

ENCLOSURE 4

Westinghouse Non-Proprietary Class 3

Submittal of AP1000 DCD Revision 18 Update Summary of New Change Notices –
May 20, 2010 Presentation - (Non-Proprietary)



AP1000 DCD Revision 18 Update

Summary of New Change Notices

May 20, 2010



Safety Brief

- Fire exit and re-grouping location
- Trip hazards
- Opening door hazard



Agenda

- Meeting Objectives
- Background
- Design Change Notice discussion



Meeting Objectives

- Conduct technical discussions on design change notices as submitted in recent letters (April 26, May 10 and May TBD)
- Identify commitments, actions and dates for closure



Background

- Important Milestones
 - All DCD Rev. 18 input submitted to NRC by July 30, 2010
 - Westinghouse submittal of DCD Rev. 18 by January, 2011
 - AP1000 Design Certification Amendment (Revision 18) by September, 2011

- Manage design change scope in accordance with ISG-11



Background...

- Recently submitted design changes
 - Letter dated April 26, 2010 – ISG-11 changes from Jan 20th letter (Change Notice #)
 - CN 1– PWS valve and piping materials
 - CN 5 – Containment girder and polar crane
 - CN6 – CCS relief valve sizing
 - CN 8 – Squib valve actuation time adjustments
 - CN 9 – CCS relief valve discharge headers
 - CN 14 – Fuel transfer tube code change
 - CN 55 – SFS valve position indications

Background...

- Letter dated May 10 – design changes necessary to support the AP1000 Licensing Finalization schedule
 - CN 58 – SG thermal hydraulic data
 - CN 59 – Ancillary DG starting current
 - CN 60 – Reactor trip for PRHR transient
 - CN 61 – Automatic rod withdrawal prohibit
 - CN 62 – RV Support System
 - CN 63 – DAS PRHR reactor/turbine trips
 - CN 65 – FWS/CVS isolation for SGTR event
- Letter dated no later than May 28
 - CN 64 – Post-DBA transmitter requirements
 - CN 66 – Gas intrusion (Generic Letter 2008-01)

CN58

Revision of AP1000 Steam Generator Thermal-Hydraulic Data Report



- CHANGE NOTICE DESCRIPTION

- An alternative calculation of the steam nozzle loss factor results in an increase in the value from 0.11 to 0.17. This results in a loss of 4-6 psi steam pressure and an increase in moisture content of 0.03%. Values in the thermal-hydraulic report are revised.

- REASON FOR DESIGN CHANGE

[—] a,c



CN58

Revision of AP1000 Steam Generator Thermal-Hydraulic Data Report



- CN58 DCD MARKUPS
- ACTION NEEDED FOR CLOSURE
 - NRC Review by xx/xx/10?
 - WEC Response by xx/xx/10?



CN59

Resizing Ancillary Diesel Generator for Starting Motor Current and Ancillary Diesel Fuel Oil Storage Tank Room Ventilation



- CHANGE NOTICE DESCRIPTION

- Upgrade the 35kW Ancillary Diesel Generator to 80kW. Revise the Temporary Electric Power Supply Room to place fuel tank one level down beneath grating.
- Extend exhaust ductwork to new fuel tank location. Duct the radiator exhaust to the outside through hurricane louvers, and provide recirculation bypass to control the room temperature.

- REASON FOR DESIGN CHANGE

[
–
] a,c

- The resulting room layout reconfiguration and fuel tank relocation beneath a floor grate required improved exhaust of room air and radiator heat during operation.



CN59

Resizing Ancillary Diesel Generator for Starting Motor Current and Ancillary Diesel Fuel Oil Storage Tank Room Ventilation



- CN59 DCD MARKUPS (Security Related Information Withheld from Public)
- ACTION NEEDED FOR CLOSURE
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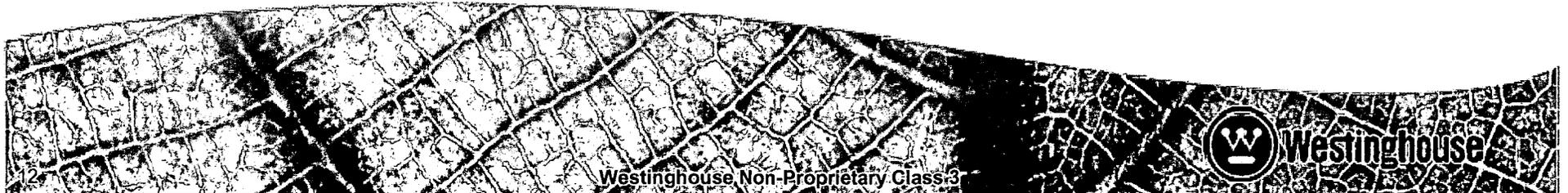
CN60

Addition of Reactor Trip to Mitigate the Inadvertent PRHR Transient



- CHANGE NOTICE DESCRIPTION

- A reactor trip will be generated to mitigate the inadvertent PRHR (Passive Residual Heat Removal) actuation transient following the inadvertent opening of one of the two PRHR HX discharge valves, V108A/B. The design change will use the existing close position indicator and add three class 1E valve position indicators to give a total of four closed signals per valve. This configuration is necessary for the “two of four” logic required for a reactor trip signal.
- In-service testing of V108A/B has been changed from once every quarter to every cold shutdown.



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Addition of Reactor Trip to Mitigate the Inadvertent PRHR Transient



- REASON FOR DESIGN CHANGE

[—] a,c

- In-service testing frequency is changed to protect the reactor from experiencing the inadvertent PRHR actuation event due to operator error during the in-service testing. By reducing the frequency of in-service testing of these valves, the frequency of the inadvertent PRHR actuation event is expected to be reduced.



CN60

Addition of Reactor Trip to Mitigate the Inadvertent PRHR Transient



- CN60 DCD MARKUPS
- ACTION NEEDED FOR CLOSURE
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CN61



Implementation of P-17 for Rod Withdrawal Prohibit

- CHANGE NOTICE DESCRIPTION

- The current design requires the rate of change in nuclear power (P-17) signal coincident with the Beacon Unavailable Signal to generate the automatic rod withdrawal prohibit. This change would remove the Beacon Unavailable Signal and the associated AND gate to enable an automatic rod withdrawal prohibit solely on the P-17 signal.

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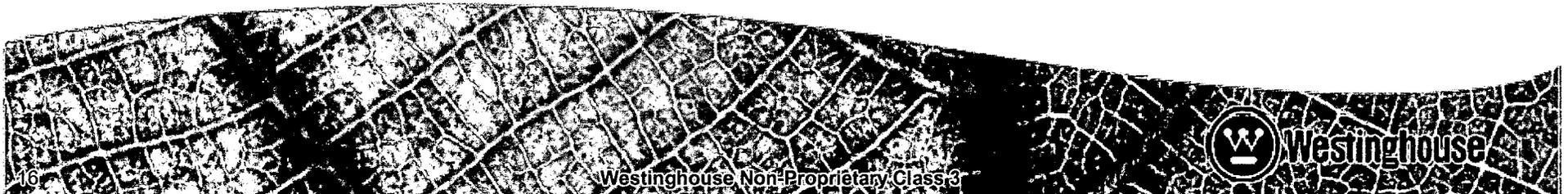


CN61

Implementation of P-17 for Rod Withdrawal Prohibit



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CN62

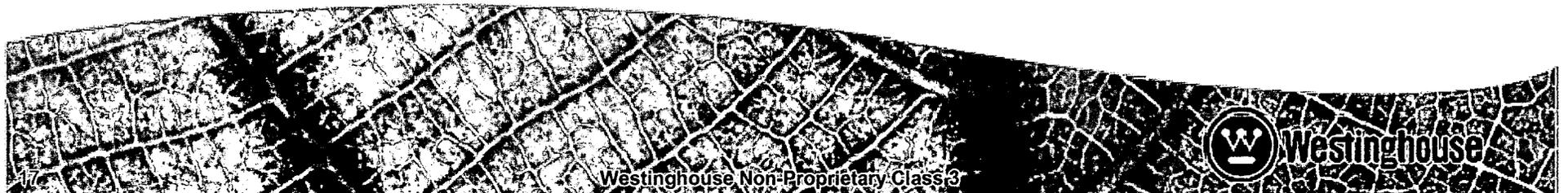
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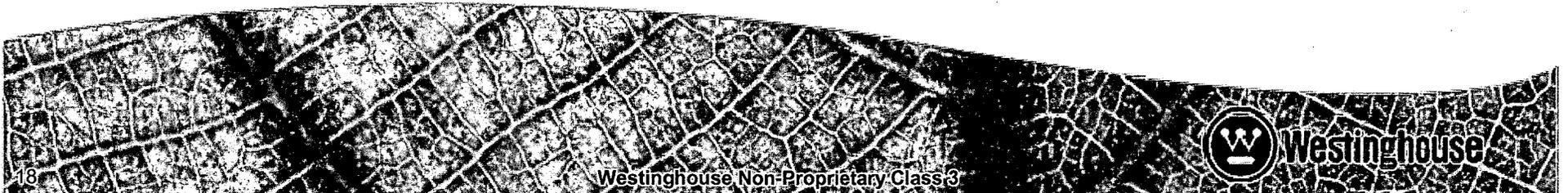


CN62

Redesign of Reactor Vessel Support System



- CN62 DCD MARKUPS
- ACTION NEEDED FOR CLOSURE
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 - WEC Response by xx/xx/10?



CN63

DAS PRHR Logic Change

- CHANGE NOTICE DESCRIPTION
 - A reactor trip and turbine trip are being added to the functional logic of DAS (Diverse Actuation System) high hot leg temperature automatic actuations. The trip will be initiated by 2 of 2 sensor output from the hot legs.
- REASON FOR DESIGN CHANGE
 - The reactor trip is necessary to align the design with the PRA assumptions.
- CN63 DCD MARKUPS
- ACTION NEEDED FOR CLOSURE
 - NRC Review by xx/xx/10?
 - WEC Response by xx/xx/10?



CN65

FWS/CVS Isolation on SGS High Alarm



- CHANGE NOTICE DESCRIPTION

- An “AND” logic is being added to the PMS (Protection and Safety Monitoring System) software to isolate the FWS (Main and Startup Feedwater System) and CVS (Chemical and Volume Control System) earlier in the SGTR (Steam Generator Tube Rupture) transient sequence in order to maintain the margin to steam generator overfill. The Steam Generator Narrow Range Level High coincident with Reactor Trip limiting setpoint is changed to 85% of narrow range level span.

- REASON FOR DESIGN CHANGE

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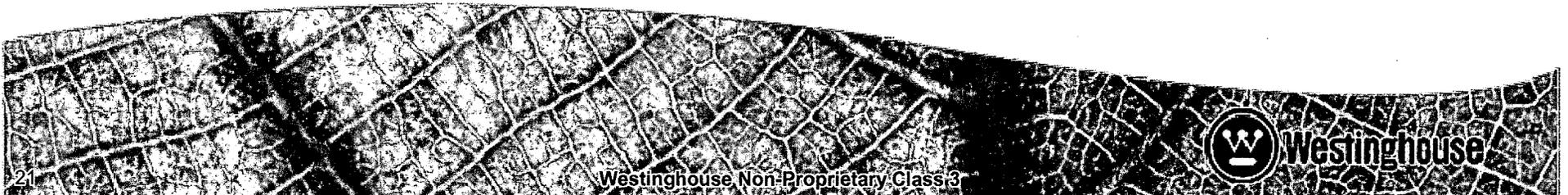


CN65

FWS/CVS Isolation on SGS High Alarm



- CN65 DCD MARKUPS
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CN64



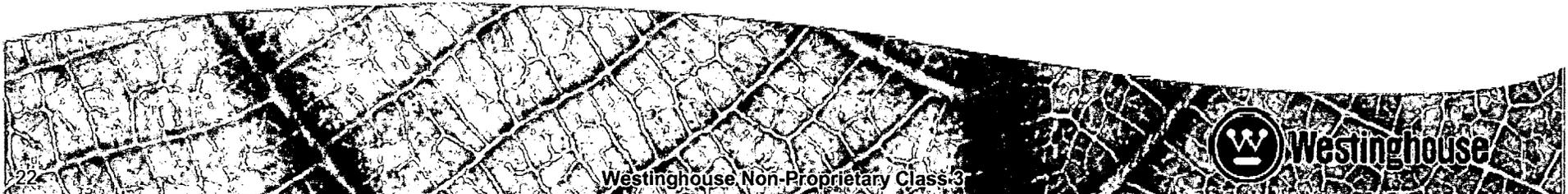
Changes to Post-DBA Transmitter Requirements

- CHANGE NOTICE DESCRIPTION

- (1) Move 7 Containment Pressure Transmitters outside of containment via four new containment penetrations.
- (2) Move 18 Category 1 PAMS (Post Accident Monitoring System) Transmitters above the maximum DBA flood level.
- (3) Reduce Post-Accident Operability time for 18 Category 2 PAMS Transmitters from 4 months to 2 weeks.

- REASON FOR DESIGN CHANGE

- (1) Relocation of Containment Pressure Transmitters outside of containment will allow direct measurement of differential pressure across the containment shell, which is the parameter of interest. It also allows those transmitters to be located in a mild environment.

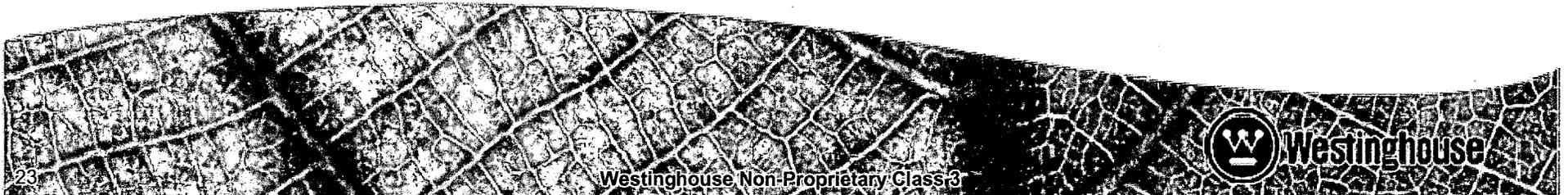


CN64



Changes to Post-DBA Transmitter Requirements

- REASON FOR DESIGN CHANGE
 - (2) Performance and qualification of transmitters will be improved if they are not submerged after a postulated DBA (Design Basis Accident).
 - (3) The instruments monitor Category 2 parameters which are not primary post-accident parameters and are therefore not required to be qualified long term following a DBA.
- CN64 DCD MARKUPS
- ACTION NEEDED FOR CLOSURE
 - NRC Review by xx/xx/10?
 - WEC Response by xx/xx/10?



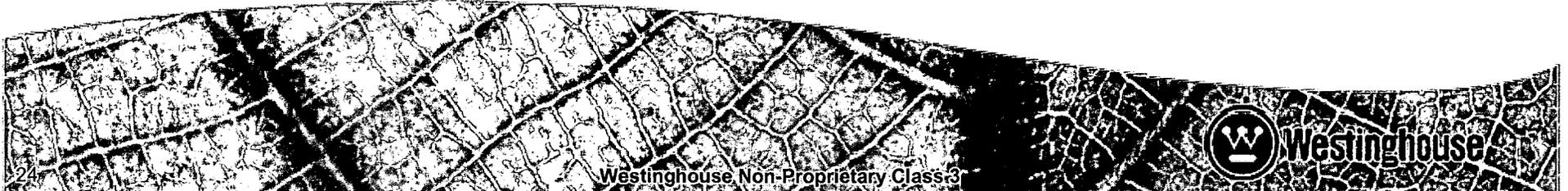
CN66

PXS Changes Due to Gas Accumulation



BACKGROUND

- Performed a gas intrusion assessment of AP1000 passive safety systems to address Generic Letter 2008-01 and Interim Staff Guidance DC/COL-ISG-019
 - Planned system reviews for gas venting high points / drain low points were already in progress before the July 09 ACRS meeting and the November 09 ISG
- Evaluated 13 different safety system line segments following NEI 09-10
 - Passive Core Cooling
 - Passive Containment Cooling
 - RCS Automatic Depressurization
- Safety system and Technical Specification DCD changes for gas void prevention / monitoring
 - Installed six (6) 1-inch maintenance vents in 4 IRWST squib valve outlets
 - Installed two (2) 1-inch maintenance vents in one containment sump recirculation line
 - Moved the accumulator discharge connection tee to be above the IRWST connection tee in the vertical portion of the DVI line
 - Revised Tech Specs 3.5.6-3.5.8 to reflect IRWST squib valve outlet high point operability (similar to existing Actions / SRs for CMT and PRHR high points)



CN66

PXS Changes Due to Gas Accumulation



GAS INTRUSION ASSESSMENT

- The AP1000 safety system lines were evaluated following the methodologies used by Westinghouse to assess operating plants for gas intrusion
 - Followed NEI 09-10 guidance to assess GL 2008-01 concerns using the same Westinghouse team performing this assessment for operating plants
 - Elements of the AP1000 gas intrusion assessment
 - Used P&ID and isometrics to identify high point locations in safety lines
 - Identified conditions when gas intrusion may occur (such as maintenance restoration or accident phenomena)
 - Identified mitigation strategies (added high point vents used for startup and post-maintenance venting)

AP1000 line sloping and gas intrusion vent effectiveness can be verified throughout the design / construction / installation processes rather than only an as-built reconciliation for the lines identified in the P&IDs from the gas intrusion assessment

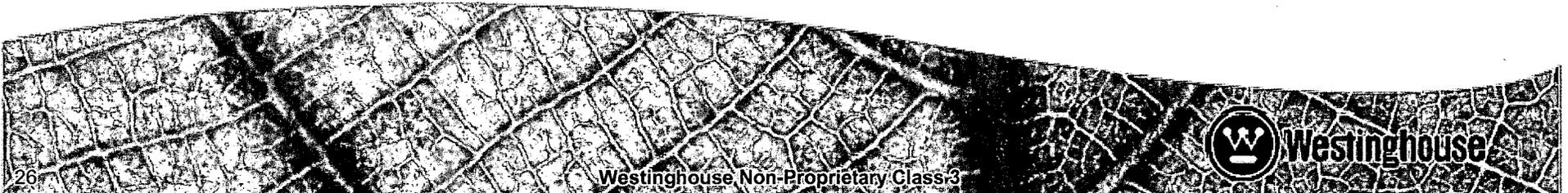
CN66

PXS Changes Due to Gas Accumulation



- CHANGE NOTICE DESCRIPTION

- Add 8 Class B/C one-inch manual maintenance valves in 6 PXS locations
 - 4 IRWST squib valve outlets (vents connect to CMT vents to RCDT)
 - 2 high points in one of the containment sump recirculation lines
- Add 4 IRWST squib valve outlet high point pipe stubs and redundant level switches (similar to CMT / PRHR inlet high point pipe stub configuration)
 - Add new IRWST Tech Spec OPERABILITY Surveillances / Actions
- Moved the accumulator discharge connection tee to be above the IRWST connection tee in the vertical portion of the DVI line
 - Would otherwise require 4 active high-point assessment vent valves
- Also included 20 required low-point assessment drain valves for PXS lines
 - 14 PXS / 5 RNS / 1 RCS manual 1-inch drain valves



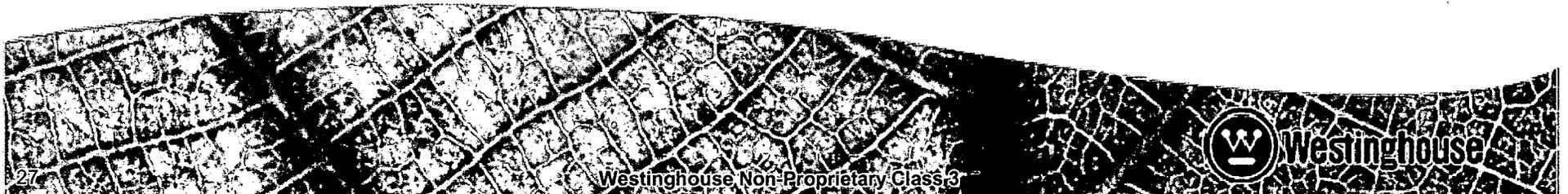
CN66

PXS Changes Due to Gas Accumulation



FUTURE GAS INTRUSION ACTIVITIES

- Interact with the NRC staff to resolve gas intrusion assessment
 - Text will be added to appropriate DCD sections to generically address gas intrusion concerns from GL 2008-01 and/or ISG-019
- Update the ACRS on gas intrusion assessment conclusions
- Update DCD 6.3 to reflect gas intrusion prevention (in addition to existing DCD 6.3.2.1.x high point discussions)
 - Add text to describe periodic plant surveillance and venting procedures to verify gas void elimination during plant startup and operations



CN66

PXS Changes Due to Gas Accumulation

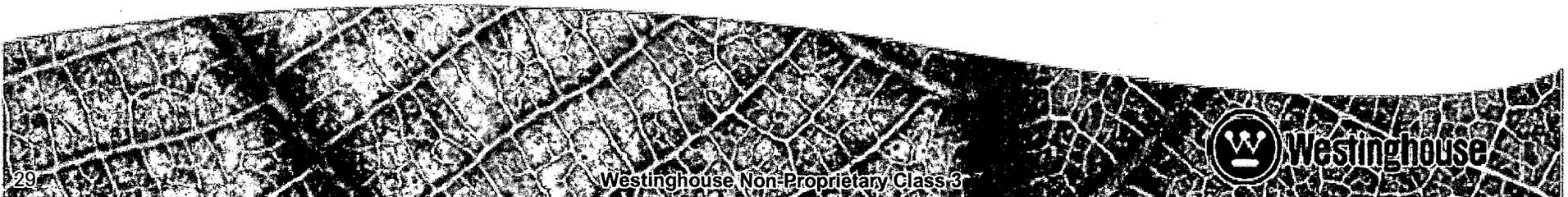


- CN66 DCD MARKUPS
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 - NRC Review by xx/xx/10?
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January 20 Letter Changes

QUESTIONS?



CN1

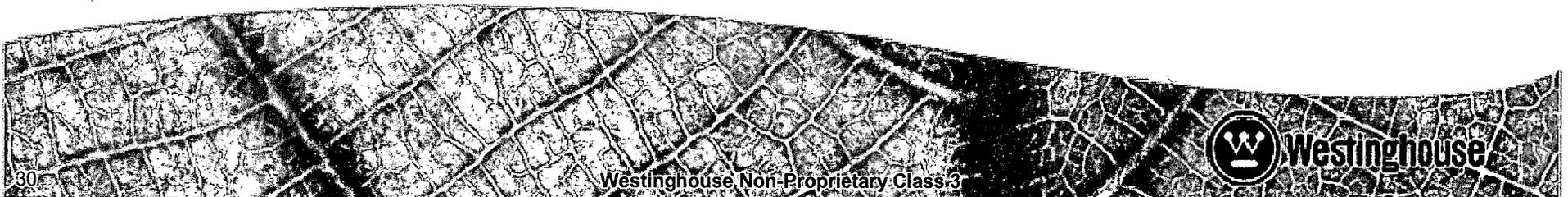
PWS Valve and Piping Material Changes

- CHANGE NOTICE DESCRIPTION

- Several changes are made to PWS (Potable Water System) piping relative to the MCR (Main Control Room) including: L319 made Safety Class C, change pipe class at V418 to JBC, delete check valve V418 and add ball valve V418, add a loop seal constructed of seismic piping material that remains filled after a seismic event, L418 and L319 are increased from 1" to 2," add V497 at the outlet of the PWS tank to isolate during maintenance, add a vacuum breaker downstream of the loop seal.

- REASON FOR DESIGN CHANGE

[—] a,c



CN1

PWS Valve and Piping Material Changes

- CN1 DCD MARKUPS
- ACTION NEEDED FOR CLOSURE
 - NRC Review by xx/xx/10?
 - WEC Response by xx/xx/10?



CN5

Steel Containment Vessel Girder and Polar Crane Rail Clip Design



- CHANGE NOTICE DESCRIPTION

- (1) The thickness of the girder top plates increased from 1.5” to 1.75”.
- (2) Remove the Gantrex Pad and replace with bolted clip design.
- (3) The Steel Containment Vessel girder is extended inward by 2.75”.

- REASON FOR DESIGN CHANGE

[—] a,c



CN5

Steel Containment Vessel Girder and Polar Crane Rail Clip Design



- REASON FOR DESIGN CHANGE

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] a,c

- (3) Tolerance requirement of the Polar Crane rail is much tighter than the construction tolerance for the Steel Containment Vessel girder.

- CN5 DCD MARKUPS

- ACTION NEEDED FOR CLOSURE

- NRC Review by xx/xx/10?
- WEC Response by xx/xx/10?



CN6

CCS Relief Valves V302A/B Size Change

- CHANGE NOTICE DESCRIPTION
 - RNS heat exchanger CCS (Component Cooling Water System) side relief valves increased in size from 1" x 1" to 3" x 4" to meet required flow capacity requirement. CCS surge tank vent line increased in size from 2" to 3" NPS.
- REASON FOR DESIGN CHANGE
 - Changes required to protect against over pressurization of the RNS (Normal Residual Heat Removal System) heat exchanger and surge tank in the event of heat exchanger tube leak.
- CN6 DCD MARKUPS
- ACTION NEEDED FOR CLOSURE
 - NRC Review by xx/xx/10?
 - WEC Response by xx/xx/10?



CN8

Squib Valve Actuation Time Adjustments



- CHANGE NOTICE DESCRIPTION
 - A time delay of at least 5 seconds is incorporated in PXS actuation control for the automatic (and manual) actuation circuitry between the firing of the first and second valve for each pair of squib valves in the same process line. The same changes will be made on PXS containment sump recirculation squib valves for PMS controls only, since DAS controls already provide a separate manual actuation of squib valves in parallel path of the same process line.

- REASON FOR DESIGN CHANGE

[-] a,c



CN8

Squib Valve Actuation Time Adjustments

- CN8 DCD MARKUPS
- ACTION NEEDED FOR CLOSURE
 - NRC Review by xx/xx/10?
 - WEC Response by xx/xx/10?



CN9



Revisions to CCS Relief Valve Discharge Headers

- CHANGE NOTICE DESCRIPTION

- (1) Eliminate RNS heat exchanger relief valve discharge lines from thermal relief valve header.
- (2) Provide separate collection headers for RNS relief valve discharges.
- (3) Provide funnel collector for RNS heat exchanger relief valve discharge tailpieces that connects to main drain header in auxiliary building.

- REASON FOR DESIGN CHANGE

[—] a,c



CN9

Revisions to CCS Relief Valve Discharge Headers

- CN9 DCD MARKUPS
- ACTION NEEDED FOR CLOSURE
 - NRC Review by xx/xx/10?
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CN14

Fuel Transfer Tube Code Change

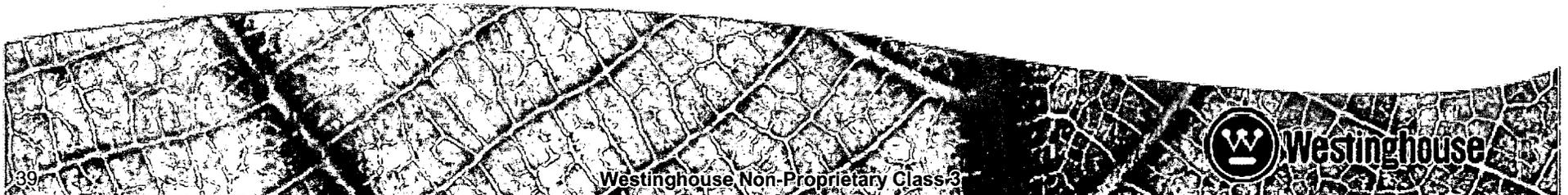


- CHANGE NOTICE DESCRIPTION

- Correctly assign the jurisdictional boundary classification for the FTT (Fuel Transfer Tube). The entire FTT will be fabricated as ASME Class MC, but only the actual primary containment pressure boundary will be identified jurisdictional Class MC. The remaining non-containment pressure boundary will be identified as MC optional.
- Designate the FTT blind flange as ASME Section III Class MC.

- REASON FOR DESIGN CHANGE

- The FTT is incorrectly classified as an ASME Class MC component.
- The FTT blind flange is incorrectly classified as an ASME Class 2 component.



CN14

Fuel Transfer Tube Code Change



- CN14 DCD MARKUPS
- ACTION NEEDED FOR CLOSURE
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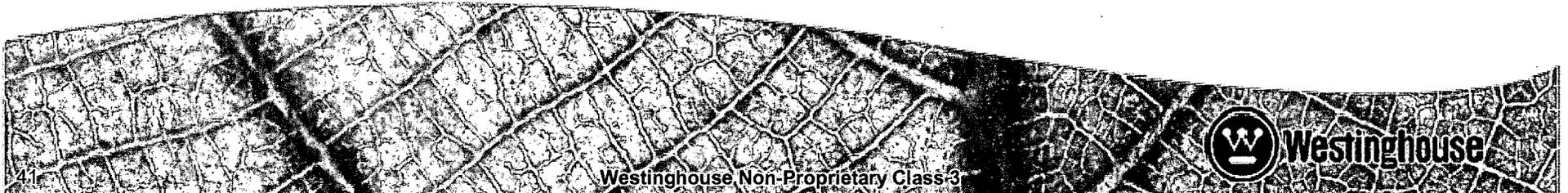


CN55

SFS Valve Design Changes Position Indication



- CHANGE NOTICE DESCRIPTION
 - Add 2 external Class 1E limit switches (open/closed) to valves SFS-PL-V031 (SFS (Spent Fuel Pit Cooling System) Refueling Cavity Drain to SGS (Steam Generator System) Compartment Isolation), SFS-PL-V033 (SFS Refueling Cavity Drain to Compartment Sump Isolation), and SFS-PL-V075 (SFS Containment Flood-up Isolation Valve)
- REASON FOR DESIGN CHANGE
 - SFS Valves V031 and V033 are required to have their position status displayed in the Main Control Room and monitored during plant shutdowns to prevent draining of the spent fuel pool. V075 is required to be locked open to provide a flow path during scenarios requiring containment flood up.



CN55

SFS Valve Design Changes Position Indication



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ENCLOSURE 5

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May 20, 2010" Presentation (used in portion of meeting open to the public)

AP1000 DCD Revision 18 Update

Summary of New Change Notices

May 20, 2010

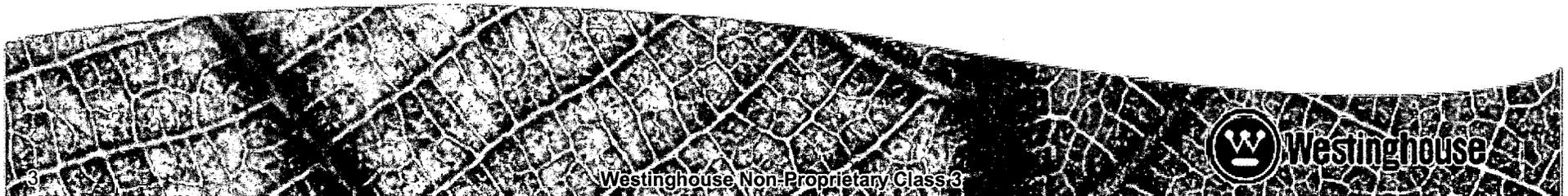
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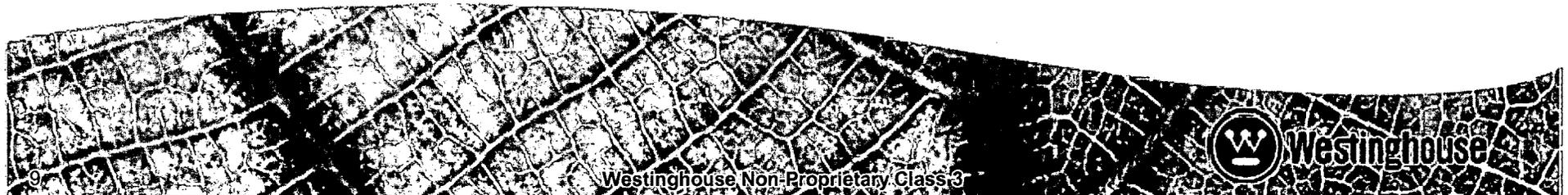


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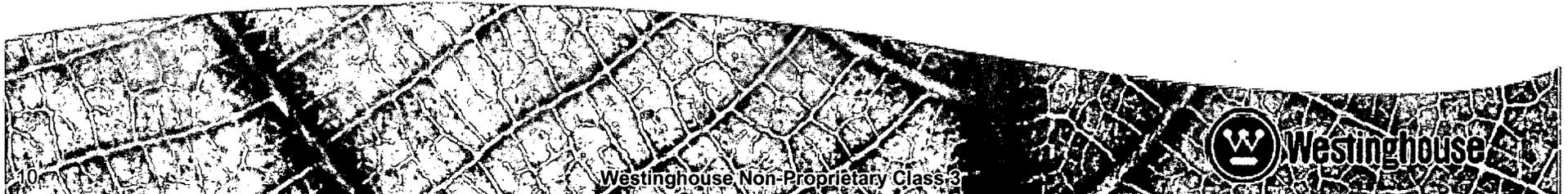


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CN65

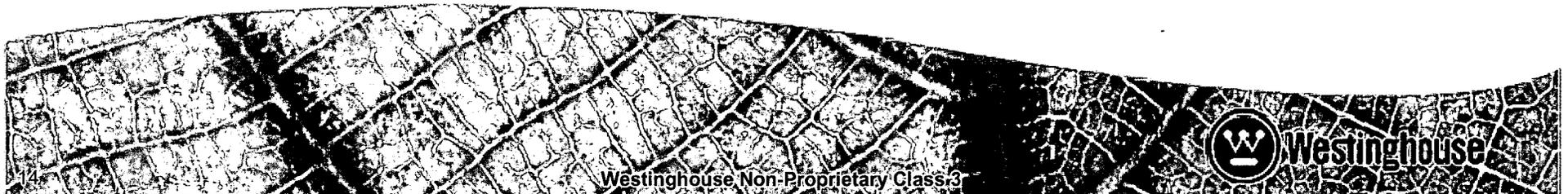
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