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May 12, 2009

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Attention: Mr. Jeffrey A. Ciocco

Docket No. 52-021
MHI Ref: UAP-HF-09235

Subject: MHI's Responses to US-APWR DCD RAI No. 286-2145 Revision 1

Reference: [1] "Request for Additional Information No. 286-2145 Revision 1, SRP Section: 09.02.05 – Ultimate Heat Sink- Design Certification and New License Applicants, Application Section: 9.2.5," dated March 25, 2009.

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Response to Request for Additional Information No. 286-2145 Revision 1".

Enclosure 1 is the responses to 9 questions that are contained within Reference [1].

Please contact Dr. C. Keith Paulson, Senior Technical Manager, Mitsubishi Nuclear Energy Systems, Inc. if the NRC has questions concerning any aspect of the submittals. His contact information is below.

Sincerely,

Y. Ogata

Yoshiki Ogata,
General Manager- APWR Promoting Department
Mitsubishi Heavy Industries, LTD.

Enclosures:

1. Responses to Request for Additional Information No. 286-2145 Revision 1

CC: J. A. Ciocco
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Enclosure 1

UAP-HF-09235
Docket No. 52-021

Responses to Request for Additional Information
No. 286-2145 Revision 1

May 2009

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/12/2009

US-APWR Design Certification

Mitsubishi Heavy Industries, Ltd.

Docket No. 52-021

RAI NO.:	**NO. 286-2145 REVISION 1**
SRP SECTION:	**9.2.5 – Ultimate Heat Sink**
APPLICATION SECTION:	**9.2.5**
DATE OF RAI ISSUE:	**3/25/2009**

QUESTION NO.: 09.02.05-1

Based on a review of the information provided in Tier 2 of the Design Control Document (DCD), Section 9.2.5, "Ultimate Heat Sink," the staff found that the description of the ultimate heat sink (UHS) is incomplete as it does not adequately explain how the applicable regulatory requirements are satisfied by the proposed design, what limiting assumptions apply, how much excess margin is available, what operating experience insights are relevant and how they were addressed. Consequently, Tier 1 and Tier 2 of the DCD needs to be revised to include information that is sufficient to demonstrate that the UHS is capable of performing its design-bases functions, that applicable regulatory requirements are satisfied by the proposed design, and that reasonable assurance exists that the availability and design-bases capability will be maintained over the life of the plant. In addition, the DCD needs to be revised to include a conceptual design for the UHS in accordance with 10 CFR 52.47(a)(24). The conceptual design should be described in sufficient detail to establish interface requirements that must be satisfied by combined license (COL) applicants.

Inspection, test, analysis and acceptance criteria (ITAAC) for the UHS have not been provided in the DCD Tier 1. DCD Tier 1, section 3.2 provides only a temperature requirement for the UHS. 10 CFR 52.47(b) requires the DCD to contain ITAAC that are necessary and sufficient to provide reasonable assurance that the plant will be built and will operate according to the DCD. The DCD should provide ITAAC for the UHS design. Technical specifications (TS) have not been identified for the UHS in Chapter 16 (TS 3.7.9). 10 CFR 52.47(a) requires the DCD to contain technical specifications. Regulatory Guide 1.206, "Combined License Applications (COL) for Nuclear Power Plants (LWR Edition)," provides guidance on the specific information that should be included in the application for evaluation by the staff.

Specifically, the applicant is requested to demonstrate in the DCD how the UHS design complies with the following General Design Criteria (GDC) or Regulatory Guide (RG). In addition, existing COL information items in the DCD related to the UHS should be evaluated once the conceptual design for the UHS has been provided.

- GDC 2, "Design Bases for Protection Against Natural Phenomena" and RG 1.27, "Ultimate Heat Sink."

- GDC 44, "Cooling Water," and RG 1.72, "Spray Pond Piping Made from Fiberglass."
- GDC 44, "Cooling Water," and RG 1.27, "Ultimate Heat Sink."
- GDC 44, "Cooling Water," and single failure evaluation.
- GDC 44, "Cooling Water," and essential service water system (ESWS) pump net positive suction head (NPSH).
- GDC 44, "Cooling Water," and instrumentation and controls and electrical features.
- TS Section 3.7.9 and its bases.
- Preoperational testing for the UHS.
- Tier 1, DCD and ITAAC for the UHS.

ANSWER:

The applicants can select from various ultimate heat sink (UHS) systems (, such as a cooling tower and a pond) that met a site-specific requirement. The description of the UHS in the DCD is changed by UHS system that is selected to the applicant. Thus, the UHS design is outside the scope of the DCD and be duly provided by the COL applicant. The significant site specific interfaces with the DCD are shown in Tier 2 DCD Subsection 1.8.

The following responses are given on the basis that the requirements in 10 CFR 52.47(a)(24) are aimed to aid the completion of the FSAR (DCD + COL applications) review:

The UHS described in Tier 2 DCD Section 9.2.5 is based on the premise that a large portion of the design elements are site-specific and therefore the design details, including process and instrument diagrams (P&IDs), type of equipment and their arrangement, instrumentation, valve positions, process flowrates, etc., will be appropriately provided by the COL applicant. The Tier 2 DCD Subsection 9.2.5.2 also clearly states that, "based on the specific site conditions and meteorological data" the type of UHS, including the necessary equipment and component layout will be identified in the COLA referencing the DCD. It follows that the conceptual design required in 10 CFR 52.47(a)(24) is outside the scope of the DCD and can only be duly provided by the COL applicant.

The description in the Tier 1 DCD Subsection 3.2 regarding the maximum cooling water supply of 95° F from the UHS to the essential service water system (ESWS) is the only nonsite-specific parameter in the UHS as it relates to the design cooling capacities of the ESWS components necessary to maintain overall plant integrity. The Tier 2 DCD Subsection 14.3.6, "Combined License Information" states in COL 14.3(1) that, "*The COL applicant provides the ITAAC for the site specific portion of the plant systems specified in Subsection 14.3.5, Interface Requirements [14.3.4.7].*" The ITAAC for the UHS, therefore, is appropriately addressed such that reiterating it in the Tier 2 DCD Subsection 9.2.5 is unnecessary. It follows that identifying the UHS in the Technical Specifications Subsection 16.3.7.9 is beyond the scope of the DCD.

The design bases for the UHS are adequately provided in Tier 2 DCD Subsection 9.2.5 except for RG 1.72 which is a site-specific requirement. Preoperational testing for the UHS is also a site-specific requirement to be addressed by the COL applicant in its ITAAC program.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

This completes the responses to NRC's questions.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/12/2009

US-APWR Design Certification

Mitsubishi Heavy Industries, Ltd.

Docket No. 52-021

RAI NO.:	**NO. 286-2145 REVISION 1**
SRP SECTION:	**9.2.5 – Ultimate Heat Sink**
APPLICATION SECTION:	**9.2.5**
DATE OF RAI ISSUE:	**3/25/2009**

QUESTION NO.: 09.02.05-2

The Design Control Document (DCD), needs to be revised to include a conceptual design for the ultimate heat sink in accordance with 10 CFR 52.47(a)(24). The conceptual design should be described in sufficient detail to establish interface requirements that must be satisfied by combined license (COL) applicants.

Based on a review of the information provided in Tier 2 of the DCD, Section 9.2.5, "Ultimate Heat Sink," and Table 3.2-2, "Classification of Mechanical and Fluid Systems, Components, and Equipment," the staff found that the description of the ultimate heat sink as it relates to equipment classification incomplete. Specifically, the applicant is requested to add equipment classification to Table 3.2-2 for the UHS.

ANSWER:

The response concerning the UHS conceptual design mentioned in the first paragraph of the question has already been addressed in the responses to question number 09.02.05-1.

The Tier 2 DCD Subsection 3.2.3 on COL information 3.2(5) states that, "*The COL Applicant is to identify the equipment class and seismic category of the site-specific, safety-related and nonsafety-related fluid systems, components (including pressure retaining), and equipment as well as the applicable industry codes and standard*," hence, the identification of the UHS equipment classification in Table 3.2-2 is outside the scope of the DCD.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

This completes the responses to NRC's questions.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/12/2009

US-APWR Design Certification

Mitsubishi Heavy Industries, Ltd.

Docket No. 52-021

RAI NO.:	**NO. 286-2145 REVISION 1**
SRP SECTION:	**9.2.5 – Ultimate Heat Sink**
APPLICATION SECTION:	**9.2.5**
DATE OF RAI ISSUE:	**3/25/2009**

QUESTION NO.: 09.02.05-3

The Design Control Document (DCD), needs to be revised to include a conceptual design for the ultimate heat sink in accordance with 10 CFR 52.47(a)(24). The conceptual design should be described in sufficient detail to establish interface requirements that must be satisfied by combined license (COL) applicants.

Standard Review Plan (SRP) 9.2.5 Section III, paragraph 1 instructs the reviewer to confirm the overall arrangement of the ultimate heat sink (UHS). The description and piping and instrumentation diagram (P&IDs) or flow diagrams are incomplete or inaccurate and the DCD needs to be revised to address the following considerations:

- P&ID, flow diagrams, or drawings were not provided for the conceptual design of the UHS. The DCD should explain the criteria that were used in establishing the appropriate pipe sizes (such as limiting flow velocities).
- The UHS system description does not provide design details such as system operating temperatures, pressures, fan speeds (if used), and flow rates for all operating modes and alignments.
- The UHS flow diagram/drawings should show where indications are displayed (e.g., local, remote panel, control room), and what instruments provide input to a process computer and/or have alarm and automatic actuation functions.
- The UHS flow diagram/drawings should show what the normal valve positions are, what valves are locked in position, and what valves have automatic functions; and these design features are not described.
- The UHS flow diagram/drawings should show any UHS bypass flow rates for low load/low ambient temperature conditions to maintain ESW cold water temperature within established limits.
- If using a UHS with mechanical fans, the UHS fan alarms discussions should be included in the DCD.
- If using a cooling tower, the UHS flow diagram should show the cooling tower basin instruments (level and temperature).

ANSWER:

All of the above requirements in this RAI question are site-specific information and are already addressed in the responses to question number 09.02.05-1.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

This completes the responses to NRC's questions.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/12/2009

US-APWR Design Certification

Mitsubishi Heavy Industries, Ltd.

Docket No. 52-021

RAI NO.:	**NO. 286-2145 REVISION 1**
SRP SECTION:	**9.2.5 – Ultimate Heat Sink**
APPLICATION SECTION:	**9.2.5**
DATE OF RAI ISSUE:	**3/25/2009**

QUESTION NO.: 09.02.05-4

The Design Control Document (DCD), needs to be revised to include a conceptual design for the ultimate heat sink in accordance with 10 CFR 52.47(a)(24). The conceptual design should be described in sufficient detail to establish interface requirements that must be satisfied by combined license (COL) applicants.

Tier 2, DCD Section 9.2.5.1 states that the ultimate heat sink along with ESWS is designed to remove the peak heat loads rejected from the ESWS under all conditions in order to mitigate the consequences of a design basis event and for a safe shutdown with or without offsite power. The staff has determined that insufficient information is provided to confirm this capability. Standard Review Plan (SRP) 9.2.5 Section III, paragraph 2.B of "Evaluation Procedures" instructs the reviewer to verify whether "the UHS can dissipate the maximum possible total heat load including that of a loss of coolant accident (LOCA) under the worst combination of adverse environmental conditions." Provide key assumptions and inputs for the design calculations that demonstrate sufficient capability and margin. Additional information that is needed in the DCD includes (for example):

1. Key assumptions and inputs (including justification) for calculations that demonstrate sufficient heat rejection capability to meet maximum predicted heat loads and define the available margin with limited system temperatures and pressures. These assumptions should include sufficient margin to account for uncertainties in the analysis, anticipated degradation in performance over time, and fluctuations in the frequency of electric current. These calculations should be made available for staff audit.
2. For cooling tower performance (if used), explanation of how the wet bulb correction was determined to be sufficient for potential tower interferences.
3. For cooling tower performance or other heat sink designs such as cooling ponds, curves that show the minimum required tower heat rejection capability verses time (including spent fuel pool cooling) for post LOCA cooldown, and cooldown to cold shutdown conditions following a reactor trip with and without offsite power available.
4. Explanation of how UHS heat rejection capability will be monitored to ensure adequate performance over time.

ANSWER:

The response concerning the UHS conceptual design mentioned in the first paragraph of the question has already been addressed in the responses to question number 09.02.05-1.

With regard to the peak heat loads from the ESWS to the UHS, including during LOCA, appropriate analysis has been performed and the results are given in Tables 9.2.5-1 and 9.2.5-2, however details of the UHS capability and safety evaluation will be provided by the COL applicant as cited in the Tier 2 DCD Subsection 9.2.5.3. The tables show that the UHS will be capable of supplying cooling water to the ESWS up to 36 days without makeup based on the worst climatic and meteorological conditions, i.e. from the maximum historical conditions of dry and wet bulb temperatures, of the site in conformance to the guidelines in Regulatory Guide 1.27.

Transient analyses concerning LOCA are described in detail in Tier 2 DCD Chapter 15.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

This completes the responses to NRC's questions.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/12/2009

US-APWR Design Certification

Mitsubishi Heavy Industries, Ltd.

Docket No. 52-021

RAI NO.:	**NO. 286-2145 REVISION 1**
SRP SECTION:	**9.2.5 – Ultimate Heat Sink**
APPLICATION SECTION:	**9.2.5**
DATE OF RAI ISSUE:	**3/25/2009**

QUESTION NO.: 09.02.05-5

General Design Criteria (GDC) 44 requires that "A system to transfer heat from structures, systems, and components important to safety, to an ultimate heat sink shall be provided." The staff noted the protection of the essential service water system (ESWS) pump suction supports compliance with GDC 44 since these components are essential for the overall system function. Describe in the Design Control Document (DCD) how the ESWS pump suction is protected from potential debris intrusion (e.g. tower fill degradation, etc.). The staff noted that some plants have found this type of protection to be necessary (e.g. screens) due to damage to the fill from failed cooling tower spay nozzles. Also, provide in the DCD a description of the cooling tower (if used) spray and fill design arrangements related to failure modes.

ANSWER:

The nature and type of the UHS is not identified in the DCD as they are site-specific items, hence the type of protection for the ESWS will vary accordingly and will be addressed by the COL applicant. There will be four trains of UHS equipment, one for each ESWS, for redundancy and diversity to ensure overall plant integrity during accidents and equipment failures. If one ESWS pump fails due to the intrusion of potential debris, the availability of three ESW pumps will ensure normal plant operation. In addition, the failure modes and effects analysis (FMEA) of the ESWS requires that at least two operating trains shall be made available to maintain normal plant operation during concurrent single active component and power supply failures.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

This completes the responses to NRC's questions.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/12/2009

US-APWR Design Certification

Mitsubishi Heavy Industries, Ltd.

Docket No. 52-021

RAI NO.:	**NO. 286-2145 REVISION 1**
SRP SECTION:	**9.2.5 – Ultimate Heat Sink**
APPLICATION SECTION:	**9.2.5**
DATE OF RAI ISSUE:	**3/25/2009**

QUESTION NO.: 09.02.05-6

General Design Criteria (GDC) 45 requires the ultimate heat sink (UHS) to be designed so that periodic inspections of piping and components can be performed to assure that the integrity and capability of the system will be maintained over time. The staff finds the design to be acceptable if the Design Control Document (DCD) describes inspection program requirements that will be implemented and are considered to be adequate for this purpose. While Tier 2, DCD Section 9.2.5.4 indicates that the combined license (COL) applicant will provide test and inspection details based on the type of UHS to be provided, the staff cannot determine if the criteria of GDC 45 is met in the DCD. Consequently, additional information needs to be provided in the DCD to describe the extent and nature of inspections that will be performed and procedural controls that will be implemented commensurate with this requirement. For example, the accessibility and periodic inspection of safety related buried piping and the cooling tower spray header system, tower fill, cooling pond systems are of particular interest. The DCD needs to be revised to state that the requirements of GDC 45 have been met.

ANSWER:

Conformance to the requirements of General Design Criteria (GDC) 45 has been addressed in the Tier 2 DCD Subsection 9.2.5.2 on the UHS system description. Subsection 9.2.5.4, "Inspection and Testing Requirements," also states that the COL applicant will provide the periodic tests and inspections which vary according to the type of UHS. A similar statement is being reiterated in the COL information Subsection 9.2.10 where the COL applicant will be responsible in providing the UHS test and inspection requirements. Since the UHS design is site-specific, the rationale provided in the responses to question 09.02.05-1 applies.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

This completes the responses to NRC's questions.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/12/2009

US-APWR Design Certification

Mitsubishi Heavy Industries, Ltd.

Docket No. 52-021

RAI NO.:	**NO. 286-2145 REVISION 1**
SRP SECTION:	**9.2.5 – Ultimate Heat Sink**
APPLICATION SECTION:	**9.2.5**
DATE OF RAI ISSUE:	**3/25/2009**

QUESTION NO.: 09.02.05-7

General Design Criteria (GDC) 46 requires the ultimate heat sink (UHS) to be designed so that periodic pressure and functional testing of components can be performed to assure the structural and leak tight integrity of system components, the operability and performance of active components, and the operability of the system as a whole and performance of the full operational sequences that are necessary for accomplishing the UHS safety functions. The staff finds the design to be acceptable if the DCD describes pressure and functional test program requirements that will be implemented and are considered to be adequate for this purpose.

While Tier 2, DCD Section 9.2.5.4 indicates that the combined license (COL) applicant will provide test and inspection details based on the type of UHS to be provided, the staff cannot determine if the criteria of GDC 46 is met in the DCD. This should include the extent and nature of these tests and procedural controls that will be implemented to assure continued UHS structural and leak tight integrity and system operability over time were not described.

Consequently, additional information needs to be provided in the DCD to describe the extent and nature of testing that will be performed and procedural controls that will be implemented commensurate with this requirement. The DCD needs to be revised to state that the requirements of GDC 46 have been met.

ANSWER:

The UHS will be designed in conformance with General Design Criteria (GDC) 46 as stated in the Tier 2 DCD Subsection 9.2.5.2. As already mentioned in the preceding responses, the UHS design is entirely site-specific, hence details, extent, and nature of the periodic pressure and functional testing of components are outside the scope of the DCD and will vary according to the individual designs by the COL applicants referencing the DCD. Furthermore, Tier 2 DCD Subsection 3.9.9 on COL Information items 3.9.10, 3.9.11, and 3.9.12 state that for the site-specific components such as pumps and valves, the type and frequency of tests will be provided by the COL applicant. No changes to the DCD section will be made regarding this matter.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA

Impact on PRA

There is no impact on the PRA.

This completes the responses to NRC's questions.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/12/2009

US-APWR Design Certification

Mitsubishi Heavy Industries, Ltd.

Docket No. 52-021

RAI NO.:	**NO. 286-2145 REVISION 1**
SRP SECTION:	**9.2.5 – Ultimate Heat Sink**
APPLICATION SECTION:	**9.2.5**
DATE OF RAI ISSUE:	**3/25/2009**

QUESTION NO.: 09.02.05-8

The Design Control Document (DCD) needs to be revised to include a conceptual design for the ultimate heat sink (UHS) in accordance with 10 CFR 52.47(a)(24). The conceptual design should be described in sufficient detail to establish interface requirements that must be satisfied by COL applicants.

Means must be provided for monitoring effluent discharge paths and the plant environs for radioactivity that may be released in accordance with General Design Criteria (GDC) 64 requirements. Also, 10 CFR 52.79(a)(45) and 10 CFR 20.1406 require combined license (COL) applicants to describe how facility design and procedures for operation will minimize contamination of the facility and the environment. The staff's review criteria (Standard Review Plan (SRP) Section 9.2.1, Paragraph III.3.D) specify that provisions should be provided to detect and control leakage of radioactive contamination into and out of the essential service water system (ESWS) which is part of the UHS. The design is considered to be acceptable by the staff if the UHS/ ESWS flow diagrams, or piping and instrumentation diagrams (P&IDs), show that radiation monitors at components that are susceptible to leakage, and if the components that are susceptible to leakage can be isolated. However, the staff noted that Tier 2, DCD, Section 9.2.5 and the UHS/ESWS flow diagrams, or P&ID, do not include radiation monitors in the system design and the NRC regulations in this regard have not been addressed. Therefore, additional information needs to be included in Tier 2, DCD Section 9.2.5 to address the NRC requirements referred to above.

ANSWER:

The response concerning the UHS conceptual design mentioned in the first paragraph of the question has already been addressed in the responses to question number 09.02.05-1.

Regarding control of radioactive contamination, the ESWS essentially does not handle radioactive cooling water nor release radioactive materials into the environment. Radiation sensors are installed in the component cooling water (CCW) heat exchangers' ESW side outlets to monitor accidental CCW leaks, if any, into the ESW lines. The CCWS components and piping, which are the intermediate link to the reactor auxiliaries, however, are designed so that there would be no

potential leakage to the ESWS. This is discussed in the Tier 2 DCD Subsection 9.2.1.2.1 and illustrated in the ESWS Piping and Instrument Diagram in Figure 9.2.1-1. No changes to the DCD section will be made regarding this matter.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA

Impact on PRA

There is no impact on the PRA.

This completes the responses to NRC's questions.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

5/12/2009

US-APWR Design Certification

Mitsubishi Heavy Industries, Ltd.

Docket No. 52-021

RAI NO.:	**NO. 286-2145 REVISION 1**
SRP SECTION:	**9.2.5 – Ultimate Heat Sink**
APPLICATION SECTION:	**9.2.5**
DATE OF RAI ISSUE:	**3/25/2009**

QUESTION NO.: 09.02.05-9

10 CFR 52.47(a)(25) relates to requirements for site specific items to be identified by the design certification applicant that must be addressed by the combined license (COL) applicant.

1. As a result of this review the staff recommends the addition of a new item to address the final election of ultimate heat sink (UHS) system piping materials. The staff notes that for some site locations the selection of service water system materials in combination with chemical treatment and ongoing inspection programs have proven to be essential for continued assurance of system integrity. Accordingly, the staff recommends that a new COL information item be added to Design Control Document (DCD), Tier 2 Table 1.8-2, "Compilation of All Combined License Applicant Items for Chapters 1-19," that states a COL applicant that references the US-APWR will identify the site specific materials selected for UHS piping and components, including the bases for the selections.
2. The staff notes in Tier 2, DCD that COL 9.2 (21) address UHS makeup water blowdown, but did not specifically address chemical treatment for the control of biofouling. In accordance with 10 CFR 52.47(a)(24) a conceptual design of makeup water and blowdown is needed in order to aid the staff's review and to determine the adequacy of the interface requirements. In addition, due to the importance of the UHS makeup, the UHS makeup should be a separate DCD section and not addressed under Tier 2, DCD Section 9.2.5. RG 1.206 states Section 9 of the application should discuss each of the plant's water systems and because these auxiliary water systems vary in number, type, and nomenclature for various plant designs, the standard format does not assign specific subsection numbers to these system discussions. The applicant should provide separate subsections (numbered 9.2.1 through 9.2.x) for each of the systems. This separate section of the DCD would be consistent with other new plant applications (raw water system) including the AP1000 and Evolutionary Power Reactor (EPR).
3. The staff has identified that a specific COL information item did not specifically address the means for providing UHS makeup sufficient to meet the maximum evaporative and drift water loss after 72 hours through the remainder of the 30 day period consistent with RG 1.27. This item may need clarification due to Regulatory Guide 1.27, "Ultimate Heat Sink for Nuclear Power Plant", Rev 2, Jan 1976, Section C3, which states in part the UHS should consist of at least two highly reliable water sources. In general a specific COL information

item did not address all of the regulatory positions in RG 1.27 that have to be met for the specific site COL (reference Tier 2, DCD Table 1.9.1-1, "US-APWR Conformance with Division 1 Regulatory Guides").

ANSWER:

1. The type of material for the UHS piping will vary according to the COL applicant's design and is considered outside the scope of the DCD. Hence, no description will be added to the Tier 2 DCD Tier 2 Table 1.8-2.
2. Description of the appropriate monitoring and neutralizing chemistry of the ESW discharges to the environment is outside the scope of the DCD but will be addressed by the COL applicant as described in the Tier 2 DCD Subsection 9.2.5.2.

   There is also no requirement in Regulatory Guide 1.206 on separating the makeup water system for the UHS into an individual subsection, hence, no revision will be made to the DCD regarding this matter.
3. The 30-day makeup capacity of the UHS without external makeup provided ensures that adequate cooling water is being supplied to the ESWS during accident conditions coincident with LOOP. Since there is no external makeup water source necessary during this event, the Regulatory Guide 1.27 position regarding the need to have two separate water sources for the UHS does not apply.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

This completes the responses to NRC's questions.