



# Lawrence Livermore National Laboratory

NUCLEAR SYSTEMS SAFETY PROGRAM

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WM Project: WM-10, 11, 16

PDR w/encl

(Return to WM, 623-55)

WM Record File: A-0297

LPDR w/encl

September 1, 1987

Dr. R. John Starmer, Leader  
Siting Section  
Technical Review Branch  
Division of Low-level Management  
and Decommissioning  
Office of NMSS  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Subject: Technical Assistance Work under 40 CFR 192 and 10 CFR 40,  
Appendix A

Reference: "Draft Proposal -- SOW for Technical Assistance in  
Geologic Stability Impacts on Uranium Recovery and  
LLW Management Sites." (Six pages)

Dear Dr. Starmer:

In accordance with regulations under 40 CFR 192 and 10 CFR 40,  
Appendix A as well as the Uranium Mill Tailings Radiation Control Act of  
1978 and the Low Level Radioactive Waste Policy Amendments Act of 1985,  
members of our staff at the Lawrence Livermore National Laboratory (LLNL)  
expressed their interest in working with the NRC staff. Among several  
interesting project possibilities, we thought that the reference SOW on  
the geologic stability project (preliminary draft) can be a point of new  
beginning for us to work for the offices of Division of Low-Level  
Management and Decommissioning. With this belief, I am taking a liberty  
of sending the reference draft SOW for your evaluation and also for your  
consideration. One member of your staff (Ms. Kristin Westbrook) worked  
with our team for a few years while she was at the Geotechnical Branch,  
Division of Waste Management, NMSS, before the recent re-organization;  
and I believe we can work together again in this new project.

In the meantime, if we can be of any assistance, please let us know.  
We enjoy our present working relationship with the Geology & Geophysics  
Section of Technical Review Branch, Division of High-Level Management,  
NMSS under the FIN A0297 project.

Best wishes,

Sincerely yours,

8712140003 870901  
PDR WMRES EXILL  
A-0297 PDR

Dae H. (Danny) Chung  
Leader  
NRC Nuclear Waste Management Projects

cc: Ms. K. Westbrook, NRC

STATEMENT OF WORK  
for

TECHNICAL ASSISTANCE IN GEOLOGIC STABILITY IMPACTS ON  
URANIUM RECOVERY AND LOW LEVEL WASTE DISPOSAL SITES

FIN:

B&R#:

*management*

1.0 Background

As required by 40 CFR Part 192<sup>1</sup> for inactive (Title I) uranium processing sites and 10 CFR Part 40, Appendix A<sup>2</sup> for active (Title II) uranium processing sites, the geologic stability of tailings piles and dams must be considered. Seismic events (earthquakes) have the potential to generate ground motion in frequencies and magnitudes that could be disruptive to the stability of tailings piles and dams. Therefore, seismic hazard potential must be assessed for each uranium processing site.

Since the seismicity of a region is dependent on the regional tectonics and local geologic structure, each must be incorporated, along with the historical seismicity, in the evaluation of seismic hazard potential for a particular site. With recent advances in seismic hazard analysis techniques, it is imperative that NRC staff develop and utilize a technical position on approaches to evaluating seismic hazard, as required for various licensing reviews.

The objective of the assistance provided by this contract to NRC will be in evaluating geologic stability to include the following:

- 1) Inform NRC staff on the latest accepted seismic hazard assessment techniques and the adaptation of these to assessing the geologic stability of uranium processing and ~~LLW~~ disposal sites;
- 2) assist NRC staff in developing a technical position and preparing guidelines on approaches to evaluating seismo-tectonic stability for uranium mill tailings piles and dams; and
- 3) peer review and preparation of written reports on selected seismo-tectonic hazard studies for both Title I and Title II uranium processing and ~~Low Level Waste~~ *Low Level Waste* (LLW) disposal sites prior to the completion of the technical position and guidelines.

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<sup>1</sup> "Health and Environmental Protection Standards for Uranium Mill Tailings"

<sup>2</sup> "Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily for Their Source Material Content"

## 2.0 Work Required

The contractor will assist NRC staff in developing a technical position on approaches to evaluating seismic hazard for uranium mill tailings piles and dams and LLW disposal sites. The contractor will assist in the preparation of guidelines in conjunction with the technical position for seismic hazard assessment methodologies with applications to uranium processing and LLW disposal sites.

In addition, the contractor will review and prepare written reports on seismic hazard analyses for uranium processing facilities and LLW disposal sites. The reviews will include selected seismic hazard analyses in site screening plans; remedial action plans; draft environmental impact statements; draft environmental assessments; decommissioning plans; and other operational activities. The reviews will include an evaluation of DOE's quality and completeness of data and the appropriateness of the analysis techniques used to assess the seismic hazard based upon consideration of regional and local geology, historical seismicity, tectonics, and specific characteristics of local subsurface structure.

### Task 1

#### *STATE-OF-THE-ART*

The contractor shall conduct a survey of ~~currently accepted~~ methodologies for determining seismic hazard. Emphasis will be placed on determining the potential magnitudes and frequencies of ground motion.

#### Subtask 1.1

The contractor will identify ~~proven~~ state-of-the-art techniques in seismic hazard analysis. The contractor will identify strengths and weaknesses of each method, and the limits of uncertainties of input data specific to various geologic structures and mediums. The products will be in the form of topical reports.

#### Subtask 1.2

The performing organization will identify and discuss reasonable modifications to the methods used and techniques identified in subtask 1.1 that would render that method or technique more useful to the evaluation of seismic hazard to uranium processing and LLW disposal sites. Uncertainties in the data and methods will be fully discussed. Written letter reports will be developed by the contractor summarizing his findings under subtask 3.1 and 3.2.

The estimated level of effort for Task 1 is <sup>5</sup> 6 man-months.

### Task 2

The contractor shall provide technical assistance in the development of NRC Staff Technical Positions for the assessment of seismic hazard at uranium processing and LLW disposal sites. The number of sites is unknown at this time. This State of Work (SOW) is based on the assumption that the contractor's work will be required on five to six sites.

The technical positions will be developed by the performing organization in conjunction with NRC guidelines on approaches to evaluating seismic hazards in assessing geologic stability of uranium recovery and LLW disposal sites.

The estimated level of effort for this task is 3 man-months.

Work for Task 2 will begin at the written direction of the NRC/PM.

### Task 3

The contractor shall provide technical assistance in the review and assessment of selected seismic hazard analyses performed by DOE or DOE contractors for particular Title I and Title II uranium processing sites. The number of sites is unknown at this time. This SOW is based on the assumption that the contractor's work will be required on five to six sites. The reviews will assess the appropriateness of the input data, including: local and regional geologic structure, historical seismicity, and tectonics; the methodology and results of the analyses; and impacts on the sites as determined by DOE.

#### Subtask 3.1

The performing organization shall review and and prepare written letter reports on DOE contractor publications concerning geologic stability with reference to seismic hazard potential.

#### Subtask 3.2

The contractor shall review and prepare written letter reports on DOE compiled seismic hazard input data, including: regional and local geologic structure, historical seismicity, and tectonics; and prepare alternate assessments as needed.

The estimated level of effort for Task 3 is 3 man-months.

Work on Task 3 will begin at the written direction of the NRC/PM.

### Task 4

The performing organization shall provide direct technical assistance in the form of attendance and participation as needed at meetings and the writing of technical positions and other such documents.

The estimated level of effort for Task 4 is 1 man-month.

Work on Task 4 will begin at the written direction of the NRC/PM.

### 3.0 Reporting Requirements

3.1 Monthly Letter Status Report - Scheduled dates listed below indicate the latest acceptable dates to NRC. However, these reports and dates are subject to the change in accordance with changes in DOE schedules.

1. Monthly letter status Reports: These reports shall be due by the 15th of each month.
2. Reports of Meetings and Discussions: Due 10 days after completion of meeting or discussion;
3. Letter Reports/Topical Reports: Due at the conclusion of each subtask assignment.

**IN THIS MONTHLY LETTER STATUS REPORT**

~~3.2 Technical Reports~~ Each month, the contractor shall submit a ~~letter~~ report which summarizes by task:

1. The work performed during the previous month and findings important to the NRC program;
2. Milestones reached and update of subcontractor (if any) activities;
3. Potential or actual contractual problem areas and their impacts (if the schedule has slipped or if the budget will be exceeded, this shall be stated and the reasons explained);

4. The personnel time expenditures during the previous month with the performing organization and subcontractor time expenditure listed separately; and
5. Costs and uncosted obligations, listed separately (a) during the previous month, (b) cumulative to date (fiscal year and total), and (c) projection by month for the current fiscal year. The first monthly report shall provide the initial projections, and subsequent reports shall either indicate revised projections or indicate "no change in the cost and uncosted obligation projection."
6. Monthly reports shall include a listing of subcontractor reports received that month and abstracts for and/or papers prepared by project personnel.

~~The reports shall be due by the 15th of each month.~~

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- Letter Reports - The contractor shall submit timely letter reports in order to bring issues of importance to the attention of the P.M.. The letter reports shall discuss significant findings and conclusions pertinent to the objective of the report in the context of their impact on licensing. Also, letter reports should include a summary that summarizes the results and conclusions in the context of their impact on licensing needs and recommendations with regard to the project objectives as defined in the Statement of Work. This is designed to enhance the useability of reports to the licensing staff and the agency as a whole. NRC comments shall be mutually resolved by the NRC Project Manager and the performing organization. The final Letter Report shall be submitted within two weeks after receiving comments from the NRC.

Each draft and final report will include a list of references. A system of cross references shall be used. In all areas where "work by others" is reviewed and used, the performing organization shall specify which conclusions are his and which are those of the original authors.

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3.4
- Topical Reports - The performing organization shall prepare draft and final topical reports at the conclusion of each subtask 1.1 assignment. These reports shall be self-contained, and will be suitable for publication as a NUREG/CR report. Reports should include an Executive Summary that summarizes the results in the context of their impact on licensing and licensing needs and recommendations with regard to the project objectives as defined in the Statement of Work. Changes of reporting schedules shall be made by the NRC project manager and performing organization jointly. Draft and final reports shall be prepared in accordance with NRC manual chapter 1102 "Formal Contractor Documents." The draft shall meet the format requirements of the formal report, shall have been edited and reviewed by the performing organization and, with the possible exception of a few minor editing corrections, shall be ready to be published as a formal report if NRC has no comments. All final reports shall include a camera ready copy and a microfiche copy.

The performing organization shall submit thirteen (13) copies of draft reports to the NRC Project Manager in accordance with the completion schedule. Within the 15 working days following ~~submission~~ <sup>RECEIPT</sup> of the draft report, the NRC Project Manager will comment in writing on these reports. The performing organization shall respond to these comments in writing within 15 days following receipt of NRC comments. Comments shall be mutually resolved by the NRC Project Manager and the performing organization. The final report shall be submitted within 20 working days after receipt of NRC comments and shall address a resolution of all NRC review comments.

Each draft and final report will include a list of references. A system of cross references between the text of the report and the list of references shall be used. In all areas where "work by others" is reviewed and used, the performing organization shall specify which conclusions are his and which are those of the original author.

3. <sup>5</sup> Final Report - The contractor shall prepare draft and final letters or topical reports at the conclusion of each task or subtask assignment. Reports should include an executive summary that summarizes that results in the context of their impact on licensing and licensing needs and recommendations with regard to the project objectives as defined in the Statement of Work. Changes of reporting schedules shall be made by the NRC Project Officer and contractor jointly. Draft and final reports shall be prepared in accordance with NRC manual chapter 3202. The draft shall meet the format requirements of the formal report, shall have been edited and reviewed by the contractor and, with the possible exception of few minor editing corrections, shall be ready to be published as a formal report if NRC has no comments.

The contractor shall submit ten (13) copies of draft reports to the NRC Project Officer in accordance with the ~~completion~~ <sup>RECEIPT</sup> schedule. Within the 15 working days following ~~submission~~ <sup>RECEIPT</sup> of the draft report, the NRC Project Officer will comment in writing on these reports. The contractor shall respond to these comments in writing within 15 days following receipt of NRC comments. Comments shall be mutually resolved by the NRC Project Officer and the contractor. The final report shall be submitted within 20 working days after receipt of NRC comments and shall address a resolution of all NRC review comments.

3. <sup>5</sup> Reporting Requirements

The following summarizes the required report distribution under this contract:

<u>Distribution</u>	<u>Monthly Letter Status Reports: Progress</u>	<u>Letter Draft</u>	<u>Reports: Final</u>
Project Officer	3	6	6

Office of the Dir., NMSS (Attn: Program Support Branch)	1	1	1
Div. of Waste Mgmt. (Attn: Div. Dir.)	2	2	2
Contracting Officer	1	1	1
High-Level Waste Tech. Dev. Branch (Attn: Branch Chief)	1	1	1
Officer of Research	1	1	1
Documents Control Center, NMSS	1	1	1
	<u>10</u>	<u>13</u>	<u>13</u>

#### 4.0 Meetings and Travel

The contractor shall attend planning or review meetings generally of one day or two days at NRC in Silver Spring, Maryland, as specified by the Project Officer.

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All domestic travel shall be approved in advance by the NRC Project Officer.

#### 5.0 NRC Furnished Material

At the initiation of the contract, NRC will provide the contractor with a copy of procedural and technical portions of 40 CFR part 192, Appendix A and 10 CFR part 40 and a copy of the present schedule of major events in uranium recovery and LLW operations.

#### 6.0 Period of Performance

The estimated period of performance will commence upon contract award and shall continue through FY 85, September 30, 1985.

#### 7.0 Technical Direction

All technical instruction to the DOE performing organization shall be issued through the PO. As used herein, technical instructions are those which provide details, suggest possible lines of inquiry, or otherwise completed the general scope of work set forth herein. Technical instructions shall not constitute new assignments of work or changes of such nature as to justify an adjustment in cost or period of performance.

#### 8.0 Level of Effort

WM-RES

WM Record File  
40297  
LLL

WM Project 10, 11, 16

Docket No. \_\_\_\_\_

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LPDR  (B, N, S)

Distribution:

Starmer \_\_\_\_\_

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