

**DIVISION OF PREPAREDNESS AND RESPONSE
EMERGENCY PREPAREDNESS DIRECTORATE**

STATEMENT OF WORK

PROJECT TITLE: *Review of NUREG-0654, Supplement 3, “Criteria for Protective Action Recommendations for Severe Accidents”* **JOB CODE:** J3162

I. BACKGROUND

Studies of severe reactor accidents and their consequences conducted in the early 1990's led the staff to conclude that the preferred initial Protective Action Recommendation (PAR) for a severe (core damage) accident is to evacuate promptly rather than to shelter the population near the plant, barring any constraints to evacuation. Supplement 3 to NUREG-0654/FEMA-REP-1, “Criteria for Protective Action Recommendations for Severe Accidents,” dated July 1996 (“Supp. 3”) provides guidance for implementing this conclusion through a simplified decision making process for protective actions in response to severe reactor accidents. Severe reactor accident analyses, documented in NUREG-1150, “Severe Accident Risks: An Assessment for Five U. S. Nuclear Power Plants”, provide the related technical basis.

Supp. 3 would have licensees preferentially recommending evacuation within a 2-mile radius and five miles downwind, in lieu of sheltering, in the case of severe reactor accidents. The staff has reinforced the guidance contained in Supp. 3 through outreach, training and inspection. Nuclear power plant licensees have largely accepted the guidance. As an unintended consequence, it has been discovered that some licensees now severely restrict the consideration and use of sheltering as evidenced in the design of their initial and follow-up notification forms and, in at least one case, entirely preclude the use of sheltering in their Emergency Plan. In addition, from an offsite perspective, some states plan only to make a Protective Action Determination (PAD) of evacuation, and thereby effectively eliminate any consideration of sheltering, regardless of the licensee recommendation (PAR).

10 CFR 50.47(b)(10) requires that nuclear plant licensees develop a range of PARs for the 10-mile plume exposure Emergency Planning Zone (EPZ), including evacuation, sheltering and issuance of radioprotective drugs, e.g., potassium iodide (KI). The capability to appropriately recommend protective actions is inspected during Nuclear Regulatory Commission (NRC)-evaluated EP biennial exercises, and is tracked as a Performance Indicator (PI) within the Reactor Oversight Process (ROP). This requirement extends beyond the 10-mile EPZ, on an ad hoc basis, should that unlikely contingency ever prove to be necessary. The regulatory basis for reasonable assurance that the public health and safety can be protected is based, in part, on NRC oversight of the licensee’s capability to make appropriate and timely PARs.

In the wake of the terrorist attacks of September 11, 2001, the staff completed an evaluation of the nuclear power reactor Emergency Preparedness (EP) planning basis with respect to the existing threat environment. The staff committed to this review in a non-publicly available SECY paper. The review was conducted in 2003, and documented in SECY-03-0165. The staff concluded that the EP planning basis for nuclear power reactors remains valid. Vulnerability studies revealed that the timing and magnitude of releases related to terrorist-

based events are no more severe than the shortest timing or largest magnitude sequences (from a spectrum of accidents) already considered in the EP planning basis. However, terrorist-based events could present unique challenges to EP programs. The staff developed a plan to address issues identified in the evaluation. One of the identified issues concerns the appropriateness of current NRC guidance on the development of PARs and the need to re-evaluate such guidance.

The staff briefed the Commission regarding EP issues on September 24, 2003. One of the topics covered in that briefing related to the appropriateness of current NRC guidance for nuclear power plant licensees on the development of PARs. Subsequent to the September 24, 2004 meeting, the staff received a Staff Requirements Memorandum (SRM) from the Commission on "the Briefing on Emergency Preparedness Program Status", with the following direction: "Continue to evaluate the NRC protective action recommendation guidance to assure that it continues to reflect our current state of knowledge with regard to evacuation and sheltering. Update the guidance, as necessary."

The staff have reviewed the recommendations of Supp. 3, and have identified areas for improvement and areas which warrant further review and investigation. Note that many of these considerations may be dependent on the relative density of the population and the design of the supporting transportation infrastructure. Or, phrased more succinctly, their relative importance to the reduction of dose and other considerations may be dependent on the Evacuation Time Estimate (ETE). Sites with shorter ETEs may not benefit as much from a reconsideration of sheltering and its use as a PAR, due to an existing low population and ample roadway capacity for evacuees.

- Early evacuation is certainly the best option when there is time to move people before a release begins. However, this may not be the best option in some scenarios, as there are considerations that may make sheltering, or other strategies, more appropriate. In some highly unlikely severe accident scenarios, the release begins in about 30 to 40 minutes (about the time it takes for public notification) and much of the source term is released within the following 90 minutes. The release does not terminate after this period, but the radioactive nuclide content decreases significantly. While the source term may be large and local shelter not robust, in some cases, evacuation through the plume may not be the preferred protective action given the short time frame of the release.
- The PAR regimen should be reviewed for its use and appropriateness during a "fast breaking" emergency. In this case, immediate shelter-in-place may be more appropriate than a recommendation and determination to evacuate.
- The establishment of local sheltering locations that would afford more protection than normal homes has not been given in-depth consideration. Multi-story schools and commercial buildings offer significant protection and may be only minutes away from the affected population, whereas evacuation travel time to a location outside of the 10-mile EPZ could be significantly longer.
- There are also other techniques for avoiding high dose rates associated with severe accidents. The most severe consequences are estimated to result from narrow plumes, as this concentrates radioactive nuclides. However, doses from such narrow plumes

may be avoided by moving short distances at right angles from the plume. In some cases, a few hundred yards may reduce dose by three orders of magnitude. While there may be issues associated with the recommendation and implementation of such a strategy, the technique has not been evaluated for its applicability and use in emergency situations, i.e., in locations with high population density.

- Supp. 3 focuses on “severe” core damage accidents, without regard to the relative frequency or the possibility for licensee recognition of accident severity. This equates to using the worst case scenario for planning purposes and may be counterproductive when applied to many other types of accidents.
- Recent research has revealed that the meaning of “shelter” when used in a PAR, is not immediately clear to the public and some stakeholders¹.
- A shadow evacuation effect, if it exists, could put the at-risk population at greater risk as a result of the potential for increased travel time within the plume.

The possibility of evacuating the public located within the 10-mile EPZ of nuclear plants has received wide and critical attention, and is seen as controversial at some sites. Within some segments of the public and for some critics of nuclear power, the prospect of evacuating even small population centers is generally feared and the implications misunderstood. Further, the perception that evacuation is the only adequate PAR may degrade public confidence, particularly where high population density and existing transportation infrastructure makes evacuation appear to be difficult. These concerns have brought the staff to the conclusion that NRC guidance for PAR development may not fully consider the appropriateness of sheltering and other strategies in response to certain scenarios.

As previously noted, the Commission has directed that a review be conducted of the effectiveness of the NRC’s PAR development guidance, as it appears appropriate to expand the use of sheltering in some situations and existing regulatory guidance preferentially advises evacuation. This review would consider population density, shadow evacuation effects, evacuation times versus release duration and the efficacy of local sheltering facilities, as well as the expected positive effect sheltering-in-place could have on traffic control issues. The review may result in recommended changes to NRC guidance for the development of PARs.

Requirements, Related Guidance & Reports

10 CFR Part 50, Section 50.47, *Emergency Plans*.

Appendix E to 10 CFR Part 50, *Emergency Planning and Preparedness for Production and Utilization Facilities*.

Regulatory Guide 1.101, Rev. 2, *Emergency Planning and Preparedness for Nuclear Power Plants*.

NUREG-0654/FEMA-REP-1, Rev. 1, *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants*.

Supplement 3 to NUREG-0654/FEMA-REP-1, Rev. 1, *Criteria for Protective Action Recommendations for Severe Accidents*.

NUREG/CR-1856, *An Analysis of Evacuation Time Estimates Around 52 Nuclear Power Plant Sites*, Vol. 1 & 2.¹

NUREG/CR-4831, NNL-776, *State of the Art in Evacuation Time Studies for Nuclear Power Plants*, 1992.

NUREG-1150, *Severe Accident Risks: An Assessment for Five U. S. Nuclear Power Plants*, 1990, Vol. 1, Final Summary Report.

NUREG/BR-0230, *Response Coordination Manual 1996 (RCM-96)*.

NUREG/CR-XXXX, *Planning and Implementation of Public Evacuation Processes*, Sandia National Laboratories.

NUREG-CR-XXXX, *Technical Review and Recommended Modifications to NUREG-4831, "State of the Art in Evacuation Time Estimate Studies for Nuclear Power Plants"*, Sandia National Laboratories.

Environmental Protection Agency (EPA) EPA-520/6-74-002, *Evacuation Risks - An Evaluation*, 1974.

EPA 520/1-78-001A, *Protective Action Evaluation Part I: The Effectiveness of Sheltering as a Protective Action Against Nuclear Accidents Involving Gaseous Releases*, 1978.

EPA 400-R-92-001, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, May 1992.

Federal Emergency Management Agency (FEMA) / Disaster Research Center at Ohio State University, *Evacuation Behavior and Problems: Findings and Implications from the Research Literature*, 1980.

FEMA / Oak Ridge National Laboratory (ORNL), RR-9, *Evacuation: An Assessment of Planning and Research*, 1987.

FEMA / Systan Co., *Emergency Evacuation Management Requirements and Concepts*, 1981.

Atomic Industrial Form (AIF) / Battelle Human Affairs Research Centers, et al., *Planning Concepts and Decision Criteria for Sheltering and Evacuation in a Nuclear Power Plant Emergency*, 1985.

National Science Foundation/Battelle Human Affairs Research Center, *Evacuation Decision Making and Emergency Planning*, 1980.

ORNL/TM-9882, *Evacuations Due to Chemical Accidents: Experience From 1980 to 1984*, 1986.

ORNL/TM-10277, *Evacuation in Emergencies: An Annotated Guide to Research*, 1987.

Becker, S. M., *Psychological and Communication Issues in Radiological Terrorism Situations*, University of Alabama at Birmingham, presented at the Fortieth Annual Meeting of the National Council on Radiation Protection and Measurements.

Perry, Ronald W., *Citizen Evacuation in Response to Nuclear and Non-Nuclear Threats*, 1981.

Perry, Ronald W., *Comprehensive Emergency Management: Evacuating Threatened Populations*, 1985.

¹ Becker, S. M., *Psychological and Communication Issues in Radiological Terrorism Situations*, University of Alabama at Birmingham, presented at the Fortieth Annual Meeting of the National Council on Radiation Protection and Measurements.

Perry, Ronald W., et al., *Evacuation Planning in Emergency Management*, 1981.

Witzig, W. F. and J. K. Shillenn, *Evaluation of Protective Action Risks*. Prepared under contract to the NRC by Penn State University, 1987.

Nuclear Energy Institute (NEI) 99-01, Revision 4, *Methodology for Development of Emergency Action Levels*, January 2003.

Selected licensee and offsite response organization emergency plan implementing procedures, re: development and notification of PARs.

II. OBJECTIVE

The purpose of nuclear plant emergency preparedness programs and the public evacuation plans that support them, is to reduce dose to the public during a radiological emergency. In order to ensure NRC Protective Action Recommendation (PAR) guidance continues to support this purpose, the Contractor shall provide an evaluation of the current NRC PAR guidance contained in Supplement 3 to NUREG-0654/FEMA-REP-1. The evaluation will consider:

- Technological advances,
- A spectrum of nuclear plant accidents,
- Improvements in accident progression understanding,
- The “post-9/11 threat environment”,
- Improvements in Evacuation Time Estimate (ETE) technologies,
- Additional sheltering strategies,
- Additional evacuation strategies,
- “Fast breaking” accident scenarios, and
- Improvements in dose projection techniques.

Specifically, the Contractor shall focus on the appropriateness of Supp. 3 guidance for preferential evacuation, as compared with modified or enhanced sheltering options. The spectrum of nuclear plant accidents that can result in the need for protective actions to protect the public health and safety must be considered and a spectrum of frequencies developed to place in perspective the relative need for each protective action. Additional protective action methods should be considered. Any recommended change in PAR strategy must show that a reduction in public dose during a radiological emergency is likely and discuss the limitations of that strategy, e.g., low population density versus high population density, availability of robust building stock versus rural areas, “fast breaking” event versus one with a slower evolution, relative frequencies.

NRC will review the evaluation, coordinate the review with the Federal Emergency Management Agency (FEMA) (co-author of Supp. 3), and determine if a revision to Supp. 3 is warranted. If a revision to Supp. 3 is warranted, NRC will exercise the option identified in Task 8 (Section III) and ask the Contractor to provide a revision to Supp. 3, that reflects the results of the above evaluation.

III. TASK STATEMENT

Task 1: The Contractor shall review the documents listed in Section I of this proposal from the perspective of information provided and referenced in Supp. 3, licensee and offsite response organization plans and procedures, NUREG/BR-0230 and NUREG-1150.

Sub-task a: Meet with NRC representatives to discuss the body of literature, with specific regard to PAR development issues.

Sub-task b: Meet with stakeholders to discuss Supp. 3 and their experience with its implementation.

Note: Sub-tasks a & b will be scheduled during the same week.

Estimated Completion Date: Two months after project initiation.

Estimated Level of Effort: 1.5 staff months.

Task 2: The purpose of this task is to depict the spectrum of events requiring PARs and provide the relative frequencies of the spectrum identified, and to sort those accidents requiring a simplified PAR scheme from those with time to develop a more complex PAR scheme. To this end, the Contractor shall review the spectrum of accidents that can result in the need for PARs. It is preferred that the spectrum of accidents be catalogued at a “fleet” level rather than at a site-specific level, though it may be determined that sorting by reactor type is most appropriate. Using information gained from this review, the Contractor shall develop a suite of reactor accidents that are General Emergencies, using information contained in NEI 99-01 as the standard classification scheme. The Contractor shall catalogue the relative frequencies of this suite of accidents to the extent the general (not site-specific) frequencies are available, e.g., through NUREG-1150. The Contractor shall examine the relative frequency of accidents considered “fast breaking” or “severe” (in the terminology of NUREG-1150) versus those considered to be “not severe” or where there is time (e.g., four or more hours) to consider and prepare for PAR implementation. The Contractor shall determine those sequences for which rapid “simplistic PARs” may be necessary to reduce public dose.

Please note this task is intended to be accomplished using existing accident progression analyses, such as NUREG-1150. Where a frequency is not known, it may be included in a qualitative manner. There is no intention to quantify the frequency of terrorism-based events, but this contingency will be considered in any enhanced PAR strategy recommended.

This results from the completion of this task shall be submitted to NRC as a technical letter report for review and comment. NRC comments will be incorporated after review.

Estimated Completion Date: Draft, three months after project initiation; final, one month after NRC comments received by the Contractor.

Estimated Level of Effort: Three staff months.

Task 3: The Contractor shall examine technological advances currently available, and in use in the nuclear industry, that may change the understanding of PAR development and implementation as expressed in Supp. 3, such as:

- Improvements in accident progression understanding,
- Improvements in evacuation time estimate technologies,
- Improvements in dose projection techniques,
- Improvements in public notification methods,
- Improvements in evacuation dynamics understanding, and
- Improvements in other areas important to public evacuations.

Information gained from completion of this task shall be submitted to the NRC as a technical letter report for review and comment. NRC comments will be incorporated after review.

Estimated Completion Date: Draft, six months after project initiation; final, one month after NRC comments received by the Contractor.

Estimated Level of Effort: Two staff months.

Task 4: The Contractor shall re-examine the efficacy of alternative sheltering and evacuation strategies in terms of reducing dose to the public from nuclear power plant accident plumes, and will:

- Perform a parametric study with MACCS2 to determine the relative advantages of shelter and evacuation (in terms of reduced dose to individuals). Specific parameters to be studied include:
 - Timing of offsite release compared to the Evacuation Time Estimate (ETE) (artifact of population density and roadway network),
 - Dose savings for sheltering or evacuation versus plume type,
 - Timing of release versus public notification time,
 - Time to evacuate,
 - Duration of sheltering period for various types of shelter,
 - Alternative evacuation strategies, e.g., cross-wind evacuation and staged evacuation,
 - Sheltering in typical local housing by region,
 - Alternative sheltering strategies, e.g., use of local commercial or governmental buildings,
 - Plume radio-nuclide content (i.e., dose rate to public, an artifact of accident type related to accident frequency) versus dose saving of sheltering or evacuation,
 - Sheltering in non-severe (yet General Emergency level) accidents,
 - Efficacy of sheltering versus evacuation for various ETE values,
 - Efficacy of sheltering as an initial action followed by staged evacuation, including the logistics of public contamination assessment, public dose assessment, KI distribution, etc., and
 - Other valuable parameter comparisons revealed in the course of the study.

- Examine the impact of sheltering one Emergency Planning Zone (EPZ) area on the evacuation of other areas (assumed to be positive),
- Examine the anticipated public reaction to sheltering strategies from a review of literature, documentation from public meetings and other available research,
- Examine other sheltering strategies for viability if others are identified, and
- Catalog implementation requirements for strategies that appear to reduce dose to assess the feasibility of implementing the strategy.

It is anticipated that as the Contractor performs the proposed MACCS2 runs, it may be determined that some are of little value while other parameter comparisons not currently recognized may be seen as providing important information. The Contractor should work closely with the Technical Monitor identified in this Statement of Work (SOW) to discuss revision to the proposed computer runs.

This task shall be submitted to NRC as a technical letter report for review and comment. NRC comments will be incorporated after review.

Estimated Completion Date: Draft, 10 months after project initiation; final, one month after NRC comments received by the Contractor.

Estimated Level of Effort: Six staff months.

Task 5: Where alternative evacuation strategies appear to have merit, the Contractor shall examine their efficacy in terms of implementation, realism and cost issues. While this task is dependant on the results of Task 4, it is possible that the following strategies may be worthy of additional evaluation:

- Cross-wind evacuation by walking or driving perpendicular to a severe accident plume,
- Staged evacuation,
- Delayed evacuation,
- Improvements in traffic control techniques to facilitate evacuation,
- Efficacy of sheltering special needs groups to facilitate public evacuation, and
- Other techniques for improving or strategies for implementing evacuations.

This task shall be submitted to NRC as a technical letter report for review and comment. NRC comments will be incorporated after review.

Estimated Completion Date: Draft, 12 months after project initiation; final, one month after NRC comments received by the Contractor.

Estimated Level of Effort: Two staff months.

Task 6: The Contractor shall survey available literature for understanding of the behavioral psychology and sociology applicable to evacuees, and:

- Determine likely public acceptance of alternate sheltering strategies,
- Determine likely public acceptance of alternate evacuation strategies,
- Determine methods to communicate advanced PAR strategies to the public, and

- Determine if other sociological factors should be considered in the development of PAR strategies.

This task shall be submitted to NRC as a technical letter report for review and comment. NRC comments will be incorporated after review.

Estimated Completion Date: Draft, 12 months after project initiation; final, one month after NRC comments received by the Contractor.

Estimated Level of Effort: Two staff months.

Task 7: The Contractor shall identify changes in PAR strategies that would result in dose savings to the public, improve public confidence, or facilitate implementation of protective actions. The Contractor shall also determine if there are better strategies for the recommendation and implementation of protective actions during nuclear power plant radiological emergencies. The psychology and sociology of evacuees must be considered, as well as methods to improve public understanding. Limitations of the various strategies must be assessed in terms of:

- Population density,
- Spectrum of accidents where dose savings could be expected,
- Applicability to fast breaking events,
- Public willingness to implement the new strategies,
- Public understanding of PARs,
- Ability of strategy to be implemented by licensees, perhaps with limited information,
- Reactor design distinctions (if any),
- Ability of offsite response organizations to implement the PAR regimen, and
- Other relevant factors.

The Contractor shall provide this determination in the form of a report suitable for NRC management review. This report will be reviewed to determine if the strategies are viable and changes are warranted to Supp. 3. Reference for all sources of information will be documented with appropriate footnotes.

The Contractor should plan for at least three formal review cycles of the summary report. Each version should be returned to NRC within three weeks of comments being transmitted to the Contractor. The estimated completion date provided below is for the first draft to be placed into the review cycle.

Estimated Completion Date: 15 months after project initiation.

Estimated Level of Effort: Six staff months.

Task 8: (optional) Should NRC management together with our FEMA counterparts (co-authors of Supp. 3) determine that a revision to Supp. 3 is warranted, the Contractor will be instructed to prepare a revision to Supp. 3 to incorporate the knowledge gained from the preceding tasks. Upon review, the Contractor shall incorporate the comments of the NRC Technical Monitor and staff into the draft revision, and submit the updated document to the NRC Project Manager in anticipation of at least three formal review cycles. Each version

should be returned to NRC within three weeks of comments being transmitted to the Contractor. The Contractor shall anticipate providing support at one public meeting. Upon completion of the review cycles, the Contractor shall prepare a final revision, and submit it to the NRC for publication. The estimated completion date provided below represents the first draft being placed in the review cycle.

Estimated Completion Date: Six months, after option is selected.

Estimated Level of Effort: Six staff months.

Additional Assumptions: In preparing the proposal, assume that Tasks 1, 2 and 6 will commence with the beginning of the project, and that they may be conducted in parallel. Also, provide cost information with and without the inclusion of Task 8.

IV. DELIVERABLES

A. Technical Reporting

Task 1 - Document meetings and literature review.

Estimated Completion Date: Two months after project initiation.

Task 2 - Draft technical letter report for review and comment, and final report with comments incorporated.

Estimated Completion Date: Four months after project initiation.

Task 3 - Draft technical letter report for review and comment, and final report with comments incorporated.

Estimated Completion Date: Seven months after project initiation.

Task 4 - Draft technical letter report for review and comment, and final report with comments incorporated.

Estimated Completion Date: 11 months after project initiation.

Task 5 - Draft technical letter report for review and comment, and final report with comments incorporated.

Estimated Completion Date: 13 months after project initiation.

Task 6 - Draft technical letter report for review and comment, and final report with comments incorporated.

Estimated Completion Date: 13 months after project initiation.

Task 7 - Report suitable for NRC management review, NRC staff comments incorporated, and NRC management review cycle begun.

Estimated Completion Date: 15 months after project initiation.

Task 8 (optional) - Revision of Supp. 3 suitable for NRC management and FEMA review, NRC staff comments incorporated, and the review cycle begun.

Estimated Completion Date: Six months after option is selected.

B. Monthly Business Letter Report

The Contractor shall submit a monthly business letter report by the 20th of each month to the Project Manager listed in Section VIII, with a copy provided to the NRC Technical Monitor. The Contractor shall include the following information, at a minimum, within the report's content:

- Title of Project.
- Job Code.
- Primary Contractor Contact & Contact Information.
- Period of Performance of the Contract.
- Reporting Period.
- List of Tasks & Sub-Tasks Accomplished to Date.
- Tasks & Sub-Tasks Accomplished During the Reporting Period (along with brief descriptions of how these items were accomplished & dates of accomplishment).
- Tasks & Sub-Tasks to be Accomplished During the Upcoming Reporting Period (along with brief descriptions of how & when these items are to be accomplished).
- Monthly Spending, Total Spending to Date, and Remaining Funds.
- Identification of Any Problems or Concerns.*

* The Contractor shall bring any administrative or technical difficulties which may affect the schedule or costs of the project to the immediate attention of the NRC Project Manager.

C. Submittal of Written Material

All documents mailed from DOE to NRC should have "Addressee Only" on the envelope to keep it from being entered into the NRC's document management system, Agency-wide Documents Access and Management System (ADAMS). Send mail for the addressee and cc's as separate mailings.

D. New Standards for Contractors Who Prepare NUREG-Series Manuscripts

The final guidance document, specified in Task 8, will be in the form of a revised Supplement to NUREG-0654/FEMA-REP-1. All format guidance for NUREG-Series Manuscripts, as specified in NUREG-0650, Revision 2, remains the same with one exception. There is no longer a requirement to include the NUREG-series designator on the bottom of each page of the manuscript. The NRC will assign this designator when the camera-ready copy is sent to the printer and the designator will then be placed on the cover, the title page and spine. The designator for each report will no longer be assigned when the decision to prepare a publication is made. NRC's Publishing Services Branch will inform the NRC Technical Monitor for the publication of the assigned designator when the final manuscript is sent to the printer.

For the electronic manuscript, prepare the text in WordPerfect 8, and use any of the following file types for tables, charts, spreadsheets, etc.

<u>File Type</u>	<u>File Extension</u>
WordPerfect®	.wpd
Microsoft® PowerPoint®	.ppt
Corel® QuattroPro®	.wb3
Corel® Presentations	.shw
Lotus® 1-2-3	.wk4
Portable Document Format	.pdf

The Contractor will publish the final document on both compact disk and in a bound document (five copies).

V. MEETINGS AND TRAVEL REQUIREMENTS

Frequently and periodically, over the course of this contract, the Contractor and the NRC Technical Monitor will interact (e.g., email, telephone, conference call) to discuss the contract's progress, NRC comments, and the general conduct and content of sub-tasks associated with this contract. It is anticipated that most of the communication between the NRC and the Contractor will be handled in this manner. The following specific meetings and travel are anticipated under this project:

Task 1: One trip (for two) for five days to NRC Headquarters is anticipated to kick-off the project, meet with the NRC Project Manager & Technical Monitor (whose names are provided in Section VIII), support the completion of Sub-tasks a and b, and discuss project requirements and the schedule as a whole.

Task 2: Upon completion of Task 2, a meeting will be held to discuss the catalogue and NRC comments. If the comments are complex, an in-person meeting may be held at NRC with agency subject matter experts, otherwise the meeting may be held at the laboratory or via conference call at the option of NRC.

Tasks 3, 4, 5 and 6: At the option of NRC, one or two face-to-face meetings may be held to discuss the technical letter reports required by these tasks. These meetings may take place at NRC or at the laboratory, or the NRC may determine that adequate oversight can be accomplished via a conference call. The conduct and location of these meetings is dependent on the complexity of the technical issues involved.

Task 7: One trip (for two) for five days to NRC Headquarters is anticipated to present project results, meet with NRC Management and discuss these results. Also, three trips (for two) should be anticipated to present the results and status of this project at public or professional conferences or meetings as selected by NRC.

Task 8 (Optional): Two trips (for two) should be anticipated to present the results and status of this project at public or professional conferences or meetings as selected by NRC.

The Contractor may propose additional travel deemed necessary for the successful completion of this effort. Over the course of the contract, NRC staff may travel to the Contractor site for

meetings. Once the contract has been awarded, the NRC Technical Monitor and Project Manager must approve all additional travel in advance.

VI. LEVEL OF EFFORT

Management & Technical Staff: 22.5 staff months. Management & Technical Staff months are broken down by task in Section III, Task Statement. Optional Task 8, if selected, adds another six staff months to the total effort.

VII. PERIOD OF PERFORMANCE

Proposed Period of Performance: July 15, 2004 - December 31, 2005 (without Task 8); July 15, 2004 - June 30, 2006 (with Task 8). Note that these periods of performance include completion of the multiple review cycles documented in Section III. No deviation from this schedule is anticipated. Deviation from the established period of performance must be approved by the Project Manager, upon advisement by the NRC Technical Monitor.

VIII. CONTACT INFORMATION

Technical Monitor

R. L. Sullivan
Sr. Emergency Preparedness Specialist
Emergency Preparedness Project Office

Phone: 301-415-1123
Email: RXS3@nrc.gov

Project Manager

Debra A. Schneck
Project Manager
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IX. NRC FURNISHED MATERIALS

NRC documents related to this effort.

X. CONTRACTOR-ACQUIRED MATERIAL

Normally, the purchase of property costing \$500 or more (including Federal Information Processing (FIP) resources) will be approved through issuance of a work order accepting the proposal in which the property is listed. If additional property costing \$500 or more (including

FIP resources) is needed after work starts, the Contractor shall request approval of the additional property in writing to the Project Manager. This written request shall be in the form of a revised proposal or a letter.

XI. SUBCONTRACTING/CONSULTANT INFORMATION

Describe any technical support effort that is proposed to be performed by a subcontractor or consultant. Identify the level of effort, by task, of any proposed subcontractor or consultant and provide an explanation of the need for subcontracting that portion of the effort. For any subcontract or consultant effort, describe the following:

- Necessity of subcontracting,
- Tasks and sub-tasks the subcontractor or consultant will perform,
- Level of effort proposed for the subcontract effort,
- Status and expected time frame for selection, and
- Method of selection of the subcontractor or consultant.

XII. ORGANIZATIONAL CONFLICT OF INTEREST DISCLOSURE

Provide descriptions of present/planned/past work for other organizations in the same/similar technical area as the NRC project scope of work, e.g., (included but not limited to), NRC licensees, vendors, industry groups or research institutes that represent or are substantially comprised of nuclear utilities. Provide the name of the organization, dollar value, and period of performance of the work identified.