

South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

December 21, 2009 U7-C-STP-NRC-090229

U. S. Nuclear Regulatory Commission Attention: Document Control Desk One White Flint North 11555 Rockville Pike Rockville, MD 20852-2738

South Texas Project Units 3 and 4 Docket Nos. 52-012 and 52-013 Response to Request for Additional Information

Attached are responses to NRC staff questions included in Request for Additional Information (RAI) letter number 291, related to Combined License Application (COLA) Part 2, Tier 2, Sections 12.2, 12.3, 12.4, and 12.5. This submittal completes the response to letter 291.

Attachments 1 through 4 contain responses to the RAI questions listed below:

12.02-13 12.03-12.04-12 12.05-5

When a change to the COLA is indicated, the change will be incorporated into the next routine revision of the COLA following NRC acceptance of the RAI response.

There are no commitments in this letter.

If you have any questions regarding these responses, please contact me at (361) 972-7136 or Bill Mookhoek at (361) 972-7274.

D091

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 12/21/09

Scott Head

Manager, Regulatory Affairs South Texas Project Units 3 & 4

SCS

Attachments:

- 1. Question 12.02-13
- 2. Question 12.03-12.04-11
- 3. Question 12.03-12.04-12
- 4. Question 12.05-5

cc: w/o attachment except*
(paper copy)

Director, Office of New Reactors U. S. Nuclear Regulatory Commission One White Flint North 11555 Rockville Pike Rockville, MD 20852-2738

Regional Administrator, Region IV U. S. Nuclear Regulatory Commission 611 Ryan Plaza Drive, Suite 400 Arlington, Texas 76011-8064

Kathy C. Perkins, RN, MBA Assistant Commissioner Division for Regulatory Services Texas Department of State Health Services P. O. Box 149347 Austin, Texas 78714-9347

Alice Hamilton Rogers, P.E. Inspection Unit Manager Texas Department of State Health Services P. O. Box 149347 Austin, Texas 78714-9347

C. M. Canady City of Austin Electric Utility Department 721 Barton Springs Road Austin, TX 78704

*Steven P. Frantz, Esquire A. H. Gutterman, Esquire Morgan, Lewis & Bockius LLP 1111 Pennsylvania Ave. NW Washington D.C. 20004

*George F. Wunder *Michael Eudy Two White Flint North 11545 Rockville Pike Rockville, MD 20852 (electronic copy)

*George F. Wunder

*Michael Eudy

Loren R. Plisco

U. S. Nuclear Regulatory Commission

Steve Winn Joseph Kiwak Eli Smith Nuclear Innovation North America

Jon C. Wood, Esquire Cox Smith Matthews

J. J. Nesrsta Kevin Pollo L. D. Blaylock CPS Energy

RAI 12.02-13

QUESTION:

NRC Staff agrees with the STP response to RAI 12.02-6 (Letter U7-C-STP-NRC-090113, ADAMS Document Number ML092360170) that ABWR DCD Section 12.2.1.2.9 "Other Radioactive Sources" is incorporated by reference in the STP COLA. However, STP is also requesting special nuclear material, by-product, and source material licenses under 10 CFR Parts 30, 40, and 70 which will allow the licensee to: (1) 'receive, possess, and use, at any time, any byproduct, source, and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required; and (2) 'receive, possess, and use in amounts as required, any byproduct, source, or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components'. Since the above mentioned radioactive sources are not identified in the ABWR DCD, supplemental information is needed in the FSAR that describes the sources.

In order to make a determination of reasonable assurance that all of the radiation sources that will be utilized at STP 3 & 4 have been fully described, the staff requests that the applicant provide the following additional information concerning radiation sources:

- 1. Describe any radiation sources containing byproduct, or special nuclear material exceeding 3.7 E+9 Bq (100 millicuries) that may be required to perform STP 3 & 4 radiation detection instrumentation calibration activities including; isotope, quantity, form, and use of the sources.
- 2. Revise the STP 3 & 4 FSAR to include the information provided in the response to item 1 above, and provide a markup of the proposed FSAR changes in the response.

RESPONSE:

The radiation sources for installed radiation monitoring system detector and portable radiation detector calibration activities are not determined because the equipment is not yet procured. However, they are expected to be considerably less than 100 millicuries. It is likely that large sources used for radiography at STP 3&4 will be under a license granted to the State of Texas. Other operations that could be expected to utilize a source exceeding 100 millicuries would be associated with general dosimetry calibration and the calibration of portable radiation monitoring equipment utilized by Health Physics personnel. These operations are expected to be performed by the Metrology Laboratory for STP Units 1 & 2.

Procurement, receipt, inventory, labeling, leak testing, control, storage, issuance for use, and disposal of all sources maintained on site is in accordance with plant procedures developed to comply with the radiation protection program elements required by 10 CFR Parts 19 and 20, to maintain personnel exposure ALARA. Sources brought to the site and utilized by contract or vendor personnel are controlled in accordance with the provisions of the license held by the contractor or vendor. If required while on site, storage of vendor-supplied sources is in accordance with site procedures.

STPNOC's response to RAI 01-15 discusses the appropriateness of STP 3 & 4 license conditions for 10CFR Parts 30, 40, and 70, and the program elements to ensure that STPNOC will have in place the necessary controls to allow receipt of byproduct and source material. In that response, STPNOC stated that the STP Units 3 & 4 FSAR (which incorporates by reference the ABWR DCD) includes Chapter 9 – Auxiliary Systems, Chapter 11 – Radioactive Waste Management, Chapter 12 – Radiation Protection, and Chapter 13 – Conduct of Operations, which provide sufficient information to provide compliance with the applicable portions of 10CFR Parts 30, 40 and 70. The license application information requested in these Parts relates to byproduct, source, and special nuclear material and its purposes, radiation safety personnel, personnel training, facilities and equipment, radiation safety program, and waste management. Specifically, FSAR sections that describe controls such as organizational structure, training, radiation protection and safety, plant procedures, security and safeguards related to special nuclear material, byproduct, and source material were cited in that response.

Also, as stated in the response, COLA Part 2, Tier 2, Rev. 3 Table 13.4S-1 provides milestones for implementation of the various operational programs that support issuance of the license and requirements relative to 10CFR Parts 30, 40, and 70, including a timetable adequate to ensure compliance with the 10CFR Parts 30, 40, and 70 licenses for receipt and use of byproduct, source, or special nuclear materials.

Section 12.2 of the COLA will be revised as shown below due to this response:

12.2.1.2.9.6 Other Contained Sources

The following supplementary information is provided:

The radiation sources for installed radiation monitoring system detectors and portable radiation detector calibration activities are expected to be less than 100 millicuries. It is expected that large sources used for radiography at STP 3&4 will be under a license granted to the State of Texas. Other operations that could be expected to utilize a source exceeding 100 millicuries are associated with general dosimetry calibration and the calibration of portable radiation monitoring equipment utilized by Health Physics personnel. These activities are expected to be performed by the Metrology Laboratory for STP Units 1 & 2.

Procurement, receipt, inventory, labeling, leak testing, control, storage, issuance for use, and disposal of all sources maintained on site is in accordance with plant procedures developed to comply with the radiation protection program elements required by 10 CFR Parts 19 and 20, to maintain personnel exposure ALARA. Sources brought to the site and utilized by contract or vendor personnel are controlled in accordance with the provisions of the license held by the contractor or vendor. If required while on site, storage of vendor-supplied sources is in accordance with site procedures.

RAI 12.03-12.04-11

QUESTION:

In the response to RAI 12.03-12.04-3 questions 1 and 2 (Letter U7-C-STP-NRC-090121, ADAMS Document Number ML092430071), STP stated that 10 CFR 20.1406 was issued after the ABWR Design Certification Rule in 1997 and that 10 CFR 20.1406(b) is not applicable to the ABWR DCD. NRC staff agrees that STP does not need to address 10 CFR 20.1406(b) through licensing action for the ABWR DCD. However, 10 CFR 20.1406(a) requires that "Applicants for licenses, other than early site permits and manufacturing licenses under part 52 of this chapter and renewals, whose applications are submitted after August 20, 1997, shall describe in the application how facility design and procedures for operation will minimize, to the extent practicable, contamination of the facility and the environment, facilitate eventual decommissioning, and minimize, to the extent practicable, the generation of radioactive waste." In addition, 10 CFR 52.79(a)(45) requires that 'The information required by 10 CFR 20.1406' be included in the FSAR in sufficient detail to enable the commission to reach a final conclusion.

In the response to RAI 12.03-12.04-3 question 3, STP provided a discussion of how the STP 3 & 4 radwaste system departures will address the requirements of 20.1406, noting that NEI 08-08, "Generic FSAR Template Guidance for Life-Cycle Minimization of Contamination" provides guidance on developing operational programs to address 20.1406 and stating that NEI 08-08 guidance will be used, to the extent practicable, when the STP 3 & 4 program and procedures are developed. In addition, the response states that all piping will be located in pipe tunnels or accessible surface trenches and that FSAR Subsection 11.2.1.2.4 will be revised to clarify that there is no piping buried in soils.

In order to make a determination of reasonable assurance that STP 3 & 4 will comply with the requirements of 10 CFR 20.1406, the staff requests that the applicant provide supplemental information to the response to RAI 12.03-12.04-3 to address the following:

- 1. Provide a complete description of the operational programs and operating procedures that STP 3 & 4 will utilize to address the requirements of 10 CFR 20.1406 in Chapter 12.3 of the FSAR. At a minimum the program description shall include the elements identified in Regulatory Positions C.1 thru C.4 of Regulatory Guide 4.21, including an initial evaluation of structures, systems, and components (SSC) and facility design features important to radiological safety that address the requirements of 10 CFR 20.1406 and form the basis of the operational programs and operating procedures that will be implemented. For reference, RG 4.21, Appendix A also contains numerous examples of measures that can be considered to address the requirements of 10 CFR 20.1406.
- 2. Include a summary in the FSAR Chapter 12.3 program description that discusses how STP 3 & 4 plans to address the requirements of 10 CFR 20.1406, including a cross reference to any applicable FSAR sections that already include discussions of design features or operational programs that are recognized in the 10 CFR 20.1406 operational programs and operating procedures.

- 3. Clarify whether the statement included in the response to RAI 12.03-12.04-3 concerning piping being located in tunnels or accessible surface trenches is applicable only to liquid radwaste system piping, or if it applies to all STP 3 & 4 piping.
- 4. If the statement concerning piping being located in tunnels or accessible surface trenches is applicable to all piping, provide appropriate reference(s) in FSAR chapter 12.3 to the applicable FSAR section(s) that contains or describes the design objective or criteria.
- 5. Provide a markup of the proposed FSAR changes in the response.

RESPONSE:

The response to this RAI does not replace the information provided in STPNOC's response to RAI 12.03-12.04-3 but is supplemental information. The ABWR DCD has finality, and as recognized in the RAI, the ABWR DCD is not required to address 10 CFR 20.1406. The provisions quoted in the RAI (i.e., 10 CFR 20.1406 and 52.79(a)(45)) were not established in accordance to 10 CFR 52.63. Therefore, in accordance with Section VI.D of the ABWR Design Certification Rule, STP is not required to provide any additional information or justification with respect to the design as described in the DCD.

However, STPNOC recognizes that 10 CFR 20.1406 is applicable to STP Units 3 and 4 with respect to the design of structures, systems, and components that are outside the scope of the DCD, and to departures from the DCD. Additionally, STPNOC recognizes that 10 CFR 20.1406 is applicable to STP Units 3 and 4, as it pertains to operational programs. With this background, STPNOC provides the following answers to the RAI.

1. The operational programs and operating procedures that STP 3&4 will utilize to address the requirements of 10 CFR 20.1406 have not yet been written. As noted in COLA Part 2, Tier 2, Rev. 3, Subsection 13.5.3.3.2, these procedures will be issued six months prior to the commencement of the Preoperational Test Program.

However, STPNOC has reviewed the RG 4.21 Positions C.1 through C.4 and concludes that the operational programs and their procedural implementation at STP 3&4 will be consistent with the intent of RG 4.21. These programs and procedures will include provisions for:

- Work practices, preventive maintenance, and procedures to minimize leaks and spills and provide containment and early and adequate detection including instruments for detection. This includes surveillance and monitoring.
- Surveillance and maintenance is performed to mitigate the consequences of undetected leakage over a long period of time.
- Operational practices will be subject to audit or inspection.
- Following construction, establishment of an onsite monitoring program as a part of the environmental monitoring program to prevent offsite migration of radionuclides via an unmonitored pathway.

- To facilitate decommissioning, maintain a system of records detailing contamination events and residual levels of environmental contaminates for the life of STP 3 & 4, readily accessible to facilitate cleanup.
- Minimizing the generation of radioactive waste as a major operational consideration that will be addressed through careful work planning. Plant procedures will include provisions for proper packaging of waste for transportation and acceptance by disposal or treatment facilities. Onsite storage is considered in certain circumstances as necessary.

Similarly, STPNOC's programs and procedures will be consistent with the intent of the examples of measures to control contamination described in Appendix A of RG 4.21.

A list of maintenance and other operating procedures for STP 3 & 4 is provided in COLA Part 2, Tier 2, Subsection 13.5.3.4.2, which includes plant radiation protection, chemical-radiochemical control, and radioactive waste management procedures. Subsection 13.5.3.4.3 lists radiation control procedures, including area radiation monitoring, process radiation monitoring, and meteorological monitoring procedures as well as procedures for discharge of effluents. As noted previously, these procedures and all others that relate to 10CFR20.1406 will be issued six months prior to the start of pre-operational testing. Operational programs that relate to 10 CFR 20.1406 requirements are listed in COLA Part 2, Tier 2, Table 13.4S-1, and include the Process and Effluent Monitoring and Sampling Program and Radiation Protection Program. 10 CFR 20.1406 requirements will also be considered in the development of these programs. A new supplemental Section 12.3.9 will be added to COLA Part 2, Tier 2 to discuss the operational programs and operating procedures.

- 2. The following is a summary that discusses features and programs that pertain to 10 CFR 20.1406:
 - COLA Part 2, Tier 2, Rev. 3, Section 12.3 provides the facility radiation protection design features that are outside the scope of the ABWR DCD or represent departures from the DCD. COLA Part 2, Tier 2, Rev. 3, Section 12.5S provides a summary of the STP 3&4 operational radiation protection program based on Nuclear Energy Institute (NEI) Report No. NEI 07-03 including the facility organization structure. The organization is further explained in COLA Part 2, Tier 2, Rev. 3 Subsection 13.1.2. Personnel training is based on NEI No. 06-13 and discussed in COLA Part 2, Tier 2, Rev. 3 Section 13.2.
 - COLA Part 2, Tier 2, Rev. 3, Section 12.5 provides information related to radiation
 protection facilities and equipment. Further information related to the radiation safety
 program including process and effluent radiological monitoring systems are described in
 COLA Part 2, Tier 2, Rev. 3, Sections 11.5 and 12.0.
 - COLA Part 2, Tier 2, Rev. 3, Section 11.4, Solid Waste Management System presents information related to the relevant waste management processes. Information related to plant procedures to implement the programs identified in COLA Part 2, Tier 2, Rev. 3, Section 12.5S and Table 13.4S-1 is given in COLA Part 2, Tier 2, Rev. 3 Section 13.5.

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Departures from the DCD design pertaining to 10 CFR 20.1406 are also summarized in the new supplemental COLA Part 2, Tier 2, Subsection 12.3.9.

- 3. STPNOC's response to RAI 12.03-12.04-3 is clarified by stating that for STP 3 & 4, all liquid radwaste system piping will be located in pipe tunnels or accessible surface trenches with none of the radwaste system piping buried in soil that could lead to undetected leakage over a long time period.
- 4. The statement in item 3 above is applicable to liquid radwaste system piping.
- 5. STP COLA Rev. 3, Part 2, Tier 2, Section 12.3 will be revised to include the following new supplemental Subsection 12.3.9.1. Gray highlighting indicates the changes.

12:3.9 Minimization of Contamination and Radioactive Waste Generation

The following site-specific supplement provides information to address 10CFR20.1406, as implemented by RG 4.21, which discusses minimizing contamination and radioactive waste generation and developing life-cycle planning.

RG 4.21 states in part that 10 CFR 20:1406 applies to applicants for licenses (other than early site permits and renewals), design certifications, approvals of standard designs, and manufacturing licenses. The regulation requires the submittal of design information and operational procedures for (1) minimizing radioactive waste generation and contamination of the facility and the environment, and (2) facilitating decommissioning.

12.3.9.1 Operational Programs and Operating Procedures

Operational programs and operating procedures will be developed to address 10 CFR 20.1406, and will be issued six months prior to commencement of the Preoperational Test Program. These programs and procedures will include:

- Work practices, preventive maintenance, and procedures to minimize leaks and spills and provide containment and early and adequate detection including instruments for detection. This includes surveillance and monitoring.
- Surveillance and maintenance is performed to mitigate the consequences of undetected leakage over a long period of time.
- Operational practices will be documented such that they are subject to audit and inspection.
- Following construction, establishment of an onsite monitoring program as a part
 of the environmental monitoring program to prevent offsite migration of
 radionuclides via an unmonitored pathway.
- To facilitate decommissioning, maintain a system of records detailing contamination events and residual levels of environmental contaminates for the life of the facility, readily accessible to facilitate cleanup.

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Minimizing the generation of radioactive waste as a major operational
consideration that will be addressed through careful work planning. Plant
procedures will include provisions for proper packaging of wastes for
transportation and acceptance by disposal or treatment facilities. Onsite storage is
considered in certain circumstances as necessary.

Maintenance and other operating procedures are provided in Subsection 13.5.3.4.2, which includes plant radiation protection, chemical-radiochemical control, and radioactive waste management procedures. Subsection 13.5.3.4.3 lists radiation control procedures, including area radiation monitoring, process radiation monitoring, and meteorological monitoring procedures as well as procedures for discharge of effluents. Operational programs are listed in Table 13.4S-1, and included the Process and Effluent Monitoring and Sampling Program and Radiation Protection Program. 10 CFR 20.1406 requirements are considered in the development of these programs.

12.3.9.2 Design Provisions and Design Features

Design of structures, systems, and components, such as the following, outside the scope of ABWR DCD or departures from the DCD in COLA Part 2, Tier 2, are applicable to 10CFR20.1406 and RG 4.21.

- Section 12.3 describes facility radiation protection design features with STD DEP 12.3-4 adding ARMs and alarm capability.
- Section 12.5 provides supplemental information related to radiation protection facilities and equipment.
- Sections 11.5 and 12.0 describe process and effluent radiological monitoring systems with STD DEP 11.5-1 providing for equipment and instrumentation reliability improvements.
- Section 11.4 describes the solid waste management system and processes with STD DEP 11.4-1 to minimize the generation of waste.
- Section 11.3 describes the gaseous waste management system with STD DEP 11.3-1 providing for optimization.
- Section 1.1.2 describes the liquid radwaste management system with STD DEP 11.2-1 providing for equipment modernization.

RAI 12.03-12.04-12

QUESTION:

In the response to RAI 12.03-12.04-7 (Letter U7-C-STP-NRC-090122, ADAMS Document Number ML092430136), STP stated that STD DEP 12.3-2 will be deleted and the Reactor Water Cleanup (CUW) System description in Subsection 12.3.1.4.1 of the FSAR will be updated, in a future COLA revision, to include the charcoal filter on the CUW Backwash Tank vent line. However, there is no commitment to include equivalent information about the CUW Backwash Tank vent line charcoal filter in other FSAR Subsections (e.g. 5.4.8, Reactor Water Cleanup System, 9.4.5, Reactor Building HVAC System, and 11.4, Solid Waste Management System), or to update the system drawing(s) to include the charcoal filter. The basis for STD DEP 12.3-2 in the COLA was because "A review of the system diagrams for the CUW system show no such filter as part of the approved design." Including requirements for the CUW Backwash Tank vent line charcoal filter in FSAR sections, other than Section 12.3, will ensure it is not removed during future design changes.

In order to make a determination of reasonable assurance that the CUW Backwash Tank vent line charcoal filter will be installed as described in the response to RAI question 12.03-12.04-7, the staff requests that the applicant provide supplemental information to address the following:

- 1. Identification of the appropriate FSAR Subsection(s) within which a description of the CUW Backwash Tank vent line charcoal filter should be included.
- 2. Identification of the appropriate system drawing(s) within which the CUW Backwash Tank vent line charcoal filter should be included.
- 3. Provide a markup of the proposed FSAR changes in the response.

RESPONSE:

As stated in STPNOC's response to RAI 12.03-12.04-7, STD DEP 12.3-2 was deleted and a commitment made to update STP 3 & 4 COLA Part 2, Tier 2, Subsection 12.3.1.4.1. This update reverts the CUW Backwash Tank vent line fitted with a charcoal filter to the design described in the certified ABWR DCD.

- 1. Identification of the filter will be added to COLA Part 2, Tier 2, Subsection 11.4.2.
- 2. STP 3&4 FSAR Figure 11.2-2 is not being revised because the vent pipe and charcoal filter for the Backwash Receiving Tank is a level of detail that was not included in the original DCD Figure 11.2-1. The CUW backwash tank vent line filter will be added to the STP 3&4 Radioactive Waste Treatment System design drawings.
- 3. The following change to STP 3&4 COLA Part 2, Tier 2, Subsection 11.4.2 will be made in a future revision. Gray highlighting indicates the change.

11.4.2.2.2 Spent Resins and Sludges

The spent resins and sludge collection subsystem collects the filter backwash sludge, reverse osmosis rejects, powdered resin slurry and spent resin into one of the five tanks in accordance with the waste characteristics. The spent resin and sludge tanks are categorized as follows:

• One CUW Backwash Receiving Tank for receiving CUW and FPCS sludge (spent resin) fitted with a filter in its vent line prior to exhaust to the HVAC system.

RAI 12.05-5

QUESTION:

In the response to RAI 12.05-1 (Letter U7-C-STP-NRC-090103, ADAMS Document Number ML092260582) STP stated that the anticipated frequency of entry into the Very High Radiation Areas listed in FSAR Section 12.5S.4.4 will be seldom, if ever. The response also included discussion of the physical barriers included in the ABWR plant design to preclude access to the identified Very High Radiation Areas and stated that no revision to the COLA is required as a result of this response.

As noted in section 12.5.4.4 of NEI 07-03A, the supplemental information that should be included in the FSAR for access control of <u>each</u> Very High Radiation Areas are:

- 1) Description of the area, including the reason for accessing the area, and reference to its location on plant layout diagrams.
- 2) Anticipated frequency of accessing the area and description of the administrative controls for restricting access to the area as required by 10 CFR 20.1602 and consistent with RG 8.38.
- 3) Detailed drawings that indicate physical barriers that completely enclose the respective area in a manner that is sufficient to thwart undetected entry into the area. Alternatively, if such detailed drawings are not available, describe how such barriers will be verified in the final design of the facility.

In order to make a determination of reasonable assurance that the FSAR contains sufficient detail of the physical barriers included in the ABWR plant design to preclude access to identified Very High Radiation Areas, and access control requirements for Very High Radiation Areas, the staff requests that the applicant include the following supplemental information in Section 12.5 or 12.5S.4.4 of the STP 3 & 4 FSAR:

- 1) Reason(s) for, and the anticipated frequency of, entry into the Very High Radiation Areas listed in FSAR Section 12.5S.4.4.
- 2) Discussion of the physical barriers included in the plant design that will preclude access to the identified Very High Radiation Areas.
- 3) Provide a markup of the proposed FSAR changes in the response.

RESPONSE:

Section 12.5S.4.4 of the COLA will be changed as shown below:

12.5S.4.4 Access Control

There are three Very High Radiation Areas in the plant: the Reactor Water Cleanup System (CUW) backwash tank room; the filter demineralizer room (both CUW and Fuel Pool Cooling and Cleanup), and the Spent Fuel Pool lower elevation. These areas are

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identified on the plant layout drawings in Section 12.3. Filter Demineralizer equipment is in shielded rooms accessible only through openings blocked by shield plugs. Removal of shield plugs requires the use of cranes. Use of the cranes is controlled by lock and key, with keys under the control of Health Physics. Postings indicate dose rates behind the shielding. Entry into these rooms is only authorized via specific Radiation Work Permit. Additional administrative controls are placed on entry into these locked areas, including access control, use of an RWP and additional monitoring.

Entry into the CUW backwash receiving tank room is through a locked door, with keys controlled by Health Physics. Entry is not anticipated, as no scheduled maintenance or surveillance is required. (See ABWR DCD, Tier 1, Table 3.2b, Ventilation and Airborne Monitoring ITAAC: Design Commitment 1, Acceptance Criterion c.) Entry into the CUW and Fuel Pool Cooling and Cleanup filter demineralizer room is anticipated once every three to five fuel cycles for replacement of filter septa. The Spent Fuel Pool lower elevation is inaccessible to personnel working above the surface due to the height of water covering spent fuel. Diving activities are controlled by Health Physics (HP) personnel using specific Radiation Work Permits (RWPs), constant HP monitoring, alarming dosimetry, and work processes governed by procedure!