JAN 9 1998

Purdue Research Foundation
ATTN: Diane E. Troyer
1021 Hovde Hall, Purdue University
West Lafayette, IN 47907-1021

Dear Ms. Troyer:

SUBJECT: TASK ORDER NO. 6 ENTITLED "SNAP RUNTIME AND OUTPUT VISUALIZATION
DEVELOPMENT" UNDER CONTRACT NO. NRC-04-97-046

In accordance with Section G.4, Task Order Procedures, of the subject
contract, this letter definitizes Task Order No. 6. This effort shall be
performed in accordance with the enclosed Statement of Work.

The period of performance for Task Order No. 6 is January 9, 1998 through
September 30, 1998. The total estimated cost for full performance of this
task order is $157,057.00. Funds in the amount of $157,057 are hereby
obligated for performance of this task order. The Contractor shall not incur
costs for this task order which exceed this obligated amount.

Accounting data for Task Order No. 6 is as follows:

    B&R No.: 860-15-21-100-5
    Job Code: W-6749
    BOC Code: 252A
    RES ID: RES-C98-011
    Appropriation No.: 31X0200
    Obligated Amount: $157,057.00

The following individuals are considered by the Government to be essential to
the successful performance of the work hereunder:

    Kenneth R. Jones

The contractor agrees that such personnel shall not be removed from the effort
under this task order without compliance with Contract Clause H.2-Key
Personnel

DP02/1

Purdue

The issuance of this task order does not amend any terms or conditions of the subject contract.

Your contacts during the course of this task order are:

Technical Matters: Jennifer Unlo, Project Officer
(301) 415-6023

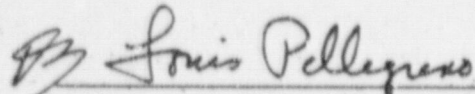Contractual Matters: Stephen Pool, Contract Specialist
(301) 415-8168

Please indicate your acceptance of this task order by having an official, authorized to bind your organization, execute three copies of this document in the space provided and return two copies to the Contract Specialist. You should retain the third copy for your records.

Sincerely,

for Mary H. Mace, Contracting Officer
Contract Management Branch No. 1
Division of Contracts and Property
  Management
Office of Administration

Enclosure:
As stated

ACCEPTED: TASK ORDER NO. 6

_____
NAME

         1/23/98
_____
DATE

Louis Pellegrino, Director
Office of Research Administration

_____
TITLE

STATEMENT OF WORK
TASK ORDER #6 "SNAP Runtime and Output Visualization Development"

Background

The NRC began development of a graphical user interface (GUI) for its thermal-hydraulic (T/H) codes with four primary goals: increase ease of use of the T/H codes, maintain investment in existing input decks, decrease the user effect, and provide a productive work environment for analysts including configuration control of their analysis projects. This GUI work culminated in a requirements and design documents from which an initial version of the Symbolic Nuclear Analysis Program (SNAP) was produced, focusing on the preprocessing for RELAP5. Significant improvements to this code included a redesign of the underlying classes, the untangling of components as they were imported. This improved version of SNAP was presented to various users for Beta Testing. The development of additional features for the RELAP5 preprocessor that were found to be lacking during the Beta Testing and a runtime/output visualization capability are now planned.

Objectives

The objectives of this contract are:

i.   To provide a basic runtime/output visualization, either in the SNAP code or via associated programs and utilities (including Xmgr5) which communicate with SNAP's information about the input model;

ii.   To enhance the graphics of the visualization package and to provide the capability for the user to add text and utilize other simple drawing features to improve the visualization graphics.

Work Requirements:

All new documents will be created and delivered to the NRC in FrameMaker 5.5 format, except for project reporting, which may be done via e-mail.

Task 1: Runtime and Output Visualization

The contractor will develop SNAP to provide a means of visualizing runtime and output data.

Subtask 1. The capability will be added to SNAP to plot component or system parameters using the SNAP's view of the input model, either via linkage to Xmgr5 or to another plotting system. The capability to connect multiple data sources (e.g. several different calculation results, NRC databank files, or other user-supplied files) will be provided.

Subtask 2. The capability will be provided for the user to perform a simple runtime/output visualization of variables output during or after a calculation using a simple view of the input model provided by SNAP.

Subtask 3. The capability will be provided for users to enhance the pictorial representation of the reactor components, such as a pipe, vessel, steam generator, etc..., when using the visualization package. SNAP will be modified to import external graphics of some standard format. Additionally, the ability for the user to add text and utilize other simple drawing features

to improve the visualization graphics will also be provided.

A requirements/approach document briefly explaining the functionality of the plotting and visualization systems will be generated. This document will be more of a summary document, provided to the NRC technical monitor 1 week before a requirements/approach meeting to be held no later than February 27, 1998, where the approach will be agreed upon between the contractor and the NRC technical monitor.

The basic plotting and visualization systems will be delivered before June 12, 1998, for integration into the main SNAP package. If the systems or a version of the systems are ready to be integrated into the main SNAP package before this date, they can be with prior approval of the NRC technical monitor.

Estimated Completion Time: September 30, 1998

Task 2: Documentation

A programmer's guide will be developed as an appendix to the SNAP design document, which describes the runtime/visualization code structure and provides a listing and brief description of the major classes, including a listing of their variables and member functions. The manual will be updated concurrent with changes to the runtime/output visualization systems.

The user manual documentation will be developed in FrameMaker 5.5, emulating a conventional text manual with table of contents hyperlinks. It will be updated as changes are made to the runtime/output visualization systems. Both the FrameMaker version and HTML version exported from FrameMaker will be distributed with SNAP.

Estimated Completion Date: September 30, 1998

Task 3: NRC User Support

The contractor will support users of RELAP5/SNAP on the use of graphical programs including Xmgr5, and the runtime/output visualization packages. Assistance requiring more than a day of effort shall be approved by the NRC technical monitor.

When errors are discovered in Xmgr5 or SNAP, they may be corrected, unless more than one week of effort is required, in which case a brief plan shall be submitted to the NRC technical monitor for approval prior to work commencing. This plan shall include the problem, proposed approach to solve the problem, and the estimated effort required.

A brief summary of assistance rendered and errors corrected shall be e-mailed to the NRC technical monitor by the 5th of each month.

Estimated Completion Date: September 30, 1998

Task 4: Testing, Distribution

Testing of the runtime/output visualization code will be performed on a suite of RELAP5 problems and experimental data sources provided to the contractor.

A version of the runtime/output visualization system will be created and provided to the NRC technical monitor before the fourth Friday of each month. This version package will consist of the executable for the platform agreed upon by both the contractor and the NRC technical monitor, the updated user documentation, and the complete archived source code and Makefiles.

Estimated Completion Date: September 30, 1998

Deliverables:

1. Runtime/output requirements and approach summary document, to be delivered one week before a meeting to be held in Rockville no later than February 27,1998.

2. The basic plotting and visualization systems, to be delivered before June 12, 1999. This version package will consist of the executable for the platform agreed upon by both the contractor and the NRC technical monitor, the updated user documentation, and the complete archived source code and Makefiles.

3. A version of the runtime/output visualization system will be created and provided to the NRC technical monitor before the fourth Friday of each month. This version package will consist of the executable for the platform agreed upon by both the contractor and the NRC technical monitor, the updated user documentation, and the complete archived source code and Makefiles.

5. Runtime/output programmer's information, to be provided for incorporation in the SNAP programmer's appendix by June 12, 1998.

Meetings and Travel

For successful completion of the work required in this contract, it is anticipated that the contractor shall travel to the NRC office in Rockville, MD at the times specified below. The contractor may propose additional travel deemed necessary for the successful completion of this effort. All travel shall be approved in advance by the Project Manager, be specifically performed in support of this project, and be in compliance with Federal Transportation Regulations.

Four trips to Rockville, MD to meet with the NRC technical monitor and/or other SNAP developers, dates TBA.