

AWARD/CONTRACT	1. THIS CONTRACT IS RATED ORDER UNDER DPAS (15 CFR 350)	RATING N/A	PAGE OF PAGES 1 43
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2. CONTRACT NO. (Proc. Inst. Ident.) NRC-04-07-115	3. EFFECTIVE DATE SEP 27 2007	4. REQUISITION/PURCHASE REQUEST/PROJECT NO. RES-07-115 SPS 00008772
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5. ISSUED BY U.S. Nuclear Regulatory Commission Div. of Contracts Attn: Neha S. Dhir Mail Stop T-7-I-2 Washington, DC 20555	CODE 3100	6. ADMINISTERED BY (If other than Item 5) U.S. Nuclear Regulatory Commission Div. of Contracts Mail Stop T-7-I-2 Washington, DC 20555	CODE 3100
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7. NAME AND ADDRESS OF CONTRACTOR (No., street, city, county, State and ZIP Code) PURDUE UNIVERSITY 401 S GRANT ST WEST LAFAYETTE IN 479072024	8. DELIVERY <input type="checkbox"/> FOB ORIGIN <input type="checkbox"/> OTHER (See below)
	9. DISCOUNT FOR PROMPT PAYMENT N/A
	10. SUBMIT INVOICES (4 copies unless otherwise specified) TO THE ADDRESS SHOWN IN

11. SHIP TO/MARK FOR U.S. Nuclear Regulatory Commission Washington DC 20555	CODE	FACILITY CODE	12. PAYMENT WILL BE MADE BY U.S. Nuclear Regulatory Commission Payment Team, Mail Stop T-7-I-3 Attn: NRC-04-07-115 Washington DC 20555	CODE 3100
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13. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION: <input type="checkbox"/> 10 U.S.C. 2304(c)() <input checked="" type="checkbox"/> 41 U.S.C. 253(c)()	14. ACCOUNTING AND APPROPRIATION DATA BR 76015171277; JC N6489; BOC 252A; APPN 31X0200.760 FFS RES-C07-258; OBLIGATION \$380,000.00
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15A. ITEM NO.	15B. SUPPLIES/SERVICES	15C. QUANTITY	15D. UNIT	15E. UNIT PRICE	15F. AMOUNT
	SEE SECTION B FOR A DESCRIPTION OF SERVICES THIS IS A COST REIMBURSEMENT TYPE CONTRACT PROJECT TITLE: "PARCS DEVELOPMENT, MAINTENANCE AND ASSESSMENT" PERIOD OF PERFORMANCE: 10/01/2007 - 11/30/2009				

15G. TOTAL AMOUNT OF CONTRACT **\$549,937.00 (CEILING)**

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CONTRACTING OFFICER WILL COMPLETE ITEM 17 OR 18 AS APPLICABLE

17. <input checked="" type="checkbox"/> CONTRACTOR'S NEGOTIATED AGREEMENT (Contractor is required to sign this document and return 3 copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all the services set forth or otherwise identified above and on any continuation sheets for the consideration stated herein. The rights and obligations of the parties to this contract shall be subject to and governed by the following documents: (a) this award/contract, (b) the solicitation, if any, and (c) such provisions, representations, certifications, and specifications, as are attached or incorporated by reference herein. (Attachments are listed herein.) Michael R. Ludwig Associate Director Sponsored Program Administration	18. <input type="checkbox"/> AWARD (Contractor is not required to sign this document.) Your offer on Solicitation Number _____ including the additions or changes made by you which additions or changes are set forth in full above, is hereby accepted as to the items listed above and on any condition sheets. This award consummates the contract which consists of the following documents: (a) the Government's solicitation and your offer, and (b) this award/contract. No further contractual document is necessary.
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19A. NAME AND TITLE OF SIGNER Michael R. Ludwig Associate Director Sponsored Program Administration	20A. NAME OF CONTRACTING OFFICER NEHA S. DHIR
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19B. NAME OF CONTRACTOR BY _____ (Signature of person authorized to sign)	19C. DATE SIGNED 9/24/07	20B. UNITED STATES OF AMERICA BY _____ (Signature of Contracting Officer)	20C. DATE SIGNED 9/27/2007
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STANDARD FORM 26 (REV. 12/2002)
Prescribed by GSA - FAR (48 CFR) 101-11.6(a)

TEMPLATE - ADM001

SUNSI REVIEW COMPLETE

OCT 31 2007

ADM002

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PART I - THE SCHEDULE

SECTION B - SUPPLIES OR SERVICES AND PRICE/COSTS

B.1 PROJECT TITLE

The title of this project is as follows:

PARCS Development, Maintenance, and Assessment

B.2 BRIEF DESCRIPTION OF WORK (MAR 1987)

The purpose of this project is to modify and update the Purdue Advanced Reactor Core Simulator (PARCS) code and to expand the application of PARCS to new and advanced reactors.

B.3 CONSIDERATION AND OBLIGATION--COST REIMBURSEMENT (JUN 1988) ALTERNATE I (JUN 1988)

- (a) The total estimated cost to the Government for full performance under this contract is \$549,937.00.
- (b) The amount presently obligated by the Government with respect to this contract is \$380,000.00.
- (c) It is estimated that the amount currently allotted will cover performance through 09/30/2008.

SECTION C - DESCRIPTION/SPECIFICATIONS/STATEMENT OF WORK

OFFICE OF NUCLEAR REGULATORY RESEARCH
DIVISION OF RISK ASSESSMENT AND SPECIAL PROJECTS
STATEMENT OF WORK

PROJECT TITLE: PARCS Development, Maintenance, and Assessment

I. Background

Fundamental to reactor safety analysis is the ability to predict the fission power and decay heat sources that arise under normal, off-normal, and accident conditions. This predictive ability entails the use of reactor physics codes. Such codes are used to simulate three-dimensional (3-D) steady-state core neutronics and fuel depletion during normal power operations as well as the core's 3-D dynamic response to control and power maneuvers, operating events, and accidents.

The TRITON¹ and PARCS² codes comprise the reactor physics component of the United States (U.S.) Nuclear Regulatory Commission (NRC) staff's audit code suite for reactor systems analysis. The other three major components of the staff's reactor systems analysis suite are the FRAPCON and FRAPTRAN³ fuel rod behavior codes, which simulate the thermo-mechanical, material, and chemical responses of fuel and cladding to steady-state and transient conditions of thermal power and cooling, the TRACE⁴ system thermal hydraulics code, and the MELCOR⁵ severe accident code.

The safety-related analysis functions performed by TRITON-PARCS resemble those of well known industry reactor physics codes such as CASMO-SIMULATE.⁶ Namely, reactor physics analyses typically use static calculations with two-dimensional (2-D) fuel-lattice neutronics and depletion codes like TRITON or CASMO to prepare for each core design the multi-variate tables of energy-collapsed and spatially smeared nodal nuclear data needed by codes like PARCS or SIMULATE for performing 3-D simulations of quasi-steady-state core operations and transient reactor kinetics.

The PARCS core neutronics code is used in coupled combination with system thermal hydraulics codes, such as TRACE, for analyses of normal operations and transients in operating reactors, analyses to support resolution of generic issues, evaluation of emergency procedures and accident management strategies, confirmation of licensee's analyses, testing the fidelity of NRC simulators, training exercises for NRC staff, and supporting analyses for the certification review of advanced reactor designs.

¹TRITON is an acronym for "Transport Rigor Implemented with Time-dependent Operation for Neutronic depletion."

²PARCS is an acronym for "Purdue Advanced Reactor Core Simulator."

³FRAPCON and FRAPTRAN are acronyms for "Fuel Rod Analysis Package for quasi-Constant conditions" and "Fuel Rod Analysis Package for Transients."

⁴TRACE is an acronym for "TRAC (*Transient Reactor Analysis Code*) RELAP (*Reactor Excursion and Leak Analysis Program*) Advanced Computational Engine."

⁵Although written in capital letters, the name MELCOR is not an acronym.

⁶Although written in capital letters, the names CASMO and SIMULATE are not acronyms.

Coupled PARCS and thermal-hydraulic calculations are performed for both steady-state and transient reactor analyses. Quasi-steady-state calculations of spatial core power and burnup distributions over core operating cycles are used in analyzing (a) peak pin powers in relation to fuel thermal limits, (b) reactivity and power control, (c) safe shutdown margins, (d) slow spatial xenon transients and oscillations, and (e) the initial conditions of spatial reactivity feedback characteristics, fission power, stored heat, and decay power as needed for the analysis of cooling and reactivity transients. Dynamically coupled transient calculations are especially important in analyzing the spatial kinetics of reactivity insertion transients (e.g., rod bank withdrawal, rod drop, rod ejection) and the core power surges and oscillations associated with transient over-cooling events (e.g., turbine trip), flow and boiling instabilities, and transients without scram.

The NRC Office of Nuclear Regulatory Research (RES) has been developing the PARCS core neutronics simulator code since 1998. The TRITON lattice physics code, consisting of analysis sequences within the SCALE⁷ modular code system, has been developed in parallel through RES in-house work in collaboration with contract work at Oak Ridge National Laboratory (ORNL). During and supporting the development of TRITON, other available lattice physics codes (e.g., HELIOS,⁸ CASMO) have been used to provide the nodal nuclear data tables needed by PARCS. The PARCS code has been dynamically coupled to TRACE and is available as both an embedded module within TRACE and as a standalone code.

PARCS is subject to continual needs for code development, maintenance, assessment, and analysis support, as are its interfacing codes for core lattice physics (TRITON) and system thermal hydraulics (TRACE). These needs are briefly discussed below:

Development: Needs for continuing code development arise in two ways: (a) the accuracy or functionality of existing code models is inadequate for an intended application, or (b) a code model required for an important phenomenon, process, or system is not available. The upgrade of existing modeling capabilities and the addition of new code models is particularly important as codes are used to simulate new operating conditions in existing plants, or as different reactor designs are evaluated for licensing. Code development includes the provision of updated code documentation (i.e., theory manual, developer manual, user manual) as well as quality assurance testing to demonstrate code functionality.

Maintenance: Continuing code maintenance is needed (a) for correcting errors and shortcomings in the codes and code documentation identified through code assessment and analysis activities, and (b) for ensuring continued code compatibility with evolving computing environments, user interfaces, and interfacing analysis tools (e.g., TRITON, TRACE).

Assessment: Code assessment provides the necessary qualification and validation of the codes for use in analyzing the safety of existing reactors and proposed new reactor designs. Code assessment establishes the technical basis for quantifying the expected accuracy and uncertainty of code predictions by means of testing the codes against a combination of code-to-code and code-to-data benchmarks that are applicable to the core design, operating conditions, and accident conditions of the reactor being analyzed. Especially important for assessing code accuracy are code-to-data benchmarks against applicable plant data, in-core data, experimental data from test reactors and/or critical facilities, and post irradiation data from fuel gamma scans, fuel isotopic assays, and fuel decay heat calorimetric measurements. Code-to-code benchmarks against similar or higher-order codes (e.g., exact-geometry continuous-energy Monte Carlo) further support the understanding of physical phenomena and modeling issues and the qualification of efficient code methods, modeling approximations, and analysis assumptions.

⁷SCALE is an acronym for "Standardized Computer Analyses for Licensing Evaluation."

⁸Although written in capital letters, the name HELIOS is not an acronym.

Analysis support: Continuing code analysis support and consultation is needed in various forms, potentially including but not limited to the provision of (a) on-the-job or formal code user training, (b) applied analysis assistance, (c) pre-analysis scoping studies, (d) experience-based technical insights and advice, (e) analysis knowledge management and preservation, (f) support for phenomena identification and ranking table (PIRT) processes, (g) analysis peer review, and (h) responses to questions and comments from code users.

II. Objective

The objective of this work is to improve, maintain, and assess the PARCS code package and support its application to the steady-state and transient analysis of next generation nuclear reactors.

III. Work Requirements

The contract work scope is described below. Deliverables, estimated levels of effort, and estimated completion dates are noted under each task. In all tasks, the contractor shall comply with code standards listed under Appendices A and B.

Task 1. PARCS Modification for New Reactor Analysis

Task 1.1 PARCS Code Conversion to NRC F90 Standards

The PARCS code was written in the early 1990s using the F77 standard coding. All modifications to the code supported by NRC since 1996 have been written using the F90 coding standards with the CVF compiler. The contractor shall convert the original PARCS coding to F90 standards using the Intel Visual Fortran compiler on Windows and the Lahey or Nag compiler on Linux. The contractor shall upgrade the coding to be consistent with the staff's TRACE Standard F90 Programming Practices and General Design Philosophies as set forth in the special requirement delineated in Appendices A and B. The contractor shall also develop a user interface routine for PARCS that will make it possible for an external user to access all variables used in PARCS consistent with the TRACE Exterior Communications Interface (ECI).

<u>Deliverables</u>	<u>Estimated Level of Effort</u>	<u>Estimated Completion Date</u>
- Updated PARCS source code	6.0 staff-months	10 months after task order start

Task 1.2 Code Documentation

The contractor shall update the current user and theory manuals for the PARCS code. The programmer's manual will also be developed to document all PARCS coding and any operating system architectural dependencies. The description will also clearly distinguish those sections of the code that are used in TRACE (or RELAP5) coupled calculations from those that are only used in PARCS standalone calculations. The contractor shall keep the document up to date to reflect code changes under tasks 2.4 to 2.9.

<u>Deliverables</u>	<u>Estimated Level of Effort</u>	<u>Estimated Completion Date</u>
- Updated code documentation	3.0 staff-months	14 months after task order start

Task 1.3 Technical Support and Source Code Configuration Control

The contractor shall provide technical support to PARCS users. A trouble report and resolution tracking system will be maintained for PARCS, the RELAP5/PARCS coupling, and the TRACE/PARCS coupling. A listing of the outstanding and resolved trouble reports will be maintained. New test problems that are added to the PARCS test suite as a result of the resolution of a trouble report will be documented. The NRC technical monitor will be notified of all technical support activities, new trouble reports, and resolution of past trouble

reports. This task will also maintain PARCS under a source code control system. The procedures for maintaining the code, including the version numbering system, required testing, and quality assurance checks will be documented and provided to NRC. The system will be able to recover previously released code versions.

<u>Deliverables</u>	<u>Estimated Level of Effort</u>	<u>Estimated Completion Date</u>
- Trouble tracking reports	4.5 staff-months	26 months after task order start
- Configuration control procedures document		6 months after task order start

Task 1.4 Develop Ability to Generate TRACE Point Kinetics Parameters from PARCS Steady-State

Several TRACE users have indicated a desire to generate the TRACE point kinetics parameters with the PARCS steady-state solution. This task will review the TRACE point kinetics models and insure the consistency of the PARCS edits of the point kinetics parameters. Verification and validation will be performed for a representative PWR and a BWR.

<u>Deliverables</u>	<u>Estimated Level of Effort</u>	<u>Estimated Completion Date</u>
- Updated PARCS source code	2.5 staff-months	15 months after task order start
- Letter report on code changes		
- Updates to code manuals		

Task 1.5 Expanded Code Functionality: Extension of Analytic Nodal Method

The analytic nodal method currently used in PARCS is restricted to uniform mesh. For models that require non-uniform mesh, such as the ESBWR, it is necessary to extend the ANM solution to arbitrary mesh size.

<u>Deliverables</u>	<u>Estimated Level of Effort</u>	<u>Estimated Completion Date</u>
- Updated PARCS source code	3.0 staff-months	8 months after task order start
- Letter report on code changes		
- Updates to code manuals		

Task 1.6 Expanded Code Functionality: Cross Section Model

The current PARCS cross section model provides a range of feedback dependencies for both instantaneous and "history" variables. New reactor designs' applications required that more variables such as fuel temperature history and instant moderator temperatures be added to these models.

<u>Deliverables</u>	<u>Estimated Level of Effort</u>	<u>Estimated Completion Date</u>
- Updated PARCS source code	2.0 staff-months	12 months after task order start
- Letter report on code changes		
- Updates to code manuals		

Task 1.7 Expanded Code Functionality: Multi-cycle Depletion Capability

The depletion capability in PARCS requires improvements in order to facilitate the depletion capability for both single and multiple cycles. For the single-cycle, the current input control cards will be updated and the output edits will be improved. For the multi-cycle improvements will be made in the fuel handling and disposition capability. For example, the user currently must track and move assemblies by hand between cycles which can lead to significant errors. Coding will be developed to implement multi-cycle depletion capability which will then be coordinated with the current PARCS SNAP plugin.

<u>Deliverables</u>	<u>Estimated Level of Effort</u>	<u>Estimated Completion Date</u>
- Updated PARCS source code - Letter report on code changes - Updates to code manuals	2.0 staff-months	20 months after task order start

Task 1.8 Expanded Code Functionality: Microscopic Depletion Capability

The existing macroscopic depletion capability in PARCS inherently limits the accurate treatment of fuel depletion history effects for reactor physics analyses and prevents or limits the application PARCS core depletion results to the safety analysis of spent fuel in storage, transport, and disposal systems. This task comprises the initial phase of work toward establishing a PARCS option for microscopic depletion analysis, whereby nodal fuel nuclide inventories will be computed and tracked for each fuel assembly. Specifically, this task will survey the technical literature on microscopic core depletion methods, identify and describe the value of such methods in supporting reactor as well spent fuel safety analyses (e.g., burnup credit), and describe effective approaches for incorporating microscopic depletion capabilities in PARCS and supporting them with the TRITON lattice code.

<u>Deliverables</u>	<u>Estimated Level of Effort</u>	<u>Estimated Completion Date</u>
- Updated PARCS source code - Letter report on code changes - Updates to code manuals	2.0 staff-months	26 months after task order start

Task 1.9 Enhanced Code Performance: Implicit Code Coupling

The current method of performing the coupled thermal-hydraulics / neutronics calculation in TRACE/PARCS is to couple the individual fields explicitly. There has been a recent effort to develop a more implicit solution method for the temperature/fluid calculation in TRACE. The task here will be to take advantage of this improvement and to make the coupling of TRACE and PARCS also more implicit.

<u>Deliverables</u>	<u>Estimated Level of Effort</u>	<u>Estimated Completion Date</u>
- Updated PARCS source code - Letter report on code changes - Updates to code manuals	3.0 staff-months	25 months after task order start

IV. Research Quality:

The quality of NRC research programs are assessed each year by the Advisory Committee on Reactor Safeguards. Within the context of their reviews of RES programs, the definition of quality research is based upon several major characteristics:

- Results meet the objectives (75% of overall score)
 - Justification of major assumptions (12%)
 - Soundness of technical approach and results (52%)
 - Uncertainties and sensitivities addressed (11%)
- Documentation of research results and methods is adequate (25% of overall score)
 - Clarity of presentation (16%)
 - Identification of major assumptions (9%)

It is the responsibility of the contractor to ensure that these quality criteria are adequately addressed throughout the course of the research that is performed. The NRC project manager and technical monitor will review all research products with these criteria in mind.

V. Reporting Requirements

In addition to the letter reports listed in the above tasks, the contractor shall also provide the monthly letter status reports described below.

Monthly Letter Status Report

A Monthly Letter Status Report (MLSR) shall be submitted to the NRC Project Manager and Technical Monitor by the 20th of the month following the month to be reported with copies provided to the following:

Project Manager (Daniel Forsyth, Mail Stop T-10K8)
Division Management Analyst (Sharon Haggerty, Mail Stop T-10E50)
Contracting Officer (TBD)

The MLSR shall identify the title of the project, the job code, the Principal Investigator, the period of performance, the reporting period, summarize each month's technical progress, list monthly spending, total spending to date, and the remaining funds and shall contain information as directed in NRC Management Directive 11.7. Any administrative or technical difficulties which may affect the schedule or costs of the project shall be immediately brought to the attention of the NRC project manager.

VI. Deliverables and Delivery Schedule

As noted under each task description

VII. Meetings and Travel

It is estimated that, for each year, there will be two, two-day meetings at the NRC for up to two staff members to cover progress, review, and participate in management briefings.

Appendix A
Special Requirements:

All code development activities must follow principles described in NUREG-1737 and adhere to the Programming Guidelines and Design Philosophies as outlined on the TRACE Development website. The contractor shall prepare a Software Requirements Document (SRD) (using an established NRC Framemaker template), Test Plan, and Software Design and Implementation Document (SDID) before implementing new models or features and submit them to NRC for their approval. Upon approval of the SRD and SDID, the contractor shall implement the changes. The results of the programming effort shall be documented in a Completion Report. The contractor does have the freedom to combine these documents, where appropriate and with NRC approval. What is important is that the relevant topics belonging to each document be addressed and formally communicated in some fashion.

All code transmittal packages shall be generated using the buildTransmittal.pl perl script and shall include the following:

- SQA documentation
- Patch files to the TRACE source in diff format
- Modified source files
- HTML summary file explaining the nature of the changes and testing
- Modified test input files (if any)
- Newly added test input decks (if any)
- HTML results of the testSummary.pl script (generated for the regression test set)
- AVScript input files (if applicable)
- Scripts or programming tools that might have been used/generated in the course of completing the update

If changes to the code manuals are required in conjunction with a particular update, the contractor may be asked by NRC to make those modifications in addition to the SQA documentation outlined above. Regarding this issue, it is NRC's expectation that the contractor shall become familiar with the content of each chapter in each manual so that manual changes are applied comprehensively and at a level of detail similar to the content that surrounds the modified or added text. The contractor shall ensure that inconsistencies between various sections of content (either in thought or in nomenclature) are not introduced.

Changes to manuals shall generally be made to the on-line, official electronic files directly. In cases where this practice is either not prudent or not possible, the contractor shall use Framemaker's built-in change bar feature to call out modifications to make it easier for NRC staff to integrate those changes into the official electronic files at the appropriate time.

It should be stressed that the NRC shall not consider it acceptable to submit graduate theses as the final product of research. All final assessment reports shall use NRC-supplied Framemaker templates.

The development of all assessment input problems shall be accompanied by the development of a calculation notebook that justifies the use of every value provided in the model. For every value, the calculation notebook should answer the questions "what is it?", "why was it chosen?", "what did you have to assume?", "how was it calculated?", and/or "where did it come from?". The calculation notebook will be prepared in an electronic format using a template to be provided by the NRC.

**TRACE Standard F90
Programming Practices and
General Design Philosophies**

Last updated: 12/07/2005

Developers should adhere to these practices for all new coding. Please send feedback to cjm4@nrc.gov. Improper style in old coding will be corrected as resources permit.

* Write GOOD requirements - see

<http://www.incose.org/workgrps/rwg/writing.html> for some online guidelines

* All code SQA reports and code documentation shall be prepared and submitted to NRC in Framemaker format. Equations shall be generated using Framemaker's built-in equation tools. Line and vector-based diagrams shall be generated using Framemaker's built-in drawing tools. In cases where this is not possible, the original picture files must accompany the document and be in a format editable by common drawing tools (eps, svg, mif, pdf, cdr). Use encapsulated postscript (eps) only as a very last resort - we expect developers to employ modern drawing tools that will not lead to this limitation. For engineering plots, ACGrace is the preferred program for generating such plots. Save them to mif format for importing into a Framemaker document. Plots should NOT be imported as bitmap images (use vector formats instead. For raster/bitmap pictures, the image may be inserted directly into the document, but the transmittal should include the image in its own file in a standard format (gif, png, or jpg).

* All new variables will be explicitly typed, and all new routines will include IMPLICIT NONE statements.

* Implement a standard KIND representation for Integers and Reals

+ Always insert the line "USE IntrType" after the MODULE statement, or for any subprograms that are not module procedures, after the SUBROUTINE or FUNCTION statement. If IntrType is declared at the module level, there is no need to include it within the CONTAINED subroutines.

+ Begin all definitions of real variables with "REAL(sdk)"

+ Begin all definitions of integer variables with "INTEGER(sik)"

* All use of real and integer constants should be implemented with the _sdk and _sik kind type parameters

+ For example, use 2_sik instead of just 2, or 1.0e+10_sdk instead of 1.0d+10, etc

* Do not use continuation lines inside of variable declaration statements

* When declaring a variable of TYPE POINTER, ALWAYS, ALWAYS, ALWAYS, initialize it with the => NULL() syntax.

* Get in the habit of using default initialization whenever variables are declared, but keep in mind that use of this syntax implies the SAVE attribute for any variable this is done for. Developers should get in the habit of using the ONLY syntax in their USE statements. This prevents unintended variables from coming into scope and preventing the compiler from detecting instances where a local variable is undeclared or an unintended global variable is used mistakenly (as can happen with variables like cco when cutting and pasting code).

* Developers should always strive for object-oriented designs. What does this imply? It means that coding should be data-centric. In other words, design the data structure first. Make it flexible enough to handle all possible situations you could ever envision needing it for. Once an effective data structure is fleshed out, on paper. Then begin to think about methods that operate on that data structure. As a minimum there ought to be constructor/initialization and destructor methods for the data structure as a whole and any substructure pointer or allocatable arrays that might exist. Make the data structure PRIVATE to the module of interest. Access to the data structure should only be through subroutines or functions. Factor these ideas into your proposals and predictions about time and cost. NRC will expect it. The penalty with these sorts of designs is in run-time

speed, so there may be situations where such designs don't make sense but a developer's priorities should be object-oriented first, run-time second. Speed can always be recaptured in the next generation of processors or by optimizing other aspects of the code. If resource permit, some prototyping of various methodologies to understand the exact costs/benefits would be appropriate.

* All dummy arguments and important local variables should be declared within their own TYPE declaration declaration statements.

* The INTENT of all dummy arguments should be declared in all new coding

* Do not use bare END statements

* All Fortran statements, attributes, intrinsic subprograms, and logical operators in new coding will be in all upper case.

```
REAL(sdk), POINTER, DIMENSION(:,:) :: a, aa
```

```
IF (i.GT.j) THEN
```

* Leading and trailing under scores shall not be used in any names (due to the potential for name mangling issues during linking), but underscores in the middle of names are allowed.

* Variable, file, and procedure names will be long enough to be self-documenting, within reason, with a suggested limit of 15-20 characters

* All new variable names will have the first letter of each sub-element capitalized except the first, as in pipeData.

* All derived type names will end in "T", as in pipeDataT.

* Module and subprogram names will begin with a capitalized letter, but don't change old subprogram names.

* All new coding will be structured, with an indentation level of three spaces.

```
DO i = 1,n
  DO j = 1,n
    IF (i.gt.j) THEN
      a(i,j) = - aa(j,i)
    ELSE
      a(i,j) = aa(i,j)
    ENDIF
  ENDDO
ENDDO
```

* Use IF-THEN-ENDIF instead of IF (condition) statement

* "GOTO" statements will be used sparingly, if at all. Instead, programmers should use IF-THEN-ELSE, SELECT CASE, CYCLE, EXIT, and internal subprograms as appropriate

* Use standard F90 free format code style with the following exceptions:

+ a limit of 110 columns per line:

+ Source code should generally start in column 7. Columns 1-6 are to be reserved for statement labels. This does not apply to comments and MODULE statements.

* Comments lines are indicated with a "!" in column 1.

* Comments that serve to delineate, summarize, and/or clarify larger multi-step algorithms should be indented one or two spaces

* Comments that serve to clarify the intent of and/or summarize small blocks of code should be given the same indentation level as that code

* Comments should be offset by at least one blank line from the previous F90 statement.

* Never place a comment at the end of a continued line (illegal Fortran)

Try not to ever use multi-line statements. It makes writing scripts to parse FORTRAN more difficult and invalidates line coverage profiling studies

* End-of-line comments should not be used except in context of data type declaration statements or where a brief comment on the same line as the statement clearly accentuates and improves the readability and intent of the IF statement or block that follows, ala

```
INTEGER(sik) :: height = 0.0_sdk ! height of the cell
```

or

```
IF (fillTab(cco)%flowin .GE. 0.0d0) THEN !Determine donor cell mixture
```

* Comment blocks should generally not be longer than a dozen lines (additional information can go in the programmer's manual, and/or the SDID subroutine report)

* Authorship information should be included for each new subroutine that a developer creates or rewrites from scratch. When significant, well defined blocks of changes (on the order of 100 lines or more) are made to an existing subroutine, a note should be placed directly beneath the existing authorship info (or below the subroutine purpose if it doesn't) denoting the name, organization, date and quick description of the modifications. Authorship info should not be provided when the changes are spread out (i.e. not in well defined blocks) - even if they significantly modify some behavior of the algorithm contained therein - although the subroutine description should be checked for accuracy and modified when appropriate.

* The following standard template should be used for each new subroutine that is developed (a plug-in to Visual Fortran has been created which can create this automatically):

```
SUBROUTINE SampleSub()
!
USE IntrType
IMPLICIT NONE
!
! The purpose of this routine is to <<Insert Description here>>
!
! Programmed by Name, Organization, Date (Month/Year)
!
! Subroutine Argument Descriptions:
!
! Variable Declarations:
!
RETURN
!
END SUBROUTINE SampleSub
```

When making a change, in general do not comment out the old coding but instead delete it

* Do not surround your coding with your initials - it just uglifies the code

- * Never use COMMON. Use a MODULE and corresponding USE instead
- * Never use EQUIVALENCE. Use POINTERS if you must, but better practice is to redesign so pointers are not necessary.
- * All code must be standard F90 - no use of non-standard compiler extensions or preprocessor definitions are allowed
- * If available in the compiler, all code should be developed with strict F90 standards checking and array bounds checking turn on. Also, compiler flags should be engaged which check for any unused variables and uninitialized variables. If any unused variables are located in a routine that a developer touches, then he or she should remove them.
- * If a new subroutine is added to the code outside the scope of a MODULE statement, then an explicit interface to that routine should be created. This allows the compiler to handle checking of the argument lists at compile time.
- * Developers should remove any unused subroutines which are created as a result of their efforts.
- * When incorporating legacy code from other computer codes into TRACE, every effort should be made to clean that code up and make sure it conforms to the stylistic rules and design philosophies outlined in this document.

When preparing an SRD for a particular development project, the requirements should take into account the planned update's effect on or interaction with such areas as:

- + restart processing
- + CSS controllers
- + control system
- + exterior component and other parallel programming interfaces
- + timestep backup flow logic
- + SNAP and/or VEDA
- + English units

* Any modification or enhancement of intercomponent transfer of information should never involve direct modification of bd array elements. All transfer should be arranged during the initialization phase of the calculation (module SysService) through the system service transfer tables.

SECTION D - PACKAGING AND MARKING

D.1 PACKAGING AND MARKING (MAR 1987)

The Contractor shall package material for shipment to the NRC in such a manner that will ensure acceptance by common carrier and safe delivery at destination. Containers and closures shall comply with the Interstate Commerce Commission Regulations, Uniform Freight Classification Rules, or regulations of other carriers as applicable to the mode of transportation. On the front of the package, the Contractor shall clearly identify the contract number under which the product is being provided.

SECTION E - INSPECTION AND ACCEPTANCE**E.1 NOTICE LISTING CONTRACT CLAUSES INCORPORATED BY REFERENCE**

The following contract clauses pertinent to this section are hereby incorporated by reference (by Citation Number, Title, and Date) in accordance with the clause at FAR "52.252-2 CLAUSES INCORPORATED BY REFERENCE" in Section I of this contract. See FAR 52.252-2 for an internet address (if specified) for electronic access to the full text of a clause.

NUMBER	TITLE	DATE
52.246-9	FEDERAL ACQUISITION REGULATION (48 CFR Chapter 1) INSPECTION OF RESEARCH AND DEVELOPMENT (SHORT FORM)	APR 1984

E.2 PLACE OF INSPECTION AND ACCEPTANCE (MAR 1987)

Inspection and acceptance of the deliverable items to be furnished hereunder shall be made by the Project Officer at the destination.

SECTION F - DELIVERIES OR PERFORMANCE**F.1 NOTICE LISTING CONTRACT CLAUSES INCORPORATED BY REFERENCE**

The following contract clauses pertinent to this section are hereby incorporated by reference (by Citation Number, Title, and Date) in accordance with the clause at FAR "52.252-2 CLAUSES INCORPORATED BY REFERENCE" in Section I of this contract. See FAR 52.252-2 for an internet address (if specified) for electronic access to the full text of a clause.

NUMBER	TITLE	DATE
	FEDERAL ACQUISITION REGULATION (48 CFR Chapter 1)	
52.247-34	F.O.B. DESTINATION	NOV 1991

F.2 2052.211-70 PREPARATION OF TECHNICAL REPORTS (JAN 1993)

All technical reports required by Section C and all Technical Progress Reports required by Section F are to be prepared in accordance with the attached Management Directive 3.7, "NUREG-Series Publications." Management Directive 3.7 is not applicable to any Contractor Spending Plan (CSP) and any Financial Status Report that may be included in this contract.

Management Directive 3.7 is available via the Internet at:

<http://adamswebsearch2.nrc.gov/idmws/doccontent.dll?library=PUADAMS^PBNTAD01&ID=042540040>

MD 3.7 can also be accessed through the NRC website (www.nrc.gov) as follows:

From www.nrc.gov

Click on "Electronic Reading Room"

Move cursor to Document Collections and select "Mgmt Directives"

F.3 2052.211-71 TECHNICAL PROGRESS REPORT (JAN 1993)

The contractor shall provide a monthly Technical Progress Report to the project officer and the contracting officer. The report is due within 15 calendar days after the end of the report period and must identify the title of the project, the contract number, appropriate financial tracking code specified by the NRC Project Officer, project manager and/or principal investigator, the contract period of performance, and the period covered by the report. Each report must include the following for each discrete task/task order:

(a) A listing of the efforts completed during the period, and milestones reached or, if missed, an explanation provided;

(b) Any problems or delays encountered or anticipated and recommendations for resolution. If the recommended resolution involves a contract modification, e.g., change in work requirements, level of effort (cost) or schedule delay, the contractor shall submit a separate letter to the contracting officer identifying the required change and estimated cost impact.

(c) A summary of progress to date; and

- (d) Plans for the next reporting period.

F.4 2052.211-72 FINANCIAL STATUS REPORT (OCT 1999)

The contractor shall provide a monthly Financial Status Report (FSR) to the project officer and the contracting officer. The FSR shall include the acquisition of, or changes in the status of, contractor-held property acquired with government funds valued at the time of purchase at \$50,000 or more. Whenever these types of property changes occur, the contractor shall send a copy of the report to the Chief, Property and Acquisition Oversight Branch, Office of Administration. The report is due within 15 calendar days after the end of the report period and must identify the title of the project, the contract number, the appropriate financial tracking code (e.g., Job Code Number or JCN) specified by the NRC Project Officer, project manager and/or principal investigator, the contract period of performance, and the period covered by the report. Each report must include the following for each discrete task:

- (a) Total estimated contract amount.
- (b) Total funds obligated to date.
- (c) Total costs incurred this reporting period.
- (d) Total costs incurred to date.
- (e) Detail of all direct and indirect costs incurred during the reporting period for the entire contract or each task, if it is a task ordering contract.
- (f) Balance of obligations remaining.
- (g) Balance of funds required to complete contract/task order.
- (h) Contractor Spending Plan (CSP) status: A revised CSP is required with the Financial Status Report whenever the contractor or the contracting officer has reason to believe that the total cost for performance of this contract will be either greater or substantially less than what had been previously estimated.

(1) Projected percentage of completion cumulative through the report period for the project/task order as reflected in the current CSP.

(2) Indicate significant changes in the original CSP projection in either dollars or percentage of completion. Identify the change, the reasons for the change, whether there is any projected overrun, and when additional funds would be required. If there have been no changes to the original NRC-approved CSP projections, a written statement to that effect is sufficient in lieu of submitting a detailed response to item "h".

- (i) Property status:

(1) List property acquired for the project during the month with an acquisition cost between \$500 and \$49,999. Give the item number for the specific piece of equipment.

(2) Provide a separate list of property acquired for the project during the month with an acquisition cost of \$50,000 or more. Provide the following information for each item of property: item description or nomenclature, manufacturer, model number, serial number, acquisition cost, and receipt date. If no property was acquired during the month, include a statement to that effect. The same information must be provided for any component or peripheral equipment which is part of a "system or system unit."

(3) For multi-year projects, in the September monthly financial status report provide a cumulative listing of property with an acquisition cost of \$50,000 or more showing the information specified in paragraph (i)(2) of this clause.

(4) In the final financial status report provide a closeout property report containing the same elements as described above for the monthly financial status reports, for all property purchased with NRC funds regardless of value unless title has been vested in the contractor. If no property was acquired under the contract, provide a statement to that effect. The report should note any property requiring special handling for security, health, safety, or other reasons as part of the report.

(j) Travel status: List the starting and ending dates for each trip, the starting point and destination, and the traveler(s) for each trip.

(k) If the data in this report indicates a need for additional funding beyond that already obligated, this information may only be used as support to the official request for funding required in accordance with the Limitation of Cost (LOC) Clause (FAR 52.232-20) or the Limitation of Funds (LOF) Clause FAR 52.232-22.

F.5 PLACE OF DELIVERY--REPORTS (JUN 1988)

The items to be furnished hereunder shall be delivered, with all charges paid by the Contractor, to:

(a) Project Officer (2 copies)

U.S. Nuclear Regulatory Commission
ATTN: Daniel Forsyth
Office of Nuclear Regulatory Research
M/S T-10K8
11545 Rockville Pike
Rockville, MD 20852

(b) Contracting Officer (1 copy)

U.S. Nuclear Regulatory Commission
ATTN: NRC-04-07-115
Division of Contracts, M/S T-712
11545 Rockville Pike
Rockville, MD 20852

F.6 DURATION OF CONTRACT PERIOD (MAR 1987)

This contract shall commence on 10/01/2007 and will expire 11/30/2009.

SECTION G - CONTRACT ADMINISTRATION DATA**G.1 2052.215-71 PROJECT OFFICER AUTHORITY (NOVEMBER 2006)**

(a) The contracting officer's authorized representative (hereinafter referred to as the project officer) for this contract is:

Name: Daniel Forsyth

Address: U.S. Nuclear Regulatory Commission
Office of Nuclear Regulatory Research
11545 Rockville Pike, M/S T-10K8
Rockville, MD 20852

Telephone Number: 301-415-5674

(b) Performance of the work under this contract is subject to the technical direction of the NRC project officer. The term "technical direction" is defined to include the following:

(1) Technical direction to the contractor which shifts work emphasis between areas of work or tasks, authorizes travel which was unanticipated in the Schedule (i.e., travel not contemplated in the Statement of Work (SOW) or changes to specific travel identified in the SOW), fills in details, or otherwise serves to accomplish the contractual SOW.

(2) Provide advice and guidance to the contractor in the preparation of drawings, specifications, or technical portions of the work description.

(3) Review and, where required by the contract, approval of technical reports, drawings, specifications, and technical information to be delivered by the contractor to the Government under the contract.

(c) Technical direction must be within the general statement of work stated in the contract. The project officer does not have the authority to and may not issue any technical direction which:

(1) Constitutes an assignment of work outside the general scope of the contract.

(2) Constitutes a change as defined in the "Changes" clause of this contract.

(3) In any way causes an increase or decrease in the total estimated contract cost, the fixed fee, if any, or the time required for contract performance.

(4) Changes any of the expressed terms, conditions, or specifications of the contract.

(5) Terminates the contract, settles any claim or dispute arising under the contract, or issues any unilateral directive whatever.

(d) All technical directions must be issued in writing by the project officer or must be confirmed by the project officer in writing within ten (10) working days after verbal issuance. A copy of the written direction must be furnished to the contracting officer. A copy of NRC Form 445, Request for Approval of Official Foreign Travel, which has received final approval from the NRC must be furnished to the contracting officer.

(e) The contractor shall proceed promptly with the performance of technical directions duly issued by the project officer in the manner prescribed by this clause and within the project officer's authority under the provisions of this clause.

(f) If, in the opinion of the contractor, any instruction or direction issued by the project officer is within one of the categories as defined in paragraph (c) of this section, the contractor may not proceed but shall notify the contracting officer in writing within five (5) working days after the receipt of any instruction or direction and shall request the contracting officer to modify the contract accordingly. Upon receiving the notification from the contractor, the contracting officer shall issue an appropriate contract modification or advise the contractor in writing that, in the contracting officer's opinion, the technical direction is within the scope of this article and does not constitute a change under the "Changes" clause.

(g) Any unauthorized commitment or direction issued by the project officer may result in an unnecessary delay in the contractor's performance and may even result in the contractor expending funds for unallowable costs under the contract.

(h) A failure of the parties to agree upon the nature of the instruction or direction or upon the contract action to be taken with respect thereto is subject to 52.233-1 -Disputes.

(i) In addition to providing technical direction as defined in paragraph (b) of the section, the project officer shall:

(1) Monitor the contractor's technical progress, including surveillance and assessment of performance, and recommend to the contracting officer changes in requirements.

(2) Assist the contractor in the resolution of technical problems encountered during performance.

(3) Review all costs requested for reimbursement by the contractor and submit to the contracting officer recommendations for approval, disapproval, or suspension of payment for supplies and services required under this contract.

(4) Assist the contractor in obtaining the badges for the contractor personnel.

(5) Immediately notify the Security Branch, Division of Facilities and Security (SB/DFS) (via e-mail) when a contractor employee no longer requires access authorization and return of any NRC issued badge to SB/DFS within three days after their termination.

(6) Ensure that all contractor employees that require access to classified Restricted Data or National Security Information or matter, access to sensitive unclassified information (Safeguards, Official Use Only, and Proprietary information) access to sensitive IT systems or data, unescorted access to NRC controlled buildings/space, or unescorted access to protected and vital areas of nuclear power plants receive approval of SB/DFS prior to access in accordance with Management Directive and Handbook 12.3.

(7) For contracts for the design, development, maintenance or operation of Privacy Act Systems of Records, obtain from the contractor as part of closeout procedures, written certification that the contractor has returned to NRC, transferred to the successor contractor, or destroyed at the end of the contract in accordance with instructions provided by the NRC Systems Manager for Privacy Act Systems of Records, all records (electronic or paper) which were created, compiled, obtained or maintained under the contract.

G.2 2052.215-77 TRAVEL APPROVALS AND REIMBURSEMENT (OCT 1999)

(a) All foreign travel must be approved in advance by the NRC on NRC Form 445, Request for Approval of Official Foreign Travel, and must be in compliance with FAR 52.247-63 Preference for U.S. Flag Air Carriers. The contractor shall submit NRC Form 445 to the NRC no later than 30 days before beginning travel.

(b) The contractor must receive written approval from the NRC Project Officer before taking travel that was unanticipated in the Schedule (i.e., travel not contemplated in the Statement of Work, or changes to specific travel identified in the Statement of Work).

(c) The contractor will be reimbursed only for those travel costs incurred that are directly related to this contract and are allowable subject to the limitations prescribed in FAR 31.205-46.

(d) It is the responsibility of the contractor to notify the contracting officer in accordance with the Limitations of Cost clause of this contract when, at any time, the contractor learns that travel expenses will cause the contractor to exceed the estimated costs specified in the Schedule.

(e) Reasonable travel costs for research and related activities performed at State and nonprofit institutions, in accordance with Section 12 of Pub. L. 100-679, shall be charged in accordance with the contractor's institutional policy to the degree that the limitations of Office of Management and Budget (OMB) guidance are not exceeded. Applicable guidance documents include OMB Circular A-87, Cost Principles for State and Local Governments; OMB Circular A-122, Cost Principles for Nonprofit Organizations; and OMB Circular A-21, Cost Principles for Educational Institutions.

G.3 2052.216-71 INDIRECT COST RATES – ALTERNATE 1 (JAN 1993)

The contractor is reimbursed for allowable indirect costs in accordance with the following predetermined rates:

INDIRECT COST POOL	RATE	BASE	PERIOD
Facilities & Administrative (On Campus)	[REDACTED]	Modified Total Direct Costs	Effective date through contract expiration

SECTION H - SPECIAL CONTRACT REQUIREMENTS**H.1 2052.209-72 CONTRACTOR ORGANIZATIONAL CONFLICTS OF INTEREST (JAN 1993)**

(a) Purpose. The primary purpose of this clause is to aid in ensuring that the contractor:

(1) Is not placed in a conflicting role because of current or planned interests (financial, contractual, organizational, or otherwise) which relate to the work under this contract; and

(2) Does not obtain an unfair competitive advantage over other parties by virtue of its performance of this contract.

(b) Scope. The restrictions described apply to performance or participation by the contractor, as defined in 48 CFR 2009.570-2 in the activities covered by this clause.

(c) Work for others.

(1) Notwithstanding any other provision of this contract, during the term of this contract, the contractor agrees to forego entering into consulting or other contractual arrangements with any firm or organization the result of which may give rise to a conflict of interest with respect to the work being performed under this contract. The contractor shall ensure that all employees under this contract abide by the provision of this clause. If the contractor has reason to believe, with respect to itself or any employee, that any proposed consultant or other contractual arrangement with any firm or organization may involve a potential conflict of interest, the contractor shall obtain the written approval of the contracting officer before the execution of such contractual arrangement.

(2) The contractor may not represent, assist, or otherwise support an NRC licensee or applicant undergoing an NRC audit, inspection, or review where the activities that are the subject of the audit, inspection, or review are the same as or substantially similar to the services within the scope of this contract (or task order as appropriate) except where the NRC licensee or applicant requires the contractor's support to explain or defend the contractor's prior work for the utility or other entity which NRC questions.

(3) When the contractor performs work for the NRC under this contract at any NRC licensee or applicant site, the contractor shall neither solicit nor perform work in the same or similar technical area for that licensee or applicant organization for a period commencing with the award of the task order or beginning of work on the site (if not a task order contract) and ending one year after completion of all work under the associated task order, or last time at the site (if not a task order contract).

(4) When the contractor performs work for the NRC under this contract at any NRC licensee or applicant site,

(i) The contractor may not solicit work at that site for that licensee or applicant during the period of performance of the task order or the contract, as appropriate.

(ii) The contractor may not perform work at that site for that licensee or applicant during the period of performance of the task order or the contract, as appropriate, and for one year thereafter.

(iii) Notwithstanding the foregoing, the contracting officer may authorize the contractor to solicit or perform this type of work (except work in the same or similar technical area) if the contracting officer determines that the situation will not pose a potential for technical bias or unfair competitive advantage.

(d) Disclosure after award.

(1) The contractor warrants that to the best of its knowledge and belief, and except as otherwise set forth in this contract, that it does not have any organizational conflicts of interest as defined in 48 CFR 2009.570-2.

(2) The contractor agrees that if, after award, it discovers organizational conflicts of interest with respect to this contract, it shall make an immediate and full disclosure in writing to the contracting officer. This statement must include a description of the action which the contractor has taken or proposes to take to avoid or mitigate such conflicts. The NRC may, however, terminate the contract if termination is in the best interest of the Government.

(3) It is recognized that the scope of work of a task-order-type contract necessarily encompasses a broad spectrum of activities. Consequently, if this is a task-order-type contract, the contractor agrees that it will disclose all proposed new work involving NRC licensees or applicants which comes within the scope of work of the underlying contract. Further, if this contract involves work at a licensee or applicant site, the contractor agrees to exercise diligence to discover and disclose any new work at that licensee or applicant site. This disclosure must be made before the submission of a bid or proposal to the utility or other regulated entity and must be received by the NRC at least 15 days before the proposed award date in any event, unless a written justification demonstrating urgency and due diligence to discover and disclose is provided by the contractor and approved by the contracting officer. The disclosure must include the statement of work, the dollar value of the proposed contract, and any other documents that are needed to fully describe the proposed work for the regulated utility or other regulated entity. NRC may deny approval of the disclosed work only when the NRC has issued a task order which includes the technical area and, if site-specific, the site, or has plans to issue a task order which includes the technical area and, if site-specific, the site, or when the work violates paragraphs (c)(2), (c)(3) or (c)(4) of this section.

(e) Access to and use of information.

(1) If in the performance of this contract, the contractor obtains access to information, such as NRC plans, policies, reports, studies, financial plans, internal data protected by the Privacy Act of 1974 (5 U.S.C. Section 552a (1988)), or the Freedom of Information Act (5 U.S.C. Section 552 (1986)), the contractor agrees not to:

(i) Use this information for any private purpose until the information has been released to the public;

(ii) Compete for work for the Commission based on the information for a period of six months after either the completion of this contract or the release of the information to the public, whichever is first;

(iii) Submit an unsolicited proposal to the Government based on the information until one year after the release of the information to the public; or

(iv) Release the information without prior written approval by the contracting officer unless the information has previously been released to the public by the NRC.

(2) In addition, the contractor agrees that, to the extent it receives or is given access to proprietary data, data protected by the Privacy Act of 1974 (5 U.S.C. Section 552a (1988)), or the Freedom of Information Act (5 U.S.C. Section 552 (1986)), or other confidential or privileged technical, business, or financial information under this contract, the contractor shall treat the information in accordance with restrictions placed on use of the information.

(3) Subject to patent and security provisions of this contract, the contractor shall have the right to use technical data it produces under this contract for private purposes provided that all requirements of this contract have been met.

(f) Subcontracts. Except as provided in 48 CFR 2009.57 0-2, the contractor shall include this clause, including this paragraph, in subcontracts of any tier. The terms contract, contractor, and contracting officer, must be appropriately modified to preserve the Government's rights.

(g) Remedies. For breach of any of the above restrictions, or for intentional nondisclosure or misrepresentation of any relevant interest required to be disclosed concerning this contract or for such erroneous representations that necessarily imply bad faith, the Government may terminate the contract for default, disqualify the contractor from subsequent contractual efforts, and pursue other remedies permitted by law or this contract.

(h) Waiver. A request for waiver under this clause must be directed in writing to the contracting officer in accordance with the procedures outlined in 48 CFR 2009.570-9.

(i) Follow-on effort. The contractor shall be ineligible to participate in NRC contracts, subcontracts, or proposals therefor (solicited or unsolicited), which stem directly from the contractor's performance of work under this contract. Furthermore, unless so directed in writing by the contracting officer, the contractor may not perform any technical consulting or management support services work or evaluation activities under this contract on any of its products or services or the products or services of another firm if the contractor has been substantially involved in the development or marketing of the products or services.

(1) If the contractor, under this contract, prepares a complete or essentially complete statement of work or specifications, the contractor is not eligible to perform or participate in the initial contractual effort which is based on the statement of work or specifications. The contractor may not incorporate its products or services in the statement of work or specifications unless so directed in writing by the contracting officer, in which case the restrictions in this paragraph do not apply.

(2) Nothing in this paragraph precludes the contractor from offering or selling its standard commercial items to the Government.

H.2 2052.215-70 KEY PERSONNEL (JAN 1993)

(a) The following individuals are considered to be essential to the successful performance of the work hereunder:

[REDACTED]

[REDACTED]

The contractor agrees that personnel may not be removed from the contract work or replaced without compliance with paragraphs (b) and (c) of this section.

(b) If one or more of the key personnel, for whatever reason, becomes, or is expected to become, unavailable for work under this contract for a continuous period exceeding 30 work days, or is expected to devote substantially less effort to the work than indicated in the proposal or initially anticipated, the contractor shall immediately notify the contracting officer and shall, subject to the concurrence of the contracting officer, promptly replace the personnel with personnel of at least substantially equal ability and qualifications.

(c) Each request for approval of substitutions must be in writing and contain a detailed explanation of the circumstances necessitating the proposed substitutions. The request must also contain a complete resume for the proposed substitute and other information requested or needed by the contracting officer to evaluate the

proposed substitution. The contracting officer and the project officer shall evaluate the contractor's request and the contracting officer shall promptly notify the contractor of his or her decision in writing.

(d) If the contracting officer determines that suitable and timely replacement of key personnel who have been reassigned, terminated, or have otherwise become unavailable for the contract work is not reasonably forthcoming, or that the resultant reduction of productive effort would be so substantial as to impair the successful completion of the contract or the service order, the contract may be terminated by the contracting officer for default or for the convenience of the Government, as appropriate. If the contracting officer finds the contractor at fault for the condition, the contract price or fixed fee may be equitably adjusted downward to compensate the Government for any resultant delay, loss, or damage.

H.3 2052.235-70 PUBLICATION OF RESEARCH RESULTS (OCT 1999)

(a) The principal investigator(s)/contractor shall comply with the provisions of NRC Management Directive 3.7: "NUREG Series Publications" regarding publication in refereed scientific and engineering journals or dissemination to the public of any information, oral or written, concerning the work performed under this contract. Failure to comply with this clause shall be grounds for termination of this contract.

(b) The principal investigator(s)/contractor may publish the results of this work in refereed scientific and engineering journals or in open literature and present papers at public or association meetings at interim stages of work, in addition to submitting to NRC the final reports and other deliverables required under this contract. However, such publication and papers shall focus on advances in science and technology and minimize conclusions and/or recommendations which may have regulatory implications.

(c) The principal investigator(s) shall coordinate all such publications with, and transmit a copy of the proposed article or paper to, the NRC Contracting Officer or Project Officer, prior to publication. The NRC agrees to review and provide comments within thirty (30) days after receipt of a proposed publication. However, in those cases where the information to be published is (1) subject to Commission approval, (2) has not been ruled upon, or (3) disapproved by the Commission, the NRC reserves the right to disapprove or delay the publication. Further, if the NRC disagrees with the proposed publication for any reason, it reserves the right to require that any publication not identify the NRC's sponsorship of the work and that any associated publication costs shall be borne by the contractor.

H.4 2052.235-71 SAFETY, HEALTH, AND FIRE PROTECTION (JAN 1993)

The contractor shall take all reasonable precautions in the performance of the work under this contract to protect the health and safety of its employees and of members of the public, including NRC employees and contractor personnel, and to minimize danger from all hazards to life and property. The contractor shall comply with all applicable health, safety, and fire protection regulations and requirements (including reporting requirements) of the Commission and the Department of Labor. If the contractor fails to comply with these regulations or requirements, the contracting office may, without prejudice to any other legal or contractual rights of the Commission, issue an order stopping all or any part of the work. Thereafter, a start work order for resumption of work may be issued at the discretion of the contracting officer. The contractor may not make a claim for an extension of time or for compensation or damages by reason of, or in connection with, this type of work stoppage.

H.5 GOVERNMENT FURNISHED EQUIPMENT/PROPERTY - NONE PROVIDED (JUN 1988)

The Government will not provide any equipment/property under this contract.

H.6 SEAT BELTS

Contractors, subcontractors, and grantees, are encouraged to adopt and enforce on-the-job seat belt policies and programs for their employees when operating company-owned, rented, or personally owned vehicles.

H.7 Annual and Final Contractor Performance Evaluations

Annual and final evaluations of contractor performance under this contract will be prepared in accordance with FAR 42.15, "Contractor Performance Information," normally at the time the contractor is notified of the NRC's intent to exercise the contract option. If the multi-year contract does not have option years, then an annual evaluation will be prepared (state time for annual evaluation). Final evaluations of contractor performance will be prepared at the expiration of the contract during the contract closeout process.

The Contracting Officer will transmit the NRC Project Officer's annual and final contractor performance evaluations to the contractor's Project Manager, unless otherwise instructed by the contractor. The contractor will be permitted thirty days to review the document. The contractor may concur without comment, submit additional information, or request a meeting to discuss the performance evaluation. The Contracting Officer may request the contractor's Project Manager to attend a meeting to discuss the performance evaluation.

Where a contractor concurs with, or takes no exception to an annual performance evaluation, the Contracting Officer will consider such evaluation final and releasable for source selection purposes. Disagreements between the parties regarding a performance evaluation will be referred to an individual one level above the Contracting Officer, whose decision will be final.

The Contracting Officer will send a copy of the completed evaluation report, marked "For Official Use Only," to the contractor's Project Manager for their records as soon as practicable after it has been finalized. The completed evaluation report also will be used as a tool to improve communications between the NRC and the contractor and to improve contract performance.

The completed annual performance evaluation will be used to support future award decisions in accordance with FAR 42.1502(a) and 42.1503(c). During the period the information is being used to provide source selection information, the completed annual performance evaluation will be released to only two parties - the Federal government personnel performing the source selection evaluation and the contractor under evaluation if the contractor does not have a copy of the report already.

H.8 Compliance with U.S. Immigration Laws and Regulations

NRC contractors are responsible to ensure that their alien personnel are not in violation of United States Immigration and Naturalization (INS) laws and regulations, including employment authorization documents and visa requirements. Each alien employee of the Contractor must be lawfully admitted for permanent residence as evidenced by Alien Registration Receipt Card Form 1-151 or must present other evidence from the Immigration and Naturalization Services that employment will not affect his/her immigration status. The INS Office of Business Liaison (OBL) provides information to contractors to help them understand the employment eligibility verification process for non-US citizens. This information can be found on the INS website, <http://www.ins.usdoj.gov/graphics/services/employerinfo/index.htm#obl>.

The NRC reserves the right to deny or withdraw Contractor use or access to NRC facilities or its equipment/services, and/or take any number of contract administrative actions (e.g., disallow costs, terminate for cause) should the Contractor violate the Contractor's responsibility under this clause.

H.9 WHISTLEBLOWER PROTECTION FOR NRC CONTRACTOR AND SUBCONTRACTOR EMPLOYEES (JULY 2006)

(a) The U.S. Nuclear Regulatory Commission (NRC) contractor and its subcontractor are subject to the Whistleblower Employee Protection public law provisions as codified at 42 U.S.C. 5851. NRC contractor(s) and subcontractor(s) shall comply with the requirements of this Whistleblower Employee Protection law, and the implementing regulations of the NRC and the Department of Labor (DOL). See, for example, DOL Procedures on Handling Complaints at 29 C.F.R. Part 24 concerning the employer obligations, prohibited acts, DOL procedures and the requirement for prominent posting of notice of Employee Rights at Appendix A to Part 24.

(b) Under this Whistleblower Employee Protection law, as implemented by regulations, NRC contractor and subcontractor employees are protected from discharge, reprisal, threats, intimidation, coercion, blacklisting or other employment discrimination practices with respect to compensation, terms, conditions or privileges of their employment because the contractor or subcontractor employee(s) has provided notice to the employer, refused to engage in unlawful practices, assisted in proceedings or testified on activities concerning alleged violations of the Atomic Energy Act of 1954 (as amended) and the Energy Reorganization Act of 1974 (as amended).

(c) The contractor shall insert this or the substance of this clause in any subcontracts involving work performed under this contract.

PART II - CONTRACT CLAUSES**SECTION I - CONTRACT CLAUSES****I.1 NOTICE LISTING CONTRACT CLAUSES INCORPORATED BY REFERENCE**

The following contract clauses pertinent to this section are hereby incorporated by reference (by Citation Number, Title, and Date) in accordance with the clause at FAR "52.252-2 CLAUSES INCORPORATED BY REFERENCE" in Section I of this contract. See FAR 52.252-2 for an internet address (if specified) for electronic access to the full text of a clause.

NUMBER	TITLE	DATE
	FEDERAL ACQUISITION REGULATION (48 CFR Chapter 1)	
52.202-1	DEFINITIONS	JUL 2004
52.203-3	GRATUITIES	APR 1984
52.203-5	COVENANT AGAINST CONTINGENT FEES	APR 1984
52.203-6	RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT	SEP 2006
52.203-7	ANTI-KICKBACK PROCEDURES	JUL 1995
52.203-8	CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY	JAN 1997
52.203-10	PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY	JAN 1997
52.203-12	LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS	SEP 2005
52.204-4	PRINTED OR COPIED DOUBLE-SIDED ON RECYCLED PAPER	AUG 2000
52.204-7	CENTRAL CONTRACTOR REGISTRATION	JUL 2006
52.209-6	PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT	SEP 2006
52.215-2	AUDIT AND RECORDS--NEGOTIATION ALTERNATE II (APR 1998)	JUN 1999
52.215-8	ORDER OF PRECEDENCE--UNIFORM CONTRACT FORMAT	OCT 1997
52.216-11	COST CONTRACT--NO FEE ALTERNATE I (APR 1984)	APR 1984
52.219-8	UTILIZATION OF SMALL BUSINESS CONCERNS	MAY 2004
52.222-3	CONVICT LABOR	JUN 2003
52.222-21	PROHIBITION OF SEGREGATED FACILITIES	FEB 1999
52.222-26	EQUAL OPPORTUNITY	MAR 2007
52.222-35	EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS	SEP 2006
52.222-36	AFFIRMATIVE ACTION FOR WORKERS WITH	JUN 1998

	DISABILITIES	
52.222-37	EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS	SEP 2006
52.223-6	DRUG-FREE WORKPLACE	MAY 2001
52.225-1	BUY AMERICAN ACT--SUPPLIES	JUN 2003
52.225-13	RESTRICTIONS ON CERTAIN FOREIGN PURCHASES	FEB 2006
52.227-1	AUTHORIZATION AND CONSENT ALTERNATE I (APR 1984)	JUL 1995
52.227-2	NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT	AUG 1996
52.227-11	PATENT RIGHTS -- RETENTION BY THE CONTRACTOR (SHORT FORM)	JUN 1997
52.227-14	RIGHTS IN DATA--GENERAL	JUN 1987
52.228-7	INSURANCE--LIABILITY TO THIRD PERSONS	MAR 1996
52.230-5	COST ACCOUNTING STANDARDS--EDUCATIONAL INSTITUTION	APR 1996
52.230-6	ADMINISTRATION OF COST ACCOUNTING STANDARDS	APR 2005
52.232-18	AVAILABILITY OF FUNDS	APR 1984
52.232-22	LIMITATION OF FUNDS	APR 1984
52.232-23	ASSIGNMENT OF CLAIMS	JAN 1986
52.232-33	PAYMENT BY ELECTRONIC FUNDS--CENTRAL CONTRACTOR REGISTRATION	OCT 2003
52.233-3	PROTEST AFTER AWARD ALTERNATE I (JUN 1985)	AUG 1996
52.233-4	APPLICABLE LAW FOR BREACH OF CONTRACT CLAIM	OCT 2004
52.242-1	NOTICE OF INTENT TO DISALLOW COSTS	APR 1984
52.242-13	BANKRUPTCY	JUL 1995
52.243-2	CHANGES--COST REIMBURSEMENT ALTERNATE V (APR 1984)	AUG 1987
52.244-2A	SUBCONTRACTS ALTERNATE I (JUNE 2007)	JUN 2007
52.244-5	COMPETITION IN SUBCONTRACTING	DEC 1996
52.244-6	SUBCONTRACTS FOR COMMERCIAL ITEMS	MAR 2007
52.245-1	GOVERNMENT PROPERTY	JUN 2007
52.245-9	USE AND CHARGES	JUN 2007
52.249-5	TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (EDUCATIONAL AND OTHER NONPROFIT INSTITUTIONS)	SEP 1996
52.253-1	COMPUTER GENERATED FORMS	JAN 1991

I.2 52.216-7 ALLOWABLE COST AND PAYMENT (DEC 2002)

(a) Invoicing.

(1) The Government will make payments to the Contractor when requested as work progresses, but (except for small business concerns) not more often than once every 2 weeks, in amounts determined to be allowable by the Contracting Officer in accordance with Federal Acquisition Regulation (FAR) Subpart 31.3 in effect on the date of this contract and the terms of this contract. The Contractor may submit to an authorized

representative of the Contracting Officer, in such form and reasonable detail as the representative may require, an invoice or voucher supported by a statement of the claimed allowable cost for performing this contract.

(2) Contract financing payments are not subject to the interest penalty provisions of the Prompt Payment Act. Interim payments made prior to the final payment under the contract are contract financing payments, except interim payments if this contract contains Alternate I to the clause at 52.232-25.

(3) The designated payment office will make interim payments for contract financing on the 30th day after the designated billing office receives a proper payment request.

In the event that the Government requires an audit or other review of a specific payment request to ensure compliance with the terms and conditions of the contract, the designated payment office is not compelled to make payment by the specified due date.

(b) Reimbursing costs.

(1) For the purpose of reimbursing allowable costs (except as provided in paragraph (b)(2) of the clause, with respect to pension, deferred profit sharing, and employee stock ownership plan contributions), the term "costs" includes only--

(i) Those recorded costs that, at the time of the request for reimbursement, the Contractor has paid by cash, check, or other form of actual payment for items or services purchased directly for the contract;

(ii) When the Contractor is not delinquent in paying costs of contract performance in the ordinary course of business, costs incurred, but not necessarily paid, for--

(A) Supplies and services purchased directly for the contract and associated financing payments to subcontractors, provided payments determined due will be made--

(1) In accordance with the terms and conditions of a subcontract or invoice; and

(2) Ordinarily within 30 days of the submission of the Contractor's payment request to the Government;

(B) Materials issued from the Contractor's inventory and placed in the production process for use on the contract;

(C) Direct labor;

(D) Direct travel;

(E) Other direct in-house costs; and

(F) Properly allocable and allowable indirect costs, as shown in the records maintained by the Contractor for purposes of obtaining reimbursement under Government contracts; and

(iii) The amount of financing payments that have been paid by cash, check, or other forms of payment to subcontractors.

(2) Accrued costs of Contractor contributions under employee pension plans shall be excluded until actually paid unless--

(i) The Contractor's practice is to make contributions to the retirement fund quarterly or more frequently; and

(ii) The contribution does not remain unpaid 30 days after the end of the applicable quarter or shorter payment period (any contribution remaining unpaid shall be excluded from the Contractor's indirect costs for payment purposes).

(3) Notwithstanding the audit and adjustment of invoices or vouchers under paragraph (g) of this clause, allowable indirect costs under this contract shall be obtained by applying indirect cost rates established in accordance with paragraph (d) of this clause.

(4) Any statements in specifications or other documents incorporated in this contract by reference designating performance of services or furnishing of materials at the Contractor's expense or at no cost to the Government shall be disregarded for purposes of cost-reimbursement under this clause.

(c) Small business concerns. A small business concern may receive more frequent payments than every 2 weeks.

(d) Final indirect cost rates.

(1) Final annual indirect cost rates and the appropriate bases shall be established in accordance with Subpart 42.7 of the Federal Acquisition Regulation (FAR) in effect for the period covered by the indirect cost rate proposal.

(2)(i) The Contractor shall submit an adequate final indirect cost rate proposal to the Contracting Officer (or cognizant Federal agency official) and auditor within the 6-month period following the expiration of each of its fiscal years. Reasonable extensions, for exceptional circumstances only, may be requested in writing by the Contractor and granted in writing by the Contracting Officer. The Contractor shall support its proposal with adequate supporting data.

(ii) The proposed rates shall be based on the Contractor's actual cost experience for that period. The appropriate Government representative and the Contractor shall establish the final indirect cost rates as promptly as practical after receipt of the Contractor's proposal.

(3) The Contractor and the appropriate Government representative shall execute a written understanding setting forth the final indirect cost rates. The understanding shall specify (i) the agreed-upon final annual indirect cost rates, (ii) the bases to which the rates apply, (iii) the periods for which the rates apply, (iv) any specific indirect cost items treated as direct costs in the settlement, and (v) the affected contract and/or subcontract, identifying any with advance agreements or special terms and the applicable rates. The understanding shall not change any monetary ceiling, contract obligation, or specific cost allowance or disallowance provided for in this contract. The understanding is incorporated into this contract upon execution.

(4) Failure by the parties to agree on a final annual indirect cost rate shall be a dispute within the meaning of the Disputes clause.

(5) Within 120 days (or longer period if approved in writing by the Contracting Officer) after settlement of the final annual indirect cost rates for all years of a physically complete contract, the Contractor shall submit a completion invoice or voucher to reflect the settled amounts and rates.

~~(6)(i) If the Contractor fails to submit a completion invoice or voucher within the time specified in paragraph (d)(5) of this clause, the Contracting Officer may--~~

(A) Determine the amounts due to the Contractor under the contract; and

(B) Record this determination in a unilateral modification to the contract.

(ii) This determination constitutes the final decision of the Contracting Officer in accordance with the Disputes clause.

(e) Billing rates. Until final annual indirect cost rates are established for any period, the Government shall reimburse the Contractor at billing rates established by the Contracting Officer or by an authorized representative (the cognizant auditor), subject to adjustment when the final rates are established. These billing rates--

(1) Shall be the anticipated final rates; and

(2) May be prospectively or retroactively revised by mutual agreement, at either party's request, to prevent substantial overpayment or underpayment.

(f) Quick-closeout procedures. Quick-closeout procedures are applicable when the conditions in FAR 42.708(a) are satisfied.

(g) Audit. At any time or times before final payment, the Contracting Officer may have the Contractor's invoices or vouchers and statements of cost audited. Any payment may be (1) reduced by amounts found by the Contracting Officer not to constitute allowable costs or (2) adjusted for prior overpayments or underpayments.

(h) Final payment. (1) Upon approval of a completion invoice or voucher submitted by the Contractor in accordance with paragraph (d)(5) of this clause, and upon the Contractor's compliance with all terms of this contract, the Government shall promptly pay any balance of allowable costs and that part of the fee (if any) not previously paid.

(2) The Contractor shall pay to the Government any refunds, rebates, credits, or other amounts (including interest, if any) accruing to or received by the Contractor or any assignee under this contract, to the extent that those amounts are properly allocable to costs for which the Contractor has been reimbursed by the Government. Reasonable expenses incurred by the Contractor for securing refunds, rebates, credits, or other amounts shall be allowable costs if approved by the Contracting Officer. Before final payment under this contract, the Contractor and each assignee whose assignment is in effect at the time of final payment shall execute and deliver--

(i) An assignment to the Government, in form and substance satisfactory to the Contracting Officer, of refunds, rebates, credits, or other amounts (including interest, if any) properly allocable to costs for which the Contractor has been reimbursed by the Government under this contract; and

(ii) A release discharging the Government, its officers, agents, and employees from all liabilities, obligations, and claims arising out of or under this contract, except--

(A) Specified claims stated in exact amounts, or in estimated amounts when the exact amounts are not known;

(B) Claims (including reasonable incidental expenses) based upon liabilities of the Contractor to third parties arising out of the performance of this contract; provided, that the claims are not known to the Contractor on the date of the execution of the release, and that the Contractor gives notice of the claims in writing to the Contracting Officer within 6 years following the release date or notice of final payment date, whichever is earlier; and

(C) Claims for reimbursement of costs, including reasonable incidental expenses, incurred by the Contractor under the patent clauses of this contract, excluding, however, any expenses arising from the Contractor's indemnification of the Government against patent liability.

I.3 52.219-28 POST-AWARD SMALL BUSINESS PROGRAM REREPRESENTATION (JUNE 2007)

(a) Definitions. As used in this clause-

"Long-term contract" means a contract of more than five years in duration, including options. However, the term does not include contracts that exceed five years in duration because the period of performance has been extended for a cumulative period not to exceed six months under the clause at 52.217-8, Option to Extend Services, or other appropriate authority.

"Small business concern" means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR part 121 and the size standard in paragraph (c) of this clause.

(b) If the Contractor represented that it was a small business concern prior to award of this contract, the Contractor shall rerepresent its size status according to paragraph (e) of this clause or, if applicable, paragraph (g) of this clause, upon the occurrence of any of the following:

(1) Within 30 days after execution of a novation agreement or within 30 days after modification of the contract to include this clause, if the novation agreement was executed prior to inclusion of this clause in the contract.

(2) Within 30 days after a merger or acquisition that does not require a novation or within 30 days after modification of the contract to include this clause, if the merger or acquisition occurred prior to inclusion of this clause in the contract.

(3) For long-term contracts-

(i) Within 60 to 120 days prior to the end of the fifth year of the contract; and

(ii) Within 60 to 120 days prior to the exercise date specified in the contract for any option thereafter.

(c) The Contractor shall rerepresent its size status in accordance with the size standard in effect at the time of this rerepresentation that corresponds to the North American Industry Classification System (NAICS) code assigned to this contract. The small business size standard corresponding to this NAICS code can be found at <http://www.sba.gov/services/contractingopportunities/sizestandardsttopics/>.

(d) The small business size standard for a Contractor providing a product which it does not manufacture itself, for a contract other than a construction or service contract, is 500 employees.

(e) Except as provided in paragraph (g) of this clause, the Contractor shall make the rerepresentation required by paragraph (b) of this clause by validating or updating all its representations in the Online Representations and Certifications Application and its data in the Central Contractor Registration, as necessary, to ensure they reflect current status. The Contractor shall notify the contracting office by e-mail, or otherwise in writing, that the data have been validated or updated, and provide the date of the validation or update.

(f) If the Contractor represented that it was other than a small business concern prior to award of this contract, the Contractor may, but is not required to, take the actions required by paragraphs (e) or (g) of this clause.

(g) If the Contractor does not have representations and certifications in ORCA, or does not have a representation in ORCA for the NAICS code applicable to this contract, the Contractor is required to complete the following rerepresentation and submit it to the contracting office, along with the contract number and the date on which the rerepresentation was completed:

The Contractor represents that it [] is, [] is not a small business concern under NAICS Code 541690 assigned to contract number NRC-04-07-115.

[Contractor to sign and date and insert authorized signer's name and title].

I.4 52.222-39 NOTIFICATION OF EMPLOYEE RIGHTS CONCERNING PAYMENT OF UNION DUES OR FEES (DEC 2004)

(a) Definition. As used in this clause--

"United States" means the 50 States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, the U.S. Virgin Islands, and Wake Island.

(b) Except as provided in paragraph (e) of this clause, during the term of this contract, the Contractor shall post a notice, in the form of a poster, informing employees of their rights concerning union membership and payment of union dues and fees, in conspicuous places in and about all its plants and offices, including all places where notices to employees are customarily posted. The notice shall include the following information (except that the information pertaining to National Labor Relations Board shall not be included in notices posted in the plants or offices of carriers subject to the Railway Labor Act, as amended (45 U.S.C. 151-188)).

Notice to Employees

Under Federal law, employees cannot be required to join a union or maintain membership in a union in order to retain their jobs. Under certain conditions, the law permits a union and an employer to enter into a union-security agreement requiring employees to pay uniform periodic dues and initiation fees. However, employees who are not union members can object to the use of their payments for certain purposes and can only be required to pay their share of union costs relating to collective bargaining, contract administration, and grievance adjustment.

If you do not want to pay that portion of dues or fees used to support activities not related to collective bargaining, contract administration, or grievance adjustment, you are entitled to an appropriate reduction in your payment. If you believe that you have been required to pay dues or fees used in part to support activities not related to collective bargaining, contract administration, or grievance adjustment, you may be entitled to a refund and to an appropriate reduction in future payments.

For further information concerning your rights, you may wish to contact the National Labor Relations Board (NLRB) either at one of its Regional offices or at the following address or toll free number:

National Labor Relations Board
Division of Information
1099 14th Street, N.W.
Washington, DC 20570
1-866-667-6572
1-866-316-6572 (TTY)

To locate the nearest NLRB office, see NLRB's website at <http://www.nlr.gov>.

(c) The Contractor shall comply with all provisions of Executive Order 13201 of February 17, 2001, and related implementing regulations at 29 CFR Part 470, and orders of the Secretary of Labor.

(d) In the event that the Contractor does not comply with any of the requirements set forth in paragraphs (b), (c), or (g), the Secretary may direct that this contract be cancelled, terminated, or suspended in whole or in part, and declare the Contractor ineligible for further Government contracts in accordance with procedures at 29 CFR Part 470, Subpart B--Compliance Evaluations, Complaint Investigations and Enforcement Procedures. Such other sanctions or remedies may be imposed as are provided by 29 CFR Part 470, which implements Executive Order 13201, or as are otherwise provided by law.

(e) The requirement to post the employee notice in paragraph (b) does not apply to--

(1) Contractors and subcontractors that employ fewer than 15 persons;

(2) Contractor establishments or construction work sites where no union has been formally recognized by the Contractor or certified as the exclusive bargaining representative of the Contractor's employees;

(3) Contractor establishments or construction work sites located in a jurisdiction named in the definition of the United States in which the law of that jurisdiction forbids enforcement of union-security agreements;

(4) Contractor facilities where upon the written request of the Contractor, the Department of Labor Deputy Assistant Secretary for Labor-Management Programs has waived the posting requirements with respect to any of the Contractor's facilities if the Deputy Assistant Secretary finds that the Contractor has demonstrated that--

(i) The facility is in all respects separate and distinct from activities of the Contractor related to the performance of a contract; and

(ii) Such a waiver will not interfere with or impede the effectuation of the Executive order; or

(5) Work outside the United States that does not involve the recruitment or employment of workers within the United States.

(f) The Department of Labor publishes the official employee notice in two variations; one for contractors covered by the Railway Labor Act and a second for all other contractors. The Contractor shall--

(1) Obtain the required employee notice poster from the Division of Interpretations and Standards, Office of Labor-Management Standards, U.S. Department of Labor, 200 Constitution Avenue, NW, Room N-5605, Washington, DC 20210, or from any field office of the Department's Office of Labor-Management Standards or Office of Federal Contract Compliance Programs;

(2) Download a copy of the poster from the Office of Labor- Management Standards website at <http://www.olms.dol.gov>; or

(3) Reproduce and use exact duplicate copies of the Department of Labor's official poster.

~~(g) The Contractor shall include the substance of this clause in every subcontract or purchase order that exceeds the simplified acquisition threshold, entered into in connection with this contract, unless exempted by the Department of Labor Deputy Assistant Secretary for Labor-Management Programs on account of special circumstances in the national interest under authority of 29 CFR 470.3(c). For indefinite quantity subcontracts, the Contractor shall include the substance of this clause if the value of orders in any calendar year of the subcontract is expected to exceed the simplified acquisition threshold. Pursuant to 29 CFR Part 470, Subpart B--Compliance Evaluations, Complaint Investigations and Enforcement Procedures, the Secretary of Labor may direct the Contractor to take such action in the enforcement of these regulations, including the imposition~~

of sanctions for noncompliance with respect to any such subcontract or purchase order. If the Contractor becomes involved in litigation with a subcontractor or vendor, or is threatened with such involvement, as a result of such direction, the Contractor may request the United States, through the Secretary of Labor, to enter into such litigation to protect the interests of the United States.

I.5 52.232-25 PROMPT PAYMENT (OCT 2003)

Notwithstanding any other payment clause in this contract, the Government will make invoice payments under the terms and conditions specified in this clause. The Government considers payment as being made on the day a check is dated or the date of an electronic funds transfer (EFT). Definitions of pertinent terms are set forth in sections 2.101, 32.001, and 32.902 of the Federal Acquisition Regulation. All days referred to in this clause are calendar days, unless otherwise specified. (However, see paragraph (a)(4) of this clause concerning payments due on Saturdays, Sundays, and legal holidays.)

(a) Invoice payments--

(1) Due date.

(i) Except as indicated in paragraphs (a)(2) and (c) of this clause, the due date for making invoice payments by the designated payment office is the later of the following two events:

(A) The 30th day after the designated billing office receives a proper invoice from the Contractor (except as provided in paragraph (a)(1)(ii) of this clause).

(B) The 30th day after Government acceptance of supplies delivered or services performed. For a final invoice, when the payment amount is subject to contract settlement actions, acceptance is deemed to occur on the effective date of the contract settlement.

(ii) If the designated billing office fails to annotate the invoice with the actual date of receipt at the time of receipt, the invoice payment due date is the 30th day after the date of the Contractor's invoice, provided the designated billing office receives a proper invoice and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(2) Certain food products and other payments.

(i) Due dates on Contractor invoices for meat, meat food products, or fish; perishable agricultural commodities; and dairy products, edible fats or oils, and food products prepared from edible fats or oils are--

(A) For meat or meat food products, as defined in section 2(a)(3) of the Packers and Stockyard Act of 1921 (7 U.S.C. 182(3)), and as further defined in Pub. L. 98-181, including any edible fresh or frozen poultry meat, any perishable poultry meat food product, fresh eggs, and any perishable egg product, as close as possible to, but not later than, the 7th day after product delivery.

(B) For fresh or frozen fish, as defined in section 204(3) of the Fish and Seafood Promotion Act of 1986 (16 U.S.C. 4003(3)), as close as possible to, but not later than, the 7th day after product delivery.

(C) For perishable agricultural commodities, as defined in section 1(4) of the Perishable Agricultural Commodities Act of 1930 (7 U.S.C. 499a(4)), as close as possible to, but not later than, the 10th day after product delivery, unless another date is specified in the contract.

(D) For dairy products, as defined in section 111(e) of the Dairy Production Stabilization Act of 1983 (7 U.S.C. 4502(e)), edible fats or oils, and food products prepared from edible fats or oils, as close as possible to, but not later than, the 10th day after the date on which a proper invoice has been received. Liquid milk, cheese, certain processed cheese products, butter, yogurt, ice cream, mayonnaise, salad dressings, and other similar products, fall within this classification. Nothing in the Act limits this classification to refrigerated products. When questions arise regarding the proper classification of a specific product, prevailing industry practices will be followed in specifying a contract payment due date. The burden of proof that a classification of a specific product is, in fact, prevailing industry practice is upon the Contractor making the representation.

(ii) If the contract does not require submission of an invoice for payment (e.g., periodic lease payments), the due date will be as specified in the contract.

(3) Contractor's invoice. The Contractor shall prepare and submit invoices to the designated billing office specified in the contract. A proper invoice must include the items listed in paragraphs (a)(3)(i) through (a)(3)(x) of this clause. If the invoice does not comply with these requirements, the designated billing office will return it within 7 days after receipt (3 days for meat, meat food products, or fish; 5 days for perishable agricultural commodities, dairy products, edible fats or oils, and food products prepared from edible fats or oils), with the reasons why it is not a proper invoice. The Government will take into account untimely notification when computing any interest penalty owed the Contractor.

(i) Name and address of the Contractor.

(ii) Invoice date and invoice number. (The Contractor should date invoices as close as possible to the date of the mailing or transmission.)

(iii) Contract number or other authorization for supplies delivered or services performed (including order number and contract line item number).

(iv) Description, quantity, unit of measure, unit price, and extended price of supplies delivered or services performed.

(v) Shipping and payment terms (e.g., shipment number and date of shipment, discount for prompt payment terms). Bill of lading number and weight of shipment will be shown for shipments on Government bills of lading.

(vi) Name and address of Contractor official to whom payment is to be sent (must be the same as that in the contract or in a proper notice of assignment).

(vii) Name (where practicable), title, phone number, and mailing address of person to notify in the event of a defective invoice.

(viii) Taxpayer Identification Number (TIN). The Contractor shall include its TIN on the invoice only if required elsewhere in this contract.

(ix) Electronic funds transfer (EFT) banking information.

~~(A) The Contractor shall include EFT banking information on the invoice only if required elsewhere in this contract.~~

(B) If EFT banking information is not required to be on the invoice, in order for the invoice to be a proper invoice, the Contractor shall have submitted correct EFT banking information in accordance with the applicable solicitation provision (e.g., 52.232-38, Submission of Electronic Funds Transfer Information with Offer), contract clause (e.g., 52.232-33, Payment by Electronic Funds Transfer--Central Contractor Registration, or

52.232-34, Payment by Electronic Funds Transfer--Other Than Central Contractor Registration), or applicable agency procedures.

(C) EFT banking information is not required if the Government waived the requirement to pay by EFT.

(x) Any other information or documentation required by the contract (e.g., evidence of shipment).

(4) Interest penalty. The designated payment office will pay an interest penalty automatically, without request from the Contractor, if payment is not made by the due date and the conditions listed in paragraphs (a)(4)(i) through (a)(4)(iii) of this clause are met, if applicable. However, when the due date falls on a Saturday, Sunday, or legal holiday, the designated payment office may make payment on the following working day without incurring a late payment interest penalty.

(i) The designated billing office received a proper invoice.

(ii) The Government processed a receiving report or other Government documentation authorizing payment, and there was no disagreement over quantity, quality, or Contractor compliance with any contract term or condition.

(iii) In the case of a final invoice for any balance of funds due the Contractor for supplies delivered or services performed, the amount was not subject to further contract settlement actions between the Government and the Contractor.

(5) Computing penalty amount. The Government will compute the interest penalty in accordance with the Office of Management and Budget prompt payment regulations at 5 CFR part 1315.

(i) For the sole purpose of computing an interest penalty that might be due the Contractor, Government acceptance is deemed to occur constructively on the 7th day (unless otherwise specified in this contract) after the Contractor delivers the supplies or performs the services in accordance with the terms and conditions of the contract, unless there is a disagreement over quantity, quality, or Contractor compliance with a contract provision. If actual acceptance occurs within the constructive acceptance period, the Government will base the determination of an interest penalty on the actual date of acceptance. The constructive acceptance requirement does not, however, compel Government officials to accept supplies or services, perform contract administration functions, or make payment prior to fulfilling their responsibilities.

(ii) The prompt payment regulations at 5 CFR 1315.10(c) do not require the Government to pay interest penalties if payment delays are due to disagreement between the Government and the Contractor over the payment amount or other issues involving contract compliance, or on amounts temporarily withheld or retained in accordance with the terms of the contract. The Government and the Contractor shall resolve claims involving disputes and any interest that may be payable in accordance with the clause at FAR 52.233-1, Disputes.

(6) Discounts for prompt payment. The designated payment office will pay an interest penalty automatically, without request from the Contractor, if the Government takes a discount for prompt payment improperly. The Government will calculate the interest penalty in accordance with the prompt payment regulations at 5 CFR part 1315.

~~(7) Additional interest penalty:~~

(i) The designated payment office will pay a penalty amount, calculated in accordance with the prompt payment regulations at 5 CFR part 1315 in addition to the interest penalty amount only if--

(A) The Government owes an interest penalty of \$1 or more;

(B) The designated payment office does not pay the interest penalty within 10 days after the date the invoice amount is paid; and

(C) The Contractor makes a written demand to the designated payment office for additional penalty payment, in accordance with paragraph (a)(7)(ii) of this clause, postmarked not later than 40 days after the invoice amount is paid.

(ii)(A) The Contractor shall support written demands for additional penalty payments with the following data. The Government will not request any additional data. The Contractor shall--

(1) Specifically assert that late payment interest is due under a specific invoice, and request payment of all overdue late payment interest penalty and such additional penalty as may be required;

(2) Attach a copy of the invoice on which the unpaid late payment interest is due; and

(3) State that payment of the principal has been received, including the date of receipt.

(B) If there is no postmark or the postmark is illegible--

(1) The designated payment office that receives the demand will annotate it with the date of receipt, provided the demand is received on or before the 40th day after payment was made; or

(2) If the designated payment office fails to make the required annotation, the Government will determine the demand's validity based on the date the Contractor has placed on the demand, provided such date is no later than the 40th day after payment was made.

(iii) The additional penalty does not apply to payments regulated by other Government regulations (e.g., payments under utility contracts subject to tariffs and regulation).

(b) Contract financing payment. If this contract provides for contract financing, the Government will make contract financing payments in accordance with the applicable contract financing clause.

(c) Fast payment procedure due dates. If this contract contains the clause at 52.213-1, Fast Payment Procedure, payments will be made within 15 days after the date of receipt of the invoice.

(d) Overpayments. If the Contractor becomes aware of a duplicate contract financing or invoice payment or that the Government has otherwise overpaid on a contract financing or invoice payment, the Contractor shall immediately notify the Contracting Officer and request instructions for disposition of the overpayment.

I.6 52.249-14 EXCUSABLE DELAYS (APR 1984)

(a) Except for defaults of subcontractors at any tier, the Contractor shall not be in default because of any failure to perform this contract under its terms if the failure arises from causes beyond the control and without the fault or negligence of the Contractor. Examples of these causes are (1) acts of God or of the public enemy, (2) acts of the Government in either its sovereign or contractual capacity, (3) fires, (4) floods, (5) epidemics, (6) quarantine restrictions, (7) strikes, (8) freight embargoes, and (9) unusually severe weather. In each instance, the failure to perform must be beyond the control and without the fault or negligence of the Contractor. "Default" includes failure to make progress in the work so as to endanger performance.

(b) If the failure to perform is caused by the failure of a subcontractor at any tier to perform or make progress, and if the cause of the failure was beyond the control of both the Contractor and subcontractor, and without the fault or negligence of either, the Contractor shall not be deemed to be in default, unless--

- (1) The subcontracted supplies or services were obtainable from other sources;
- (2) The Contracting Officer ordered the Contractor in writing to purchase these supplies or services from the other source; and
- (3) The Contractor failed to comply reasonably with this order.

(c) Upon request of the Contractor, the Contracting Officer shall ascertain the facts and extent of the failure. If the Contracting Officer determines that any failure to perform results from one or more of the causes above, the delivery schedule shall be revised, subject to the rights of the Government under the termination clause of this contract.

I.7 52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

<http://www.arnet.gov/far>

PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

SECTION J - LIST OF ATTACHMENTS

ATTACHMENT NUMBER	TITLE
1	Billing Instructions
2	Contractor Spending Plan
3	48 CFR 2009.5, Organizational Conflict of Interest