



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001**

November 17, 2010

MEMORANDUM TO: ACRS MEMBERS

FROM: Maitri Banerjee, Senior Staff Engineer **/RA/**
Advisory Committee on Reactor Safeguards

SUBJECT: CERTIFICATION OF THE MINUTES OF THE ACRS ABWR
SUBCOMMITTEE MEETING, OCTOBER 20, 2010, ROCKVILLE,
MARYLAND

The minutes of the subject meeting have been certified on November 15, 2010 as the official record of the proceedings for that meeting. A copy of the certified minutes is attached.

Attachment: As stated

cc via e-mail: C. Santos
A. Dias



**UNITED STATES
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WASHINGTON, DC 20555 – 0001**

MEMORANDUM TO: Maitri Banerjee, Senior Staff Engineer
Reactor Safety Branch – A
ACRS

FROM: Said Abdel-Khalik, Chairman
Advanced Boiling Water Reactor (ABWR) Subcommittee

SUBJECT: CERTIFICATION OF THE MINUTES OF THE MEETING OF THE
SUBCOMMITTEE ON ABWR REGARDING COL APPLICATION OF
SOUTH TEXAS PROJECT (STP) ON OCTOBER 20, 2010

I hereby certify, to the best of my knowledge and belief, that the minutes of the subject meeting held on October 20, 2010, are an accurate record of the proceedings for that meeting.

/RA/

11/15/2010

Said Abdel-Khalik, Chairman
ABWR Subcommittee

Date

Certified: November 15, 2010

By: Said Abdel-Khalik

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
MINUTES OF THE MEETING OF THE SUBCOMMITTEE ON
ADVANCED BOILING WATER REACTOR (ABWR) REGARDING STP COLA
ON OCTOBER 20, 2010, IN ROCKVILLE, MARYLAND

On October 20, 2010, the ACRS Subcommittee on ABWR held a meeting in Room T-2B1, 11545 Rockville Pike, Rockville, Maryland. The purpose of the meeting was to receive a briefing from the NRC staff and the South Texas Project Nuclear Operating Company (STPNOC), the applicant for a combined license (COL) for two ABWR units at their existing reactor site in Texas, regarding Chapters 3, 8, 9 and 18 of the COL application (COLA) FSAR and staff's safety evaluation report (SER). Chapters 8 and 18 were presented to the Subcommittee for the second time and the SER did not have any open items. The meeting was convened at 8:30 AM. The meeting was open to the public.

Attendees:

ACRS Members

Said Abdel-Khalik
(Chairman)

J. Sam Armijo

Joy Rempe

Charlie Brown

Jack Sieber

Dennis Bley

John Stetkar

Michael Ryan

Mario Bonaca

ACRS Staff

Maitri Banerjee (DFO)

STNOC Presenters

Scott Head

Coley Chappell

Evans Heacock

STNOC Presenters

Jim Agles

Tom Daley

Robert Quinn, Westinghouse

NRO Staff Presenters

David Jeng

Tom Tai

Adrian Muniz

Tuan Le

Angelo Stubbs

Rocky Foster

Amar Pal

Paul Pieringer

Mark Tonacci

Thomas Scarbrough

Dennis Andrukut

NRO Staff/Consultant

Roy Karimi, ERI

Michael Norato

Jennifer Dixon-Herrity

Tim Steingass

Jim Stunisha

Peter Kang

Gordon Curran

Paul Hernandez

Eugene Eagles

STPNOC & Others

Craig Swanner, TANE

Koichi Kondo, TANE

Soichi Yoshida, TANE

Richard Bense, STPNOC

Thomas Fay, TANE

Michael Murray, STPNOC

Al Gutterman, Morgan Lewis

The presentation slides and handouts used during the meeting are attached to the Office Copy of the meeting transcript. The presentation to the Subcommittee is summarized below.

Opening Statement

Chairman Abdel-Khalik convened the meeting by introducing the ACRS members. He noted that the current briefing was to discuss the COLA FSAR and the corresponding staff SER for Chapters 3, 8, 9 and 18. The SER for Chapters 3 and 9 was with-open-items and presented for the first time to ACRS. Open items in the SER for Chapters 8 and 18 presented in a previous briefing were closed in this SER. Some of the action items resulting from prior ABWR Subcommittee meetings were to be presented also. He stated that the telephone bridge line available to the stakeholders to listen to the proceeding would be opened in both directions for receiving comments and questions at the end of the meeting. After asking the staff and the applicant to identify the need for closing the meeting before going into discussion of proprietary information, Chairman Abdel-Khalik invited the staff to begin the presentation.

Introduction

In their opening statements, Mr. Mark Tonacci, the NRO Branch Chief for STP COLA, and Mr. Tom Tai, the NRO Lead Project Manager (PM), introduced the staff presenters. Mr. Scott Head, the STP Regulatory Affairs Manager, introduced the STP staff and provided a short outline of their presentation.

STPNOC and NRO Staff Presentation on Chapter 8

Mr. Evans Heacock started the STP presentation of COLA Chapter 8, by providing a summary description of the open items in the staff SER and questions asked by the ACRS members that were not closed at the time of the last presentation of this chapter to the ACRS. The first of these three items involved the inspection and testing of inaccessible (underground) cables. This included medium voltage power, instrumentation and controls cables and the water level monitoring system installed in manholes. Member Brown asked about environmental qualification of high voltage cables that are submerged or installed underground. Mr. Heacock noted that following long term industry experience of successful operation, lead-sheathed cabled are used for these applications. Member Bley asked if there was any rodent damage observed by the industry (similar to the telephone industry experience). Mr. Heacock noted that was not the case (high voltage induced spark may keep the critters away).

The next item Mr. Heacock presented was about demonstrating that required operator actions can be completed to power one safety bus within 10 minutes after a station blackout (SBO). This was an item (#28) on the ACRS action item list. Mr. Heacock discussed the automatic and manual steps that need to be completed. He noted that the combustion turbine generator (CTG) units were designed to be of large enough capacity so that all non-safety related loads do not have to be shed before safety related loads can be added for SBO mitigation. Upon Member Stetkar's question that such demonstration need to be realistic, Mr. Heacock noted that the initial start-up test would be on a real-time basis followed by periodic testing and operator qualification. Mr. Heacock then discussed the ACRS action item (#27) on performance of switching logic under various electrical transient involving the offsite power.

Mr. Adrian Muniz, NRO PM for Chapter 8, began the staff presentation by introducing the reviewers and providing an outline of staff's presentation which involved the staff's SER open item on cable testing and ACRS action item on SBO. Mr. Amar Pal of NRO, the technical

reviewer for Chapter 8, started his presentation discussing the STP underground cable monitoring program that follows industry best practices. The members asked some exploratory questions regarding the use of manhole high water level alarms. Mr. Pal then discussed the post SBO plant response with a timeline, and noted that the STP preoperational testing would demonstrate the STP capability to connect the CTG to any one of the safety buses within 10 minutes. He noted that the staff SER open items were all resolved. Based on the information presented the members agreed that the follow-up items on the ACRS action item list involving the last two issues (SBO mitigation and switching logic) could be closed.

STPNOC and NRO Presentations on Chapter 18

Mr. Coley Chappell of STPNOC started the presentation by noting that while Chapter 18 was last presented to the ABWR Subcommittee (on March 2, 2010), the staff SER did not have any open items. He noted the contents of the COLA FSAR Chapter 18, and discussed the two ACRS action items (#13, 15) related to the design of the safety parameter display system and the remote shutdown system respectively. He provided an overview of the human factor engineering (HFE) design process that included a task analysis, human system interaction (HSI) design implementation plan and inspection of the as-built plant. He noted that STP would consider the good HFE practices in NUREG -0711, Rev. 2, "Human Factors Engineering Program Review Model."

Mr. Rocky Foster, NRO PM for Chapter 18, noted the departures and COL information items in the FSAR reviewed by the staff and the confirmatory items in the staff's SER. These items were presented at the last ABWR meeting on March 2, 2010 also. He mentioned the follow-up items in the ACRS action item list on Chapter 18. Then he introduced the NRO technical reviewer, Mr. Paul Pieringer.

Mr. Pieringer discussed the improvements to the post accident operators' response resulting from the addition of the safety parameter display system (SPDS). A departure identifies drywell and wetwell pressure as type A variables and adds wetwell pressure to the SPDS indication on the control room large display panel. The ACRS members, during the March 2 briefing, questioned the staff's SER statement that indicated addition of dry/wet well pressure indication on the SPDS provided higher assurance of safety regarding post accident control room capability. The members noted the SPDS was a non-safety related component (ACRS action item 13). Mr. Pieringer stated that the staff had revised the statement to say that addition of these parameters on SPDS was an improvement in reactor safety as it brings the design in closer adherence to Regulatory Guide 1.97, "Criteria for Accident Monitoring Instrumentation for Nuclear Power Plants." Upon Member Stetkar's question, Mr. Pieringer clarified that selection of plant parameters for post accident monitoring are made based on task analysis using the emergency operating procedure guidelines for safe shutdown. STPNOC has been developing the HFE implementation plan and will run scenarios during the integrated system validation. Based on the results, components may be moved to the safety related displays via design changes. Mr. Chappell noted that some parameters on SPDS are also available on other safety related displays. Additionally, successful completion of ITAAC will verify adequate implementation of the HFE process.

Regarding the ACRS question on operator's ease in switching from the digital main control room (MCR) to the analog remote shutdown system (RSS) (ACRS action item 15), Mr. Pieringer noted that designs with mixed technology (digital and analog) already exist in currently operating plants. A similar process of HFE validation through task analysis, design improvement, procedure development and training is expected to resolve this operator interface issue. Regarding the ACRS concern on use of DAC (ACRS action item 12), especially in the digital I&C areas, the staff

noted that the HFE DAC incorporated the DCD by reference, hence it was outside the scope of the COLA review. The ACRS members noted that the DAC issues on the ACRS action item list (#12, 17) should be treated as one generic issue and closed for the purposes of ACRS review of the STP COLA. The members agreed that the other two action items regarding SPDS and MCR vs. RSS display may be closed also.

STPNOC Presentation on Chapter 3

Mr. Chappell of STPNOC started the STP COLA FSAR Chapter 3 presentation. He noted the contents, and the missing Sections including Section 3.9.2, Dynamic Testing and Analysis, that would be discussed at a later date. The completion of staff review of this particular section is pending STPNOC submittal of a technical report on reactor flow induced vibration due later this year. Chairman Abdel-Khalik requested that once available to the staff, this report be submitted for ACRS review. Also Sections 3.7 and 3.8 on seismic design were to be presented later as the staff was not ready to present the SER at this time.

Regarding Section 3.3 on wind and tornado loadings, Member Stetkar questioned how STPNOC came to the position that the site is bounded by the DCD wind loading and design basis hurricane. He noted that the recent history of hurricanes in the south Texas area seem to indicate otherwise. He noted the design gust wind speed and related hurricane category and questioned the recurrence interval assumed. He asked the applicant to discuss the 100 year history record of hurricane within 50 miles of the site. Regarding tornado wind speed, he also questioned the use of Regulatory Guide 1.76 Region II parameters for STP design purposes as the site appeared to be closer to Region I in the map. Mr. Daley stated that STPNOC would be prepared to discuss these questions during the Chapter 2 presentation (scheduled for November 30, 2010). These questions were entered in the ACRS Action Item List (items 54 and 55) for future follow up.

Mr. Coley discussed FSAR Section 3.4, "Water Level (Flood) Design." The design basis flood level had been revised from the DCD number to account for the failure of the main cooling reservoir. Upon Member Armijo's question, Mr. Head noted that a different break in the reservoir was assumed for Units 1 and 2 that resulted in a higher flood level. Member Stetkar asked the applicant to confirm that the reactor building rail/truck access bay opening door was indeed watertight. He also asked STPNOC to provide the elevations for the reactor service water (RSW) pump house foundation waterproofing membrane application compared to the grade level (FSAR Section 3H.6.6.4). He asked the applicant to clarify various water level parameters discussed in Chapter 3 and how they were derived. These questions were entered in the ACRS Action Item List (items 56, 57 and 58) for future follow up.

Section 3.4.1.1.2.5 of the FSAR noted an automatic means of shutting down the Circulating Water System and Turbine Service Water (TSW) System in the event of flooding in the Turbine Building that was inconsistent with Chapter 19 discussion indicating the pump trips to be manual. Mr. Daley reported later (during Chapter 9 discussion) that the Chapter 19 discussion was correct and STPNOC would revise the FSAR to reflect that.

Regarding Section 3.5, "Missile Protection," Chairman Abdel-Khalik re-iterated the Committee's desire to review the turbine maintenance program and missile analysis as indicated in the ACRS interim letter dated August 9, 2010. This request had been entered in the ACRS Action Item List already as item 42 for future follow up. STPNOC stated that they plan to submit the document sooner than previously committed "within 3 years after receiving a COL." Regarding the Chapter 10 discussion of minimum reliability requirement related to turbine missile

generation, Member Stetkar asked the applicant to address why a value of 1×10^{-2} per year per plant was chosen as a conservative value for the product of strike and damage probabilities (conditional probability of impact and damage given impact). Mr. Head noted they plan to discuss these issues during the next Chapter 10 presentation. This question was entered in the ACRS Action Item List (item 59). A discussion ensued regarding impact on Units 1 and 2.

No site proximity missiles or aircraft hazards were identified for the site. Regarding commercial aircraft crash evaluation, STPNOC noted that a detailed discussion on types of aircrafts and frequency etc. were discussed in their letter dated September 14, 2009 in response to an RAI. A copy of the letter was provided to the ACRS members after the meeting.

Mr. Chappell discussed the significant issues including the departures and COL information items in Section 3.6, "Protection against Dynamic Effects Associated with the Postulated Rupture of Piping." A Tier 1 departure changed the minimum steam tunnel wall thickness from 2 meter in the DCD to 1.6 meter supported by analysis. Chairman Abdel-Khalik wanted to know if the evaluation considered the maximum design basis pressure resulting from a LOCA (main steam line break) in the steam tunnel. At a later time during the meeting, Mr. Bob Quinn of Westinghouse responded to this question by noting that the wall was design for the combination of safe shutdown earthquake plus high-energy line break requirements. However, radiation shielding was the most restrictive consideration regarding the steam tunnel wall thickness and not the design basis pressure in combination with a safe shutdown earthquake load.

STPNOC presentation on Section 3.9, "Mechanical Systems and Components," included several Tier 1 and Tier 2 departures, COL information items, use of Code Cases in pre-service and in-service testing (PST and IST), and one relief request on RHR keep-fill pump flow measurement. STPNOC also discussed the surveillance and testing requirements for the explosive actuated squib valves used in the automatic traversing incore probe system. Upon Member Armijo's question, Mr. Daley stated that standard departure related to incore guide tubes and stabilizers was consistent with the Japanese application of the ABWR.

Regarding Section 3.10, "Seismic and Dynamic Qualification of Mechanical and Electrical Equipment," STPNOC noted that the seismic and hydrodynamic spectra are bounded by the DCD and that the equipment qualification records would be available prior to installation. No seismic Category I equipment is qualified by experience at STP 3 and 4.

Section 3.11, "Environmental Qualification of Safety-Related Mechanical and Electrical Equipment" – Member Stetkar asked the applicant to address the basis for the FSAR statement that indicated the safety-related remote digital logic controllers housed in emergency electrical equipment room would be "inherently unaffected by their own heat sources." STPNOC noted that the room where these equipment are located has safety related ventilation system and the cabinets holding the controllers are well ventilated also.

NRO Staff Presentation on Chapter 3

Mr. Tom Tai, the NRO PM for Chapter 3, introduced the NRO staff, and provided a brief outline of staff presentation on the topics of interest (Subsections 3.4.2 and 3.9.3). Mr. David Jeng of NRO presented the staff review of Subsections 3.4.2, "Analytical and Test Procedures." The issue raised by the staff involved the STP design basis flood level that was increased from the DCD number and the ability of the STP structures to withstand the increased hydrostatic and hydrodynamic loads (including waves). He noted that the applicant used an earlier version of the ASCE Code compared to the SRP resulting in smaller wave heights. Upon various members'

exploring, Mr. Jeng noted that the consideration of waves would result in 10 to 15 % increase in flood level. The applicant has been asked to revise the wave height or justify the deviation from the SRP (open item). Upon Member Bley's question Mr. Jeng noted that there are ITAACs on watertight doors. STPNOC noted that the analysis of flood elevation including wave height would be presented during the Chapter 2 briefing. The question on SRP deviation related to wave heights was entered in the ACRS Action Item List (item 61) for future follow up.

Mr. Tuan Le of NRO presented the results of the staff review of Section 3.9.3, "ASME Code Class 1, 2, and 3 Components, Component Supports, and Core Support Structures." He discussed the SER open items that included staff review of the ECCS strainer design reports and ITAAC resolution. STPNOC will provide the design specification to the staff during the first quarter of 2011 for review prior to an audit. Design reports will be available later. Upon Member Brown's question a discussion ensued regarding the STPNOC proposed use of the Japanese Society of Mechanical Engineers Code in the design of ECCS strainers. Mr. Le explained the issue identified by the staff in that the STP analysis did not adequately address the ASME code requirement for the load combination stipulated in the DCD. STPNOC noted that they agreed to construct the strainers to the ASME codes after staff's questioning.

Mr. Tom Scarbrough of NRO responded to Member Stetkar's question regarding the extension of diagnostic test intervals based on future completion of a risk-informed evaluation (use of the OM Code Cases) in Section 3.9.6, Testing of Pumps and Valves. The staff has been working on updating RG 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code" to accept the most recent revision of the OM Code Code Cases. This will include the OMN-1 and other Code Cases that are being used in STP. The regulatory guide accepted the OMN-1, Rev. 0, which allows extension of the quarterly motor operated valve (MOV) stroke time testing to every outage and diagnostic tests at a longer interval, with conditions. These conditions would require evaluating valve conditions before changing the test frequency. He noted the staff wanted to make sure that any change to the test program is made in a deliberate and slow manner with ongoing gathering of diagnostic test data that demonstrate design basis capability. For high risk MOVs, staff found that the plant PRAs take credit for quarterly stroke time testing. Hence they asked that plants look at how the change would affect the CDF or the PRA. Rev.1 of OMN-1 that STP plans to use has not been addressed in the regulatory guide. STP plans to submit a relief request with FSAR revisions that address the conditions on Rev. 0 of the Code Case. Members Stetkar and Bley were concerned about the maturity of the STP PRA at the COL stage, and Mr. Scarbrough noted that STP has to have an acceptable risk ranking methodology. Member Bley wondered if extension of the test period could result in new types of failure modes. Mr. Scarbrough stated that the test interval can only be extended up to the next outage and any issues or failure modes seen during exercising of valves have to be considered in test program revisions. The members noted that they would like to review the draft revision of the regulatory guide before it is issued.

Chairman Abdel-Khalik went over the action items for future follow-up resulting from the discussion above, after that the meeting broke for lunch.

STPNOC Presentation on Chapter 9

Messrs. Coley Chappell and Tom Daley of STPNOC made the applicant's presentation on Chapter 9 which includes various plant water and auxiliary systems. Sections 9.1.1 and 9.1.2 on new and spent fuel storage were deferred as staff SER was not available. Mr. Chappell briefly discussed the departures, COL and site specific supplemental information, and associated ITAAC. Some parts of the systems under this chapter were not addressed in the DCD. Regarding FSAR Section

9.2.5.5.2, Member Stetkar wanted to know about the basis and application of the 30 minute response time upon a single passive failure of the RSW piping stated in the section. He also wanted to know how the analysis justifying a 30 day supply requirement for the UHS accounted for the pipe failure. This was taken as a follow-up action item for the applicant to respond to at a future briefing (Item 62 on ACRS Action Item List). For the UHS, STPNOC replaced the DCD concept of a spray pond with reinforced concrete basins and force draft cooling towers separate for each unit. The STP well water is the primary source of the makeup water to the UHS water storage basin. Upon member's question, the applicant noted that they plan to dig two more wells to extend the water supply.

FSAR Section 9.2.15.2 states that the available NPSH to the RSW pump is approximately 17 meters. Member Stetkar wanted to know the basis for this number and how it was calculated. Although to be verified by a site specific ITAAC, his concern was that at the end of the 30 day period the NPSH may be lower. Mr. Jim Agles of STPNOC noted that the recently submitted revision 4 of the FSAR made certain revisions. STPNOC took this question as an action item for future follow up (Item 63 on ACRS Action Item List).

Upon Member Ryan's question, Mr. Head noted that the upgraded stainless steel piping for the radwaste system would use butt welding. Mr. Chappell discussed the ventilation system, and the members asked a few questions seeking further clarification. For the STP fire protection program, the applicant adopted the NEI guidance as modified by the RG 1.189, rev. 2, "Fire Protection for Nuclear Power Plants," as it applies to single and multiple spurious actuation.

Regarding the lower drywell flooder, Members Stetkar and Bley asked about information on operational details, failure modes and operating experience. Member Bley was concerned that a small leak during normal operation would go undetected thus accumulating water in the lower drywell. A discussion ensued and the applicant noted that a Toshiba test was ongoing. This item was discussed at the last ABWR briefing on Chapter 19, and a follow-up item (Item 41) exists in the ACRS Action item list.

NRO Staff Presentation on Chapter 9

Mr. Tom Tai, NRO PM for Chapter 9 introduced the technical reviewers and provided a status of the only open item in Chapter 9 related to the increased diesel generator room temperature which had been resolved (discussed later). The staff planned to present only two areas of technical interest, namely the UHS and the fire protection program. Mr. Angelo Stubbs of NRO discussed the staff review of Section 9.2.5 on UHS. He noted that site specific ITAAC will verify the TSW pump NPSH for adequate margin. The staff had received the Rev. 4 of the FSAR recently, but did not complete their review.

Mr. Dennis Andrukat discussed staff review of Section 9.5.1, Fire protection including how the COLA was revised to address multiple spurious actuations following the industry guidance in NEI 00-01, Rev. 2, "Guidance for Post-Fire Safe Shutdown Circuit Analysis." STP will also use NUREG 1852, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire." Regarding spurious signal generation, Member Stetkar wanted to know if generation of such signal in digital I&C cabinets containing only fiber optic cables should be considered. His concern was that heat effect of fire in the room could result in the cabinet generating spurious signals (similar to a laptop computer). A detailed and long discussion ensued. Mr. Andrukat noted that the staff did not consider all the implications of this generic question and the staff would address this question at a future briefing (Item 64 on ACRS Action Item List).

STPNOC Presentation on ACRS Action Items

Before going into discussion of the existing ACRS action items, Mr. Head noted that their September 14, 2009 letter provided detailed commercial aviation related statistical information and calculation of average crash rates and probability of impact on STP 3 and 4. This letter will be made available to Member Stetkar. Mr. Head summarized the information in this letter.

Mr. Chappell addressed nine of the ACRS action items on the list that were open. The first one (Item 2) dealt with human habitability inside the DG room with maximum temperature of 60 degrees C. Messrs. Agles and Head addressed the item, and noted that STP industrial safety procedures would address the issue of heat stress and at such high temperatures operators would be prohibited from entering the room. With the local control panel outside the room, all operator actions can be taken without entering the room. Also, once lost, the recovery of a DG is not credited in the design basis analyses, thus precluding any reason to enter the room. Based on this information Chairman Abdel-Khalik noted that the action item could be closed.

STPNOC made changes to the FSAR and technical specification (TS) bases to address 1988 Part 21 report on BWR operation with a main steamline isolated (Item 4 of the list). Mr. Chappell discussed the resolution. STPNOC currently does not plan to operate with one main steamline isolated. But the FSAR and TS changes will require completion of an analysis justifying such an operation if they ever decide to operate under that condition. Upon Member Rempe's question, Mr. Head noted that such an analysis would be done under the 10 CFR 50.59 process. This item was closed.

Regarding Action Item 9 on underground piping carrying radioactive fluid, STPNOC committed to the industry guidance in NEI 08-08A on minimizing facility contamination. Additional design features like use of corrosion resistant material (carbon steel), welded connections and enclosing tunnels were discussed. Member Ryan wanted to know if the applicant plans to use any wrappings or coatings on such pipes. This item was left open pending further clarification.

Action Item 27 on offsite power switching logic under electrical transients was discussed with the Chapter 8 presentation (slides 7-10). This item was closed. Action items no. 30 on DRAP list was discussed also. STPNOC provided a copy of a draft list that had been reviewed by their expert panel. Mr. Chappell noted that the panel had only recommended minor changes. STPNOC will provide a presentation on the expert panel process with examples at a future meeting. The members wanted to get a copy of the staff's audit report when completed.

Action item 33 on comparison of steam velocity numbers for ABWR vs. the BWR design was closed upon STPNOC presentation (slide 15). Action item 36 was closed when STPNOC noted (slides 16, 17) that the text clarification on description of SCRAM actuating relays was withdrawn.

STPNOC discussed the results of the failure modes and effects analysis on flooder valve (Action Item 41). There was some discussion of the potential failure modes and method of detection

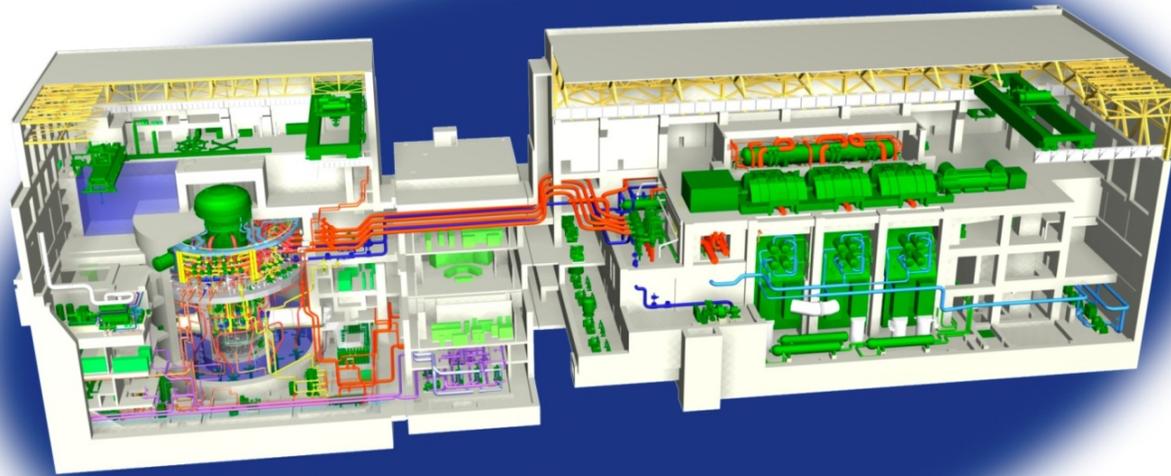
(lowering of suppression pool level). Member Bley asked if STPNOC considered a slow leak through the valve resulting in water in lower drywell. STPNOC will provide an update at a future meeting.

Chairman Abdel-Khalik asked the ACRS members for input or comments. Chairman Abdel-Khalik expressed thanks to both STPNOC and the staff for very informative presentations, and adjourned the meeting at 3:38 PM.

Attachments:

1. ACRS ABWR Subcommittee Action item list
2. Slides - STP 3 &4 Presentation to ACRS Subcommittee – ACRS Action Items

South Texas Project Units 3 & 4 Presentation to ACRS Subcommittee ACRS Action Items



Agenda

- Working Action Items List
- Action Items Discussion

Attendees

Scott Head	Regulatory Affairs Manager, STP 3&4
Evan Heacock	Design Engineering Manager
Thomas Daley	Mechanical Systems Supervisor
Coley Chappell	Regulatory Affairs, STP 3&4

Working Action Items List

No.	Action Item	Owner, <i>date resolved</i>
1	Fuel-related topical reports and fuel change (amendment to COL)	<i>Resolved 4/9</i>
2	Address DG qualification to 60° C, occupancy issues and HVAC changes	<i>DG EQ resolved on 3/18; Remainder discuss Ch 9</i>
3	Part 21 reports issued on stability analysis	<i>Resolved 3/18</i>
4	Part 21 issues that affect the ABWR design	STP/NRO
5	Deletion of MSIV closure and scram on high radiation	<i>Resolved 3/2</i>
6	FW line break mitigation, accident is not described in Chapter 15	<i>Resolved 6/24</i>
7	Address FPGA in more detail. Application of Common Q platform.	STP (<i>FPGA resolved 5/20</i>)
8	Address GSI-191 flow blockage (not just for fuel). This item is part of No. 47.	<i>Resolved 6/24</i>
9	Address underground piping carrying radioactive liquids	STP/NRO
10	New GALE code	<i>Resolved 3/18</i>
11	Disparity between presentations related to x/q values bounded by DCD	<i>Resolved 3/2</i>
12	How specific DAC acceptance criteria are amenable to staff inspection	ACRS
13	How adding wetwell pressure indication on SPDS gives higher assurance of control room capability post accident	NRO
14	EDG qualification to increased ambient temperature	<i>Resolved 3/18</i>
15	SER conclusion on operator ability to switch from digital MCR to analog RSS	NRO
16	Staff review of HFE	<i>ACRS closed</i>

Working Action Items List (cont'd)

No.	Action Item	Owner, <i>date resolved</i>
17	Staff needs to formalize handling of DAC	ACRS / NRO (See #12)
18	SER open item 1-3 on aging management	ACRS / NRO
19	Comparison of occupational doses	<i>Resolved 3/18</i>
20	RCIC cycles during an 8 hour SBO event	<i>Resolved 6/8</i>
21	Rx vessel EOL fluence value and error band	<i>Resolved 3/18</i>
22	Consistent use of a set of units (English or Metric) in plant documents	<i>Resolved 6/24</i>
23	RCS leakage Tech Spec limits and instrument sensitivity	<i>Resolved 6/24</i>
24	East transmission lines capacity	<i>Resolved 6/8</i>
25	Single or double closing coils on switchyard breakers	<i>Resolved 6/24</i>
26	Switchyard control system backup battery discharge time	<i>Resolved 6/8</i>
27	Switching logic under various electrical transients	STP, discussed on 6/8
28	SBO rule, operator actions, and CTG startup time within 10 minutes	NRO
29	Qualification of submerged 345 KV cables	<i>Resolved 6/8</i>
30	D-RAP list and staff review	STP/NRO
31	RAT 4.16 kV winding capability	<i>Resolved 6/8</i>
32	Identification of ESF (and RPS) overlap testing, end-to-end testing	<i>Resolved 6/24</i>
33	Steam velocities for STP3&4 (compared to extended uprate plants)	STP, discuss Ch 3

Working Action Items List (cont'd)

No.	Action Item	Owner, <i>date resolved</i>
34	Staff to provide FIV reports for ACRS review	NRO
35	Cyber Security ITAAC	NRO
36	Apparent discrepancy between STD DEP 7.2-2 text and Figure 7.2-8	STP
37	Provide copy of SSAR for ACRS review	<i>ACRS, closed</i>
38	Provide copy of RAI letter with white paper for departure screenings	<i>Resolved 6/10</i>
39	Provide copy of RAI letter with USACE report on dam failure	<i>Resolved 6/10</i>
40	Provide copy of U.S. Bureau of Reclamation report on dam failure	<i>Resolved 6/10</i>
41	Address failure modes of lower drywell fusible plugs to pass water	STP
42	Main turbine missile analysis and maintenance program	STP/NRO, discuss Ch 3
43	Documented basis for turbine rotor integrity (FATT and Cv) departure	STP/NRO
44	NRO process for review of Tier 2 departures	ACRS
45	Provide RAI response on turbine overspeed sensor redundancy and diversity	STP
46	Identify and justify chemical effects analysis assumptions on Boron in solution	STP
47	Downstream effects: future briefing on licensing condition basis for fiber (1 ft ³)	STP/NRO
48	Provide three ERI reports used in staff review of containment analysis	NRO
49	Future briefing on design of vacuum breaker shield (loading and water level)	STP

Action Items for Discussion

- (#2) Address emergency diesel generator qualification to 60° C, occupancy issues, and HVAC changes
- (#4) Part 21 issues that affect the ABWR design
- (#9) Address underground piping carrying radioactive liquids
- (#27) Switching logic under various electrical transients
- (#30) D-RAP list and staff review
- (#33) Steam velocity numbers for STP 3 & 4
- (#36) Discrepancy between STD DEP 7.2-2 text and Figure 7.2-8
- (#41) Address failure modes of lower drywell flooders fusible plugs to pass water
- (#42) Main turbine missile analysis and maintenance program

Action Item #2

Address Emergency DG qualification to 60° C, occupancy issues, and HVAC changes.

Response: Discussed with Chapter 9 presentation.

Action Item #4

Part 21 issues that affect the ABWR design.

Response: 10 CFR Part 21 notice (2002-21) was issued due to an inadequate 1988 analysis for BWR operation with a main steamline (MSL) isolated (MSIV OOS). The analysis did not address long-term flow induced vibratory loads on MSIVs in operating steamlines.

STP 3&4 has not completed an analysis to allow continued operation with one MSL isolated at reduced reactor pressure and steam flow, and does not propose to operate in that condition without an adequate analysis.

This issue is addressed in the ABWR DCD (Tier 2) as shown on the following slide.

Action Item #4 (cont'd)

Subsection 7.2.1.1.4.3 (3) provides a MSL Isolation Special Bypass, manual bypass for one MSL isolation trip output signal to allow continued operation while any one MSL is isolated without causing a half-scam condition.

Only one channel may be bypassed at a time. The remaining MSLs revert to 2/3 trip logic such that isolation of a second MSL will result in a half-scam condition.

As stated in Subsection 7.2.2.2.3.1 (12), this special bypass allows flexibility for testing and continued reduced power operation in the possible event of MSIV malfunction such that up to two MSLs can be isolated, for testing or otherwise, without resulting in a full scram, provided load is reduced to limit reactor pressure and steam flow.

Nevertheless, a weakness in the ABWR Technical Specifications was identified through interaction with NRC staff.

Action Item #4 (cont'd)

To address continued plant operation following isolation of a main steamline, information (STD DEP 16.3-105) was added to the Technical Specification Bases for:

- LCO 3.6.1.3, PCIVs, Required Actions (RA) A.1 and A.2;
- LCO 3.3.1.1, SSLC Sensor Instrumentation, RA Q.1, Q.2; and
- LCO 3.3.1.2, RPS and MSIV Actuation, RA L.1, L.2.

“An analysis of the effects of flow-induced vibration on the remaining open MSIVs and other critical components in the reactor and steam systems must be performed prior to continued operation with an isolated main steamline. Continued plant operation must remain within the bounds of this analysis.”

Similar statements were included in appropriate FSAR subsections.

Action Item #9

Address underground piping carrying radioactive liquids.

Response: To address 10 CFR 20.1406, STP 3 & 4 has committed to NEI 08-08A guidance for operational programs and for plant design as applicable to departures and site-specific SSCs. FSAR Section 12.3.9 describes the ABWR DCD design features credited by NEI 08-08A.

Selection of corrosion-resistant materials and design considerations, such as use of welded piping (vice flanged) to the extent practical, limit the potential for leakage of radioactive fluids.

All below-grade piping carrying radioactive fluids is enclosed in tunnels designed to contain potential leakage. During operation, periodic walkdowns of systems carrying radioactive fluids will provide for early detection and correction of potential leakage conditions.

The STP 1 & 2 site groundwater monitoring program currently in place complies with NEI 07-07A, and will be modified to include STP 3 & 4.

Action Item #27

Performance of switching logic under various electrical transients.

Response: Discussed with Chapter 8 presentation.

Action Item #30

Design reliability assurance program (D-RAP) list and staff review.

Response: The RAP activities for important SSCs are included in FSAR Table 19K-4, "Failure Modes and RAP Activities," as modified by departures. Other components are incorporated by reference from ABWR DCD Tier 2 Table 19K-4. Significant human errors are addressed in Subsection 19D.7.

An audit of the STP 3&4 D-RAP records and procedures will facilitate the staff's determination that the list of risk-significant SSCs within the scope of D-RAP is being developed appropriately and in accordance with the methodology described in FSAR Subsection 17.4S.1.4, "Methods of Analysis for Risk Significant SSC Identification."

The expert panel will complete all system reviews, provide a list of the set of D-RAP SSCs, and have the program elements in place to control future activities by the third quarter of 2011. (COM 17.4-1)

Action Item #33

Steam velocity numbers for STP 3 & 4.

Response: Comparison of NSSS design characteristics (approximated):

	STP 3&4 ABWR	Grand Gulf ⁽¹⁾ BWR/6	BWR/5 ⁽²⁾	Quad Cities ⁽³⁾ BWR/3
Rated Power (MWt)	3926	3833	3489	2885
Steam Flow (Mlbm/hr)	16.8	16.5	15.1	11.5
MSL pipe diameter (in.)	28	28	28	20
Steam velocity (ft/sec)	144	140	130	205

As noted, data points for comparison with BWR power uprates:

- (1) Grand Gulf numbers do not reflect 65 MWt MUR (2002)
- (2) Typical for BWR/5, based on LaSalle 1&2 166 MWt EPU (2000)
- (3) Quad Cities 1&2, 446 MWt EPU (2001)

Action Item #36

Apparent discrepancy between STD DEP 7.2-2 text and Figure 7.2-8

Response: The text clarification made by STD DEP 7.2-2, “Description of SCRAM Actuating Relays,” as presented in COLA in Revision 3, was withdrawn (U7-C-STP-NRC-100159, dated July 8, 2010).

This departure did not change the ABWR DCD design.

As described in Tier 2 Subsection 7.2.1.1.4.1 (3), when in a tripped state, the backup scram relay coils de-energize and close the normally-closed relay contacts to cause energization (125 VDC power source) of the backup scram air header dump valve solenoids to initiate venting the air header, causing the control rods to be inserted.

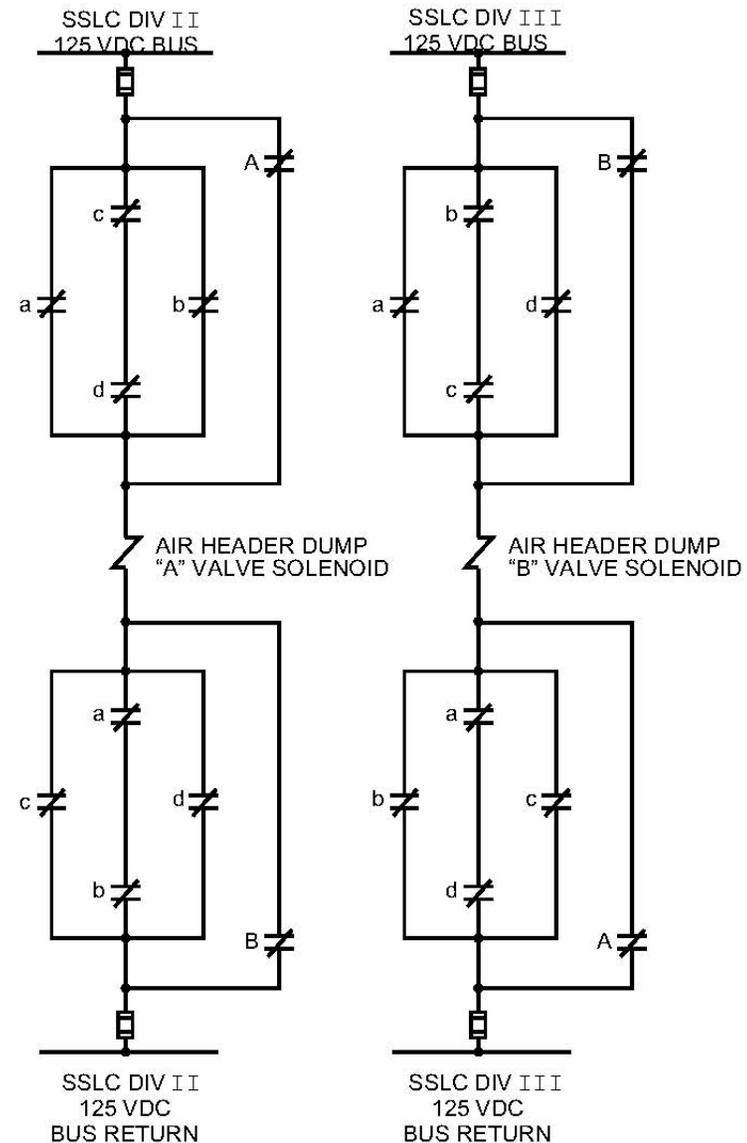
This description is consistent with the interrupting device arrangement in the scram logic circuitry shown in Figure 7.2-8, Scram Solenoids and Air Header Dump Valves Power Distribution.

Action Item #36 (cont'd)

ABWR DCD Tier 2 Subsection
7.2.1.1.4.1 General RPS Equipment

(3) Divisions of Trip Actuators

Normally closed relay contacts are arranged in the scram logic circuitry between the air header dump valve solenoids and air header dump valve solenoid 125 VDC power source such that, when in a tripped state (coil de-energized), the relays will cause energization of the air header dump valve solenoids (air header dump initiation). All relays within a division interconnect with relays in all other divisions into two separate two-out-of-four air header dump logic arrangements (Figure 7.2-8).



Action Item #41

Address failure modes of lower drywell flooders fusible plug valves to pass water.

Response: A Failure Modes and Effects Analysis (FMEA) for the lower drywell flooders fusible plug valves (FPV) was conducted. FMEA functional requirement for the FPV is zero leakage under all operating and DBA conditions.

FMEA results show that the FPV design, methods for detecting FPV leakage, and recommended actions to reduce risks are appropriate for the assumed potential failure modes:

- Valve damage
- Improper (false) operation
- Seat leakage
- Flange leakage

The assumed potential failure modes were postulated to occur from assembly/manufacture defect, strength poverty, use of defective parts and fusible metals, improper installation, and earthquake/vibration.

Action Item #42

Main turbine missile analysis and maintenance program.

Response: Discussed with Chapter 3 presentation.

ACRS Action Items

Questions and Comments



ACRS ABWR Subcommittee Action Items

No.	MTG/ date generated	ACTION ITEM	CONTEXT	AREA	LEAD(s)	COMMENTS / ACTION / DISPOSITION	Date Resolved
March 2, 2010 Subcommittee Meeting							
1	3/2/10	<p>Dr. Armijo expressed interest in the fuel related topical reports and the effect of the fuel change (amendment to COL) on the analyses in Chapters 4 and 15.</p> <p>Communicate ACRS desire to review fuel amendment (first reload) application that replaces GE 7 fuel (DCD) to contemporary fuel (Armijo)</p>	Chapter 4	SER	NRG/ACRS (Abdullahi/ Banerjee)	<p>Potential impact to other areas including Chapters 6 and 15 in addition to Chapter 4.</p> <p>Closed as Follows: A list of fuel amendment related technical/ topical reports has been provided. ACRS (Dr. Armijo lead) to determine which ones the Committee would like to review and the responsible Subcommittee(s). Proposal to be presented at the April P&P.</p> <p>ACRS, with Member Banerjee's lead, will review the TRs.</p>	4/9/10
2	3/2/10	<p>Future presentation of staff and STP to address diesel qualification to 60 degrees C, related occupancy issues and HVAC changes. (Abdel-Khalik)</p>	Chapter 9	COLA/SER	STP/NRO	<p>STP to provide additional discussion on habitability at future Subcommittee meeting on impact of higher temperature (departure T1 2.15-2) when Chapter 9 is presented to the Subcommittee. The issue of diesel qualification was addressed at 3/18/10 meeting and <u>the issue of habitability was addressed at 10/20/10 meeting</u> satisfactory to the members.</p>	<u>10/20/10-closed</u>

ACRS ABWR Subcommittee Action Items

No.	MTG/ date generated	ACTION ITEM	CONTEXT	AREA	LEAD(s)	COMMENTS / ACTION / DISPOSITION	Date Resolved
3	3/2/10	Part 21 reports issued on stability analysis post DCD need to be addressed (Abdel-Khalik)	Chapters 4 and 15	COLA/SER	STP/NRO	<p>STP and staff to address at March 18, 2010 meeting. Closed as follows:</p> <p>STPNOC will provide an updated Stability Option III analyses including resolution of the Part 21 issues before fuel load (COM 4.4-3)</p> <p>Staff will follow-up commitment through established processes.</p>	3/18/10
4	3/2/10	Part 21 reports issued post DCD - how staff identifies, captures and addresses Part 21 issues that affect the ABWR design? (Abdel-Khalik)	Chapters?	COLA/SER	NRO/STP	<p>Staff plans to address it at a future meeting.</p> <p>STP is preparing a list of all applicable Part 21 items since original design certification and will develop a process to address them in the COLA space. Staff to follow-up and address at a future ACRS meeting. STP provided additional information on 6/8/10 (slides 8 and 9) and at 10/20/10 (slides 9 -11, ACRS Action Items). STPNOC made changes to FSAR and TS bases to address 1988 Part 21 on BWR operation with a MSL isolated.</p> <p>Also, how to address it process-wise. The EDO response dated 9/10/10 to ACRS interim letter, dated 8/9/10, committed to develop guidance for addressing Part 21 reports in new reactor licensing process. The staff will update ACRS when such guidance is completed.</p>	This item is closed.

ACRS ABWR Subcommittee Action Items

No.	MTG/ date generated	ACTION ITEM	CONTEXT	AREA	LEAD(s)	COMMENTS / ACTION / DISPOSITION	Date Resolved
5	3/2/10	Deletion of MSIV closure and scram on hi radiation	Chapters 7 and 19	DCD	-	BWROG Topical Report reviewed and approved by NRC. Closed	3/2/10
6	3/2/10	FW line break mitigation – This accident is not described in Chapter 15 (Abdel-Khalik).	Chapter 6	COLA/SER	STP/NRO	The applicant stated that this accident does not affect Chapter 15 doses and that the entirety of the accident and its effects will be discussed in the presentation on Chapter 6. Addressed during 6/24/10 meeting. Refer to Sections 6.2, 6.3 and 15.6.	6/24/10
7	3/2/10	FPGA – address in more detail (e.g., inter-channel communication, determinancy) Application of Common Q platform (Brown)	Chapter 7	COLA/SER	STP/NRO	Staff to discuss at 5/20 meeting. NRO to provide documents to Subcommittee in advance of briefing on this topic as needed. Based on 5/20 meeting FPGA is closed. Application of Common Q platform, independence and determinancy are being considered by Member Brown.	
8	3/2/10	Address GSI-191 flow blockage (not just for fuel) (Abdel- Khalik)	Chapter 6	COLA/SER	STP/NRO	Staff and STP to discuss this issue during presentation on strainers and downstream effects testing as part of Chapter 6 on 6/24, 2010. This item is part of item 47.	6/24/10

ACRS ABWR Subcommittee Action Items

No.	MTG/ date generated	ACTION ITEM	CONTEXT	AREA	LEAD(s)	COMMENTS / ACTION / DISPOSITION	Date Resolved
9	3/2/10	Address how underground release is handled (e.g., H3) in STP design and operational programs. Address if underground piping carrying radioactive liquids run through tunnels, designed for zero leakage, or above/ below the water table. (Ryan)	Chapter 11	COLA/SER	STP	<p>To be discussed at a future meeting. Implementation of commitments made in STP RAI response, letters U7-C-STP-NRC-100156, 6/30/10 and U7-C-STP-NRC-090121, 8/26/09, and staff follow-up will be the subject.</p> <p><u>AT 10/20/10 ABWR SC - STPNOC slide 12 on Action Items, committed to NEI 08-08A. More details about corrosion resistance of material, coatings, wrappings and types of connection (flanged?) were asked.</u></p>	
10	3/2/10	GALE code – impact of the very conservative approach used by the staff and need for uncertainty analysis and use of actual experience data. (Ryan)	Chapter 12	SER	NRO	<p>Dr. Ryan asked if staff has any insights on how results from the new GALE code will compare to results from the old GALE code. What impact is this likely to have on the application? He also expressed concern regarding the effect on the applicant of making significant changes to RGs in the middle of a review?</p> <p>Staff to address this issue generically at a future meeting.</p> <p>Staff discussed the issue at 3/18/10 SC meeting to Committee's satisfaction. The issue is closed.</p>	3/18/10

ACRS ABWR Subcommittee Action Items

No.	MTG/ date generated	ACTION ITEM	CONTEXT	AREA	LEAD(s)	COMMENTS / ACTION / DISPOSITION	Date Resolved
11	3/2/10	Disparity between staff and STP presentation related to all x/q values being bounded by DCD.	Chapter 15	SER	NRO	Staff acknowledged error in presentation slides. Issue closed.	3/2/10
12	3/2/10	Related to HFE, how specific DAC acceptance criteria be amenable to staff inspection (Bley)	Chapter 18	SER	ACRS	<p>DAC issues will be closed after the issuance of the COL. This means that the Committee will not be able to track the closure of DAC-related technical issues before they are requested to write a letter on the staff's SER.</p> <p>ACRS to receive briefing on digital I&C DAC at 570 ACRS meeting on 3/5/10, and decide if further follow-up is needed.</p> <p>Also see item 17. <u>At 10/20/10 ABWR SC meeting members decided that this issue will be rolled into the generic ACRS comments on the DAC process. This item was closed.</u></p>	<u>10/20/10</u>
13	3/2/10	Subcommittee would like a better understanding of how adding dry/wetwell pressure indication on SPDS gives higher assurance of control room capability post accident when SPDS is non-safety related (Stetkar)	Chapter 18	SER	NRO	<p>Staff to provide additional information to ACRS.</p> <p><u>Staff presentation at 10/20/10 ABWR SC meeting. See meeting minutes. This item was closed based on information provided and the application of the HFE process.</u></p>	<u>10/20/10</u>

ACRS ABWR Subcommittee Action Items

No.	MTG/ date generated	ACTION ITEM	CONTEXT	AREA	LEAD(s)	COMMENTS / ACTION / DISPOSITION	Date Resolved
14	3/2/10	EDG qualification to increased ambient temperature (Stetkar)	Chapters 8, 9	FSAR/SER	STP/NRO	STP to discuss at next meeting. DG qualified to room temperature and electronics are located in cabinet outside room. This item is closed.	3/18/10
15	3/2/10	Subcommittee would like a better understanding of the basis for SER conclusion related to MCR and RSS and operator ability in switching from a digital MCR to analog RSS (Stetkar)	Chapter 18	SER	NRO	Staff to address this question in the context of the Chapters 7 and 18 discussions on RSS. Staff presentation at 10/20/10 ABWR SC meeting. See meeting minutes. This item was closed based on information provided and the application of the HFE process through design and operator training.	10/20/10
16	3/2/10	May need more aggressive staff review of HFE. Dr. Bonaca indicated that he might have questions on Chapter 18 (human factors engineering) after he reflected on the presentation. (Bonaca)	Chapter 18	SER	ACRS/NRO	Staff to address: Dr. Bonaca referring to questions from Dr. Stetkar above – Treatment of SPDS, core cooling display parameters and their bases. Closed-refer to item 15 above.	Closed
17	3/2/10	Staff needs to formalize handling of DAC	Chapter 18	NRO Programs	ACRS/NRO	ACRS comments in their 7/24/09 letter applies, plus another letter is expected to be drafted in July 2010. At 10/20/10 ABWR SC meeting members decided that this issue will be rolled into the generic ACRS comments on the DAC process. This item was closed.	10/20/10

ACRS ABWR Subcommittee Action Items

No.	MTG/ date generated	ACTION ITEM	CONTEXT	AREA	LEAD(s)	COMMENTS / ACTION / DISPOSITION	Date Resolved
18	3/2/10	Related to SER open item 1-3 on aging management, it was noted that detailed technical review is conducted under license renewal process when it should be an issue to consider from the first day on. Dr. Stetkar noted that additional guidance in the area may be helpful.	Chapter 1	Aging management	ACRS/NRO	Staff plans to close this issue in the staff's final SER with no open items.	
19	3/2/10	Occupational doses received from ABWRs and how they compare to occupational doses at other reactors. Can we compare ABWR to other Japanese BWRs as well as to U.S. BWRs? (Ryan)	Chapter 12	ABWR occupational dose	NRO	Staff to address this issue at a future meeting. At 3/18 SC meeting, NRO and STP provided occupational dose data for Japanese and US BWRs since 1993 and the average dose for the Kashiwazaki-Kariwa plants, two of which are ABWR units, from 1997 thru 2002.	3/18/10

ACRS ABWR Subcommittee Action Items

March 18, 2010 Subcommittee Meeting							
20	3/18/10	Number of times RCIC is expected to cycle on and off during an 8 hour SBO event (Stetkar)	Chapter 5	RCIC	STP	RCIC qualification and Operator response may be challenged due to repeated cycling (Response-4 times during 8 hr. SBO-STP slide 18 and 19, 6/8/10 ABWR SC-Closed)	6/8/10
21	3/18/10	Rx vessel EOL fluence value and error band (Abdel-Khalik/Armijo)	Chapter 5	Rx Vessel Material	STP	COLA uses DCD value, will be updated once PTLR is finalized/approved	3/18/10
22	3/18/10	Ensure all documents (engineering, design, procedures, PTS etc) at the plant use a consistent set of units (either British or Metric). (Abdel-Khalik)	All	All	STP	Too may number of problems and near misses happen when operators and technicians at the plant have to take action based on inconsistent units. Closed per STP slide 8&9 presented at 6/24/10 meeting.	6/24/10
23	3/18/10	Address how K6 and K7 RCS leakage TS limits compare with proposed STP numbers, and justify STP limits, if higher. Also address instrument sensitivity and how it compares with 1 gpm number. (Armijo)	Chapter 5	PTS	STP	Unidentified leakage limit was increased from 1 gpm DCD value to 5 gpm STP TS as STP is not using LBB. Closed per STP slide 10&11 presented at 6/24/10 meeting.	6/24/10
24	3/18/10	Confirm that East transmission lines are capable of supplying all 4 units' safety loads when other lines are lost. (Stetkar/Sieber)	Chapter 8	FSAR	STP	Concern was that given shared transmission right of way and towers, all other lines could be lost under a storm situation. Closed per STP slide 10, ABWR SC meeting 6/8/10.	6/8/10

ACRS ABWR Subcommittee Action Items

25	3/18/10	State if there are single or double closing coils on switchyard breakers. (Stetkar)	Chapter 8	FSAR	STP	There may be additional questions if the answer is "single." 6/8/10 ABWR SC – STP slide 11, answer is "single closing coil." Stetkar question-demonstration of capability to reclose upon (single?) failure of DC power under worst switchyard fault to restore one offsite power supply. Closed per STP slide page 12 presented at 6/24/10 meeting.	6/24/10
26	3/18/10	Provide switchyard control system backup battery discharge time. (Stetkar/Sieber)	Chapter 8	FSAR	STP	Breakers may not close after LOOP clears if battery exhausted. Batteries sized to operate 10 hrs, expected life 15-20 yrs.- re: STP slide 12 at 6/8/10 ABWR SC.	6/8/10
27	3/18/10	Performance of switching logic under various electrical transients. (Stetkar)	Chapter 8	FSAR	STP	STP may want to address it beyond COL while detailed design is finalized. STP slides 14-16, 6/8/10 ABWR SC meeting. Stetkar to review and decide if sufficient to close action item. See STP slides 7-11 on Chapter 8 at 10/20/10 ABWR SC.	.10/20/10-closed
28	3/18/10	NRO to address how the SBO rule requirements are being ensured after operator action time is factored into the scenario with STP specification of "less than 10 minutes CT startup time." (Stetkar)	Chapter 8	SER	NRO	As STP chose not to do SBO coping analysis, they have to demonstrate that the CTs are capable of powering shutdown buses within 10 minutes of the onset of SBO (10 CFR 50.63 (c)(2)). The scenario involves needed operator action to shed/load buses before breaker can be closed. EDO letter, 9/1/10 – discuss at next Chapter 8 briefing	10/20/10 – See NRO slides on Chapter 8, page 4 and backup-closed.

ACRS ABWR Subcommittee Action Items

29	3/18/10	Address qualification of submerged 345 KV cables. (Brown)	Chapter 8	FSAR	STP	High water table prompted question on qualified life. STP slide 13, 6/8/10 ABWR SC meeting.	6/8/10
30	3/18/10	Address when DRAP list will be effectively populated and staff review is completed. How does staff ensure the DRAP list and the process (COLA vs. ITAAC) related to it are acceptable? (Stetkar)	Chapter 17	FSAR/SER	STP/NRO	With evolving plant PRA and DRAP, members were concerned that ITAAC may not be an appropriate closer mechanism for DRAP list. STP slide 20 6/8/10 ABWR SC meeting –List and justifying analysis to be available to ACRS 3 rd quarter 2011. Staff to address the ACRS review timing question. At the 6/24/10 ABWR SC meeting the staff discussed their review of evolving DRAP list thru an audit (3 rd quarter of 2010 and inspection late 2011. STP/NRO will brief ABWR SC in future, time to be determined. <u>10/20/10 ABWR SC STP slide 14 – Provided draft DRAP list, staff to provide audit report when available. Future presentation by STP on process with examples.</u>	
31	3/18/10	4.16 kV winding in CTG1 bus could carry two PIP buses together with one safety bus (Stetkar)	Chapter 8	FSAR/SER	STP	STP to confirm at a future meeting. STP slide 17 6/8/10 ABWR SC - confirmed	6/8/10

May 20, 2010 Subcommittee Meeting

ACRS ABWR Subcommittee Action Items

32	5/20/10	During the presentation on preoperational testing, members Stetkar and Brown noted that they had identified “overlap testing” requirements for various systems but could not identify end-to-end testing requirements.	Chapter 14	FSAR	STP	STP to address at a future meeting. Closed per STP slide page 13 &14 presented at 6/24/10 meeting.	6/24/10
33	5/20/10	Dr. Abdel-Khalik wanted to know the steam velocity and how it compares to other plants that have undergone extended uprate.	Chapter 14	FSAR	STP	STP to address at a future meeting. Re: STP slide 15 of 10/20/10 ABWR SC presentation on Action items.	10/20/10 closed
34	5/20/10	Dr. Abdel-Khalik wants the staff to provide reports submitted regarding reactor flow induced vibration for review by the Committee, and a briefing on their review of the predictive analysis.	Chapter 14 Section 3.9.2	Tech. Report	NRO		
35	5/20/10	Member Brown raised the issue of cyber-security ITAAC and whether or not it should be included in Chapter 14.	Chapter 14	ITAAC	NRO	NRO staff to address at a future meeting	
36	5/20/10	Dr. Stetkar pointed out a possible inconsistency between the diagram of the backup SCRAM control circuit and the description of that circuit in the text.	Chapter 14	FSAR/SER	STP/NRO	STP and NRO staff to address at a future meeting. Text clarification withdrawn by STP. Re: Slide 16, 17 of 10/20/10 ABWR SC briefing on Action Items.	10/20/10 closed

June 8, 2010 Subcommittee

ACRS ABWR Subcommittee Action Items

37	6/8/10	Compile ABWR SSAR in a CD and provide to members	-	DCD	ACRS Staff	CD mailed to the members during the week of 6/13/10	Closed
38	6/8/10	STP White paper on PRA screening process for plant changes – provide to members	Chapter 19	FSAR	STP	E-mailed to members on 6/10/10 and a CD provided on 6/11/10.	6/10/10
39	6/8/10	2006 MCR dam failure screening assessment	Chapter 19	FSAR	STP	E-mailed to members on 6/10/10 and a CD provided on 6/11/10.	6/10/10
40	6/8/10	Dam failure risk – Baecher paper, US Bureau of Reclamation data and Army Corps of Engineer report used in SER	Chapter 19	SER	NRO	E-mailed to members on 6/10/10 and a CD provided on 6/11/10	6/10/10
41	6/8/10 <u>10/20/10</u>	DW flood valve failure modes other than failure of fusible links considered in FSAR. <u>Operating experience? A small leak during normal operation would go undetected thus accumulating water in the lower drywell. Toshiba test results. (Bley)</u>	Chapter 19 <u>Section 9.5.12</u>	FSAR	STP	<u>STP Slide 18, ABWR SC 10/20/10 provided results of a FEMA. Additional question on valve leak during normal operation (10/20/10).</u>	
June 23-24, 2010 Subcommittee Meeting							
42	6/23	Main turbine missile analysis and maintenance program will be submitted to the NRC <u>within</u> 3 years after issuance of COL. ACRS wanted to be informed about staff's decision-making regarding adequacy of program.	Chapter 10, 3	SER	STP/NRO	The turbine design will meet acceptance criteria of SRP 3.5.1.3 and RG 1.115, will meet the minimum requirements in Table 3.5-1, STP Commitment. 3.5-1. Expected to be addressed in next Chapter 3 <u>10</u> presentation.	<u>At the 10/20/10 ABWR SC meeting STPNOC noted that documents may be submitted sooner.</u>
43	6/23	Documented basis for adequacy of turbine rotor integrity related to FATT and Cv departure	Chapter 10	FSAR/SER	STP/NRO	EDO letter, 9/1/10 – discuss resolution at future briefing.	

ACRS ABWR Subcommittee Action Items

44	6/23	NRO process for review of Tier 2 departures (review if qualifies as T2, not the technical adequacy)	Generic	SER	ACRS	ACRS to decide if they want to raise any issue regarding it.
45	6/23, ACRS Letter 8/9/10	Provide RAI response regarding redundancy and diversity of turbine overspeed sensors including power supply – ITAAC very general in scope	Chapter 10	RAI resp.	STP	<p>Member Brown's question – STP letter U7-C-STP-NRC-100106, dated May 10, 2010, was provided to Mr. Brown. His review noted that the DAC and ITAAC Acceptance Criteria, as they are presently constituted in the various DCDs and COLAs Tier 1 Sections, lack identification of the attributes and types of analyses (including what should be included in the analyses) necessary for inspectors of any training to confirm that the systems meet the rules and guidance that are specified in the DCD Tier 1 and 2 sections.</p> <p>EDO letter 9/10/10 – Resolution will be presented with final SE with no OI.</p>
46	6/24	Identify and justify assumptions regarding ppm Boron in solution used in chemical effects analysis (GSI 191 ECCS Strainer)	Chapter 6	FSAR	STP	Important contributor regarding concentration of AI in SP (ECCS recirculating water)
47	6/24	Downstream effects: Future briefing on test and analysis (Lic. Condn.) Basis for assuming destroyed fiber (10% of 1 ft ³) reaching fuel	Chapter 6 Chapter 4	FSAR/SER	STP/NRO	STP to brief by 4/2011

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48	6/24	Provide three ERI reports used in staff review of containment analysis	Chapter 6	SER	NRO	<u>Staff provided reports, to be given to members before next Chapter 6 briefing.</u>
49	6/24	Future briefing on design of vacuum breaker shield	Chapter 6	FSAR	STP	To address loading and height of water level
50	6/24, EDO letter 9/10/10	Presentation on Toshiba Technical reports - strainer design and pool swell analyses	Chapter 6	FSAR	STP/NRO	NRO and ACRS staff to schedule
51	EDO letter 9/10/10	Staff to update ACRS after developing guidance on the process of addressing Part 21 reports in new reactor licensing.	ACRS Letter dated 8/9/10	COLA/DC review process	NRO	NRO to advise ACRS staff when such briefing can be scheduled.
52	EDO letter 9/10/10	Staff to brief ACRS on Long term cooling	SRM dated 5/8/08	COLA	NRO	NRO and ACRS staff to schedule
<u>53</u>	<u>10/20/10</u>	<u>NRO to submit for ACRS review technical report on flow induced vibration</u>	<u>Section 3.9.2</u>	<u>SER</u>	<u>NRO</u>	<u>This technical report is due from STPNOC in later 2010.</u>
<u>54</u>	<u>10/20/10</u>	<u>Basis for STP being bounded by the DCD wind loading and design basis hurricane, i.e., basis for 3 second gust wind loading and the 100 year history record of hurricane within 50 miles of site (Stetkar).</u>	<u>Section 3.3 Chapter 2</u>	<u>FSAR</u>	<u>STP</u>	<u>STPNOC to address at 11/30 ABWR SC meeting.</u>
<u>55</u>	<u>10/20/10</u>	<u>Basis for the use of Regulatory Guide 1.76 Region 2 parameters</u>	<u>Section 3.3 Chapter 2</u>	<u>FSAR</u>	<u>STP</u>	<u>STPNOC to address at 11/30 ABWR SC meeting.</u>

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<u>56</u>	<u>10/20/10</u>	<u>Confirm rail/truck large equipment access bay door in reactor building is water tight. (Stetkar)</u>	<u>Section 3.4 Chapter 2</u>	<u>FSAR</u>	<u>STP</u>		
<u>57</u>	<u>10/20/10</u>	<u>Confirm levels of water-proofing of foundation of RSW pump house. (Stetkar)</u>	<u>Section 3H.6.6.4</u>	<u>FSAR</u>	<u>STP</u>		
<u>58</u>	<u>10/20/10</u>	<u>Clarify various water level parameters discussed in Chapter 3 and how they were derived. (Stetkar)</u>	<u>Section 3.4</u>	<u>FSAR</u>	<u>STP</u>		
<u>59</u>	<u>10/20/10</u>	<u>A value of 1×10^{-2} per year per plant was chosen as a conservative value for the product of strike and damage probabilities- provide basis.</u>	<u>Section 3.5, Chapter 10</u>	<u>FSAR</u>	<u>STP</u>	<u>STP to address at next Chapter 10 briefing.</u>	
<u>60</u>	<u>10/20/10</u>	<u>Types of commercial aircraft and frequency considered. (Stetkar)</u>	<u>Sections 3.5, 2.3</u>	<u>FSAR</u>	<u>STP</u>	<u>RAI response dated 9/14/09 provided to members.</u>	<u>10/25/10</u>
<u>61</u>	<u>10/20/10</u>	<u>Justify deviation from SRP related to wave height.</u>	<u>Chapter 2</u>	<u>FSAR</u>	<u>STP</u>	<u>Open item in SER</u>	
<u>62</u>	<u>10/20/10</u>	<u>The basis and application of the 30 minute response time upon a single passive failure of the RSW piping and how the analysis justify a 30 day supply for the UHS while accounting for the pipe failure. (Stetkar)</u>	<u>Section 9.2.5.5.2</u>	<u>FSAR</u>	<u>STP</u>		

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<u>63</u>	<u>10/20/10</u>	<u>The basis for approx. 17 meter RSW pump NPSH and how it was calculated (specifically at end of 30d).</u>	<u>Section 9.2.15.2</u>	<u>FSAR</u>	<u>STP</u>
<u>64</u>	<u>10/20/10</u>	<u>Generation of spurious signals in digital I&C cabinets containing only fiber optic cables due to heat related to fire in the room. (Stetkar)</u>	<u>Section 9.5.1</u>	<u>FSAR</u>	<u>NRO</u>