



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

SEP 25 1979

Mr. Richard R. Rojas  
Associate Director of Research for Oceanology  
(Code 8000)  
U.S. Naval Research Laboratory  
Washington, DC 20375

Gentlemen:

Subject: Interagency Agreement No. NRC-03-79-166

Pursuant to the authority contained in the Economy Act of 1932, as amended, 31 USC 686, the U.S. Nuclear Regulatory Commission (NRC) and the U.S. Naval Research Laboratory (NRL) desire to enter into a cooperative agreement whereby NRL will provide technical assistance in reviewing equipment qualification methods and procedures submitted by applicants for Operating License review.

Accordingly, the Parties hereto mutually agree to the following terms of this agreement:

I Period of Performance

The period of performance is from September 25, 1979 through September 24, 1981.

II Statement of Work

Work performed under this agreement shall be in accordance with Attachment I which is attached and made a part hereof.

III Estimate of Cost

The estimated cost of the effort described in paragraph II above is \$456,000.00. The NPL shall provide within seven (7) days of the date of this agreement a detailed cost estimate for the work described in Article II, above, which may result in a reduction in the total estimated cost of the agreement.

IV Obligation of Funds

The amount presently obligated hereunder for the effort described is \$31,000.00, chargeable to the following B&R and FIN No.:

B&R: 20-19-03-05-1

FIN: B-6825

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Additional obligations to cover the remainder of costs will be provided through unilateral modifications to this agreement, subject to the availability of funds, until such obligations equal the estimated cost in III above.

V Billing Instructions

NRL, to receive reimbursement for costs incurred, shall submit invoices in accordance with Attachment II, Billing Instructions for NRC Cost-Type Contracts, which is attached and made a part hereof.

VI Advance Notification

Whenever NRL has reason to believe that the total cost of the work under this agreement will be substantially greater or less than the presently estimated cost of the work or whenever NRL expects to incur costs in excess of the funds presently obligated, NRL shall promptly notify NRC in writing. When the costs incurred equal 100% of such estimated total costs, NRL shall not incur costs in excess of the estimated cost.

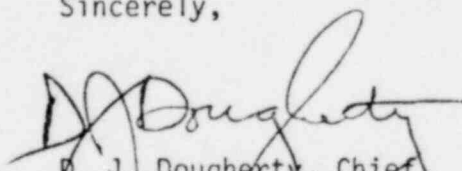
VII NRC Contacts

Technical Contact: The NRC technical contact for the work hereunder is Mr. Robert J. Bosnak, Division of Systems Safety, telephone number (301) 492-7456.

Contracts Contact: The NRC contact is Mr. William B. Menczer, telephone number (301) 427-4480.

If this agreement is acceptable to NRL, please so indicate by signing in the space below and returning two (2) signed copies to me. The third signed copy is for your records.

Sincerely,



D. J. Dougherty, Chief  
Technical Assistance Contracts Branch  
Division of Contracts  
Office of Administration

ACCEPTED:

BY: U.S. Naval Research Laboratory

TITLE: D. M. Johnson  
Budget Officer

DATE: 25 SEP 1979

BY: R. R. Rojas

TITLE: Assoc. Director of Research

DATE: 25 September 1979

## STATEMENT OF WORK

Title: Mechanical Engineering Case Reviews (V)

FIN: B6825

E&R Number: FY 79 20-19-03-05-1; FY 80 20-19-05-13

Technical Monitor: S. N. Hou

Cognizant Branch Chief: R. J. Bosnak (FTS 492-7456)

Background Information

Applicants seeking to construct and operate a nuclear power plant must submit to NRC for review and evaluation documentation consisting of a Preliminary Safety Analysis Report (PSAR), and a Final Safety Analysis Report (FSAR). At the PSAR stage the applicant describes what his design approach will be to meet the NRC design criteria. At the FSAR stage the Applicant describes in detail all safety related systems required for safe plant shutdown under all conditions of operation including design basis accident, and how these systems meet the criteria. On completion of the FSAR review, evaluation and approval, the Applicant receives an Operating License (OL) for commercial plant operation.

Mechanical and electrical equipment may be subjected to vibration from earthquakes and hydrodynamic loads. Applicants are required to use test or analysis methods or a combination of both to qualify equipment essential to plant safety, such that its safety function will be ensured during and after the dynamic event.

Objective

The objective of this work order is to obtain expert technical personnel to assist the Mechanical Engineering Branch in their areas of responsibility for the review and evaluation of equipment dynamic qualification contained in FSAR's submitted by Utilities for an OL.

General Requirements

The reviews are to be conducted using the guidance contained in the Regulatory Guide 1.100, Industry Standard IEEE-344, 1975 and guidance and acceptance criteria in the Standard Review Plans (SRP) Section 3.9.2, 3.9.3 and 3.10 in the areas related to equipment qualification of the MEB responsibility. The contractor will generally follow the approach outlined below in conducting reviews and evaluations:

- Perform an in depth review of the dynamic qualification of electrical and mechanical equipment. Evaluate assumptions, calculations, tests and analysis, methods and procedures to ensure adequate and acceptable implementation of criteria.
- Recommend requests for additional information or clarification based upon initial review and evaluation of the information provided by the applicants.

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- Attendance at meetings with the staff, applicants and architect engineers to discuss and resolve outstanding issues, conduct in-situ inspection of equipment and audit the implementation of applicant commitments.
- Prepare Safety Evaluation Report (SER) input which describes the evaluation of equipment qualification.
- Attend meetings with the Advisory Committee on Reactor Safeguards (ACRS) and public hearings to assist the staff in explaining bases for conclusions and positions reached in the SER.
- Preparation of input to SER Supplements which further clarify and document systems evaluations in the SER based upon review by the ACRS.

#### Level of Effort and Period of Performance

It is estimated that this program will require manpower at an average rate of 2.2 man-years per year over a two year period of performance. Each plant equipment qualification review will take an average of 0.34 man-years.

#### Reporting Requirements

1. Upon a completion of each subtask of each task the contractor will provide the cognizant NRC branch chief with a letter report which includes, as appropriate, safety evaluation report input testimony and supplemental safety report input.
2. A bi-monthly business letter report shall be submitted by the 20th of the month to the cognizant branch chief with a copy to the Director, Division of Systems Safety (Attn: B. L. Grenier). These reports will contain:
  - A listing of any efforts completed during the period; milestones reached, or if missed, an explanation provided;
  - The amount of funds expended during the period and cumulative to date;
  - Any problems or delays encountered or anticipated;
  - A summary of the progress to date;
  - Plans for the next reporting period;
  - The first bi-monthly letter report should contain the planned monthly rate of expenditure based upon review schedule established.

Note: These reports are not to be technical in nature.

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#### Meetings and Travel

Two engineers will attend approximately 25 trips of five days duration to plant sites. One engineer will attend approximately 20 trips of two days duration to either the NSSS, A/E or plant sites. Approximately 25 local trips will be required between NRL and Bethesda, Md.

#### Computer Costs

The contractor will be required to perform approximately six dynamic analyses requiring computer models.

#### NRC Furnished Materials

Documents needed for review will be forwarded to the contractor under separate cover. Some of this material may contain proprietary information, as marked, and must be kept in confidence by the contractor.

#### Billing Requirements

Vouchers submitted for payment should list expenditures for manpower and any other major items of expenditures for each task, i.e., for each separate plant.

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## Specific Work Requirements

### Task 1: Zimmer

The contractor shall review the design adequacy of all NSSS and/or A/E supplied safety related mechanical and electrical equipment and their supports to ensure functional capability, operability and structural integrity under the loading associated with the dynamic effects of earthquake, and hydrodynamic loads. The review shall include an evaluation of related information contained in Sections 3.9.2, 3.9.3 and 3.10 of the Final Safety Analysis Report (FSAR) and related reports submitted to the Nuclear Regulatory Commission (NRC) for obtaining an Operating License (OL) of the subject plant. Plant site inspection of equipment shall be conducted and the combined effects of seismic and other concurrently occurring vibrator loads to the equipment shall be evaluated. The review should be conducted in accordance with sections 3.9.2, 3.9.3 and 3.10 of Standard Review Plans (SRP) and Regulatory Guide 1.100.

<u>Subtasks</u>	<u>Estimated Completion Date</u>
1. Review and evaluate the subject information contained in the above FSAR sections and the reports referenced in the FSAR against the acceptance criteria outlined in the same sections of the SRP. Prepare for use in subtask 2 a listing of plant equipment items and areas of inquiry with respect to methods and procedures used for test and analysis.	1-80
2. Participate in meetings with the applicant and the NRC staff to resolve the issues identified in subtask 1. It is estimated that two engineers will be required to make two trips to the plant site, with each trip of one week duration. During these trips the contractor will inspect equipment and review the test and analysis methods and calculations in sufficient depth to conclude whether the criteria is satisfactorily implemented.  In addition one engineer will be required to make one or two trips of two days duration to either the NSSS, A/E or plant site for follow-up discussions.	5-80
3. Prepare a final SER. This SER may contain open issues or describe areas in which the contractor and staff continue to differ with an applicant.	7-80

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<u>Subtasks</u>	<u>Estimated Completion Date</u>
4. Participate at ACRS meetings, prepare testimony for and appear at Licensing Board Hearings as necessary for verifying technical accuracy and adequacy of the contracted review.	To be scheduled
5. Review and evaluate any unresolved or open issues identified in the SER, or issues raised at ACRS meetings and in hearings. Participate in meetings, as necessary, with the applicant and the NRC staff to resolve any outstanding issues. Prepare inputs to SER supplements to complete the resolution of all outstanding issues.	12-80

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## Specific Work Requirements

### Task 2: Shoreham

The contractor shall review the design adequacy of all NSSS and/or A/E supplied safety related mechanical and electrical equipment and their supports to ensure functional capability, operability and structural integrity under the loading associated with the dynamic effects of earthquake, and hydrodynamic loads. The review shall include an evaluation of related information contained in Sections 3.9.2, 3.9.3 and 3.10 of the Final Safety Analysis Report (FSAR) and related reports submitted to the Nuclear Regulatory Commission (NRC) for obtaining an Operating License (OL) of the subject plant. Plant site inspection of equipment shall be conducted and the combined effects of seismic and other concurrently occurring vibratory loads to the equipment shall be evaluated. The review should be conducted in accordance with sections 3.9.2, 3.9.3 and 3.10 of Standard Review Plans (SRP) and Regulatory Guide 1.100.

<u>Subtasks</u>	<u>Estimated Completion Date</u>
1. Review and evaluate the subject information contained in the above FSAR sections and the reports referenced in the FSAR against the acceptance criteria outlined in the same sections of the SRP. Prepare for use in subtask 2 a listing of plant equipment items and areas of inquiry with respect to methods and procedures used for test and analysis.	12-79
2. Participate in meetings with the applicant and the NRC staff to resolve the issues identified in subtask 1. It is estimated that two engineers will be required to make two trips to the plant site, with each trip of one week duration. During these trips the contractor will inspect equipment and review the test and analysis methods and calculations in sufficient depth to conclude whether the criteria is satisfactorily implemented.  In addition one engineer will be required to make one or two trips of two days duration to either the NSSS, A/E or plant site for follow-up discussions.	3-80
3. Prepare a final SER. This SER may contain open issues or describe areas in which the contractor and staff continue to differ with an applicant.	5-80

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<u>Subtasks</u>	<u>Estimated Completion Date</u>
4. Participate at ACRS meetings, prepare testimony for and appear at Licensing Board Hearings as necessary for verifying technical accuracy and adequacy of the contracted review.	To be scheduled
5. Review and evaluate any unresolved or open issues identified in the SER, or issues raised at ACRS meetings and in hearings. Participate in meetings, as necessary, with the applicant and the NRC staff to resolve any outstanding issues. Prepare inputs to SER supplements to complete the resolution of all outstanding issues.	10-80

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## Specific Work Requirements

### Task 3: San Onofre

The contractor shall review the design adequacy of all NSSS and/or A/E supplied safety related mechanical and electrical equipment and their supports to ensure functional capability, operability and structural integrity under the loading associated with the dynamic effects of earthquake, and hydrodynamic loads. The review shall include an evaluation of related information contained in Sections 3.9.2, 3.9.3 and 3.10 of the Final Safety Analysis Report (FSAR) and related reports submitted to the Nuclear Regulatory Commission (NRC) for obtaining an Operating License (OL) of the subject plant. Plant site inspection of equipment shall be conducted and the combined effects of seismic and other concurrently occurring vibratory loads to the equipment shall be evaluated. The review should be conducted in accordance with sections 3.9.2, 3.9.3 and 3.10 of Standard Review Plans (SRP) and Regulatory Guide 1.100.

<u>Subtasks</u>	<u>Estimated Completion Date</u>
1. Review and evaluate the subject information contained in the above FSAR sections and the reports referenced in the FSAR against the acceptance criteria outlined in the same sections of the SRP. Prepare for use in subtask 2 a listing of plant equipment items and areas of inquiry with respect to methods and procedures used for test and analysis.	12-79
2. Participate in meetings with the applicant and the NRC staff to resolve the issues identified in subtask 1. It is estimated that two engineers will be required to make two trips to the plant site, with each trip of one week duration. During these trips the contractor will inspect equipment and review the test and analysis methods and calculations in sufficient depth to conclude whether the criteria is satisfactorily implemented.  In addition one engineer will be required to make one or two trips of two days duration to either the NSSS, A/E or plant site for follow-up discussions.	6-80
3. Prepare a final SER. This SER may contain open issues or describe areas in which the contractor and staff continue to differ with an applicant.	8-80

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<u>Subtasks</u>	<u>Estimated Completion Date</u>
4. Participate at ACRS meetings, prepare testimony for and appear at Licensing Board Hearings as necessary for verifying technical accuracy and adequacy of the contracted review.	To be scheduled
5. Review and evaluate any unresolved or open issues identified in the SER, or issues raised at ACRS meetings and in hearings. Participate in meetings, as necessary, with the applicant and the NRC staff to resolve any outstanding issues. Prepare inputs to SER supplements to complete the resolution of all outstanding issues.	12-80

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## Specific Work Requirements

### Task 4: Summer

The contractor shall review the design adequacy of all NSSS and/or A/E supplied safety related mechanical and electrical equipment and their supports to ensure functional capability, operability and structural integrity under the loading associated with the dynamic effects of earthquake, and hydrodynamic loads. The review shall include an evaluation of related information contained in Sections 3.9.2, 3.9.3 and 3.10 of the Final Safety Analysis Report (FSAR) and related reports submitted to the Nuclear Regulatory Commission (NRC) for obtaining an Operating License (OL) of the subject plant. Plant site inspection of equipment shall be conducted and the combined effects of seismic and other concurrently occurring vibratory loads to the equipment shall be evaluated. The review should be conducted in accordance with sections 3.9.2, 3.9.3 and 3.10 of Standard Review Plans (SRP) and Regulatory Guide 1.100.

<u>Subtasks</u>	<u>Estimated Completion Date</u>
1. Review and evaluate the subject information contained in the above FSAR sections and the reports referenced in the FSAR against the acceptance criteria outlined in the same sections of the SRP. Prepare for use in subtask 2 a listing of plant equipment items and areas of inquiry with respect to methods and procedures used for test and analysis.	1-80
2. Participate in meetings with the applicant and the NRC staff to resolve the issues identified in subtask 1. It is estimated that two engineers will be required to make two trips to the plant site, with each trip of one week duration. During these trips the contractor will inspect equipment and review the test and analysis methods and calculations in sufficient depth to conclude whether the criteria is satisfactorily implemented.  In addition one engineer will be required to make one or two trips of two days duration to either the NSSS, A/E or plant site for follow-up discussions.	2-80
3. Prepare a final SER. This SER may contain open issues or describe areas in which the contractor and staff continue to differ with an applicant.	4-80

Subtasks

Estimated Completion Date

4. Participate at ACRS meetings, prepare testimony for and appear at Licensing Board Hearings as necessary for verifying technical accuracy and adequacy of the contracted review.

To be scheduled

5. Review and evaluate any unresolved or open issues identified in the SER, or issues raised at ACRS meetings and in hearings. Participate in meetings, as necessary, with the applicant and the NRC staff to resolve any outstanding issues. Prepare inputs to SER supplements to complete the resolution of all outstanding issues.

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## Specific Work Requirements

### Task 5: LaSalle

The contractor shall review the design adequacy of all NSSS and/or A/E supplied safety related mechanical and electrical equipment and their supports to ensure functional capability, operability and structural integrity under the loading associated with the dynamic effects of earthquake, and hydrodynamic loads. The review shall include an evaluation of related information contained in Sections 3.9.2, 3.9.3 and 3.10 of the Final Safety Analysis Report (FSAR) and related reports submitted to the Nuclear Regulatory Commission (NRC) for obtaining an Operating License (OL) of the subject plant. Plant site inspection of equipment shall be conducted and the combined effects of seismic and other concurrently occurring vibratory loads to the equipment shall be evaluated. The review should be conducted in accordance with sections 3.9.2, 3.9.3 and 3.10 of Standard Review Plans (SRP) and Regulatory Guide 1.100.

<u>Subtasks</u>	<u>Estimated Completion Date</u>
1. Review and evaluate the subject information contained in the above FSAR sections and the reports referenced in the FSAR against the acceptance criteria outlined in the same sections of the SRP. Prepare for use in subtask 2 a listing of plant equipment items and areas of inquiry with respect to methods and procedures used for test and analysis.	2-80
2. Participate in meetings with the applicant and the NRC staff to resolve the issues identified in subtask 1. It is estimated that two engineers will be required to make two trips to the plant site, with each trip of one week duration. During these trips the contractor will inspect equipment and review the test and analysis methods and calculations in sufficient depth to conclude whether the criteria is satisfactorily implemented.  In addition one engineer will be required to make one or two trips of two days duration to either the NSSS, A/E or plant site for follow-up discussions.	6-80
3. Prepare a final SER. This SER may contain open issues or describe areas in which the contractor and staff continue to differ with an applicant.	8-80

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Subtasks

Estimated Completion Date

4. Participate at ACRS meetings, prepare testimony for and appear at Licensing Board Hearings as necessary for verifying technical accuracy and adequacy of the contracted review.

To be scheduled

5. Review and evaluate any unresolved or open issues identified in the SER, or issues raised at ACRS meetings and in hearings. Participate in meetings, as necessary, with the applicant and the NRC staff to resolve any outstanding issues. Prepare inputs to SER supplements to complete the resolution of all outstanding issues.

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## Specific Work Requirements

### Task 6: Watts Bar

The contractor shall review the design adequacy of all NSSS and/or A/E supplied safety related mechanical and electrical equipment and their supports to ensure functional capability, operability and structural integrity under the loading associated with the dynamic effects of earthquake, and hydrodynamic loads. The review shall include an evaluation of related information contained in Sections 3.9.2, 3.9.3 and 3.10 of the Final Safety Analysis Report (FSAR) and related reports submitted to the Nuclear Regulatory Commission (NRC) for obtaining an Operating License (OL) of the subject plant. Plant site inspection of equipment shall be conducted and the combined effects of seismic and other concurrently occurring vibratory loads to the equipment shall be evaluated. The review should be conducted in accordance with sections 3.9.2, 3.9.3 and 3.10 of Standard Review Plans (SRP) and Regulatory Guide 1.100.

<u>Subtasks</u>	<u>Estimated Completion Date</u>
1. Review and evaluate the subject information contained in the above FSAR sections and the reports referenced in the FSAR against the acceptance criteria outlined in the same sections of the SRP. Prepare for use in subtask 2 a listing of plant equipment items and areas of inquiry with respect to methods and procedures used for test and analysis.	4-80
2. Participate in meetings with the applicant and the NRC staff to resolve the issues identified in subtask 1. It is estimated that two engineers will be required to make two trips to the plant site, with each trip of one week duration. During these trips the contractor will inspect equipment and review the test and analysis methods and calculations in sufficient depth to conclude whether the criteria is satisfactorily implemented.  In addition one engineer will be required to make one or two trips of two days duration to either the NSSS, A/E or plant site for follow-up discussions.	8-80
3. Prepare a final SER. This SER may contain open issues or describe areas in which the contractor and staff continue to differ with an applicant.	10-80

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Subtasks

Estimated Completion Date

4. Participate at ACRS meetings, prepare testimony for and appear at Licensing Board Hearings as necessary for verifying technical accuracy and adequacy of the contracted review.
5. Review and evaluate any unresolved or open issues identified in the SER, or issues raised at ACRS meetings and in hearings. Participate in meetings, as necessary, with the applicant and the NRC staff to resolve any outstanding issues. Prepare inputs to SER supplements to complete the resolution of all outstanding issues.

To be scheduled

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## Specific Work Requirements

### Task 7: Midland

The contractor shall review the design adequacy of all NSSS and/or A/E supplied safety related mechanical and electrical equipment and their supports to ensure functional capability, operability and structural integrity under the loading associated with the dynamic effects of earthquake, and hydrodynamic loads. The review shall include an evaluation of related information contained in Sections 3.9.2, 3.9.3 and 3.10 of the Final Safety Analysis Report (FSAR) and related reports submitted to the Nuclear Regulatory Commission (NRC) for obtaining an Operating License (OL) of the subject plant. Plant site inspection of equipment shall be conducted and the combined effects of seismic and other concurrently occurring vibratory loads to the equipment shall be evaluated. The review should be conducted in accordance with sections 3.9.2, 3.9.3 and 3.10 of Standard Review Plans (SRP) and Regulatory Guide 1.100.

#### Subtasks

#### Estimated Completion Date

1. Review and evaluate the subject information contained in the above FSAR sections and the reports referenced in the FSAR against the acceptance criteria outlined in the same sections of the SRP. Prepare for use in subtask 2 a listing of plant equipment items and areas of inquiry with respect to methods and procedures used for test and analysis.

5-80

2. Participate in meetings with the applicant and the NRC staff to resolve the issues identified in subtask 1. It is estimated that two engineers will be required to make two trips to the plant site, with each trip of one week duration. During these trips the contractor will inspect equipment and review the test and analysis methods and calculations in sufficient depth to conclude whether the criteria is satisfactorily implemented.

8-80

In addition one engineer will be required to make one or two trips of two days duration to either the NSSS, A/E or plant site for follow-up discussions.

3. Prepare a final SER. This SER may contain open issues or describe areas in which the contractor and staff continue to differ with an applicant.

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<u>Subtasks</u>	<u>Estimated Completion Date</u>
4. Participate at ACRS meetings, prepare testimony for and appear at Licensing Board Hearings as necessary for verifying technical accuracy and adequacy of the contracted review.	To be scheduled
5. Review and evaluate any unresolved or open issues identified in the SER, or issues raised at ACRS meetings and in hearings. Participate in meetings, as necessary, with the applicant and the NRC staff to resolve any outstanding issues. Prepare inputs to SER supplements to complete the resolution of all outstanding issues.	3-81

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## Specific Work Requirements

### Task 8: Susquehanna

The contractor shall review the design adequacy of all NSSS and/or A/E supplied safety related mechanical and electrical equipment and their supports to ensure functional capability, operability and structural integrity under the loading associated with the dynamic effects of earthquake, and hydrodynamic loads. The review shall include an evaluation of related information contained in Sections 3.9.2, 3.9.3 and 3.10 of the Final Safety Analysis Report (FSAR) and related reports submitted to the Nuclear Regulatory Commission (NRC) for obtaining an Operating License (O.L.) of the subject plant. Plant site inspection of equipment shall be conducted and the combined effects of seismic and other concurrently occurring vibratory loads to the equipment shall be evaluated. The review should be conducted in accordance with sections 3.9.2, 3.9.3 and 3.10 of Standard Review Plans (SRP) and Regulatory Guide 1.100.

#### Subtasks

#### Estimated Completion Date

1. Review and evaluate the subject information contained in the above FSAR sections and the reports referenced in the FSAR against the acceptance criteria outlined in the same sections of the SRP. Prepare for use in subtask 2 a listing of plant equipment items and areas of inquiry with respect to methods and procedures used for test and analysis.

6-80

2. Participate in meetings with the applicant and the NRC staff to resolve the issues identified in subtask 1. It is estimated that two engineers will be required to make two trips to the plant site, with each trip of one week duration. During these trips the contractor will inspect equipment and review the test and analysis methods and calculations in sufficient depth to conclude whether the criteria is satisfactorily implemented.

9-80

In addition one engineer will be required to make one or two trips of two days duration to either the NSSS, A/E or plant site for follow-up discussions.

3. Prepare a final SER. This SER may contain open issues or describe areas in which the contractor and staff continue to differ with an applicant.

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Estimated Completion Date

To be scheduled

4. Participate at ACRS meetings, prepare testimony for and appear at Licensing Board Hearings as necessary for verifying technical accuracy and adequacy of the contracted review.

5. Review and evaluate any unresolved or open issues identified in the SER, or issues raised at ACRS meetings and in hearings. Participate in meetings, as necessary, with the applicant and the NRC staff to resolve any outstanding issues. Prepare inputs to SER supplements to complete the resolution of all outstanding issues.

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## Specific Work Requirements

### Task 9: WNP-2

The contractor shall review the design adequacy of all NSSS and/or A/E supplied safety related mechanical and electrical equipment and their supports to ensure functional capability, operability and structural integrity under the loading associated with the dynamic effects of earthquake, and hydrodynamic loads. The review shall include an evaluation of related information contained in Sections 3.9.2, 3.9.3 and 3.10 of the Final Safety Analysis Report (FSAR) and related reports submitted to the Nuclear Regulatory Commission (NRC) for obtaining an Operating License (OL) of the subject plant. Plant site inspection of equipment shall be conducted and the combined effects of seismic and other concurrently occurring vibratory loads to the equipment shall be evaluated. The review should be conducted in accordance with sections 3.9.2, 3.9.3 and 3.10 of Standard Review Plans (SRP) and Regulatory Guide 1.100.

#### Subtasks

#### Estimated Completion Date

1. Review and evaluate the subject information contained in the above FSAR sections and the reports referenced in the FSAR against the acceptance criteria outlined in the same sections of the SRP. Prepare for use in subtask 2 a listing of plant equipment items and areas of inquiry with respect to methods and procedures used for test and analysis.

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2. Participate in meetings with the applicant and the NRC staff to resolve the issues identified in subtask 1. It is estimated that two engineers will be required to make two trips to the plant site, with each trip of one week duration. During these trips the contractor will inspect equipment and review the test and analysis methods and calculations in sufficient depth to conclude whether the criteria is satisfactorily implemented.

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In addition one engineer will be required to make one or two trips of two days duration to either the NSSS, A/E or plant site for follow-up discussions.

3. Prepare a final SER. This SER may contain open issues or describe areas in which the contractor and staff continue to differ with an applicant.

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Subtasks

Estimated Completion Date

4. Participate at ACRS meetings, prepare testimony for and appear at Licensing Board Hearings as necessary for verifying technical accuracy and adequacy of the contracted review.
5. Review and evaluate any unresolved or open issues identified in the SER, or issues raised at ACRS meetings and in hearings. Participate in meetings, as necessary, with the applicant and the NRC staff to resolve any outstanding issues. Prepare inputs to SER supplements to complete the resolution of all outstanding issues.

To be scheduled

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## Specific Work Requirements

### Task 10: Fermi 2

The contractor shall review the design adequacy of all NSSS and/or A/E supplied safety related mechanical and electrical equipment and their supports to ensure functional capability, operability and structural integrity under the loading associated with the dynamic effects of earthquake, and hydrodynamic loads. The review shall include an evaluation of related information contained in Sections 3.9.2, 3.9.3 and 3.10 of the Final Safety Analysis Report (FSAR) and related reports submitted to the Nuclear Regulatory Commission (NRC) for obtaining an Operating License (OL) of the subject plant. Plant site inspection of equipment shall be conducted and the combined effects of seismic and other concurrently occurring vibratory loads to the equipment shall be evaluated. The review should be conducted in accordance with sections 3.9.2, 3.9.3 and 3.10 of Standard Review Plans (SRP) and Regulatory Guide 1.100.

<u>Subtasks</u>	<u>Estimated Completion Date</u>
1. Review and evaluate the subject information contained in the above FSAR sections and the reports referenced in the FSAR against the acceptance criteria outlined in the same sections of the SRP. Prepare for use in subtask 2 a listing of plant equipment items and areas of inquiry with respect to methods and procedures used for test and analysis.	8-80
2. Participate in meetings with the applicant and the NRC staff to resolve the issues identified in subtask 1. It is estimated that two engineers will be required to make two trips to the plant site, with each trip of one week duration. During these trips the contractor will inspect equipment and review the test and analysis methods and calculations in sufficient depth to conclude whether the criteria is satisfactorily implemented.  In addition one engineer will be required to make one or two trips of two days duration to either the NSSS, A/E or plant site for follow-up discussions.	12-80
3. Prepare a final SER. This SER may contain open issues or describe areas in which the contractor and staff continue to differ with an applicant.	2-81

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Subtasks

Estimated Completion Date

4. Participate at ACRS meetings, prepare testimony for and appear at Licensing Board Hearings as necessary for verifying technical accuracy and adequacy of the contracted review.
5. Review and evaluate any unresolved or open issues identified in the SER, or issues raised at ACRS meetings and in hearings. Participate in meetings, as necessary, with the applicant and the NRC staff to resolve any outstanding issues. Prepare inputs to SER supplements to complete the resolution of all outstanding issues.

To be scheduled

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## Specific Work Requirements

### Task 11: Waterford

The contractor shall review the design adequacy of all NSSS and/or A/E supplied safety related mechanical and electrical equipment and their supports to ensure functional capability, operability and structural integrity under the loading associated with the dynamic effects of earthquake, and hydrodynamic loads. The review shall include an evaluation of related information contained in Sections 3.9.2, 3.9.3 and 3.10 of the Final Safety Analysis Report (FSAR) and related reports submitted to the Nuclear Regulatory Commission (NRC) for obtaining an Operating License (OL) of the subject plant. Plant site inspection of equipment shall be conducted and the combined effects of seismic and other concurrently occurring vibratory loads to the equipment shall be evaluated. The review should be conducted in accordance with sections 3.9.2, 3.9.3 and 3.10 of Standard Review Plans (SRP) and Regulatory Guide 1.100.

<u>Subtasks</u>	<u>Estimated Completion Date</u>
1. Review and evaluate the subject information contained in the above FSAR sections and the reports referenced in the FSAR against the acceptance criteria outlined in the same sections of the SRP. Prepare for use in subtask 2 a listing of plant equipment items and areas of inquiry with respect to methods and procedures used for test and analysis.	11-80
2. Participate in meetings with the applicant and the NRC staff to resolve the issues identified in subtask 1. It is estimated that two engineers will be required to make two trips to the plant site, with each trip of one week duration. During these trips the contractor will inspect equipment and review the test and analysis methods and calculations in sufficient depth to conclude whether the criteria is satisfactorily implemented.  In addition one engineer will be required to make one or two trips of two days duration to either the NSSS, A/E or plant site for follow-up discussions.	1-81
3. Prepare a final SER. This SER may contain open issues or describe areas in which the contractor and staff continue to differ with an applicant.	3-81

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Subtasks

Estimated Completion Date

4. Participate at ACRS meetings, prepare testimony for and appear at Licensing Board Hearings as necessary for verifying technical accuracy and adequacy of the contracted review.

To be scheduled

5. Review and evaluate any unresolved or open issues identified in the SER, or issues raised at ACRS meetings and in hearings. Participate in meetings, as necessary, with the applicant and the NRC staff to resolve any outstanding issues. Prepare inputs to SER supplements to complete the resolution of all outstanding issues.

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## Specific Work Requirements

### Task 12: Farley-2

The contractor shall review the design adequacy of all NSSS and/or A/E supplied safety related mechanical and electrical equipment and their supports to ensure functional capability, operability and structural integrity under the loading associated with the dynamic effects of earthquake, and hydrodynamic loads. The review shall include an evaluation of related information contained in Sections 3.9.2, 3.9.3 and 3.10 of the Final Safety Analysis Report (FSAR) and related reports submitted to the Nuclear Regulatory Commission (NRC) for obtaining an Operating License (OL) of the subject plant. Plant site inspection of equipment shall be conducted and the combined effects of seismic and other concurrently occurring vibratory loads to the equipment shall be evaluated. The review should be conducted in accordance with sections 3.9.2, 3.9.3 and 3.10 of Standard Review Plans (SRP) and Regulatory Guide 1.100.

<u>Subtasks</u>	<u>Estimated Completion Date</u>
1. Review and evaluate the subject information contained in the above FSAR sections and the reports referenced in the FSAR against the acceptance criteria outlined in the same sections of the SRP. Prepare for use in subtask 2 a listing of plant equipment items and areas of inquiry with respect to methods and procedures used for test and analysis.	4-80
2. Participate in meetings with the applicant and the NRC staff to resolve the issues identified in subtask 1. It is estimated that two engineers will be required to make two trips to the plant site, with each trip of one week duration. During these trips the contractor will inspect equipment and review the test and analysis methods and calculations in sufficient depth to conclude whether the criteria is satisfactorily implemented.  In addition one engineer will be required to make one or two trips of two days duration to either the NSSS, A/E or plant site for follow-up discussions.	7-80
3. Prepare a final SER. This SER may contain open issues or describe areas in which the contractor and staff continue to differ with an applicant.	9-80

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<u>Subtasks</u>	<u>Estimated Completion Date</u>
4. Participate at ACRS meetings, prepare testimony for and appear at Licensing Board Hearings as necessary for verifying technical accuracy and adequacy of the contracted review.	To be scheduled
5. Review and evaluate any unresolved or open issues identified in the SER, or issues raised at ACRS meetings and in hearings. Participate in meetings, as necessary, with the applicant and the NRC staff to resolve any outstanding issues. Prepare inputs to SER supplements to complete the resolution of all outstanding issues.	, 2-81

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## Specific Work Requirements

### Task 13: Comanche Peak

The contractor shall review the design adequacy of all NSSS and/or A/E supplied safety related mechanical and electrical equipment and their supports to ensure functional capability, operability and structural integrity under the loading associated with the dynamic effects of earthquake, and hydrodynamic loads. The review shall include an evaluation of related information contained in Sections 3.9.2, 3.9.3 and 3.10 of the Final Safety Analysis Report (FSAR) and related reports submitted to the Nuclear Regulatory Commission (NRC) for obtaining an Operating License (OL) of the subject plant. Plant site inspection of equipment shall be conducted and the combined effects of seismic and other concurrently occurring vibratory loads to the equipment shall be evaluated. The review should be conducted in accordance with sections 3.9.2, 3.9.3 and 3.10 of Standard Review Plans (SRP) and Regulatory Guide 1.100.

#### Subtasks

#### Estimated Completion Date

1. Review and evaluate the subject information contained in the above FSAR sections and the reports referenced in the FSAR against the acceptance criteria outlined in the same sections of the SRP. Prepare for use in subtask 2 a listing of plant equipment items and areas of inquiry with respect to methods and procedures used for test and analysis.

12-80

2. Participate in meetings with the applicant and the NRC staff to resolve the issues identified in subtask 1. It is estimated that two engineers will be required to make two trips to the plant site, with each trip of one week duration. During these trips the contractor will inspect equipment and review the test and analysis methods and calculations in sufficient detail to conclude whether the criteria is satisfactorily implemented.

2-81

In addition one engineer will be required to make one or two trips of two days duration to either the NSSS, A/E or plant site for follow-up discussions.

3. Prepare a final SER. This SER may contain open issues or describe areas in which the contractor and staff continue to differ with an applicant.

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Estimated Completion Date

Subtasks

To be scheduled

4. Participate at ACRS meetings, prepare testimony for and appear at Licensing Board Hearings as necessary for verifying technical accuracy and adequacy of the contracted review.
5. Review and evaluate any unresolved or open issues identified in the SER, or issues raised at ACRS meetings and in hearings. Participate in meetings, as necessary, with the applicant and the NRC staff to resolve any outstanding issues. Prepare inputs to SER supplements to complete the resolution of all outstanding issues.

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