UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 7, 2002

United States Department of Commerce
National Institute of Standards and Technology
Attn: Sharon Rinehart
Gaithersburg, Maryland 20899

SUBJECT: INTERAGENCY AGREEMENT NO. NRC-02-02-007 ENTITLED, "RAIL TUNNEL FIRE ANALYSIS FOR SPENT FUEL TRANSPORTATION CASK"
Job Code J5414

Dear Ms. Rinehart:

Pursuant to the Economy Act of 1932, as amended, the U. S. Nuclear Regulatory Commission desires to enter into an agreement with the National Institute of Standards and Technology (NIST) whereby NIST will provide the NRC with a computational computer model useful for investigating fire events and evaluating the consequences of fires.

Accordingly, the terms and conditions of this Interagency Agreement are as follows:

Article I - Scope of Work

The work to be performed under this Agreement shall be in accordance with the attached NRC statement of work (SOW) and the NIST revised proposal dated February 26, 2002, hereby incorporated into and made a part of this Agreement.

Article II - Period of Performance

The period of performance of this Agreement shall be from the effective date of the Agreement and shall continue until August 31, 2002. The SOW and the period of performance may be changed, as mutually agreed to by both parties, by the NRC's issuance of a modification to this Agreement.

Article III - Estimated Ceiling Amount and Obligation of Funds

The total estimated amount (ceiling) for the services ordered, delivered, and accepted under this Agreement is $104,046.00.

The amount presently obligated by the NRC for this Agreement is $104,046.00. The ceiling and obligated amount may be increased as mutually agreed by written modification to this Agreement. When and if the amount(s) paid and payable to NIST hereunder shall equal the obligated amount, NIST shall not be obligated to continue performance of the work unless and until additional funds are obligated with respect to this Agreement. Any work undertaken by NIST in excess of the obligated amount is done so at NIST's sole risk.

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It is estimated that the amount currently allotted will cover performance under this Agreement through August 31, 2002.

Article IV - Payment

Payment shall be made on a reimbursable basis. NIST shall submit invoices in accordance with the attached billing instructions for Interagency Agreements, which are hereby incorporated into and made part of this Agreement. NIST shall bill the NRC for costs incurred through the Treasury On-Line Payment and Collection (OPAC) System. All payments shall be transmitted electronically in accordance with FAR Clause 52.232-33, Payment By Electronic Funds Transfer-Central Contractor Registration.

If requests for reimbursements cannot be made through the Treasury On-Line Payment, each request shall be submitted to:

U.S. Nuclear Regulatory Commission
Division of Accounting and Finance
Financial Operations Branch, M/S T9E2
Washington, D.C. 20555-0001
Voice: (301) 415-7342
Facsimile: (301) 415-5384

Each invoice shall cite the following data:

Appropriation No.:	31X0200
B&R No.:	25015308270
Job Code No.:	J5414
BOC Code No.	253A
Interagency Agreement No.:	NRC-02-02-007
Agency Location Code:	31-00-0001
Amount Obligated:	$104,046.00

Article V - Certification of Funds

I certify that FY02 funds are available for this effort in the amount of $104,046.00 .

Penelope Kinney

Penelope Kinney, NMSS Funds Certifying Official

3/4/02
DATE

Article VI - Termination

The NRC may terminate this Agreement upon 60 days written notice of such termination to NIST. In the event of earlier termination, NIST shall be reimbursed for all services provided through the termination date and for any obligations that were incurred prior to the notice of termination and that could not be canceled. Payments under this Agreement, including payments under this article shall not exceed the amount(s) committed under this Agreement.

Article VII - Points of Contact

The NIST contact responsible for the successful completion of this Agreement is Anthony Hamins, (301)975-6598.

The NRC contacts for this Agreement are:

Technical Contact: Christopher Bajwa (301)415-1237
Administrative Contact: Penelope Kinney (301)415-7805

If this Agreement is acceptable, please so indicate by having an official authorized to bind your organization execute three copies of this document, by signing in the space provided, and return two copies to Penelope Kinney at the address stated above. You should retain the third copy for your records.

Sincerely,

John J. Linehan, Director
Program Management, Policy
Development and Analysis Staff
Office of Nuclear Material Safety
and Safeguards

Attachments:
1. Statement of Work
2. Billing Instructions

ACCEPTED:

BY: _____

TITLE: _____

DATE: _____

Statement of Work

PROJECT TITLE:	Rail Tunnel Fire Analysis for Spent Fuel Transportation Cask
JOB CODE NUMBER:	J5414
B&R NUMBER:	25015308270
NRC ISSUING OFFICE:	Office of Nuclear Material Safety and Safeguards (NMSS)
NRC TECHNICAL PROJECT MANAGER (TPM):	Christopher Bajwa, SFPO, (301) 415-1237
NRC TECHNICAL ASSISTANCE PROJECT MANAGER (TAPM):	Penelope Kinney, (301) 415-7805
FEE RECOVERABLE TASK:	No

1. BACKGROUND:

In response to Congressional inquires [e.g., Congressman Markey of Massachusetts, Senator Reid's staff of Nevada, and California and Maryland congressmen], and to the September 11, 2001, terrorist events at the World Trade Center in New York City and the Pentagon in Virginia, NRC staff has performed a thermal analyses of the consequences of a Baltimore tunnel fire event and evaluated spent nuclear fuel casks. Initial discussions with the National Transportation Safety Board (NTSB) indicated that they would be performing thermal analyses of the July 2001, Baltimore tunnel fire event and provide those results to the NRC by Spring 2002. The NRC would, in turn, confirm its safety evaluations of a spent fuel cask postulated to reside in the tunnel. Subsequent discussions with NTSB indicated that such analyses would not be provided since the fire was not the cause of the train derailment.

On a separate topic, the NRC staff and the Department of Transportation are performing assessments of potential terrorist acts on rail shipments. In preparation for addressing terrorist acts related to transport through tunnels, it may be necessary for NRC staff to perform thermal analyses of postulated terrorist events in a tunnel. Therefore, the NRC needs a computer model developed for performing thermal analyses of tunnels. This project will provide input for both programs.

1. OBJECTIVES:

The objectives of this project are as follows:

1) Develop a computer model of the Baltimore Tunnel that will replicate the thermal conditions that existed during the July 2001 fire. These thermal conditions will then be used by the NRC staff as boundary conditions on a certified spent fuel transportation cask.

2) Develop a detailed Computational Fluid Dynamics (CFD) computer model of a tunnel that could be used by the NRC staff for postulated terrorist event assessments. The computer models should include all parameters that would be present in a fire, including the flow of air through the tunnel itself and the heating of the tunnel walls surrounding the source of the fire and the spent fuel cask.

2. TECHNICAL and OTHER SPECIAL QUALIFICATIONS REQUIRED

The personnel performing this work must be experienced in modeling and validating CFD and fire analysis computer codes on enclosure fires.

3. LEVEL of EFFORT:

The estimated level of effort for this project is 20 staff weeks.

4. PERIOD of PERFORMANCE:

The period of performance for the work specified in this agreement shall begin on the date of execution and shall continue through August 31, 2002.

5. SCOPE of WORK:

The National Institute of Standards and Technology (NIST) shall perform thermal-hydraulic studies using a railroad tunnel model with railroad cars necessary to simulate the Baltimore Tunnel event which occurred in July 2001. A fire within the tunnel as well as railcars in the vicinity of the fire will be modeled. Results should include a time-temperature profile at the hottest tunnel cross section and an overall heat flux provided by the fire at the hottest cross section. Once the study and modeling activities have been completed, NIST shall provide to the NRC a technical report that documents the studies performed and provide training on the use of the computer code used to model the tunnel. The work to be performed is described in detail below.

A. NIST staff shall develop 3-dimensional heat transfer models of the Baltimore rail tunnel fire event, incorporating a fire in either a CFD or fire analysis computer code. NRC personnel will provide the necessary information, including tunnel dimensions and fuel characteristics for the fire, rail cars, etc. NIST shall also determine the temperature gradient and heat flux in the tunnel and, if requested, on the outside of a spent fuel cask engulfed by the fire.

Deliverable date: May 23, 2002.

B. The tunnel fire model shall be developed and documented by NIST to allow for future use of the model by Spent Fuel Project Office (SFPO) staff to assess possible terrorist event scenarios involving the transportation of spent nuclear fuel. Therefore, a draft and final report that addresses the development of the computer model, the results of the study and includes the temperature gradients within the tunnel and the temperature distribution on the surface of the transportation cask shall be completed.

Draft report due:	June 6, 2002
Final report due:	Two weeks following receipt of NRC staff comments on the draft report.

C. Provide SFPO staff training on the use of the computer code used to model the Baltimore tunnel fire event.

Training Date:	Time to be negotiated between NIST and SFPO personnel's availability (between June and July 2002).

6. MEETINGS and TRAVEL

Two, two (2) person trips for 2 days each to NRC headquarters to present and discuss findings is anticipated. Training will be provided to one member of SFPO's staff at the NRC in Rockville, Maryland or at the NIST office in Gaithersburg, Maryland. The NRC TPM will work with NIST personnel to determine the location of the one day training session.

7. NRC-FURNISHED MATERIALS:

The NRC TPM will provide NIST with all necessary information regarding the geometry of the spent fuel cask and tunnel, as well as the fuel for the fire to be analyzed. This effort will be coordinated with NTSB personnel.

8. UNCLASSIFIED WORK EFFORTS

It is mutually expected that the activities under this agreement must not involve classified or sensitive unclassified information or material. If, in the opinion of either party, this expectation changes, the party shall immediately notify the other party in writing. In any event, NIST shall handle and otherwise safeguard classified and sensitive unclassified information and material, including unclassified controlled nuclear information, in accordance with applicable law and NIST requirements, and shall promptly inform the NRC office in writing if and when classified or sensitive unclassified information or material becomes involved.

The NIST shall not permit any individual to have access to Restricted Data or other classified or sensitive unclassified information and material except in accordance with the Atomic Energy Act of 1954, as amended, and NIST and NRC regulations or requirements.

Except as specifically authorized by this agreement or as otherwise approved by the issuing authority, records or other information, documents, and materials furnished by the office in the performance of the agreement shall be used only in connection with the work performed under the agreement. Upon completion or termination of this agreement, the NIST shall transmit to the office all information that NRC requires.

All parties conducting activities under this agreement shall be responsible for the safeguarding from unauthorized disclosure any information or other documents and material exempt from public connection with the performance of work, or generated in the performance of this work under this agreement. Both parties agree to conform to all regulations, requirements, and directions of NRC with respect to this material.

9. PROPRIETARY INFORMATION

In connection with the performance of work under this agreement, the NRC may furnish for review, evaluation, or other use, certain trade secrets or confidential or privileged commercial or financial information determined by the office to be exempt from public inspection or disclosure. A synopsis of such information must be submitted in writing to the NIST contracting officer for reaching agreement with the office on the acceptance and use of the information. Guidance on the protection of proprietary information used in reports prepared by NIST and examples of proper marking of cover, title page, and back cover are contained in NRC MD 12.6.(a).

Proprietary or other privileged information may be provided by the office on an individual basis to NIST employees working as NRC consultants with the understanding that it shall be protected from disclosure and shall be returned to the office upon completion of the work. Any such claimed proprietary data will be appropriately identified and marked as such. The use of proprietary information in reports prepared by consultants requires the protection specified in NRC MD 12.6.(b).

10. DELIVERABLES/SCHEDULE:

The required deliverables shall be prepared and submitted to the NRC TPM in accordance with the anticipated schedule provided below.

a.	Provide a description of the CFD Tunnel fire models with boundary conditions for NRC comment/review and approval.	Prior to initiating calculations
b.	Develop the models Provide the draft technical report	May 23, 2002 June 06, 2002
c.	Provide the final technical report (both hardcopy and a electronic version) that incorporates NRC staff comments.	2 weeks following receipt of NRC staff comments.

11.0 SPECIAL REPORTING REQUIREMENTS

NIST shall provide monthly technical and financial status reports to the TPM, TAPM, and SFPO Project Coordinator each month. The technical report shall summarize the work performed each month, list efforts completed, identify any problems or delays encountered or anticipated, and make recommendations for resolution. In the financial report, identify total agreement amount, total costs incurred each month, total costs incurred to date, and balance of funds remaining. The reports are due within 15 calendar after the end of the report period. In addition, a contractor spending plan (CSP) is required. The CSP should include a projection of expenditures for each month of performance and indicate the percentage of the project completed. The initial CSP must be submitted with the proposal for approval and should be included in each monthly report with a comparison of the planned to the actual expenditures. (see example below)

Costs	1st Month	2nd Month etc.
Planned	$	$
Actual	$	$
Project Completion	%	%

12.0 TECHNICAL/PROJECT DIRECTION

Penny Kinney is the NMSS TAPM and is the focal point for all contract-related activities. All work assignments and program funding actions are initiated by the NMSS TAPM. All proposed work scope or schedule changes must be processed through the NMSS TAPM.

Christopher Bajwa is designated the NMSS/SFPO TPM and is responsible for providing technical guidance to the performing organization regarding staff interpretations of the technical aspects of regulatory requirements, copies of interpretations of the technical aspects of regulatory requirements, and copies of relevant documents (e.g., Standard Review Plans and applicant Technical Safety Analysis Reports) when requested by the performing organization. All work products must be reviewed and approved by the TPM before they are submitted as final documents. All technical directions given to the performing organization must be consistent with the work scope and schedule. The NMSS TPM is not authorized to unilaterally make changes to the approved work scope or schedule, or give the performing organization any direction that would increase costs over approved levels.

BILLING INSTRUCTIONS FOR INTERAGENCY AGREEMENT

The Agency shall submit an original and four copies of vouchers for cost-reimbursement in the following manner:

Claims shall be submitted on the Standard Form 1081, Voucher for Transfers Between Appropriations and/or Funds.

Frequency. The Agency shall submit claims for reimbursement as each task is completed.

Billing of Costs After Expiration of Agreement. If reimbursable costs are incurred during the agreement period and claimed after the agreement has expired, the period during which these costs were incurred must be cited.

The Agency shall furnish the information set forth below:

(a) Address the original voucher (with copies) to the Contracting Officer, U.S. Nuclear Regulatory Commission, Mail Stop T-7-I2, Washington, D.C. Payment will be made by U.S. Nuclear Regulatory Commission, Office of the Controller, Division of Accounting and Finance, General Accounting Branch, Washington, DC 20555.

(b) Voucher Number. Insert the appropriate serial number of the voucher. This must be in sequential order beginning with 001 as the number to be used for the first voucher submitted under this agreement.

(c) Date of Voucher. Insert the date the voucher is prepared.

(d) Agreement Number, FIN Number, and Date. Insert the agreement number, the FIN number, and the effective date of the agreement.

(e) Payee's Name and Address. Show the name and address of the Agency and include name of voucher preparer and telephone number.

(f) Billing Period. Insert the beginning and ending dates (day, month, and year) of the period in which costs were incurred and for which reimbursement is claimed.

(g) Billing Detail. Insert the major cost elements as follows:

(1) Direct Labor. This Consists of salaries and wages paid (or accrued) for direct performance of the contract.

(2) Materials and Supplies. This is consumable materials and supplies and equipment. Specify separately all items over $1,000.

(3) Other. List all other direct costs.

(4) Overhead. Show that amount of the billing which is overhead.

(h) Amount Billed for Current Period. Insert the amount billed for adjustments and adjusted amounts for the period.