



Central File

3

DISTRIBUTION:
April 26, 1982 V. Zeoli, CON
D. Dandois, CON
G. Knighton, DST
PYChen
RHermann
WRussell
EButcher
GLainas
JLeonard
DCorley
BGrenier
DEisenhut
SEPB Reading

Mr. J. B. LaBrene
San Francisco Operations Office
U. S. Department of Energy
1333 Broadway, Wells Fargo Building
Oakland, California 94612

Dear Mr. LaBrene:

SUBJECT: LBL TECHNICAL ASSISTANCE TO THE DIVISION OF LICENSING,
NRC, "REVIEW OF SEISMIC RELATED TOPICS OF SELECTED
OPERATING PLANTS FOR THE SYSTEMATIC EVALUATION PROGRAM"
(FIN NO. A-0435)

My letter of February 19, 1982, provided the balance of FY 1982 funds in the amount of \$295,000 to complete the work specified in the Statement of Work (Rev. 1). I have received your letter of March 22, 1982, suggesting that slight modifications to the scope of work (Rev. 1) are needed in order to reflect the current status of the Systematic Evaluation Program. The suggested modifications, as described in your March 22, 1982 letter, are incorporated in the revised scope of work (Rev. 2) included with the enclosed NRC Form 173, Standard Order for DOE Work.

As stated in your March 22, 1982 letter, these modifications result in no change either in the total amount of work or level of funding.

Other than the enclosed modifications, all other agreements in the scope of work remain unchanged and changes to the Statement of Work are not authorized without prior written approval from me.

If you have any questions, please contact J. Leonard on FTS 492-9608. Thank you for your assistance.

Sincerely,

Original signed by
Darrell G. Eisenhut

Darrell G. Eisenhut, Director
Division of Licensing

Enclosure:
NRC Form 173

cc w/enclosure:
See next page

*See previous yellow for additional concurrences.

TCB:G
BGrenier
4/1/82
DEisenhut
4/14/82

OFFICE	SEP8:DL	SEP8:DL	SEP8:DL	C:TAPMG	AD:SA:DL	DL	TCB
SUB-NAME	PYChen:b1*	RHermann*	WRussell*	EButcher*	GLainas	JLeonard	DCorley
DATE	4/7/82	4/8/82	4/8/82	4/9/82	4/13/82	4/13/82	4/13/82

Mr. J. B. LaGrone
San Francisco Operations Office
U. S. Department of Energy
1333 Broadway, Wells Fargo Building
Oakland, California 94612

Dear Mr. LaGrone:

SUBJECT: LLNL TECHNICAL ASSISTANCE TO THE DIVISION OF LICENSING,
NRR, NRC, "REVIEW OF SEISMIC RELATED TOPICS OF SELECTED
OPERATING PLANTS FOR THE SYSTEMATIC EVALUATION PROGRAM"
(FIN NO. A-0436)

My letter of February 19, 1982, provided the balance of FY 1982 funds in the amount of \$295,000 to complete the work specified in the Statement of Work (Rev. 1). I have received your letter of March 22, 1982, suggesting that slight modifications to the scope of work (Rev. 1) are needed in order to reflect the current status of the Systematic Evaluation Program. The suggested modifications, as described in your March 22, 1982 letter, are incorporated in the enclosed revised scope of work (Rev. 2).

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If you have any questions, please contact J. Leonard on FTS 492-9608. Thank you for your assistance.

Sincerely,

Darrel G. Eisenhut, Director
Division of Licensing

Enclosures:
As stated

cc w/enclosures:
See next page

bcc: V. Zioli, COM
D. Dandois, COM
G. Knighton, DST

TCSB:C
BGrenier
4/ /82

D:D
DE
4/

NAME	DATE	NAME	DATE	NAME	DATE	NAME	DATE	NAME	DATE
SEPB:pyc	4/ /82	SEPB:SL	4/8/82	SEPB:C	4/9/82	C:TAPMC	4/9/82	AD:SA:DL	4/ /82
PYChen:bl		RHermann		WRussell		EB:cooper		GLainas	
								JLeonard	4/ /82
								DCorley	4/ /82

cc w/enclosures:

R. Barber, DOE-HQ
J. M. Johnson, LLNL
R. Murray, LLNL
T. Nelson, LLNL

NRC FORM 173
(2-78)

U.S. NUCLEAR REGULATORY COMMISSION

ORDER NUMBER

20-82-335

STANDARD ORDER FOR DOE WORK

DATE

ISSUED TO (DOE Office)

San Francisco Operations Office

ISSUED BY (NRC Office)

Office of Nuclear Reactor
Regulation, DL

ACCOUNTING CITATION

APPROPRIATION SYMBOL

31X0200.202

B&R NUMBER

20-19-20-21-1

FIN NUMBER

A0436-2

PERFORMING ORGANIZATION AND LOCATION

Lawrence Livermore National Laboratory
Livermore, CA

WORK PERIOD THIS ORDER

FIXED ☒

ESTIMATED ☐

FROM

TO

04/01/81

01/30/83

FIN TITLE

Review of Seismic Related Topics of Selected Operating Plants
for the Systematic Evaluation Program

OBLIGATION AVAILABILITY PROVIDED BY:

A THIS ORDER

\$ 0

B TOTAL OF ORDERS PLACED PRIOR TO THIS DATE WITH THE PERFORMING ORGANIZATION
UNDER THE SAME "APPROPRIATION SYMBOL" AND THE FIRST FOUR DIGITS OF THE
B&R NUMBER CITED ABOVE

\$ 1,999,000

C TOTAL ORDERS TO DATE

(TOTAL A & B)

\$ 1,999,000

D AMOUNT INCLUDED IN "C" APPLICABLE TO THE "FIN NUMBER" CITED IN THIS ORDER

\$ 350,000

FINANCIAL FLEXIBILITY

☐ FUNDS WILL NOT BE REPROGRAMMED BETWEEN FINs. LINE D CONSTITUTES A LIMITATION ON OBLIGATIONS
AUTHORIZED

☒ FUNDS MAY BE REPROGRAMMED NOT TO EXCEED 10% OF FIN LEVEL UP TO \$50K. LINE C CONSTITUTES A LIMITATION
ON OBLIGATIONS AUTHORIZED 1. SEE BELOW

STANDARD TERMS AND CONDITIONS PROVIDED DOE ARE CONSIDERED PART OF THIS ORDER
UNLESS OTHERWISE NOTED.

ATTACHMENTS

THE FOLLOWING ATTACHMENTS ARE HEREBY
MADE A PART OF THIS ORDER

- ☒ STATEMENT OF WORK (Modification)
☐ ADDITIONAL TERMS AND CONDITIONS
☐ OTHER

SECURITY

- ☐ WORK ON THIS ORDER IS NOT CLASSIFIED
☐ WORK ON THIS ORDER INVOLVES CLASSIFIED
INFORMATION. NRC FORM 187 IS ATTACHED

REMARKS

This order modifies the LLNL proposal dated February 18, 1981, as revised by DOE
Work Order 20-82-188 dated February 19, 1982 in accordance with the attached and
requests that an NRC Form 189 without the attachments that reflects any changes in
costs or period of performance be submitted. Please send a copy of the revised NRC
Form 189 to B. L. Grenier, NRR

After acceptance, please send to the NRC Office of the Controller, ATTN: D. Dandois,
and provide a copy to the Office of Nuclear Reactor Regulation, ATTN: D. Corley.

ISSUING AUTHORITY

ACCEPTING ORGANIZATION

SIGNATURE

Darrell G. Eisenhut, Director

SIGNATURE

TITLE

Division of Licensing, NRR

TITLE

DATE

NRC FORM 173 (2-78) 1/ Reprogramming limited to
changes on FINs within the same B&R Number
and the same Appropriation Symbol. In order for this reallocation to be effective, this
office must be notified within 5 days so that an appropriate NRC Form 173 can be issued and
counter-signed to complete the action prior to receipt of any bills.

8205270594

REVISION 2STATEMENT OF WORKBACKGROUND

In order to determine the margin of safety of the selected ten operating nuclear power plants relative to those designed under current standards, criteria and procedures, and to define the nature and extent of retrofitting to bring these plants to acceptable levels of capability if they are not already at such levels, the Office of Nuclear Reactor Regulation (NRR) has been proceeding with Phase II of the Systematic Evaluation Program (SEP) since October 1977 through the review of 137 safety topics developed in Phase I of the SEP. The seismic design considerations, and the assessment of safety margins in light of changes in design codes, design criteria, and load combinations are among the 137 safety topics to be reviewed.

Lawrence Livermore National Laboratory (LLNL) has provided technical assistance to the NRC in seismic review under FIN AD415, "LLL Technical Assistance on Seismic Review of Selected Operating Plants for the Systematic Evaluation Program," and FIN AD233, "Seismic Review of Selected Operating Plants for SEP." This work included development of site specific spectra and seismic reanalyses for structures systems and components of the Group I SEP plants. Further, LLNL is performing analyses to determine containment temperature and pressure loads for post accident conditions for SEP plants.

OBJECTIVES

The overall objective of this project is to provide technical assistance to reassess safety adequacy of selected operating plants for SEP. More specifically, the objectives of the following Tasks 1, 2, and 3 are to determine the capability of each plant to withstand the effects of earthquakes (Topic III-6). The objective of Task 4 is to determine if the plant Seismic Category I structures will withstand the NRC specific design conditions without impairment of the structural integrity or the loss of the ability to perform the required safety functions (III-7.8).

WORK REQUIREMENTS

The bases for evaluation for Tasks 2, 3, and 4 will generally follow the appropriate criteria documented in NUREG/CR-0098, "Development of Criteria for Seismic Review of Selected Nuclear Power Plants" by N. M. Newmark and W. J. Hall, dated May 1978, and Standard Review Plan, Sections 2.5, 3.7, 3.8, 3.9, and 3.10. All tasks will be carried out on a best effort basis.

Task 1 - Licensee Site Specific Spectra ReviewsEstimated Completion Date

- A. Perform the review of seismic site specific input spectra submitted by Yankee Rowe. Run additional sensitivity studies using model and data contained in Yankee Rowe's sumittal. Assess sensitivity of real spectra to various parameters. Carefully explore the effect on the 1 to 2 Hz range.

6/30/81

Project Title: REVIEW OF SEISMIC RELATED TOPICS OF SELECTEDFin/189A No. A-0436OPERATING PLANTS FOR THE SYSTEMATIC EVALUATION

B&P No. _____

PROGRAM

- B. Recommend site specific ground response spectra to be used for Yankee Rowe reanalysis (i.e., the licensee spectra or SSSP spectra or some other spectra). This will require several meetings with NRC Geosciences staff. A letter report shall be issued which will include Tasks A & B.

Estimated Completion Date
7/15/81

Task 2 - Seismic Safety Assessments of Seismic Group I Plants

Review licensee's proposed corrective action to address open items from FIN A0233 and FIN A0115 reviews to increase the seismic resistance of structures, systems and components. Open items are identified in NUREG/CR-0891, CR-1833 and CR-1821 and in the Draft Oyster Creek and Millstone I reports. A final report will be issued for each plant in the form of either a revision or supplement to the original NUREG seismic review reports.

- 1) Palisades
- 2) Ginna
- 3) Dresden 2
- 4) Oyster Creek
- 5) Millstone I

Review schedule will be established upon receipt of licensee submittals. (See Enclosure for Task 2 Schedule)

Rev.
1
Rev.
2

Task 3 - Seismic Safety Assessment of Seismic Group II Plants

- A. Evaluate the licensee's reanalysis program results for Category I structures.

Review schedule will be established upon receipt of licensee submittals. Licensee reanalysis results are due by 1/1/82. (See Enclosure for Task 3A Schedule)

Rev.
1
Rev.
2

- B. Perform an independent seismic analysis of the reactor containment structures using SSSP recommended ground response spectra. The estimated starting date is April 1, 1981. The final report will incorporate a comparison with the licensee's analysis.

	Rev. 1	Draft Report to NRC	Final Report to NRC	Rev. 1	
1) San Onofre	Delete	8/30/81	1/31/82	Delete	
2) Big Rock Point	1/31/82	10/16/81	2/28/82	6/30/82	
3) Haddam Neck	2/15/82	12/21/81	2/21/82	*9/30/82	
4) Yankee Rowe	2/15/82	2/16/82	4/30/82	*8/31/82	
5) LaCrosse	2/28/82	2/20/82	6/21/82	*9/15/82	

Rev.
1

*The results of this task will be used in Task 3A and Task 4. A letter report will be issued upon completion of each plant.

- C. Perform on-site inspection of Group II SEP plants if needed for successful completion of Task 3.A and 3.B. To be scheduled as the need arises.

Project Title REVIEW OF SEISMIC RELATED TOPICS OF SELECTEDFin/189A No. A-0436OPERATING PLANTS FOR THE SYSTEMATIC EVALUATION

BSP No. _____

PROGRAMEstimated Completion DateTask 4 - Load Combinations

Perform safety assessment of reactor containment structures in accordance with the intent of current NRC licensing criteria. The loads to be considered are seismic loads (SSSP spectra), normal operating loads, and the pressure and temperature loads due to LOCA. The seismic loads for Group I plants are developed at LLNL under FIN A0415 and the seismic loads for Group II plants will be developed in Task 3.B of this proposal. Currently, LLNL is performing analyses to determine containment temperature and pressure loads for post LOCA conditions for use in this task.

	Rev. 2	Draft Report to NRC	Final Report to NRC	Rev. 2	
1) Palisades	Complete	7/31/81	11/30/81	1/31/82	Rev.
2) Ginna	Complete	8/31/81	12/31/81	1/31/82	2
3) Dresden 2*	5/15/82	9/30/81	1/31/82	7/15/82	
4) Oyster Creek	3/31/82	10/31/81	2/26/82	5/31/82	
5) Millstone 1	4/30/82	11/30/81	2/21/82	6/30/82	Rev.
6) San Onofre	7/31/82	1/21/82	6/21/82	9/30/82	1
7) Haddam Neck	6/30/82	2/21/82	3/21/82	9/15/82	

*This subtask will be performed based on the results obtained in Millstone 1 and Oyster Creek.

The final report will be issued for each plant incorporating the letter report from Task 3.B

SUBCONTRACTS

Structural Mechanics Associates -

Provide two members for peer review function.

Provide analytical support in the structures and equipment area.

R. P. Kennedy will not participate in Oyster Creek work due to potential conflict of interest.

J. D. Stevenson will not participate in San Onofre due to potential conflict of interest.

EG&G -

Provide analytical support.

NCT Engineering -

Provide review and analytical support in the structures area.

William J. Hall -

Provide peer review function and analytical and consulting support.

We have reviewed our subcontractors for possible conflict of interest and find none except as mentioned above with Drs. Kennedy and Stevenson.

Rev
2Rev
2

PROGRAMREPORTING REQUIREMENTS

1. Upon completion of each plant, provide the cognizant NRC manager with the reports specified in the "work requirements" for each task. Reporting will include analysis criteria used, analysis results, and safety evaluations.
2. A monthly business letter report shall be submitted by the 15th of the month to the cognizant NRC manager with copies to the Director, Division of Licensing; Assistant Director, Division of Licensing; SEP Branch Chief, Division of Licensing and B. L. Grenier, NRR. These reports will contain:
 - a) A listing of any efforts completed during the period; milestones reached, or if missed, an explanation provided;
 - b) The amount of funds expended for manpower and computed services during the period and cumulative to date for each task;
 - c) Any problems or delays encountered or anticipated;
 - d) A summary of the progress to date; and
 - e) Plans for the next reporting period.

MEETINGS AND TRAVEL

1. The following meetings and travel are planned and budgeted.
 - Task 1 - Two one-day meetings may be required to discuss the results with the staff.
 - Task 2 - One meeting per facility will be held to discuss with the staff the final results of the review of Group I plants.
 - Task 3 - One meeting per plant with the staff and one site visit per plant may be required. Several informal and formal working level meetings with each licensee and its A/E may be necessary to expedite the review to meet the SEP program schedules.
 - Task 4 - Any meetings necessary to review results will be combined with meetings under Task 2 or 3 above.
2. If necessary, LLNL will attend meetings in Washington, D. C. to present the results of review to ACRS as a consultant to the staff over the period of performance.
3. Peer review meetings will be conducted to cover the results generated under the proposed tasks. At any meetings scheduled for peer review, LLNL will also meet with the staff.

Project Title: REVIEW OF SEISMIC RELATED TOPICS OF SELECTED

FIN/189A No. A-0436

OPERATING PLANTS FOR THE SYSTEMATIC EVALUATION

B&R No.

PROGRAM

NRC FURNISHED MATERIALS

Documents needed for completion of this project have been provided to LLNL. If LLNL identifies additional documentation which is required, NRC will provide the needed documentation within 30 days of receipt of the request or receipt of the documentation, whichever is later.

PROPRIETARY DATA

When proprietary information is submitted to LLNL, it must be specifically identified. The University agrees to exercise its best efforts to avoid release of proprietary data. Nevertheless, neither the University, its employees, nor the government shall be liable in any way in the event such information is released. Furthermore, limitation shall not be imposed on the use of any information and data previously delivered to the University or government without limitations or previously published in any form as to be generally available.

ENCLOSURE

FIN A-0436 - Review of Seismic Related Topics of Selected Operating Plants
for the Systematic Evaluation Program

Task 2 - Review schedule

A final letter report will be prepared for each plant in the form of a supplement to the original NUREG seismic review reports.

- 1) Palisades
- 2) Ginna
- 3) Dresden 2
- 4) Oyster Creek
- 5) Millstone 1

Final Report to NRC
<u>1/31/82</u>
1/31/82
4/30/82
5/28/82
5/28/82

Rev.
2

Task 3A - Review schedule

- 1) San Onofre 1
- 2) Haddam Neck Part I
 Part II
- 3) Yankee Rowe
- 4) LaCrosse

Draft Letter Report to NRC
<u>6/30/82</u>
6/30/82
8/31/82
7/31/82
7/31/82

Final Letter Report to NRC
<u>8/31/82</u>
9/30/82
9/30/82
8/31/82
9/15/82

Rev.
2

Part I - Structures related to hot shutdown condition
Part II - Balance of structures