ACRONYMS AND ABBREVIATIONS (CONTINUED)

EPS	emergency power source
EQ	environmental qualification
EQDP	equipment qualification data package
EQSDS	equipment qualification summary data sheet
ERAC	electrical rigid aluminum conduit
ERDA	Energy Research and Development Administration (now U.S. DOE)
ERDS	emergency response data system
ERSC	electrical rigid steel conduit
ESF	engineered safety features
ESFAS	engineered safety features actuation system
ESFVS	engineered safety features ventilation system
ESLS	electrical system logic system
ESQDSR	Equipment Qualification Data Summary Report
ESQR	Equipment Seismic Qualification Report
ESW	essential service water
ESWP	essential service water pump
ESWPC	essential service water pipe chase
ESWPT	essential service water pipe tunnel
ESWS	essential service water system
ESX	ex-vessel steam explosion
ET	event tree
ETSB	effluent treatment system branch
EV	elevartor
EZB	exclusion zone boundary
FA	function allocation
FAB	feed and bleed
FAC	flow-accelerated corrosion
FATT	fracture appearance transit temperature
FCC	Federal Communications Commission
FCV	feedwater control valve
FE	finite element
Fe	iron
FEM	finite element method
FHA	fire hazard analysis
FHS	fuel handling system
FIRS	foundation input response spectra
FLB	feedwater line break

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1.2.1.5.7 Main Control Room and Other Human-System Interface

The main control room (MCR) is designed to perform centralized monitoring and control of the instrumentation and control systems that are necessary for use during normal operation, abnormal transients, and accidents. Furthermore, the main control room boards are designed to reduce the potential for misoperation and misjudgment and to allow easy operation. The human-system interface (HSI) other than the MCR includes the remote shutdown console (RSC), local control stations such as the auxiliary equipment control console, the technical support center (TSC), and the emergency operations facility (EOF).

1.2.1.6 Site Characteristics

The US-APWR is a standard nuclear power plant designed to be constructed on a site, whose parameters are as described in DCD Chapter 2 (Site Characteristics), which are used as the basis for design certification. The allowable site interface parameters described in Chapter 2 are selected by MHI to bound most potential sites in the U.S.

The site-specific details of a US-APWR site plan is to be presented in the licensee's combined license application (COLA). A typical site plan has, however, been prepared by MHI and is shown in Figure 1.2-1.

The area within the perimeter fence of a US-APWR installation includes a site-specific portion of the facility. The control structure at the main gate controls site ingress and egress. As shown on the site plan, the main building structures are arranged with the R/B in the center and the other buildings clustered around the R/B to facilitate safe and efficient operation. The final configuration of the main cooling system is site-specific; however, the reference plant main cooling complex is of the [[cooling tower]] type. The unit's auxiliary transformers, reserve auxiliary transformer, and the main step-up transformers are located in the transformer area. The main switchyard area is site-specific.

1.2.1.7 Plant Arrangement

1.2.1.7.1 General Plant Arrangement

The main US-APWR power block is comprised of the following buildings and structures:

- The reactor building (R/B), including prestressed concrete containment vessel (PCCV), the containment internal structure (CIS) and the essential service water pipe chase (ESWPC) MIC-03-01-00015
- The power source buildings (PS/Bs), including the ESWPC
- The power source fuel storage vaults (PSFSV)
- The essential service water pipe tunnel (ESWPT)
- The auxiliary building (A/B)

- The access building (AC/B)
- The turbine building (T/B)

The R/B including the PCCV, the CIS and the ESWPC, the PS/Bs including the ESWPC, and the A/B are founded on the common reinforced concrete mat and compose a structurally integrated building, which is termed Reactor Building Complex (R/B Complex). The outline and the arrangement of those buildings and structures are shown in Figure 1.2-1. The equipment layout within the buildings provides for ease of plant operation and maintenance, and minimizes personnel radiation exposure. Provisions, including redundant train separation and segregation barriers, have been made to assure that the functions of the safety-related systems are maintained in the event of postulated incidents such as fires, floods, and high-energy pipe break events. Within the buildings, access control zonings are established to regulate access to radiation areas and to define the required radiation shielding and monitoring during operation, shutdown, and accident conditions. MIC-03-01-00015

The R/B, PS/B, PSFSV, and ESWPT are designed and constructed as safety-related structures, to the requirements of seismic Category I, as defined in RG 1.29. These safety-related structures are designed for the effects of all applicable loads and their combinations, including the postulated seismic response loads. These structures are designed to withstand the effects of natural phenomena such as hurricanes, floods, tornados, tsunamis, and earthquakes without loss of capability to perform their safety functions. They are also designed to withstand the effects of postulated internal events such as fires and flooding without loss of capability to perform their safety functions.

~~The remaining power block buildings are designed as non safety-related structures, and are free-standing on separate concrete base mats.~~ The A/B and T/B are designed to meet seismic Category II requirements as defined in RG 1.206 although A/B is founded on the common reinforced concrete mat shared with the R/B and the PS/Bs. Other structures are designed to American National Standard Institute (ANSI), ASCE and other applicable codes, and meet non-seismic Category requirements. MIC-03-01-00015

Radioactive equipment and piping in all buildings are arranged and shielded to minimize radiation exposure. Pathways through the plant are designed to accommodate equipment maintenance and equipment removal from within the plant. The size of the pathways is dictated by the largest piece of equipment that may have to be removed or installed after initial installation. Where required, laydown space is provided for disassembling large pieces of equipment to accommodate the removal or installation process. Adequate space is provided for equipment maintenance, laydown, removal, and inspection. Hatches, monorails, hoists, and removable shield walls are provided to facilitate maintenance.

The general arrangement drawings for the US-APWR are provided in Figures 1.2-2 through 1.2-51.

A refueling cavity with stainless steel liner is provided above the reactor vessel for refueling operations. Two containment racks are installed on the north and west walls of the refueling cavity. The fuel transfer tube connects this cavity to the fuel storage and handling area located outside the containment. The main steam and feedwater pipes that connect to the steam generators are routed within the containment with consideration of minimizing pipe run lengths, while providing sufficient flexibility to accommodate thermal expansion. DCD_12.03-12.04-40

Safety System Pumps and HX*s Area* - The safety system pumps (CS/RHR pumps and safety injection pumps), which require sufficient net positive suction head (NPSH) to draw water from the recirculation sumps inside the containment, are located at the lowest level of the R/B to secure the required NPSH. In addition, they are located adjacent to the containment to minimize pipe lengths. The safety system HXs (CS/RHR HXs) are located on the upper floor of the R/B.

Fuel Storage and Handling Area - The fuel storage and handling area is located in the R/B.

Fuel handling operations are performed on the top floor of the area at the same level as the C/V operating floor. The containment emergency airlock is located adjacent to the fuel handling area to facilitate easy access between the containment and fuel handling area when refueling procedures are in progress. The bridge crane is located to span the spent fuel pit, the transfer canal, and the cask loading pit. The spent fuel cask handling crane is capable of lifting the spent fuel cask from ground level to the operating floor.

Main Steam and Feed Water Piping Area - The main steam and feedwater piping room is located on the top floor of this area and contains the main steam and feedwater pipes, where they pass between the T/B and the containment.

Safety-related Electrical Area - The safety-related electrical area has two floors and is located in the R/B and under the main steam and feed water piping area. It is normally a nonradioactive zone and is completely separated from the radioactive zones of the R/B. This area houses the following safety-related facilities:

- MCR
- Safety metal clad switchgear and load center
- Safety I&C room

Separation of Redundant Systems - Four redundant safety systems containing radioactive material are located in each zone of the four quadrants surrounding the containment structure. Each of the quadrant areas is separated by a physical barrier to assure that the functions of the safety-related systems are maintained in the event of postulated incidents such as fires, floods, and high-energy pipe break events. Nonradioactive safety systems such as EFWS, CCWS, ESWS and electrical systems are located in the non-radioactive control area of R/B including the ESWPC which is located in the south of the R/B. This area is also separated into four divisions by physical barriers to assure that the functions of the safety-related systems are maintained in the event of postulated incidents such as fires, floods, and high-energy pipe break events. MIC-03-01-00015

1.2.1.7.2.2 Power Source Buildings (PS/B)

Two PS/Bs are arranged adjacent to the R/B. These buildings are ~~freestanding~~founded on the common reinforced concrete mats shared with the R/B and the A/B, and each building contains two identical emergency power sources, which are separated from each other by physical barriers. The safety-related HVAC chillers are also located in these buildings. The ESWPC which contains ESWS is located in the south of the PS/Bs. The electrical, I&C and HVAC equipment related to the EPSs are also contained in the PS/Bs. MIC-03-01-00015 MIC-03-01-00015

1.2.1.7.2.3 Power Source Fuel Storage Vault (PSFSV)

The PSFSVs are structures constructed with reinforced concrete, and classified as seismic Category I. The vaults contain the fuel oil tanks of safety-related gas-turbine generators.

1.2.1.7.2.4 Essential Service Water Pipe Tunnel (ESWPT)

The ESWPT is a structure constructed with reinforced concrete, and is classified as seismic Category I. ~~Terminating in part under the T/B, the structure is isolated from other structures to prevent any seismic interaction.~~The ESWPT is terminated at the south east and the south west corners of the R/B Complex, interfacing to the ESWPC in the R/B Complex. The other termination point is located at the Ultimate Heat Sink Related Structure (UHSRS) that connects to the Ultimate Heat Sink (UHS) water. MIC-03-01-00015

1.2.1.7.2.5 Auxiliary Building (A/B)

The A/B is located adjacent to the R/B. The A/B is founded on the common reinforced concrete mat shared with the R/B and the PS/Bs. The A/B contains the main components of the waste disposal systems and the non safety-related electrical area. The non safety-related electrical area is normally a non-radioactive zone and is completely separated from the radioactive zones of the A/B. MIC-03-01-00015

1.2.1.7.2.6 Access Building (AC/B)

The AC/B is located adjacent to the A/B. The AC/B houses the access control area, and the chemical sampling and laboratory area.

1.2.1.7.2.7 Turbine Building (T/B)

The T/B houses the non safety-related equipment of the T/G and its auxiliary systems, (main condenser, feedwater heaters, moisture separator reheaters, etc.). The T/B is steel structure, which is designed to withstand all loads including the load of the overhead traveling crane. The foundation of the building is made of concrete.

The building is designed based on the following:

- The T/B is oriented in such a way that any plane perpendicular to the turbine generator axis shall not intersect with the R/B. This arrangement minimizes the

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Figure 1.2-1 Typical US-APWR Site Arrangement Plan

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Figure 1.2-2 Power Block at Elevation -26'-4" - Plan View

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Figure 1.2-3 Power Block at Elevation -8'-7" - Plan View

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Figure 1.2-4 Power Block at Elevation 3'-7" - Plan View

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Figure 1.2-5 Power Block at Elevation 13'-6" - Plan View

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Figure 1.2-6 Power Block at Elevation 25'-3" - Plan View

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Figure 1.2-7 Power Block at Elevation 35'-2" - Plan View

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Figure 1.2-8 Power Block at Elevation 50’-2” - Plan View

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Figure 1.2-9 Power Block at Elevation 76'-5" - Plan View

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Figure 1.2-10 Power Block at Elevation 101'-0" - Plan View

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Figure 1.2-11 Power Block at Elevation 115’-6” - Plan View

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Figure 1.2-12 Power Block Sectional View A-A

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Figure 1.2-13 Power Block Sectional Views B-B and C-C

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Figure 1.2-14 Reactor Building at Elevation -26'-4" - Plan View

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Figure 1.2-15 Reactor Building at Elevation -8’-7” – Plan View

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Figure 1.2-16 Reactor Building at Elevation 3'-7" – Plan View

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Figure 1.2-17 Reactor Building at Elevation 13'-6" – Plan View

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Figure 1.2-18 Reactor Building at Elevation 25'-3" – Plan View

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Figure 1.2-19 Reactor Building at Elevation 35'-2" – Plan View

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Figure 1.2-20 Reactor Building at Elevation 50'-2" – Plan View

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Figure 1.2-21 Reactor Building at Elevation 76'-5" – Plan View

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Figure 1.2-22 Reactor Building at Elevation 101'-0" – Plan View

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Figure 1.2-23 Reactor Building at Elevation 115'-6" – Plan View

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Figure 1.2-24 Reactor Building Sectional View A-A

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Figure 1.2-25 Reactor Building Sectional View B-B

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Figure 1.2-26 Power Source Building at Elevations -26'-4" and -14'-2" - Plan Views

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Figure 1.2-27 Power Source Building at Elevations 3'-7", 24'-2" and 39'-6" – Plan Views

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Figure 1.2-28 Power Source Building Sectional View A-A

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Figure 1.2-29 Auxiliary Building at Elevation -26'-4" – Plan View

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Figure 1.2-30 Auxiliary Building at Elevation -8’-7” - Plan View

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Figure 1.2-31 Auxiliary Building at Elevation 3'-7" - Plan View

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Figure 1.2-32 Auxiliary Building at Elevation 13’-6” - Plan View

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Figure 1.2-33 Auxiliary Building at Elevation 25’-3” - Plan View

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Figure 1.2-34 Auxiliary Building at Elevation 35’-2” - Plan View

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Figure 1.2-35 Auxiliary Building at Elevation 50’-2” - Plan View

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Figure 1.2-36 Auxiliary Building at Elevation 76'-5" - Plan View

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Figure 1.2-37 Auxiliary Building at Elevation 89'-7" - Plan View

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Figure 1.2-38 Auxiliary Building Sectional View A-A

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Figure 1.2-39 Auxiliary Building Sectional View B-B

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Figure 1.2-40 Turbine Building at Elevation -18'-0" – Plan View

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Figure 1.2-41 Turbine Building at Elevation 3'-7" – Plan View

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MIC-03-01-0
0020

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Figure 1.2-42 Turbine Building at Elevation 34'-0" – Plan View

MIC-03-01-0 0017
MIC-03-01-0 0020

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Figure 1.2-43 Turbine Building at Elevation 61'-0" – Plan View

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Figure 1.2-44 Turbine Building at Elevation 88'-10" – Plan View

MIC-03-01-0 0017
MIC-03-01-0 0020

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Figure 1.2-45 Turbine Building at Elevations 108'-4" and 113'-6" – Plan Views

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MIC-03-01-0 0020

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Figure 1.2-46 Turbine Building at Elevation 169'-10"– Plan View

MIC-03-01-0 0017
MIC-03-01-0 0020

Security-Related Information – Withheld Under 10 CFR 2.390

Figure 1.2-47 Turbine Building Sectional View A-A

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MIC-03-01-0
0020

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Figure 1.2-48 Turbine Building Sectional View B-B

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0015

Security-Related Information – Withheld Under 10 CFR 2.390

Figure 1.2-51 Access Building Sectional Views A-A and B-B

Table 1.6-2 Material Referenced as Technical Reports (Sheet 2 of 5)

Report Number(1)	Title	DCD Section Number(2)	
MUAP-07029-P MUAP-07029-NP	Probabilistic Evaluation of Turbine Valve Test Frequency, Revision 2, January 2011.	3.5.1, 10.2.3	MIC-03-01-0 0002 MIC-03-01-0 0002 S1
MUAP-07030	US-APWR Probabilistic Risk Assessment, Revision 3, June 2011.	6.2.5, 7.1.3, 7.5.1, 17.4.7, 18.6.3, 19.0, 19.1.4, 19.2.3 16 (B3.3.1), 16 (B3.3.2), 16 (B3.3.5)	
MUAP-07031-P MUAP-07031-NP	Subcompartment Analysis for US-APWR Design Confirmation, Revision 1, October 2009.	6.2.1	
MUAP-07032-P MUAP-07032-NP	Criticality Analysis for US-APWR New and Spent Fuel Storage Racks, Revision 1, December, 2009.	9.1.1	
MUAP-07033-P MUAP-07033-NP	Mechanical Analysis for US-APWR New and Spent Fuel Racks, Revision 0, March, 2009.	9.1.2	
MUAP-07035	Structural Analysis for US-APWR Reactor Coolant Pump Motor Flywheel, Revision 0, December 2007.	5.4.1	
MUAP-07036	Justification for Deviations Between NUREG-1431 Revision 3.1 and US-APWR Technical Specifications, Revision 2, November 2009.	16	
MUAP-08001-P MUAP-08001-NP	US-APWR Sump Strainer Performance, Revision 5, August 2011	5.2.3, 6.2.2, 6.3.2	MIC-03-01-0 0006
~~MUAP-08002~~	~~Enhanced Information for PS/B Design, Revision 1, January 2011.~~	~~3.7.2~~	MIC-03-01-0 0022
MUAP-08007-P MUAP-08007-NP	Evaluation Results of US-APWR Fuel System Structural Response to Seismic and LOCA Loads, Revision 2, December 2010.	4.2.3	
MUAP-08009	US-APWR Test Program Description, Revision 1, October 2009.	14.2.1, 14.2.2, 14.2.3, 14.2.4, 14.2.5, 14.2.6, 14.2.13, 14.3.4	
MUAP-08011-P MUAP-08011-NP	US-APWR Sump Debris Chemical Effects Test Results, Revision 0, November 2008.	6.2.2	MIC-03-01-0 0006
MUAP-08012-P MUAP-08012-NP	US-APWR Sump Strainer Stress Report, Revision 1, March 2011.	3.9	MIC-03-01-0 0006
MUAP-08013-P MUAP-08013-NP	US-APWR Sump Strainer Downstream Effects, Revision 2, August 2011.	6.2.2, 6.3.2	MIC-03-01-0 0006
MUAP-08014-P MUAP-08014-NP	Human System Interface Verification and Validation (Phase 1a), Revision 1, May 2011.	1.5.2, 18.1.1, 18.1.5, 18.2.3	
MUAP-08015	US-APWR Equipment Qualification Program, Revision 1, November 2009.	3.11, 3.11.4, 3.11.5, 3.11.6, 3.11.7, 3D.1.7, 7.1.3, 7.5.1	
MUAP-09001-P MUAP-09001-NP	Summary of Design Transient, Revision 0, January 2009.	3.9.1	
MUAP-09002-P MUAP-09002-NP	Summary of Seismic and Accident Load Conditions for Primary Components and Piping, Revision 2, December 2010.	3.7.2, 3.8.5, 3.9.2, 3.9.3	
MUAP-09004-P MUAP-09004-NP	Summary of Stress Analysis Results for Core Support Structures, Revision 1, January 2011.	3.9.3, 3.9.4	

Table 1.6-2 Material Referenced as Technical Reports (Sheet 4 of 5)

Report Number(1)	Title	DCD Section Number(2)	
~~MUAP-10001~~	~~Seismic Design Bases of the US-APWR Standard Plant, Revision 3, June 2011.~~	~~3.7.1, 3.7.2, 3.8.3, 3.8.5 Appendix 3H.(3H.3)~~	MIC-03-01-0 0022
MUAP-10002-P MUAP-10002-NP	Damping Ratio of SC Structure, Revision 0, March 2011.	3.7.1, 3.7.2, 3.7.3	
MUAP-10003	US-APWR Physical Security Hardware ITAAC Abstracts, Revision 1, March 2011.	14.3.4	
MUAP-10006	Soil-Structure Interaction Analyses and Results for the US-APWR Standard Plant, Revision ~~1~~3, ~~January 2011~~November 2012.	3.7.1, 3.7.2, 3.8.3, 3.8.5 Appendix 3H (3H.2.3.1. 3H.3) Appendix 3I (3I.1)	MIC-03-01-0 0022
MUAP-10008	Staffing and Qualifications Implementation Plan, Revision 0, April 2010.	18.5.1	
MUAP-10009	HSI Design Implementation Plan, Revision 0, April 2010.	18.1.1, 18.1.5, 18.6.3	
~~MUAP-10010~~	~~Procedure Development Implementation Plan, Revision 0, April 2010.~~	~~18.1.1, 18.1.5, 18.6.3~~	MIC-03-01-0 0023
~~MUAP-10011~~	~~Training Program Development Plan, Revision 0, April 2010.~~	~~18.1.1, 18.1.5, 18.6.3~~	MIC-03-01-0 0023
MUAP-10012	Verification and Validation Implementation Plan, Revision 0, April 2010.	18.1.1, 18.1.5, 18.6.3	
MUAP-10013	Design Implementation Plan, Revision 1, April 2010.	18.1.1, 18.1.5, 18.6.3, 18.11.2	
MUAP-10014	Human Performance Monitoring Implementation Plan, Revision 0, April 2010.	18.1.1, 18.1.5, 18.6.3, 18.12.2	
MUAP-10015-P MUAP-10015-NP	Summary of Environmental Fatigue Analysis Results for the US-APWR Class 1 Components, Revision 1, October 2011	3.9	
MUAP-10016-P MUAP-10016-NP	Summary of Environmental Fatigue Analysis Results for the US-APWR Reactor Coolant Loop Branch Piping, Revision 0, July 2010.	3.9	
MUAP-10017-P MUAP-10017-NP	US-APWR Methodology of Pipe Break Hazard Analysis, Revision 2, September 2011.	3.6.2	
MUAP-10018-P MUAP-10018-NP	US-APWR Containment Performance for Pressure Loads, Revision 0, June 2010.	3.8.1	
MUAP-10019-P MUAP-10019-NP	Calculation Methodology for Radiological Consequences in Normal Operation and Tank Failure Analysis, Revision 1, March 2011.	11.2.3, 11.3.3	
MUAP-10020	Safety-Related Air Conditioning, Heating, Cooling, and Ventilation Systems Calculations, Revision 1, April 2011.	9.4.8	
MUAP-10022	Evaluation on Jet Impingement Issues Associated with Postulated Pipe Rupture, Revision 1, September 2011.	3.6.2	

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MIC-03-01-0 0002 S1

Table 1.6-2 Material Referenced as Technical Reports (Sheet 5 of 5)

Report Number(1)	Title	DCD Section Number(2)	
MUAP-10023-P MUAP-10023-NP	Initial Type Test Results of Class 1 E Gas Turbine Generator System, Revision 3, September 2011	1.5.2	MIC-03-01-0 0002 MIC-03-01-0 0002 S1
MUAP-10024	Structural Design Criteria for US-APWR Access Building, Revision 1, November 2011.	3.7.2	MIC-03-01-0 0022
~~MUAP-11001~~	~~Auxiliary Building Model Properties, SSI Analyses, and Structural Integrity Evaluation for the US-APWR Standard Plant, Revision 1, June 2011.~~	~~3.7.2~~	
MUAP-11002	Turbine Building Model Properties, SSI Analyses, and Structural Integrity Evaluation, Revision 0, January 2011.	3.7.2	
MUAP-11003-P MUAP-11003-NP	Summary of Stress Analysis Results for Pressurizer Surge Line. Revision 1, March 2011.	3.6.3	
MUAP-11005	Research Achievement of SC Structure and Strength Evaluation of US-APWR SC Structure based on 1/10th Scale Test Results, Revision ~~0~~1, ~~February 2011~~December 2012.	3.8.3	MIC-03-01-0 0022
~~MUAP-11006~~	~~FE Model Development and Verification, Revision 0, June 2011.~~	~~3.7.2, 3H.1, 3H.2.1, 3H.2.3, 3H.2.4, 3H4.1, 3H.4.2, 3H.4.3~~	MIC-03-01-0 0022
MUAP-11007	~~Results of Evaluation Using LMSM for R/B Complex, Revision 0, June 2011.~~Ground Water Effects on SSI, Revision 2, November 2012.	3.7.2, 3.8.5	MIC-03-01-0 0022
~~MUAP-11011~~	~~Effects of Structure-Soil-Structure Interaction (SSSI) on Standard Seismic Design of US-APWR Plant, Revision 0, June 2011.~~	~~3.7.2~~	MIC-03-01-0 0022
MUAP-11012-P MUAP-11012-NP	US-APWR RCCA Insertion Limit Load Test Report, Revision 0, March 2011.	3.9.5	
MUAP-11013	Design Criteria for SC Modules, Revision 1, August 2011.	3.8.3	
MUAP-11014-P MUAP-11014-NP	Over Temperature ΔT and Over Power ΔT Trip Function and Setpoint Determination Process, Revision 0, June 2011.	7.2.1	
MUAP-11017-P MUAP-11017-NP	Hydraulic Test of the Full Scale US-APWR Fuel Assembly, Revision 0, May 2011	4.2	
MUAP-12002-P MUAP-12002-NP	Sliding Evaluation and Results, Revision 0, May 2012	3.7.2	MIC-03-01-0 0022

NOTE(1): -P(**p**roprietary), -NP(**n**on-**p**roprietary)
(2): If actual section number is indicated as x.y.z.a.b, a x.y.z level is used for the DCD Section Number. (ex. When actual section number is 6.3.2.1.2, only 6.3.2 is used in Table.

Table 1.8-1 Significant Site Specific Interfaces with the Standard US-APWR Design (Sheet 1 of 4)

Interface	Interface Type	Description of Items Considered to be Outside the Standard Scope of Design	DCD Section	
Circulating Water System	CDI	The system design of the circulating water system (CWS) is CDI. A typical "reference plant" physical layout, configuration and the associated design basis information for the CWS are presented in the DCD. The final system configuration for the CWS is site-specific.	1.2 8.3.1, 12.3 10.1 10.4.5 10.4.13 11.2.3.1 14.2.12.1.33	MIC-03-01-0 0014
Essential Service Water System and Ultimate Heat Sink	CDI	Certain functional aspects of the ESWS and the UHS must meet interface requirements to be consistent with the standard plant design. The UHS is a safety-related system required to remove the heat transferred from the ESWS during normal operation, design basis events and safe shutdown. Decisions regarding the UHS design are to be based on available water sources and how the cooling water can be supplied to the ESWS. A typical configuration for the ESWS and UHS is presented in this DCD as CDI. ~~The final configuration of the ESWS will be comprised of the ESWPT (see below) and UHS related structures (including piping and piping support layout) and is site-specific~~The final configuration of the ESWS including SSCs in the ESWPC which is a part of R/B Complex, the ESWPT and UHS related structures is site-specific. However, the structural design of the ESWPC is a part of standard design and not site-specific..	1.2 9.2.1 9.2.5 12.3 Ch 16, 3.7.9 2.4 3.8	MIC-03-01-0 0014 MIC-03-01-0 0015

Table 1.8-1 Significant Site Specific Interfaces with the Standard US-APWR Design (Sheet 2 of 4)

Interface	Interface Type	Description of Items Considered to be Outside the Standard Scope of Design	DCD Section
Essential Service Water Pipe Tunnel	CDI	The ~~portions of the~~ essential service water pipe tunnel (ESWPT) is outside the standard US-APWR buildings and is CDI. The termination points of the ESWPT are ~~under the T/B~~ at the ESWPC which is a part of the R/B Complex and at the UHS related structures. A typical design for the ESWPT is presented in figures in this DCD and is CDI. The final configuration, including physical layout of the ESWPT, is site-specific.	1.2 8.3.1 App. 9A 11.5 12.3
Offsite Power System	CDI	The offsite power system, transmission circuits, and components that are located outside the high voltage terminals of the main and reserve transformers are CDI. The interface requirements between the standard plant design and the local electrical grid are addressed in this DCD. A typical configuration of the transformers is presented in the DCD, and is CDI. The final configuration of the offsite power transmission system including location and design of the main switchyard area physical layout of the equipment; as well as design details such as transmission tie line voltage level, is site-specific.	~~8.1,~~ 8.2
Power Source Fuel Storage Vault	CDI	The typical design of the power source fuel storage vaults (PSFSVs) as presented in figures in this DCD is CDI. The final configuration of the PSFSVs including physical location in relation to the standard US-APWR buildings is site-specific.	1.2 App. 9A 12.3
Potable and Sanitary Water System	CDI	The design and configuration of the potable and sanitary water systems (PSWS) is CDI. The potable water system provides water supply and distribution fit for human consumption, and the sanitary water system provides collection of sanitary wastewater, with standard plant design features to prevent the potential for contamination from radioactive sources.	9.2.4
Steam Generator Blowdown System	CDI	The portions of steam generator blowdown system (SGBDS) that are downstream of the processing equipment for steam generator blowdown are CDI; including the flow path to the waste water system that is outside of the US-APWR standard plant design.	9.3.2 10.4.8 14.2.12.1.83

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Table 1.8-2 Compilation of All Combined License Applicant Items for Chapters 1-19 (Sheet 6 of 37)

COL ITEM NO.	COL ITEM	
COL 3.7(6)	*The COL Applicant is to develop site-specific GMRS and FIRS ~~by an analysis methodology, which accounts for the upward propagation of the GMRS~~. The FIRS are compared to the CSDRS to assure that the US-APWR standard plant seismic design is valid for a particular site. If the FIRS are not enveloped by the CSDRS, the US-APWR standard plant seismic design is modified as part of the COLA in order to validate the US-APWR for installation at that site.*	MIC-03-03-00066
COL 3.7(7)	*The COL Applicant is to determine the allowable static and dynamic bearing capacities based on site conditions, including the properties of fill concrete placed to provide a level surface for the bottom of foundation elevations, and to evaluate the bearing loads to these capacities.*	
COL 3.7(8)	*The COL Applicant is to evaluate the strain-dependent variation of the material dynamic properties for site materials.*	
COL 3.7(9)	*The COL Applicant is to assure that the design or location of any site-specific ~~seismic category I~~safety-related SSCs, for example pipe tunnels or duct banks, will not expose those SSCs to possible impact due to the failure or collapse of non-seismic category I structures, or with any other SSCs that could potentially impact, such as heavy haul route loads, transmission towers, non safety-related storage tanks, etc.*	DCD_03.07.02-88
COL 3.7(10)	*It is the responsibility of the COL Applicant to ~~further address structure-to-structure interaction if the specific site conditions can be important for the seismic response of particular US-APWR seismic category I structures, or may result in exceedance of assumed pressure distributions used for the US-APWR standard plant design~~address the potential SSSI effect of the R/B complex and T/B on the site specific seismic category I structures.*	MIC-03-03-00054
COL 3.7(11)	*~~Deleted~~It is the responsibility of the COL Applicant to confirm the masses and frequencies of the PCCV polar crane and fuel handling crane and to determine if coupled site-specific analyses are required.*	DCD_03.07.02-102
COL 3.7(12)	*It is the responsibility of the COL Applicant to design seismic category I below- or above-ground liquid-retaining metal tanks such that they are enclosed by a ~~tornado missile~~tornado/hurricane missile protecting concrete vault or wall, in order to confine the emergency gas turbine fuel supply.*	DCD_02-03S01
COL 3.7(13)	*The COL Applicant is to set the value of the OBE that serves as the basis for defining the criteria for shutdown of the plant, according to the site specific conditions.*	
COL 3.7(14)	*The COL Applicant is to determine from the site-specific geological and seismological conditions if multiple US-APWR units at a site will have essentially the same seismic response, and based on that determination, choose if more than one unit is provided with seismic instrumentation at a multiple-unit site.*	
COL 3.7(15)	*Deleted*	

Table 1.8-2 Compilation of All Combined License Applicant Items for Chapters 1-19 (Sheet 7 of 37)

COL ITEM NO.	COL ITEM	
COL 3.7(16)	*The COL Applicant shall provide free-field seismic instrumentation in the vicinity of the power block area at surface grade which shall be used for shutdown determination, unless otherwise justified. Any such justification shall be based on conditions and requirements specific to the site, and shall include justification for evaluation of OBE exceedance using only measurements from instrumentation installed on the buildings and the structures of the US-APWR standard plant.*	
COL 3.7(17)	*Deleted*	
COL 3.7(18)	*Deleted*	
COL 3.7(19)	*The COL Applicant is to identify the implementation milestone for the seismic instrumentation implementation program based on the discussion in Subsections 3.7.4.1 through 3.7.4.5.*	
COL 3.7(20)	*The COL Applicant is to validate the site-independent seismic design of the standard plant for site-specific conditions, including geological, seismological, and geophysical characteristics, and to develop the site-specific GMRS.*	
COL 3.7(21)	*The COL Applicant is responsible for the seismic design of those seismic category I and seismic category II SSCs that are not part of the US-APWR standard plant using site-specific SSE design ground motion.*	MIC-03-03-0 0066
COL 3.7(22)	*The COL Applicant is required to perform site-specific seismic analyses, including SSI analysis which may consider seismic wave transmission incoherence ~~and analysis of the CAV~~ of the seismic input motion, in order to determine if high-frequency exceedances of the CSDRS could be transmitted to SSCs in the plant superstructure with potentially damaging effects.*	MIC-03-03-0 0066
COL 3.7(23)	*The COL Applicant is to verify that the results of the site-specific SSI analysis ~~for the broadened ISRS and basement walls lateral soil pressures~~ are enveloped by the US-APWR standard design.*	MIC-03-03-0 0054
COL 3.7(24)	*The COL Applicant is to verify that the site-specific ratios V/A and AD/V^2 (A, V, D, are PGA, ground velocity, and ground displacement, respectively) are consistent with characteristic values for the magnitude and distance of the appropriate controlling events defining the site-specific uniform hazard response spectra.*	
COL 3.7(25)	*The COL Applicant referencing the US-APWR standard design is required to perform a site-specific SSI analysis for the R/B complex ~~PCCV containment internal structure, and PS/B model~~, utilizing ~~the program~~a SASSI program such as ACS SASSI (Reference 3.7-17) which contains time history input incoherence function capability. The SSI analysis using SASSI is required in order to confirm that site-specific effects are enveloped by the standard design. ~~After the SASSI analysis is first performed for a specific unit, subsequent COLAs for other units may be able to forego SASSI analyses if the FIRS and GMRS derived for those subsequent units are much smaller than the US-APWR standard plant CSDRS, and if the subsequent unit can also provide justification through comparison of site-specific geological and seismological characteristics.~~*	MIC-03-03-0 0054 MIC-03-01-0 0013 DCD_03.07. 02-107

Table 1.8-2 Compilation of All Combined License Applicant Items for Chapters 1-19 (Sheet 8 of 37)

COL ITEM NO.	COL ITEM
COL 3.7(26)	*SSI effects are also considered by the COL Applicant in site-specific seismic design of any seismic category I and II structures that are not included in the US-APWR standard plant. ~~Consideration of structure-to-structure interaction is discussed in Subsection 3.7.2.8.~~ The site-specific SSI analysis is performed for buildings and structures including, but not limited to, to the following:* • *Seismic category I ESWPT* • *Seismic category I PSFSV* • *Seismic category I UHSRS*
COL 3.7(27)	*It is the responsibility of the COL Applicant to perform any site-specific seismic analysis for dams that may be required.*
COL 3.7(28)	*Deleted.~~The overall basemat dimensions, basemat embedment depths, and maximum height of the US-APWR R/B, PCCV, and containment internal structure on their common basemat are given in Table 3.7.1-3 and as updated by the COL Applicant to include site-specific seismic category I structures.~~*
COL 3.7(29)	*Table 3.7.2-1, as updated by the COL Applicant to include site-specific seismic category I structures, presents a summary of dynamic analysis and combination techniques including types of models and computer programs used, seismic analysis methods, and method of combination for the three directional components for the seismic analysis of the US-APWR standard plant seismic category I buildings and structures.*
COL 3.7(30)	*The COL Applicant is to provide site-specific design ground motion time histories and durations of motion.*
COL 3.8(1)	*Deleted*
COL 3.8(2)	*Deleted*
COL 3.8(3)	*It is the responsibility of the COL Applicant to assure that any material changes based on site-specific material selection for construction of the PCCV meet the requirements specified in ASME Code, Section III, Article CC-2000 of the code and supplementary requirements of RG 1.136 as well as SRP 3.8.1.*
COL 3.8(4)	*Deleted*
COL 3.8(5)	*Deleted*
COL 3.8(6)	*Deleted*
COL 3.8(7)	*It is the responsibility of the COL Applicant to determine the site-specific aggressivity of the ground water/soil and accommodate this parameter into the concrete mix design as well as into the site-specific structural surveillance program.*
COL 3.8(8)	*Deleted*
COL 3.8(9)	*Deleted*

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