ORDER FOR SUPPLIES OR SERVICES

IMPORTANT: Mark all packages and papers with contract and/or order numbers. BPA NO.

1. DATE OF ORDER: DEC 31 2007

2. CONTRACT NO. (If any): NRC-42-07-481

3. ORDER NO.: 0002 MODIFICATION NO.:

4. REQUISITION/REFERENCE NO.: NRC-42-07-481(02) FFS: NRO-08-018

5. ISSUING OFFICE (Address correspondence to)
U.S. Nuclear Regulatory Commission
Div. of Contracts
Attn:Kala Shankar, 301-415-6310
Mail Stop T-7-I-2
Washington, DC 20555

6. SHIP TO:
a. NAME OF CONSIGNEE: U.S. Nuclear Regulatory Commission
b. STREET ADDRESS: Attn: Elinor Cunningham, 301-415-6580
Mail Stop: T6-F29
c. CITY: Washington
d. STATE: DC
e. ZIP CODE: 20555
f. SHIP VIA

7. TO:
a. NAME OF CONTRACTOR
N J NUMARK ASSOCIATES INC
NUMARK ASSOCIATES
b. COMPANY NAME
c. STREET ADDRESS: 1220 19TH ST NW STE 500
d. CITY: WASHINGTON
e. STATE: DC
f. ZIP CODE: 200362444

8. TYPE OF ORDER
[ ] a. PURCHASE
REFERENCE YOUR _____
Please furnish the following on the terms and conditions specified on both sides of this order and on the attached sheet, if any, including delivery as indicated.
[X] b. DELIVERY
Except for billing instructions on the reverse, this delivery order is subject to instructions contained on this side only of this form and is issued subject to the terms and conditions of the above-numbered contract.

9. ACCOUNTING AND APPROPRIATION DATA
~~825-15-171-111~~; JC:Q-4159; BOC: 252A; 31X0200
Obligate: $100,000
Contractor DUNS: 788247377 BAR: 825-15-171-103

10. REQUISITIONING OFFICE: NRO

11. BUSINESS CLASSIFICATION (Check appropriate box(es))
[X] a. SMALL
[ ] b. OTHER THAN SMALL
[ ] c. DISADVANTAGED
[ ] g. SERVICE-DISABLED VETERAN-OWNED
[ ] d. WOMEN-OWNED
[ ] e. HUBZone
[ ] f. EMERGING SMALL BUSINESS

12. F.O.B. POINT: Destination

13. PLACE OF
a. INSPECTION
b. ACCEPTANCE

14. GOVERNMENT B/L NO.

15. DELIVER TO F.O.B. POINT ON OR BEFORE (Date)

16. DISCOUNT TERMS

17. SCHEDULE (See reverse for Rejections)

ITEM NO. (a)	SUPPLIES OR SERVICES (b)	QUANTITY ORDERED (c)	UNIT (d)	UNIT PRICE (e)	AMOUNT (f)	QUANTITY ACCEPTED (g)
	Issuance of Task Order No. 2 under Contract No. NRC-42-07-481 Title: "Review of Containment and Ventilation (SPCV) Systems (CIA) for EPR DCD Application." Period of Performance: 01/02/2008-07/01/2010 Estimated Reimbursable Cost: $309,330 Fixed Fee: $15,040 Total Cost Plus Fixed Fee: $324,370 Funding in the amount of $100,000 is being provided. See attached pages for a description of Task Order No. 02 and the Statement of Work.					

SEE BILLING INSTRUCTIONS ON REVERSE

18. SHIPPING POINT
19. GROSS SHIPPING WEIGHT
20. INVOICE NO.

21. MAIL INVOICE TO:
a. NAME: U.S. Nuclear Regulatory Commission
See Attachment 7 of Contract Award Document for Billing Instructions
b. STREET ADDRESS (or P.O. Box): Attn: (NRC-42-07-481-TO02)
c. CITY: Washington
d. STATE: DC
e. ZIP CODE: 20555

17(h) TOTAL (Cont. pages)

17(i). GRAND TOTAL: 324,370

22. UNITED STATES OF AMERICA
BY (Signature): Kala Shankar 12/31/07

23. NAME (Typed)
Kala Shankar
Contracting Officer
TITLE: CONTRACTING/ORDERING OFFICER

AUTHORIZED FOR LOCAL REPRODUCTION
PREVIOUS EDITION NOT USABLE

TEMPLATE ADM001

SUNSI REVIEW COMPLETE

JAN 11 2008

OPTIONAL FORM 347 (REV. 4/2006)
PRESCRIBED BY GSA/FAR (48 CFR 53.213(f))

ADM002

In accordance with Section G.4, Task Order Procedures, of Contract No. NRC-42-07-481, this definitizes Task Order No. 02. The effort shall be performed in accordance with the attached Statement of Work.

Task Order No. 02 shall be in effect from 01/02/2008 through 07/01/2010, with a cost ceiling of $324,370. The amount of $309,330 represents the estimated reimbursable costs, and the amount of $15,040 represents the fixed fee.

The amount obligated by the Government with respect to this task order is $100,000, of which $95,694 represents the estimated reimbursable costs, and the amount of $4,306 represents the fixed fee.

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

Your contacts during the course of this task order are:

Technical Matter:	Elinor Cunningham Project Officer 301-415-6580
Contractual Matters:	Kala Shankar Contract Specialist 301-415-6310

Acceptance of Task Order No. 02 should be made by having an official, authorized to bind your organization, execute three copies of this document in the space provided and return two copies to the Contract Specialist at the address identified in Block No. 5 of the OF 347. You should retain the third copy for your records.

ACCEPTANCE:

NAME

President

TITLE

Jan. 8, 2008

DATE

TASK ORDER STATEMENT OF WORK

JCN/Contract No.	Contractor	Task Order No.
Q- 4159	Numark	2
Applicant	Design/Site	Docket No.
AREVA	EPR	Project No. 733
Title/Description		
Review of Containment and Ventilation (SPCV) Systems (CIA) for EPR DCD Application		
TAC No.	B&R Number	SRP Section(s)
(If fee recoverable)		Containment and Ventilation Sections (see Section 2)
NRC Technical Assistance Project Manager (TAPM)		
Elinor Cunningham	(301) 415-6580	EMC3@nrc.gov
NRC Technical Monitor (TM)		
Anne-Marie Grady, DSRA/SPCV	(301) 415-7645	AXG5@nrc.gov

REQUEST FOR PROPOSAL

A proposal is requested to perform the work described in this Statement of Work. The due date for your proposal is 2 p.m. Washington, DC local time, December 21, 2007, and shall consist of two parts: a technical approach and a cost estimate.

As a minimum, the technical approach shall substantiate your understanding of the requirements of the work, note any anticipated problem areas or deviations from the Statement of Work, identify key personnel who will perform the work, include resumes of those personnel not already in the contract, and address any potential conflict of interest issues. The following certification must also be submitted with your proposal: "I represent to the best of my knowledge and belief that the award to _____, Incorporated of Task Order No. __2__ to Contract No. NRC-42-07-481 does / / or does not / / involve situations or relationships of the type set forth in NRCAR 2009.570-3.

The contractor shall provide a staffing plan that specifically reflects services to be provided. Examples of the staffing plan are provided in Section J, Attachment 2 of the basic contract award document.

You are also required to identify any current/former NRC employees who have or will be involved, directly or indirectly, in developing the proposal, or in negotiating on behalf of your firm or in managing, administering or performing any purchase orders, contracts, consultant agreement or subcontract resulting from this proposal (list name, title and date individual left NRC and provide brief description of individual's role under this proposal.) If there are no current/former NRC employees involved, a negative statement is required.

The second part of your proposal shall be your cost estimate. Submit your cost estimate in accordance with the Federal Acquisition Regulation (FAR). Your proposal format along with supporting information in your own format (information such as proposed labor hours and labor rates, cost of equipment and materials, etc.) which supports your estimated costs must be submitted.

CAUTION - It should be noted that this request for proposal does not commit the Government to

pay any costs incurred in the submission of proposals or make necessary studies or designs for the preparation thereof, nor to procure or contract for the services in the enclosed Statement of Work. It is also brought to your attention that the Contracting Officer is the only individual who can legally commit the Government to the expenditure of public funds in connection with this proposed task order.

Your response to the subject RFP should be sent electronically to KXS4@nrc.gov with a copy to EMC3@nrc.gov, RXF@nrc.gov, and AXG5@nrc.gov.

The proposal shall be signed by an official authorized to bind the company, and it shall contain a statement indicating a proposal acceptance period of not less than 30 days.

1.0 BACKGROUND

Combined Operating License (COL) Applications are submitted pursuant to Section 52 of Title 10 of the *Code of Federal Regulations* (10 CFR 52), "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants." The U.S. Nuclear Regulatory Commission (NRC) reviews COL Applications based on information furnished by electric utility companies pursuant to 10 CFR 52.79, "Contents of Applications Technical Information."

Standard Design Certification (DCD) Applications are submitted pursuant to Section 52 of Title 10 of the *Code of Federal Regulations* (10 CFR 52), "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants." The U.S. Nuclear Regulatory Commission (NRC) reviews DCD Applications based on information furnished by applicants pursuant to 10 CFR 52.47, "Contents of Applications, Technical Information."

In particular, the application shall include: a final safety analysis report (FSAR) describing the facility; compliance with the principal design criteria for the facility, as described in 10 CFR 50, Appendix A, general design criteria (GDC); and an evaluation of the standard plant design against the Standard Review Plan (SRP).

A Standard Review Plan (NUREG-0800) is prepared for the guidance of staff reviewers in the Office of New Reactors in performing safety reviews of applications to construct or operate nuclear power plants and the review of applications to approve standard designs and sites for nuclear power plants. The principal purpose of the SRP is to assure the quality and uniformity of staff safety reviews.

An Environmental Safety Review Plan (NUREG-1555) is prepared for the guidance of staff reviewers in performing environmental reviews of applications related to nuclear power plants. The ESRPs are companions to regulatory guides that address siting and environmental issues. As with NUREG-0800 the purpose of the ESRP is to assure the quality and uniformity of environmental reviews.

The staff publishes the results of these reviews in a Safety Evaluation Report (SER).

Design Certification Process

The NRC may approve and certify a standard nuclear plant design through a rulemaking, independent of a specific site. An application for a standard design certification must contain proposed inspections, tests, analyses, and acceptance criteria (ITAAC) for the standard design. Additionally, the application must demonstrate how the applicant complies with the Commission's relevant regulations.

An application must contain a level of design information sufficient to enable the Commission to reach a final conclusion on all safety questions associated with the design. In general terms, a design certification application should provide an essentially complete nuclear plant design, with the exception of site-specific design features such as intake structures and the ultimate heat sink.

The application presents the design basis, the limits on operation, and a safety analysis of structures, systems, and components of the facility as a whole. The scope and contents of the application are equivalent to the level of detail found in a Final Safety Analysis Report for a currently operating plant. The NRC staff prepares a Safety Evaluation Report that describes its review of the plant design and how the design meets applicable regulations.

The ACRS reviews each application for a standard design certification, together with the NRC staff's safety evaluation report, in a public meeting. Upon determining that the application meets the relevant standards and requirements of the Atomic Energy Act and the Commission's regulations, the Commission drafts a rule to issue the standard design certification as an appendix to the 10 CFR Part 52 regulations.

An application for a combined license under 10 CFR Part 52 can incorporate by reference a design certification and/or an early site permit. The advantage of this approach is that the issues resolved during the design certification rulemaking and the early site permit hearing processes are precluded from reconsideration later at the combined license stage.

2.0 OBJECTIVE

The objective of this task order is to obtain technical expertise from the contractor to assist the staff in determining the adequacy of the DCD application relating to the EPR design.

If directed by the NRC, the initial task will be to perform an Acceptance Review of the Standard Design Application (DCD) to determine the completeness and technical sufficiency of the application. This includes identifying major deficiencies in the application that might impact the review process or affect the planned resources and schedule. This review will be conducted in accordance with Office Instruction NRO-REG-100, "Acceptance Review Process for Design Certification and Combined License Applications", [ML071980027], sections 3.2.1, 3.2.3, and Attachment C. This acceptance review will be documented in the table, columns 1-6, 10 and 11, provided in attachment 2 to this Task Order Statement of Work (SOW).

The primary deliverable, or output, of this regulatory review shall be the Technical Evaluation Report (TER). The TER will serve as input to the NRC staff's SER which will document the NRC's technical, safety, and legal basis for approving the EPR DCD application. The TER must provide sufficient information to adequately explain the NRC staff's rationale for why there is *reasonable assurance* that public health and safety is protected. The TER, and ultimately the SER, should be written in a manner whereby a person with a technical (non-nuclear) background and unfamiliar with the applicant's request could understand the basis for the staff's conclusions. The TER shall be prepared using the NRC provided SER Template. A sample of the TER format is provided in Attachment 1 to this SOW.

The contractor will review the EPR DCD application for the Containment and Ventilation Branch 1 (SPCV) under its purview. The contractor has primary review responsibilities for the following SRP sections:

6.2.4 Containment Isolation System

6.2.5 Combustible Gas Control in Containment
6.2.6 Containment Leakage Testing
14.3.11 Containment Systems and Severe Accidents – Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)

In addition, the contractor will review applicable Containment and Ventilation Branch generic issues including NRC Bulletins and Generic Letters, TMI action Items, Task Action Plan, and New Generic Issues. For passive plants, the contractor will review the applicable Containment and Ventilation Branch Regulatory Treatment of Non-Safety systems (RTNSS).

3.0 WORK REQUIREMENTS, SCHEDULE AND DELIVERABLES

Tasks/Standards	Scheduled Completion	Deliverables
1. REQUIREMENT: Become familiar with SRP Sections 6.2.4, 6.2.5, 6.2.6, and 14.3.11. STANDARD: Written confirmation that familiarization is complete. The level of effort for Task 1 is based on the volume of materials to be reviewed; this task is for familiarity and not for evaluation.	* 10 days after authorization of work	Documentation that assigned personnel have reviewed references.
2. REQUIREMENT: Participate in an orientation/kick-off meeting with the NRC staff to discuss the scope of the work, expectations and task order management. STANDARD: Attendance by individuals designated by NRC.	* 10 days after authorization of work	N/A
3. REQUIREMENT: Acceptance review. Support staff's acceptance review to determine the completeness and technical sufficiency of a combined license application. This includes identifying major deficiencies in the application that might impact the review process or affect the planned resources and schedule. STANDARD: Written documentation that review is complete.	* 15 days after receipt of application	Acceptance review results documented in Attachment 2

Tasks/Standards	Scheduled Completion	Deliverables
4. REQUIREMENT: Review the DCD application Sections 6.2.4, 6.2.5, 6.2.6, and 14.3.11 to determine the adequacy of the containment design described in those sections. Determine if the methods and approach proposed by the applicant meet the appropriate review guidance. Identify issues and those aspects of the application that need additional or clarifying information, RAIs. Prepare a Technical Evaluation Report (TER). STANDARD: Completed TER that follows the NRC provided template without deviation. No deviation from the guidance defined in Section III, RAI Guidance of Attachment 1 to the basic contract SOW. One round of comment incorporation acceptable.	* 90 days after receipt of application	TER, and RAIs if applicable
5. REQUIREMENT: Review responses to the RAI questions to determine if they adequately resolve the outstanding issues. Identify any other open items. Prepare a TER providing the input to the SER with open items (SER/OI). STANDARD: Complete TER with open items	* 30 days after receipt of the responses.	Revised TER with open items
6. REQUIREMENT: Review the applicant's response to the open items identified in the SER/OI. Identify any unresolved issues. Prepare a TER providing the input to the final SER describing the resolution to the open items. STANDARD: Complete TER that follows the NRC provided template without deviation.	*45 days after receipt of responses to OIs	SER input with open items resolved
7. REQUIREMENT: Prepare final supplement with no open items. STANDARD: Supplement reviewed and approved by NRC staff.	10 days following ACRS review of supplement	Final supplement.

Tasks/Standards	Scheduled Completion	Deliverables
8a. REQUIREMENT: *(If applicable)* Prepare for and travel to the applicant's office and participate in an NRC review team to: a) Audit the __TBD__ as described in the DCD for the EPR standard design b) Evaluate and discuss the applicant's responses to the unresolved issues identified in Task 4 to determine if the outstanding issues are adequately resolved. c) Prepare a trip report (as an input to NRC Audit Report) to summarize the information reviewed, results of the audit, and meeting discussions. STANDARD: Complete evaluation as defined in Task. Submit Trip Report within 2 weeks of site review.	*2 weeks after the trip	Trip Report
8b. REQUIREMENT: As needed and requested by the staff, provide technical support to the staff during related ACRS meetings and hearing proceedings. STANDARD: Ensure presentation materials are reviewed and approved by NRC staff.	TBD	Prepare presentation materials. Attend meetings, if requested.

* These Work Schedules are subject to change by the NRC Contracting Officer (CO) and Project Manager (NRC PM) to support the needs of the NRC Licensing Program Plan.

4.0 TECHNICAL AND OTHER SPECIAL QUALIFICATIONS REQUIRED

As specified in the basic task ordering agreement, the contractor shall provide individuals who have the required educational background and work experience to meet the objectives of the work specified in this task order. Specific qualifications for this effort include:

- Mechanical engineers or fluid systems engineer(s) or analysts with extensive experience in reviewing containment isolation design, combustible gas control design and containment leakage testing programs.

The contractor shall provide a project manager (PM) to oversee the effort and ensure the timely submittal of quality deliverables so that all information is accurate and complete as defined in the base contract.

The NRC will rely on representations made by the contractor concerning the qualifications of the personnel assigned to this task order, including assurance that all information contained in the technical and cost proposals, including resumes, is accurate and truthful. The resume for each professional proposed to work under this task order (principal investigators, technical staff,

employees, consultants, specialists or subcontractors) shall describe the individual's experience in applying his or her area of engineering specialization to work in the proposed area. The use of particular personnel on this task order is subject to the NRC technical monitor's (TM's) approval and the resume for each shall be provided. This includes any proposed changes to key personnel during the life of the task order.

5.0 REPORTING REQUIREMENTS

Task Order Progress Report

The contractor shall provide a bi-weekly progress report summarizing accomplishments, expenditures, contractor staff hours expended, percent completed for each task under this task order, and any problems encountered by the contractor. The report shall be sent via e-mail to the NRC TM, TAPM and CO.

Please refer to Section F of the basic contract award document for contract reporting requirements.

Technical reporting requirements

Unless otherwise specified above, the contractor shall provide all deliverables as draft products. The NRC TM will review all draft deliverables (and coordinate any internal NRC staff review, if needed) and provide comments back to the contractor. The contractor shall revise the draft deliverable based on the comments provided by the TM, and then deliver the final version of the deliverable. When mutually agreed upon between the contractor and the TM, the contractor may submit preliminary or partial drafts to help gauge the contractor's understanding of the particular work requirement.

The contractor shall provide the following deliverables in hard copy and electronic formats. The electronic format shall be provided in MS Word or other word processing software approved by the TM. For each deliverable, the contractor shall provide one hard copy and electronic copy to both the TAPM and the TM. The schedule for deliverables shall be contained in the approved project plan for the task order effort.

In all correspondence, include identifying information: JCN No.: Q-_4159; Task Order No._2_; the applicant, AREVA for the EPR design.

A. At the completion of Task 4, submit a TER that contains, for each Sub-section of the SER (see Attachment 1 for the outline, format and content of the report): a description of the information proposed by the applicant including the assumptions for the analysis, design, and references to consensus standards: review findings (including the basis for the findings), as a result of comparison with the review guidelines: and a list of "Requests for Additional Information (RAIs). See Attachment 1 in the base contract SOW for the guidelines for developing RAIs.

B. At the completion of Task 5, submit a TER (see Attachment 1) that contains a summary of the review results and the updated report completed under Task 4 incorporating the findings from the resolution of the RAIs. Include a separate list of the remaining open items and the basis for such determination.

C. At the completion of Task 8a, submit a trip report, as an input to NRC audit report, that contains a summary of documents audited, the audit results of the design reports and

design calculations, a summary of meeting discussions conducted with, the applicant list of outstanding issues, significance of these issues, and the basis for the conclusion. Incorporate the findings in the report developed under Task 4.

D. At the completion of Task 6, submit a TER (see Attachment 1) that contains a safety evaluation report with open items resolved and update of the TER developed under Task 5.

6.0 MEETINGS AND TRAVEL

The following travel assumptions should be considered in planning the work effort. It is likely that a smaller group than the entire review team will be necessary to accomplish some activities; the actual travel contingent will be determined by the NRC TM after discussion with the contractor PM. Travel in excess of the total number of person-trips must be approved by the NRC TAPM; travel within the work scope limits will be approved by the NRC TM.

- One, 3-person, 2-day working meeting to kickoff project and contractor orientation (Task 2)
- *(If required)* one, 2-person, 3-day trip to the applicant's facility (Task 8a)
- One, 2-person, 2-day working meeting at NRC headquarters to review deliverables (task 8b)
- Two, 2-person, 2-day meetings, if needed, for hearing or ACRS meeting. (Task 8b)

At the discretion of the NRC TM, quarterly progress meetings may be conducted at the contractor's office or via telephone or video conference.

7.0 NRC FURNISHED MATERIAL

The following NRC furnished materials will be provided to the contractor together with SOW:

a) CD-ROM containing the Design Certification Document (DCD) Application

b) CD-ROM containing Technical Reports supporting the DCD.

8.0 LEVEL OF EFFORT

The estimated level of effort in professional staff hours apportioned among the subtasks and by labor category for the DCD review is as follows:

Task(s)	Labor Category	Level of Effort FY 2008 (hrs)	Level of Effort FY 2009 (hrs)	Level of Effort FY 2010 (hrs)
1	Fluid systems engineers / analysts	[redacted]	0	0
2	Fluid systems engineers / analysts	[redacted]	0	0
3	Fluid systems engineers / analysts	[redacted]	0	0
4	Fluid systems engineers / analysts	[redacted]	0	0
5	Fluid systems engineers / analysts	[redacted]	0	0
6	Fluid systems engineers / analysts	0	[redacted]	0
7	Fluid systems engineers / analysts	0	0	[redacted]
8	Fluid systems engineers / analysts	[redacted]	[redacted]	[redacted]
9	Project Manager	[redacted]	[redacted]	[redacted]
Total	DCD[redacted]	[redacted]	[redacted]	[redacted]

9.0 PERIOD OF PERFORMANCE

The projected period of performance is 30 months from authorization of work.

10.0 OTHER APPLICABLE INFORMATION

License Fee Recovery

- All work under this task order is fee-recoverable under 10 CFR Part 170 and shall be charged to the appropriate TAC number(s).

Assumptions and Understandings:

- The level of effort for Task 1 is based on the volume of materials to be reviewed; this task is for familiarity and not for evaluation.

- The level of effort for Tasks 3 and 4 is based on the assumption that the contractor is familiar with the review procedures of the SRP Sections.

- The level of effort for Task 5 is based on the assumption that there will be 50 RAIs and it will take, on the average, 2.5 hours to review and address each response.

- The level of effort for Task 6 is based on the need to resolve 20 open items and it will take, on the average, 4 hours to review and resolve each open item, and prepare an SER.

- The level of effort for the visit to the applicant's site, if necessary, is based on one, two-person, three-day trip (including travel time) plus four days to prepare for the trip and to write the trip reports.

- The level of effort in Task 8b is based on requiring three, two-day trips to NRC headquarters.

- It is assumed that the contractor has access to the NRC furnished material available on the Internet.

- It is understood that the scope of the review consists of conference calls with the NRC staff, and with the NRC staff and the applicant, to discuss open items in an attempt to obtain additional information or reach resolution.

- During the course of the review, the TM, and possibly other NRC personnel, may travel to the contractor site to discuss the status of the review and participate in the resolution of open items. It is assumed that the level of effort covers such a meeting.\

- The technical reviewer(s) for both the DCD application and the COLA will be the same for the respective sections.

Attachments:

1. Outline, format, and sample content for the TER (draft SER) Input. Sample Generic Safety Evaluation Report for ABWR COL, chapter 6

2: Acceptance Criteria Checklist. From NRO Office Instruction, NRO-REG-100, "Acceptance Review Process for Design Certification and Combined License Applications", [ML071980027], Attachment C, Table 1

GENERIC SAFETY EVALUATION REPORT
CHAPTER 6

ENGINEERED SAFETY FEATURES

This chapter of the application discusses the design and functional requirements of engineered safety features (ESF) of the plant that are features provided to mitigate the consequences of serious accidents. The features can be divided into three general groups: (1) containment systems (2) emergency core cooling systems (ECCSs) and (3) control room habitability systems. The containment systems include the primary containment, heat removal and isolation systems, combustible gas control, secondary containment, and standby gas treatment system (SGTS). The emergency core cooling systems include high pressure core flooder (HPCF), automatic depressurization system (ADS), low pressure flooder (LPFL) mode of the residual heat removal (RHR) system, and reactor core isolation cooling (RCIC) system. The habitability systems include missile protection, radiation shielding, radiation monitoring, air filtration and ventilation systems, lighting, personnel and administrative support, and fire protection.

Engineered safety features materials

6.1.1 Metallic Materials (RELATED TO RG 1.206 SECTION 6.1.1, "METALLIC MATERIALS")

6.1.1.1 Introduction/Overview/General

Section 6.1.1, "Metallic Materials" of the FSAR, addresses the materials used in ESF components as well as compatibility of materials and fluids for ESF systems. The fluids used in ESF systems, when interacting with the reactor coolant pressure boundary (RCPB) components, should have a low probability of causing abnormal leakage, of rapidly propagating failure, and of gross rupture. In addition, the application may also address the compatibility of fluids and materials for the auxiliary systems such as station service water and ESF ventilation that directly support the ESF systems.

6.1.1.2 Summary of Application

The applicant incorporated by reference Section 6.1.1, "Metallic Materials," of the certified ABWR DCD and the FSER referenced in Appendix A to 10 CFR Part 52, Appendix A. The review Criteria can be found in SRP section 6.1.1, "Engineered Safety Features Materials". No departures from the certified design were identified. The COL applicant has referenced a certified design and does not need to include additional information.

6.1.1.3 Regulatory Basis

N/A

6.1.1.4 Technical Evaluation

As documented in NUREG-1503, "Final Safety Evaluation Report Related to the Certification of the Advanced Boiling Water Reactor," the NRC staff reviewed and approved Section 6.1.1 of the generic DCD for the ABWR design. The applicant took no exceptions to Section 6.1.1 of the generic DCD for the ABWR design and there is no outstanding information item related to this section.

6.1.1.5 Post Combined License Activities

TBD – NRC staff to provide further guidance

6.1.1.6 Conclusion

The staff finds that this area is addressed within the generic DCD and the related NRC FSER provided in NUREG-1503. The applicant has provided sufficient information to support issuance of a license.

6.1.2 Organic Materials (RELATED TO RG 1.206 SECTION 6.1.2, "ORGANIC MATERIALS")

6.1.2.1 Introduction/Overview/General

Section 6.1.2, "Organic Materials" of the FSAR, addresses the protective coating systems and organic materials used inside the containment. Evaluations are performed to ensure that the protective coatings will not fail under design-basis-accident (DBA) conditions and the materials will not generate significant amount of solid debris that would impair the performance of the ESF systems. Performance of the protective coatings and organic materials should be examined in consideration of radiation and chemical effects in the containment.

6.1.2.2 Summary of Application

The applicant incorporated by reference Section 6.1.2 of the certified ABWR DCD referenced in 10 CFR Part 52, Appendix A. No departures from the certified design were identified. The applicant provided information to address COL information items 6.1 from the generic DCD.

- COL information item 6.1 addresses the protection coatings and organic materials.

6.1.2.3 Regulatory Basis

The acceptance criteria from NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," Section 6.1.2, "Protective Coating Systems (Paints) - Organic Materials," are incorporated by reference to the generic DCD for the ABWR design and NUREG-1503. COL information items 6.1 is satisfied based on meeting the requirements of Appendix B to 10 CFR Part 50 and guidelines of regulatory guide (RG) 1.54, "Service Level I, II, and III Protective Coatings Applied to Nuclear Power Plants," and the requirements of ANSI N101.2.

6.1.2.4 Technical Evaluation

As documented in NUREG-1503, the NRC staff reviewed and approved Section 6.1.2 of the generic DCD for the ABWR design. The applicant took no exceptions to Section 6.1.2 of the generic DCD for the ABWR. The NRC staff's review of this application is limited to the COL information item 6.1. Specific information that shall be provided by the applicant to address COL information item 6.1 includes

(1) Indicating the total amount of protective coatings and organic materials used inside the containment that do not meet the requirements of ANSI N101.2 and RG 1.54,

(2) Evaluating the generation rate as a function of time of combustible gases that can be formed from organic materials under DBA conditions, and

(3) Providing the technical basis and assumptions used for this evaluation described in DCD Subsection 6.1.2.1 and 6.1.2.2.

The NRC staff reviewed the applicant's proposal using the review procedures described in Section 6.1.2 of NUREG-0800, ...

6.1.2.5 Post Combined License Activities

TBD – NRC staff to provide further guidance

6.1.2.6 Conclusion

The staff finds that this area is addressed within the generic DCD and the related NRC FSER provided in NUREG-1503. The staff has compared the application to the relevant NRC regulations, acceptance criteria defined in NUREG-0800, Section 6.1.2, and other NRC regulatory guides and concludes that the applicant is in compliance with the NRC regulations. COL information item 6.1 is adequately addressed by the applicant and can be considered closed. The applicant has provided sufficient information to support issuance of a license.

Containment systems

6.2.1 Containment functional design (RELATED TO RG 1.206 SECTION 6.2.1, "CONTAINMENT FUNCTIONAL DESIGN")

6.2.1.1 Introduction/Overview/General

Section 6.2.1, "Containment Functional Design" of the FSAR, addresses the functional capability of the ABWR containment. The containment encloses the reactor system and is the final barrier against the release of significant amounts of radioactive fission products in the event of an accident. The containment structure must be capable of withstanding, without loss of function, the pressure and temperature conditions resulting from postulated steam line, feedwater line break, or loss-of-coolant accident (LOCA). The containment structure must also maintain functional integrity in the long term following a postulated accident. The containment design basis includes the effects of stored energy in the reactor coolant system, decay energy, and energy from other sources such as the secondary system, and metal-water reactions including the recombination of hydrogen and oxygen. The evaluation of a containment functional design includes calculation of the various effects associated with the postulated rupture in the primary or secondary coolant system piping.

The review under this section is coordinated closely with the review described in SRP Section 6.2.2. Containment design features as related to debris formation have an important relationship to the ECCS's ability to provide containment cooling. A primary source of debris in containment is the thermal insulation, which if is dislodged and enters the wetwell, it can cause plugging of the ECCS suction strainers, which can impede ECCS performance and containment cooling.

6.2.1.2 Summary of Application

The applicant incorporated by reference Section 6.2.1 of the certified ABWR DCD referenced in 10 CFR Part 52, Appendix A. Two departures from the certified design were identified (from Departure Status Report – 8/2/07).

- STD DEP 6.2-2, "Containment Analysis"
- STD DEP 6C-1, "Containment Debris Protection for ECCS Strainers"

The applicant provided information to address COL information items 6.4 and 6.5 from the generic DCD.

- COL information item 6.4 addresses methods to maintain suppression pool cleanliness, and
- COL information item 6.5 addresses the structural shielding regarding wetwell-to-drywell vacuum breaker protection.

6.2.1.3 Regulatory Basis

The acceptance criteria from NUREG-0800, Section 6.2.1 are incorporated by reference to the generic DCD for the ABWR design and NUREG-1503. COL information items 6.4 is satisfied based on following the guidance of RG 1.82, Rev. 3, "Water Sources for Long Term Recirculation Cooling Following a Loss of Coolant Accident," and NRC Bulletin No. 93-02, "Debris Plugging of Emergency Core Cooling Suction Strainers." COL information item 6.5 is satisfied based on meeting the requirements of _____.

6.2.1.4 Technical Evaluation

As documented in NUREG-1503, the NRC staff reviewed and approved Section 6.2.1 of the generic DCD for the ABWR design. The applicant took no exceptions to Section 6.2.1 of the generic DCD for the ABWR. The NRC staff's review of this application is limited to the COL information items 6.4 and 6.5. Specific information that shall be provided by the applicant to address COL information item 6.4 includes acceptable methods to maintain suppression pool cleanliness in support of preventing ECCS suction strainer plugging in accordance with DCD Subsection 6.2.1.7 and Appendix 6C, "Containment debris protection for ECCS strainers." Specific information that shall be provided by the applicant to address COL information item 6.5 includes appropriate design features providing complete structural shielding of vacuum breaker valves from pool swell loads. The structural shielding features will be designed for pool swell loads determined based on the methodology approved for Mark II/III designs. For the design of structural shielding features, pool swell loads to the maximum practical extent will be defined.

The NRC staff reviewed the applicant's proposal using the review procedures described in Section 6.2.1 and 6.2.2 of NUREG-0800, ...

Departures

The following departures were identified by the applicant and addressed in the application.

- STD DEP 6.2-2, "Containment Analysis"
- STD DEP 6C-1, "Containment Debris Protection for ECCS Strainers"

The NRC staff reviewed the applicant's departures from the certified ABWR design using the review procedures described in Section 6.2.1 of NUREG-0800 ...

6.2.1.5 Post Combined License Activities

TBD – NRC staff to provide further guidance

6.2.1.6 Conclusion

The staff finds that this area is addressed within the generic DCD and the related NRC FSER provided in NUREG-1503. The staff has compared the application to the relevant NRC regulations, acceptance criteria defined in NUREG-0800, Section 6.2.1, and other NRC regulatory guides and concludes that the applicant is in compliance with the NRC regulations. COL information item 6.4 and 6.5 are adequately addressed by the applicant and can be considered closed. The identified departures are adequately addressed by the applicant and can be considered closed. The applicant has provided sufficient information to support issuance of a license.

6.2.2 Containment Heat removal system (RELATED TO RG 1.206 SECTION 6.2.2, "CONTAINMENT HEAT REMOVAL SYSTEMS")

6.2.2.1 Introduction/Overview/General

Section 6.2.2, "Containment Heat Removal System (CHRS)" of the FSAR, addresses the types of systems provided to remove heat from the containment. The CHRS is an integral part of the RHR System and is designed to prevent excessive containment temperatures and pressures, thus maintaining containment integrity following a LOCA. The operating modes of CHRS include low-pressure flooder (LPFL) mode, suppression pool cooling mode, and the wetwell and drywell spray cooling mode. To minimize the potential for single failure, redundant CHRS loops and associated equipment are located in separate protected areas of the reactor building.

6.2.2.2 Summary of Application

The applicant incorporated by reference Section 6.2.2, "Containment Heat Removal System," of the certified ABWR DCD and the FSER referenced in 10 CFR Part 52, Appendix A. The review criteria may be found in SRP section 6.2.2. No departures from the certified design were identified. The COL applicant has referenced a certified design and does not need to include additional information.

6.2.2.3 Regulatory Basis

N/A

6.2.2.4 Technical Evaluation

As documented in NUREG-1503, the NRC staff reviewed and approved Section 6.2.2 of the generic DCD for the ABWR design. The applicant took no exceptions to Section