

Reporting Requirements

This task order shall result in a final report(s) submitted to NRC in publishable form including one camera-ready copy acceptable to NRC's Division of Document Control for printing as a NUREG. Coordinate with Pat Larkins (301-492-7566) of that Division for what is acceptable copy. Each task report shall document the review work accomplished including:

1. Answers to questions posed in this work statement, and
2. Conclusions and recommendations of SAI's review.

At the conclusion of the review for this task order, the technical coordinator and the management coordinator shall deliver the final report and conduct a briefing at the NRC Headquarters.

In addition, monthly status letter reports of the review work are required including expenditures of time and money, both for the month and cumulatively.

Special Instructions

NRC shall provide each reviewer with a copy of the products to be reviewed.

A post award meeting shall be held by Telecon with the SAI review team within two weeks after the award date.

Desired Completion Date

The final report(s) for this task order is due at NRC Headquarters on November 30, 1982.

Place of Performance

The review shall be conducted at SAI facilities in Palo Alto, California.

Maximum Cost Limitation

The cost of the work performed under this task order shall not exceed \$65,000.00

ROUTING AND TRANSMITTAL SLIP

Date 9/20/82

TO: (Name, office symbol, room number, building, Agency/Post)

	Initials	Date
1. Johnson St May Concern		
2.		
3.		
4.		
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Action	File	Note and Return
Approval	For Clearance	Per Conversation
As Requested	For Correction	Prepare Reply
Circulate	For Your Information	See Me
Comment	Investigate	Signature
Coordination	Justify	

REMARKS

This was not sent with
 mod # 5 do contract
 number NRC 0480178.
 Please attach to 255

Thanks

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)

Bob Haller
 RCB

Room No.—Bldg.

Phone No.
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OPTIONAL FORM 41 (Rev. 7-76)
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